

**Meeting of the Central Valley Flood Protection Board
August 26, 2011**

**Staff Report – Levee Improvement EA/IS
Sacramento Area Flood Control Agency
South Sacramento County Streams, Sacramento County**

BOARD ACTION

Consider approval of Resolution No. 11-23 to:

1. Adopt the Mitigated Negative Declaration, Findings and Mitigation Monitoring Plan for the South Sacramento County Streams Morrison Creek – Union Pacific Railroad Flood Damage Reduction Project and delegate authority to the Executive Officer to execute the Notice of Determination;
2. Approve the Sacramento County Streams Morrison Creek – Union Pacific Railroad Flood Damage Reduction Project.

SPONSORS

The South Sacramento County Streams Morrison Creek – Union Pacific Railroad Flood Damage Reduction Project is a cooperative effort between the US Army Corps of Engineers (USACE), the Central Valley Flood Protection Board (CVFPB), and the Sacramento Area Flood Control Agency (SAFCA).

LOCATION AND BACKGROUND

The South Sacramento County Streams drainage basin lies southeast of the city of Sacramento. A portion of the basin lies within the Sacramento city limits, while the remainder is within the Sacramento County boundary. The Morrison Creek/UPRR project is located in the lower basin within the city of Sacramento limits, south of Meadowview Road and west of Franklin Boulevard. The Morrison Creek/UPRR Project is on the east side of Morrison Creek between the UPRR trestle that crosses Morrison Creek downstream to the confluence with Unionhouse Creek.

The South Sacramento County Streams drainage basin has a long history of flooding during heavy rainfall. Recent flooding in 1952, 1955, 1962, 1963, 1982, 1985, and 1986 damaged residences, businesses, and agricultural land and disrupted transportation and public facilities. Local runoff from the Morrison Creek watershed can cause flooding due to limited channel capacities and bridge restrictions and contributes to the flood

volume in the Beach-Stone Lakes area. In addition, overflow from the Cosumnes and Mokelumne rivers inundates Beach-Stone Lakes, causing high backwater on the study creeks, and threatening south Sacramento, the Pocket Area, and the Sacramento County Regional Sanitation District (SCRSD) treatment plant.

To address potential flooding hazards, the South Sacramento County Streams Project was authorized by the Water Resources Development Act of 1999. The selected plan, described in the Final Feasibility Report (prepared in 1998), includes a combination of flood protection features including raising and extending levees, the installation of concrete floodwalls, and modifications to existing channel geometry.

In 1998 the USACE and SAFCA prepared a joint EIS/EIR addressing flood protection improvements on the streams within the Morrison Creek Stream Group in accordance with CEQA and NEPA (State Clearinghouse No. 1997102056). The USACE completed the Final EIS/EIR, recognizing that changes to the project may occur during design. SAFCA certified the completion of the EIS/EIR in April 2000 and the USACE signed the Record of Decision (ROD) in June 2000.

Flood hydrology studies were found to need revision and updating. As a result of the revision, SAFCA and the USACE developed a series of refined design elements that would raise the level of flood protection within the Morrison Creek watershed to safely contain the 100 year flood event. Without these refinements, the area would not be provided with a minimum of 100 year flood protection. The USACE released an EA for NEPA compliance addressing the proposed refined design improvement measures in 2004. The EA concluded that the proposed design improvements would be implemented with no significant adverse effect on the environment, supporting a Finding of No Significant Impact (FONSI).

In 2004, SAFCA prepared a separate Supplemental EIR on the refined design improvements for CEQA compliance and adopted a Statement of Overriding Considerations pursuant to CEQA compliance for the 2004 Supplemental EIR at the time of project approval.

For the 3000-foot portion of the project along Morrison Creek at the Union Pacific Railroad (UPRR) the design has changed from the original approved project. The original design was to construct a floodwall on the west side of the UPRR tracks (water side) at Morrison Creek. Subsequent requirements caused the floodwall design to move to the east side of the UPRR tracks (land side) at Morrison Creek. This specific change of movement of the floodwall design from the water side of the UPRR tracks to the land side of the UPRR tracks is the subject of today's CVFPB item and resolution request.

DESCRIPTION

Portions of the South Sacramento County Streams Flood Protection Project were constructed over the years 2004-2008, and included levees on Morrison Creek from Franklin Boulevard to Unionhouse Creek. One segment of levee along Morrison Creek at the Union Pacific Railroad was not constructed as part of that contract – a 3000 foot section on the east side of the creek in South Sacramento, California (Plate 1).

The UPRR embankment, which is acting as the current flood protection for homes east of Morrison Creek does not meet USACE standards and is not providing adequate protection to homes in the area. With the levee improvements completed upstream, along the west bank of Morrison Creek, and along Unionhouse Creek, this section is the weak point in the system. This project would be constructed to provide a minimum of 100 year (a flood event with a 1% chance of occurrence in any given year) protection to residents east of Morrison Creek. Levee failure along any of the levees in the system would result in flooding of more than 14,000 acres.

The USACE proposes to construct approximately 3000 feet of floodwall, 100 feet of levee and 900 feet of retaining wall on the east side of the UPRR tracks. The USACE proposes to excavate existing material, construct the floodwall, retaining wall, and levee, and then reseed with native grasses. This project would be constructed in 2012. SAFCA is the CEQA lead agency on this project and has already approved the CEQA document and floodwall project at their Board meeting on August 18th. The CVFPB is a responsible agency for CEQA on this project. The Environmental Assessment/Initial Study (EA/IS), a Mitigated Negative Declaration, included in today's CVFPB item is a supplemental NEPA/CEQA document that addresses the design change from the water side of the UPRR tracks to the land side of the UPRR tracks. The supplemental EA/IS covers two project alternatives: 1) No Action and 2) a Floodwall on the Landside (east) of the UPRR tracks.

STAFF RECOMMENDATION

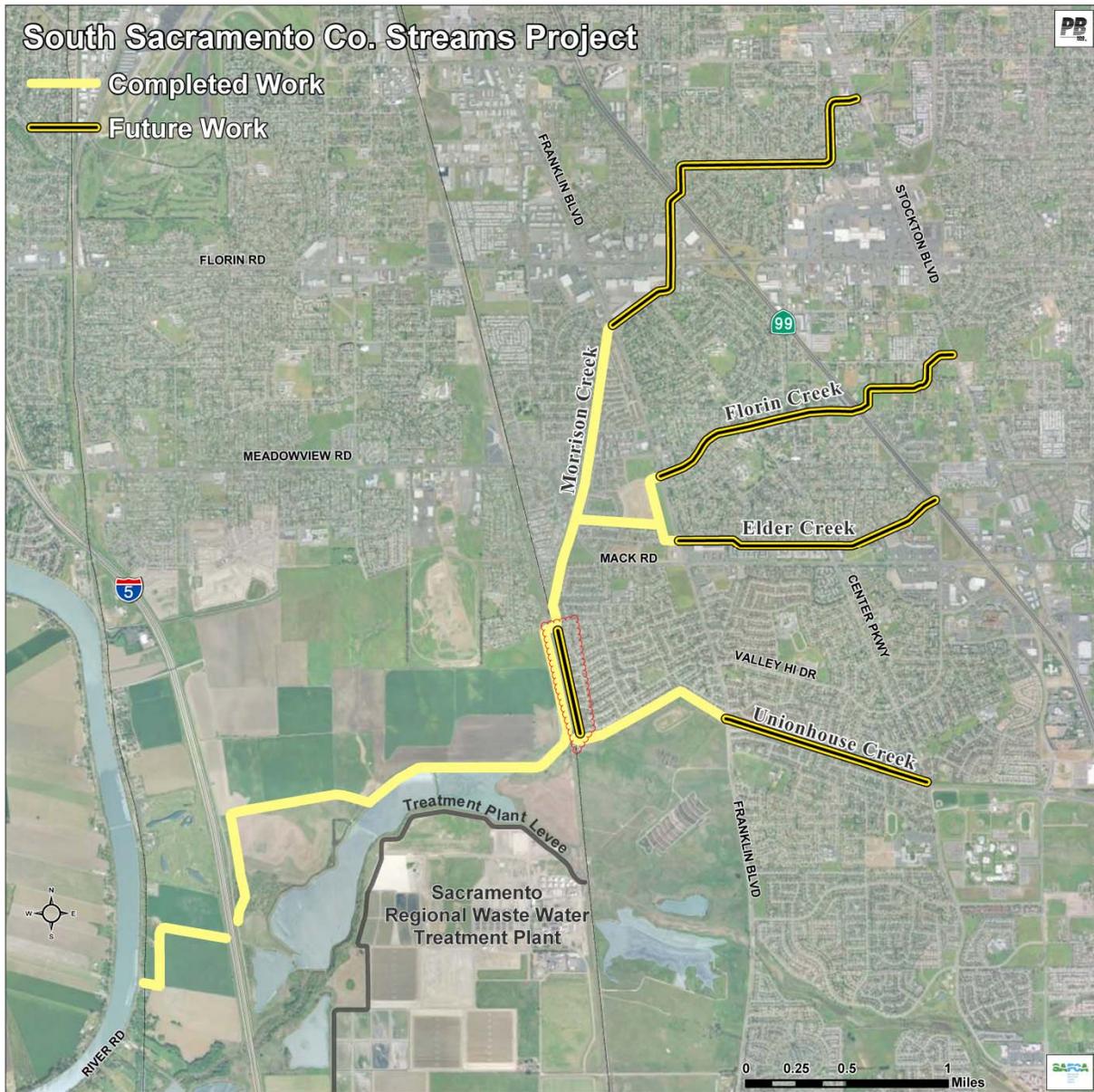
Staff recommends that the board approve Resolution No. 11-23 to adopt the EA/IS with its Mitigated Negative Declaration, Findings and Mitigation Monitoring Plan; delegates the authority to the CVFPB Executive Officer to sign the Notice Of Determination; and approves the South Sacramento County Streams Morrison Creek – Union Pacific Railroad Flood Damage Reduction Floodwall Project.

LIST OF ATTACHMENTS

- A. Resolution 11-23
- B. Environmental Assessment/Initial Study, Mitigated Negative Declaration
- C. Mitigation Monitoring Plan

Plate 1: Location Map

Morrison Creek – Union Pacific Railroad Flood Damage Reduction Floodwall Project
Shown circled in red



STATE OF CALIFORNIA
THE RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD
SOUTH SACRAMENTO COUNTY STREAMS PROJECT AS AUTHORIZED BY
WATER RESOURCES DEVELOPMENT ACT OF 1999
MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
RESOLUTION 11-23

WHEREAS, the Central Valley Flood Protection Board (Board), formerly known as The Reclamation Board, is the non-federal sponsor and California Environmental Quality Act (CEQA) responsible agency for the South Sacramento Streams County Project, Morrison Creek-Union Pacific Railroad Project, and the U.S. Army Corps of Engineers (USACE) is the federal sponsor and lead agency under the National Environmental Policy Act (NEPA) and Sacramento Area Flood Control Agency (SAFCA) is the local sponsor and lead agency under CEQA; and

WHEREAS, Congress authorized levee and channel improvements known as South Sacramento Streams County Project (Project) in the Water Resources Development Act (WRDA) of 1999, (Public Law 106-53); and

WHEREAS, the Morrison Creek-Union Pacific Railroad Project from the Union Pacific Railroad (UPRR) trestle to Unionhouse Creek is part of the larger Project, parts of which were constructed in 2005 except for a 3,000 foot section on the east side of the creek (Morrison Creek/Union Pacific Railroad Project); and

WHEREAS, the USACE determined that the UPRR embankment, which is acting as the current flood protection for homes east of Morrison Creek, does not meet USACE standards and is not providing adequate protection to homes in the area; and

WHEREAS, the Morrison Creek-Union Pacific Railroad Project includes the construction of approximately 3,000 feet of floodwall, 100 feet of levee, and 900 feet of retaining wall on the east side of Morrison Creek and the UPRR tracks; and

WHEREAS, in 1998 the USACE and SAFCA prepared and circulated a draft joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the South Sacramento County Streams Flood Protection Project, recognizing that future changes to the project may occur during the design; and

WHEREAS, SAFCA certified the completion of the EIS/EIR in April 2000, USACE signed the Record of Decision (ROD) in June 2000, and the Board, as CEQA responsible agency, adopted the EIR and approved the Project in May 2002; and

WHEREAS, the USACE released an Environmental Assessment (EA) addressing the proposed refined design improvement measures in 2004 and completed a Finding of No Significant Impact; and

WHEREAS, SAFCA prepared a separate Supplemental EIR in 2004 on the refined design, adopted a Statement of Overriding Considerations, and approved the project in February 2005; and

WHEREAS, the draft EA/IS for the South Sacramento County Streams Morrison Creek – Union Pacific Railroad Flood Damage Reduction Project is a supplemental NEPA/CEQA document intended to address design changes from the 1998 EIS/EIR; and

WHEREAS, the USACE and SAFCA circulated the draft EA/IS for the Project for public review from July 7, 2011 to August 5, 2011 addressing the construction of the floodwall on the east side of the UPRR tracks; and

WHEREAS, all comments on the draft EA/IS have been received, responses prepared, and included in a Final EA/IS, MND and Mitigation and Monitoring Plan and SAFCA as CEQA lead agency on August 18, 2011 has approved the Final documents and the project; and

WHEREAS, the Board, as a CEQA responsible agency, has considered the Final EA/IS and finds that on the basis of the whole record, including comments received on the draft EA/IS, and mitigation measures that have been included in the Project, there is no substantial evidence that the proposed Project will have a significant effect on the environment, and that the Mitigated Negative Declaration reflects the independent judgment and analysis of the Board.

NOW, THEREFORE, BE IT RESOLVED that the Board:

1. Adopts the Mitigated Negative Declaration as a CEQA responsible agency, Findings and Mitigation Monitoring Plan for the South Sacramento County Streams Morrison Creek – Union Pacific Railroad Flood Damage Reduction Project, and delegates authority to the Executive Officer to execute the Notice of Determination; and
2. Approves the Sacramento County Streams Morrison Creek – Union Pacific Railroad Flood Damage Reduction Project.

By: _____ Date: _____

Benjamin F. Carter
President

By: _____ Date: _____

Francis Hodgkins

Secretary

Approved as to Legal Form and Sufficiency

By: _____ Date: _____

Jeremy Goldberg

Staff Counsel

FINAL SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT/INITIAL STUDY

SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT



SACRAMENTO, CALIFORNIA

August 2011



US Army Corps
of Engineers



SAFCA
Sacramento
Area Flood
Control
Agency



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA, 95814-2922

Environmental Resources Branch

TO ALL INTERESTED PARTIES:

The draft Environmental Assessment/Initial Study (EA/IS) for the South Sacramento County Streams Morrison Creek-Union Pacific Railroad project (Morrison Creek-UPRR project) now is available for public review.

The overall purpose of the Morrison Creek-UPRR project is to provide flood risk reduction to residents east of Morrison Creek in Sacramento City. To implement the proposed improvements, the U.S. Army Corps of Engineers (USACE) would construct approximately 3,000 feet of flood wall, 100 feet of retaining wall, and 900 feet of levee along Morrison Creek on the land side of the UPRR tracks between the railroad bridge and Unionhouse Creek below Mack Road.

Printed copies of the EA/IS are available for review at the following locations:

- Valley Hi-North Laguna Library, 7400 Imagination Parkway, Sacramento, CA 95758
- Sacramento Public Library: Martin Luther King Jr. Branch, 7340 24th Street Bypass, Sacramento, CA 95822
- Sacramento Public Library: Central Library, 828 I Street, Sacramento, CA 95814

The EA/IS is also available at USACE's Web site: www.spk.usace.army.mil. CD copies of the EA/IS may be requested from USACE by contacting Ms. Sarah Ross (see below). **The 30-day public review period for the EA/IS ends on August 5, 2011.** Please provide any written comments by August 5, 2011 to:

U.S. Army Corps of Engineers, Sacramento District
Attn: Ms. Sarah Ross, Environmental Resources Branch
1325 J Street, Sacramento, CA 95814-2922
Fax: (916) 557-5256
E-mail: Sarah.R.Ross@usace.army.mil

A public meeting will be held during the review period. Notification of the time and location of the public meeting will be sent in a future distribution. All comments received on the EA/IS will be considered and incorporated into the final EA/IS, as appropriate. For further information, please contact Ms. Ross at (916) 557-5256.

Sincerely,

Alicia Kirchner
Chief, Planning Division

Subject: **REVISED** - Notice of Intent to Adopt a Mitigated Negative Declaration for the South Sacramento County Streams Morrison Creek – Union Pacific Railroad Project

The Sacramento Area Flood Control Agency (SAFCA) finds that while this project could have a significant effect on the environment, there will not be a significant effect because revisions in the project have been made and, therefore, a Mitigated Negative Declaration (MND) will be prepared. This finding is based on the criteria established in California Environmental Quality Act (CEQA) Guidelines Sections 15064 (Determining Significant Effects), 15065 (Mandatory Findings of Significance) and 15070 (Decision to Prepare a Mitigated Negative Declaration), and the findings presented in the attached Initial Study Environmental Checklist. This Notice of Intent (NOI) to Adopt a MND has been prepared consistent with CEQA Guidelines Section 15072.

Project Location: Morrison Creek in the City of Sacramento, south of Meadowview Road and west of Franklin Boulevard

Project Description: The U.S. Army Corps of Engineers (Corps) propose to construct 3000 feet of floodwall, 100 feet of levee and 900 feet of retaining wall on the east side of Morrison Creek along the Union Pacific Rail Road (UPRR) tracks (Morrison Creek/UPRR project or proposed project). The Corps proposes to excavate existing material, construct the floodwall, retaining wall, and levee, and then reseed with native grasses. This project would be constructed in 2012.

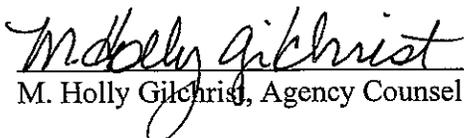
Public Comment Period and Availability of Document: The Draft Environmental Assessment and Initial Study (DEA/IS) was released for public review on July 7, 2011 and the 30 day public review period will close August 5, 2011. The DEA/IS will be available for review at:

- **Valley Hi-North Laguna Library, 7400 Imagination Parkway, Sacramento, CA 95823**
- Sacramento Public Library: Martin Luther King Jr. Branch, 7340 24th Street Bypass, Sacramento, CA 95822
- Sacramento Public Library: Central Library, 828 I Street, Sacramento, CA 95814

The DEA/IS is also available at USACE's Web site: www.spk.usace.army.mil and SAFCA's Web site: www.safca.org. Copies of the EA/IS on CD may be requested by phone or by e-mail (see below). SAFCA also has a limited number of copies of the EA/IS available for public review upon request at the SAFCA offices at 1007 7th Street, 7th Floor, Sacramento, CA 95814. Written comments on the EA/IS must be received no later than 5 pm on August 5, 2011 and should be sent to:

SAFCA
Attn: Ms. M. Holly Gilchrist
1007 7th Street 7th Floor, Sacramento CA 95814
Fax (916) 874-8289
E-mail: gilchristh@saccounty.net

USACE
Attn: Ms. Sarah Ross, ERB
1325 J Street, Sacramento, CA 95814-2922
Fax: (916) 557-5256
E-mail: Sarah.R.Ross@usace.army.mil


M. Holly Gilchrist, Agency Counsel

Date 7-12-11

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3. Site Access and Haul Routes
4. Viewshed from Residents Backyards
5. Habitat Map
6. Photos

APPENDICES

- A. Initial Study/Environmental Checklist
- B. HTRW Phase 1 Site Assessment
- C. SMAQMD Road Construction Emissions Model
- D. Wetland Delineation
- E. Special Status Species Lists
- F. Special Status Species Coordination
- G. Coordination Act Report
- H. Cultural Resources Coordination
- I. Public Comments, Responses, and Summary of Text Changes

ACRONYMS & ABBREVIATIONS

ADT	average daily trips
APE	area of potential effects
AQMD	air quality management district
BACT	best available control technologies
BMPs	best management practices
CARB	California Air Resources Board
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CCAA	California Clean Air Act
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CH ₄	methane
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalents
Corps	U. S. Army Corps of Engineers
CVFPB	Central Valley Flood Protection Board
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
cy	cubic yards
dB	decibels
dBA	A-weighted decibel
DNL	day-night sound level
EA	Environmental Assessment
EA/IS	Environmental Assessment/Initial Study
EFH	essential fish habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U. S. Environmental Protection Agency
°F	degrees Fahrenheit
FEIS/EIR	Final Environmental Impact Statement/Environmental Impact Report
FONSI	Finding of No Significant Impact
GCR	General Conformity Rule
GHG	greenhouse gas
HFC	hydrofluorocarbons
HOV lanes	bus/carpool lanes
HTRW	hazardous, toxic, and radiological wastes
L ₅₀	noise level exceeded more than 30 minutes per hour
L _{eq}	equivalent sound level
L _{max}	maximum sound level
LOS	level of service
µg/m ³	micrograms per cubic meter
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards

NEPA	National Environmental Policy Act
NO ₂	nitrogen dioxide
NOA	naturally-occurring asbestos
NO _x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O ₃	ozone
OPR	Governor's Office of Planning and Research
Pb	lead
PFC	perfluorocarbons
PM	particulate matter
PM _{2.5}	fine particulate matter
PM ₁₀	inhalable particulate matter
ppm	parts per million
RCNM	Road Construction Noise Model
Reclamation	United States Bureau of Reclamation
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board
SAFCA	Sacramento Area Flood Control Agency
SF ₆	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO ₂	sulfur dioxide
SSC	California Species of Special Concern
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
USFWS	U. S. Fish and Wildlife Service
v/c	volume to capacity ratio
VELB	valley elderberry longhorn beetle
VOC	volatile organic compound

1.0 INTRODUCTION

1.1 Proposed Action

From 2005 to 2007, the U.S. Army Corps of Engineers (Corps) constructed the South Sacramento County Streams Project 1B1, the Morrison Creek Levee from Franklin Boulevard to Unionhouse Creek, which is part of the larger South Sacramento County Streams Project. An approximately 3,000 foot section on the east side of Morrison Creek and the Union Pacific Railroad (UPRR) tracks (Morrison Creek-UPRR project) was not completed at that time. The Corps proposes to construct approximately 3000 feet of floodwall, 100 feet of levee and 900 feet of retaining wall in this location on the east side of the UPRR tracks in South Sacramento, California (Plate 1). The Corps proposes to excavate existing material, construct the floodwall, retaining wall, and levee, and then seed the area with native grasses. This project would be constructed in 2012.

This Environmental Assessment/Initial Study (EA/IS) is a joint supplemental National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) document that will address design changes from the 1998 South Sacramento County Streams Investigation Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR). The 1998 EIS/EIR (State Clearinghouse No. 1997102056) covered construction of a floodwall on the west side of the UPRR tracks in this area, known as Section 2A in the EIS/EIR. This supplemental EA/IS covers two project alternatives: No Action and a Floodwall on the Landside (east side) of the UPRR tracks. The proposed actions are to adopt a Finding of No Significant Impact (FONSI) under NEPA and a Mitigated Negative Declaration (MND) under CEQA based on the findings included in this EA/IS (See Section 1.6 and 1.7 for additional information)

1.2 Purpose and Need for Proposed Action

The South Sacramento County Streams drainage basin has a long history of flooding during heavy rainfall. Recent flooding in 1952, 1955, 1962, 1963, 1982, 1985, and 1986 damaged residences, businesses, and agricultural land and disrupted transportation and public facilities. Local runoff from the Morrison Creek watershed can cause flooding due to limited channel capacities and bridge restrictions and contributes to the flood volume in the Beach-Stone Lakes area. In addition, overflow from the Cosumnes and Mokelumne rivers inundates Beach-Stone Lakes, causing high backwater on the study creeks, and threatening south Sacramento, the Pocket Area, and the Sacramento County Regional Sanitation District (SCRSD) treatment plant with flooding.

The UPRR embankment, which is acting as the current flood protection for homes east of Morrison Creek does not meet Corps standards and is not providing adequate protection to homes in the area. With the levee improvements completed upstream, along the west bank of Morrison Creek, and along Unionhouse Creek, this section remains insufficient and is not certifiable as a flood protection feature. Levee failure along any of the levees in the system would result in flooding of more than 14,000 acres. Flooding would result in damages to property, damages from toxic and hazardous waste contamination and disruption to commercial and governmental activities. Damages would range from \$700 million to more than \$2 billion (in 1998 dollars) depending on the size of the annual flood event (1998 EIS/EIR). The Morrison Creek-UPRR project would complete Project 1B1 and provide 100-year event flood protection (a flood event with a 1% chance of occurrence in any given year) along Morrison, Unionhouse, Elder, and Florin Creeks downstream of Franklin Boulevard. A full environmental analysis for the South Sacramento County Streams Project was conducted in the 1998 EIS/EIR.

which was authorized in the Water Resources Development Act of 1999, Sec. 101, Public Law 106-53, August 17, 1999, 113 Stat 275, Title I. The authority is stated as follows:

“The following projects are authorized for construction... South Sacramento County Streams, California. The project for flood control, environmental restoration and recreation, South Sacramento County Streams, California: Report of the Chief of Engineers dated October 6, 1998, at a total cost of \$41,200,000 and an estimated non-Federal cost of \$24,300,000.”

This authorization also serves as authorization for the additional refinements to the South Sacramento County Streams Project (i.e., the current Morrison Creek-UPRR project under consideration).

1.5 Background and Previous Environmental Documents

The Corps, the Central Valley Flood Protection Board (CVFPB), and the Sacramento Area Flood Control Agency (SAFCA) have conducted numerous studies and prepared environmental documentation related to flood control projects in the South Sacramento area. The following provides a summary of some of the key reports leading up to the current state of the South Sacramento County Streams Project. The environmental documents described in this section are on file and available at the Corps office on 1325 J Street, Sacramento, CA 95814.

To address potential flooding hazards, the South Sacramento County Streams Project was authorized by the Water Resources Development Act of 1999. The selected plan, described in the Final Feasibility Report (prepared in 1998), included a combination of flood protection features including raising and extending levees, the installation of concrete walls, and modifications to existing channel geometry.

In 1998 the Corps and SAFCA prepared a joint EIS/EIR, which addressed flood protection improvements on the streams within the Morrison Creek Stream Group in accordance with CEQA (State Clearinghouse No. 1997102056) and NEPA (2000 ROD). The Corps identified the locally preferred plan (LPP) and completed the Final EIS/EIR, recognizing that changes to the project may occur during design. SAFCA certified the completion of the EIS/EIR in April 2000 and filed the Notice of Determination (NOD) with the State Clearinghouse on October 29, 2001. The Corps signed the ROD on June 28, 2000.

The Corps and SAFCA found that Flood hydrology studies needed revision and updating. As a result of the revision, SAFCA and the Corps developed a series of refined design elements that would raise the level of flood protection within the Morrison Creek watershed to provide flood risk reduction. Without these refinements, the area would not be provided with flood risk protection. The Corps released the South Sacramento County Streams Project Design Refinements EA addressing the proposed refined design improvement measures in December 2004. The EA concluded that the proposed design improvements would be implemented with no significant adverse effect on the environment, supporting a Finding of No Significant Impact (FONSI).

In 2004, SAFCA prepared a separate Supplemental EIR on the refined design improvements for the South Sacramento County Streams Project pursuant to CEQA Guidelines Section 15163 (State Clearinghouse No. 2004102009). This Supplemental EIR relied on the 1998 EIS/EIR analysis and complemented it by evaluating the additional environmental effects that would result from changes to the previously studied project features and components. SAFCA adopted and approved the project on February 17, 2005 and filed the NOD with the State Clearinghouse on February 25, 2005. This document provided information necessary for development of future portions of the South Sacramento County

Streams Project. SAFCA adopted a Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093 for the 2004 Supplemental EIR at the time of project approval..

1.6 Purpose of this Environmental Assessment/Initial Study

This EA/IS (1) describes the existing environmental resources in the project area, (2) evaluates the environmental effects of the proposed action on these resources, and (3) identifies measures to avoid or reduce any effects to less than significant. This EA/IS is in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and provides full disclosure of the effects of the proposed action. The Corps is the lead agency for NEPA compliance, and SAFCA is the lead agency for CEQA compliance. The CVFPB is a responsible agency that will need to consider the action after SAFCA has approved the project

1.7 Decisions to Be Made

The District Engineer, commander of the Sacramento District, must decide whether or not the proposed action qualifies for a FONSI under NEPA or whether an EIS must be prepared. In addition, SAFCA must decide if the proposed action qualifies for a Mitigated Negative Declaration under CEQA or whether an EIR must be prepared.

2.0 PROJECT ALTERNATIVES

2.1 Alternatives Previously Considered but Not Studied in Detail

Waterside Floodwall Alignment. This alternative was evaluated in the 1998 EIS/EIR and involved constructing a floodwall immediately west of the UPRR tracks on the waterside of the railroad embankment. It was originally selected as the preferred alternative, but eliminated from further consideration due to difficult access, environmental concerns, and restriction of the floodway. In order to construct between Morrison Creek and the UPRR embankment, equipment would have had to be moved over the UPRR tracks or over Morrison Creek. Construction would have taken place from within the Morrison Creek channel, removing habitat and disturbing Morrison Creek and several adjacent wetlands. This alternative would also have caused significant habitat loss in the form of wetlands and riparian vegetation. In addition, a floodwall on the waterside of the UPRR tracks would have decreased the channel capacity along 3000 feet of Morrison Creek.

Another alternative that was considered in the 1998 EIS/EIR was constructing a levee in the project area, along the current alignment. It was eliminated from consideration due to insufficient land available to construct it.

2.2 Alternative 1 - No Action

The no action alternative describes the without-project conditions and is the baseline for the environmental analysis. This alternative assumes that there would be no Federally-funded flood control improvements made to Section 2A along the UPRR tracks. The risk of flooding would continue east of Morrison Creek at the UPRR tracks with the potential to damage homes, businesses, and public infrastructure as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR.. Flooding would result in damages to property, damages from toxic and hazardous waste contamination and disruption to

commercial and governmental activities. Damages would range from \$700 million to more than \$2 billion (in 1998 dollars) depending on the size of the annual flood event (1998 EIS/EIR).

2.3 Proposed Action - Landside Floodwall

The proposed action would consist of constructing approximately 3,000 linear feet of flood wall, 900 feet of retaining wall, and 100 feet of levee along the east side of the UPRR tracks just inside the UPRR right of way (ROW) (Plate 2). The total project impact area would be just over 5.5 acres. Two and a half acres would have a flood protection levee easement (FPLE), which would include one acre of permanent road easement (PRE), 2.5 acres would be a temporary work area easement (TWAE) adjacent to the FPLE, and another 0.6 acre would be a TWAE in the Sacramento Municipal Utility District (SMUD) lot adjacent to the project area (Plate 2).

The current design includes a reinforced concrete floodwall, built to an elevation of 20.5 feet, approximately 900 feet of 4 foot high retaining wall, and an approximately 100-foot section of levee at the south end of the alignment. The flood wall would be twelve to eighteen feet above the top of the footing and fourteen to twenty feet above grade. An aggregate base patrol road and drainage system would be constructed parallel to the private properties immediately adjacent to the ROW.

There were two design issues that had to be resolved: an existing eight inch water line crossing under the floodwall near Station 4+75, and a SMUD 20 inch high pressure gas line that crosses below the proposed levee section at the south end of the alignment and parallels the flood wall alignment. The water line was in conflict with wall footing, but under the current design will be sleeved through the floodwall. The current design leaves the gas line in place beneath the levee; construction of the levee at the south end of the proposed site would avoid impacts to the gas line. The proposed design has been approved by the Corps.

All construction methods and scheduling would be determined by the construction contractor and approved by the Corps. The floodwall footprint would be cleared, grubbed, and excavated to a depth of 2 to 5 feet and a width of 15 to 20 feet to place slurry cement and construct the floodwall footing. The floodwall would be constructed in sections. A 100 foot section of levee would be constructed at the south end of the project site to accommodate the existing SMUD gas line within the limited space available. It will be necessary to protect the existing sound wall and utilities during construction in compliance with the City and utilities owners. In addition all construction activities will comply with City of Sacramento ordinances for sound and vibration restrictions (See tables in Section 3.3).

2.3.1 Construction Workers, Equipment, and Schedule

An estimated 31 construction workers would be onsite each day during construction. The workers would be encouraged to park in nearby public parking areas and carpool to the project site by entering the neighborhood east of the project site from Franklin Boulevard. Carpool vehicles would be parked in the SMUD staging area at the northeast end of the project area, and in the neighborhood adjacent to the project area.

Construction vehicles necessary for the project would include: two excavators, two loaders, two graders, two dozers, two rollers, two water trucks, one maintenance truck, and six 0.75-ton pick up trucks. A generator would also be required for construction.

Construction hours would be limited to the hours from 7 a.m. to 6 p.m. Monday through Saturday, and 9 a.m. to 6 p.m. on Sunday. The project would take approximately four months to

complete. It is anticipated that the project would be initiated in the spring of 2012, with all construction completed by October 1, 2012.

2.3.2 Access and Staging

The 0.6-acre SMUD staging area, located on Deertree Court, would be used as the main staging area. A second 2.5-acre staging area would be located west of the project footprint, within in the TWAE, and would also be used during construction (Plate 2). The SMUD staging area's primary use would be the location of the construction trailers, the storage of some equipment, the parking of vehicles, and for access to the project site. The staging area along the west side of the project footprint would be primarily used for stockpiling and equipment storage.

There are three access points for the project area (Plate 3). The Morrison Creek levee access point can be reached by taking Interstate 5 (I-5) to Pocket/Meadowview Road and accessing the Morrison Creek East levee after Meadowview Road turns into Mack Road. From the levee access point, vehicles would travel south on the Morrison Creek levee for half a mile until they reach the north end of the project site. The Unionhouse Creek levee access point can be reached by taking State Route 99 (SR 99) to Cosumnes River Blvd., then taking a right on Franklin Blvd. and making a U-turn at the first light to access the Unionhouse Creek North levee. From the levee access point, vehicles would travel west on the Unionhouse Creek levee for just over three quarters of a mile to reach the south end of the project site. Vehicles weighing more than 6,000 pounds would not be permitted to use the levee roads for access to the site.

Heavy equipment and haul trucks would access the site through the neighborhood and the SMUD staging area (See Plate 3). From Mack Road, vehicles would turn south onto Franklin Boulevard and enter the neighborhood by making a right onto Armadale Drive. From Cosumnes River Boulevard, vehicles would make a right turn on Franklin Boulevard and enter the neighborhood by making a left turn on Armadale Drive. At the end of Armadale Drive, vehicles would make a right turn onto Deer Lake Drive. Vehicles would then take a left onto Deer Water Drive. Deertree Court is the first court on the right. The SMUD lot is accessed from the back end of the cul-de-sac. This route would be the main ingress for all haul trucks accessing the project site. The egress for all haul trucks leaving the project site would be to leave the SMUD lot at the end of Deertree Court, turn right on Deer Water Drive, turn left onto De La Vina Way, left onto Deer Lake Drive and right onto Armadale Way (See Plate 3).

A ramp would be constructed at the southwest end of the SMUD lot to create access for haul trucks between the SMUD lot and the levee crown. This ramp would be left in place after completion of the project. The haul trucks would deliver and load all material traveling north to south along the project footprint. The trucks would then turn around in the TWEA (See Plate 3) and exit back through the neighborhood.

2.3.3 Site Preparation

Prior to construction, all construction and staging areas would be fenced off with cyclone fencing to limit public access. The Corps would conduct any preconstruction environmental surveys, while the contractor would ensure that any required environmental controls, such as exclusion fencing for giant garter snake (*Thamnophis gigas*), are properly installed. The existing ground would be cleared and grubbed of all grass cover to a depth of approximately six inches. The contractor would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) identifying specific best management practices (BMPs) to avoid or minimize soil erosion. All suitable excavated soils material would be reused in the project area to the extent feasible. Excavated material from the project would be temporarily placed

in the TWAE (Plate 2) and would be disposed of at an appropriate waste site authorized to accept such waste.

2.3.4 Borrow and Disposal Sites

There are no borrow or disposal sites within the project area. The contractor would be required to import and export all soil to and from a licensed, permitted facility that meets all Federal and State standards and requirements. This will ensure that no contaminated material would be introduced into the site. Excavated material would be stockpiled onsite in the staging area adjacent to the project footprint to create a road with all remaining material exported to a licensed facility.

2.3.5 Restoration and Cleanup

The project site, levee roads, and staging areas would be topographically and photographically surveyed prior to construction to provide a baseline pre-project condition. Once construction is complete, the same areas would be re-surveyed to identify any construction related issues. All construction equipment and excess materials would be transported offsite via local and regional roadways. The access ramp constructed in the SMUD staging area would be left for SMUD access upon project completion. The disturbed areas would be reseeded with a native grass seed mix to promote revegetation and minimize soil erosion. All staging areas, access ramps, and levee roads would also be restored to pre-project conditions. Any damage from construction would be repaired. Finally, the work sites and staging areas would be cleared of all rubbish, and all parts of the work area would be left in a safe and neat condition, suitable to the setting of the area.

2.3.6 Operation and Maintenance

After construction is complete, responsibility for the project would be turned over to the CVFPB in conjunction with SAFCA. This responsibility would include operation, maintenance, repair, rehabilitation, and replacement of all project features except environmental mitigation. The levee, floodwall, and access roads would be operated and maintained in accordance with current Corps criteria and the Operations and Maintenance Manual. Regular maintenance activities would include clearance of maintenance roads, rodent control, vegetation maintenance, managing graffiti, and performing periodic inspections.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents the affected environment and environmental consequences associated with specific environmental issue areas. Subsection 3.1 addresses environmental issues that were determined not to be affected by the alternatives described in Section 2.0 of this document and are therefore not subject to further analysis. Those issue areas that have a potential to be affected by one or more of the alternatives are addressed in Subsections 3.2 through 3.10. Each subsection includes a description of existing conditions against which the potential for impacts is assessed for each alternative. A discussion of the direct and indirect environmental consequences is followed, and as necessary, with recommendations to avoid, minimize, and/or mitigate adverse effects. The CEQA checklist can be found in Appendix A.

3.1 Resources not Considered in Detail

Initial evaluation of the alternatives indicated there would be little to no direct, indirect, or cumulative adverse effects on several resources. These resources are discussed briefly in Sections 3.1.1 through 3.1.8 to add to the overall understanding of the environmental setting.

3.1.1 Recreation

Construction of the Morrison Creek-UPRR project would occur within the South Sacramento Planning Area of the City of Sacramento Department of Parks and Recreation. There are no existing recreational facilities located adjacent to the construction area, and the area is not accessible to the public. Construction would not restrict access to or interrupt use of any recreational facilities. The project would not result in an increase in population so it would not result in a need to upgrade or build new recreation facilities. Furthermore, construction activities would be short-term and limited in scope. As a result, there are no anticipated effects on recreation in the project area.

3.1.2 Land Use, Agriculture, and Forestry Uses

The primary land use designations in the project area are the same as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR and include residential, commercial, agriculture, and open land. Surrounding uses are characterized as urban (residential) and no forest land or timberland exists on or adjacent to the project area. The proposed project is not located within any applicable habitat conservation plan or natural community conservation plan and therefore would not result in a conflict with either type of conservation plan. Morrison Creek in the project area is an urban waterway that flows onto the Sacramento Regional County Sanitation District (SRCSA) property shortly below the lower extent of the project area. The levee is not accessible to the public in the project area. There are no prime and unique farmlands within the project area. According to the City of Sacramento General Plan, the project area is not enrolled in or restricted by a Williamson Act contract. The City General Plan has designated the project area as railroad right of way. The proposed project does not propose changes to land use designations and would have no adverse effects to existing or proposed land uses within the project area. As a result, there are no anticipated effects on land use in the project area.

3.1.3 Fisheries

During non-flood conditions, there is no direct hydrologic connectivity between Morrison Creek and the Sacramento River (SAFCA, 2004). During these periods, water is pumped from Morrison Creek into the Sacramento River by the City of Sacramento (SAFCA, 2004). This pump is an impassable barrier to fish species in the Sacramento River (SAFCA, 2004). During high flood conditions, floodwaters from the Mokelumne River back up into the Beach and Stone Lakes basin through the Lambert structure providing access for fish into the creeks upstream.

Currently, Morrison Creek adjacent to and downstream of the project area has a soft substrate bottom with some vegetation in the water and along the banks. Morrison Creek upstream of the Railroad Bridge and Unionhouse Creek just downstream of the project area are channelized flood control drainages with concrete lined low flow channels. The source of water for Morrison Creek in the summer is agricultural and/or urban runoff. This results in low flows, high temperatures, and poor water quality in the creek during the summer. There is vegetation growing in the channel adjacent to the project site and

some observed growing in the bottom of the concrete lined channels adjacent to the project site. During surveys, it was noted that the concrete lined channel bottoms upstream of the project area lacked substantial amounts of soil or gravel substrate that would provide habitat for aquatic invertebrates or cover for fish. Vegetation on the creek bed and along the lower portion of the banks is removed annually as part of maintenance practices to improve creek flow (SAFCA, 2004). This combination of factors results in poor quality fish habitat in Morrison Creek most of the time. Fish are occasionally found in the creek during flood events, usually as upstream or downstream migrants and can become stranded in the creek after flood events (SAFCA, 2004).

The majority of the fish species found in the Morrison Creek watershed are resident species which include: white catfish (*Ameiurus catus*), black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), brown bullhead (*Ameiurus nebulosus*), goldfish (*Carassius auratus*), warmouth (*Chaenobryttus gulosus*), sculpin ssp. (*Cottus* ssp.), common carp (*Cyprinus carpio*), threadfin shad (*Dorosoma petenense*), mosquito fish (*Gambusia affinis*), California roach (*Hesperoleucus symmetricus*), channel catfish (*Ictalurus punctatus*), bluegill (*Lepomis macrochirus*), inland silverside (*Menidia berylina*), largemouth bass (*Micropterus salmoides*), hardhead (*Mylopharadon conocephalus*), Sacramento blackfish (*Orthodon microlepidotus*), bigscale logperch (*Percina macrolepida*), white crappie (*Pomoxis annularis*), and black crappie (*Pomoxis nigromaculatus*) (SRSCD, 2000). Winter, fall/late-fall and spring Chinook salmon (*Oncorhynchus tshawytscha*) which are migratory species, are occasionally found in the creeks during flood events.

Because Morrison Creek is cut-off from the Sacramento and Mokelumne Rivers except during major flood events and has poor habitat conditions for fish, it provides only intermittent habitat for migratory fish species, and is not considered an important migratory corridor. The Beach and Stone Lakes basin and its tributary streams including Morrison and Unionhouse Creeks are not designated as Critical Habitat or Essential Fish Habitat (EFH) for any of the Federally-listed Chinook salmon evolutionarily significant units (winter, fall/late-fall, or spring).

The proposed Morrison Creek-UPRR project is expected to have no effect on special-status fish species or their habitats because: 1) the project is more than 50 feet from Unionhouse Creek and more than 150 feet from Morrison Creek except at the northern end of the project area where Morrison Creek is just under 100 feet away and thus would not contribute sediment or toxic substances to the creek ; 2) the project would not alter bank stability; and 3) Morrison and Unionhouse Creeks do not support special-status fish species except during flood events. In addition, within the project vicinity, Morrison and Unionhouse Creeks do not support optimal fish populations as the habitat quality is poor and the creek is not designated as EFH or Critical Habitat.

3.1.4 Hazardous, Toxic, and Radiological Waste

A Phase 1 Environmental Site Assessment (ESA) was conducted in January 2011 to determine the current status of hazardous, toxic, and radiological waste (HTRW) conditions in the project area. The Corps also completed two ESAs for the 1998 EIS/EIR to identify any potential sources of HTRW in the project area (Corps, 1998 and 2004). The purpose of the ESAs was to: (1) satisfy the requirements of the Corps Engineering Regulation (ER) 1165-2-132; (2) identify and document any Recognized Environmental Conditions (RECs) that may impact the construction project; (3) demonstrate “due diligence” in conducting all appropriate inquiries under the Comprehensive Environmental Response, Comprehensive and Liability Act (CERCLA); and (4) provide useful information for the construction contractor when planning for worker safety and health. The ESAs included a review of regulatory lists of HTRW sites and a records and database search was also conducted. These ESAs encompassed a one-mile corridor on each side of the project area.

The assessment revealed one REC within one mile of the project area where hazardous chemicals have been released into the environment in the past (Corps, 2011). The site is a SMUD power station where a Polychlorinated Biphenyls (PCB) release was confirmed in 1987. The Corps concluded that the site and its contaminants pose no adverse impact to construction due to the distance from the project site. The site is also physically secured behind cyclone fencing and brick walls that are maintained by SMUD. The Phase 1 ESA Report contains a detailed review of this site (Appendix B). Based on the findings of the ESA, the Corps concludes that no further environmental actions are warranted for the project site. Additionally, without construction of the Morrison Creek-UPRR floodwall, the risk of “levee” failure would remain high. A failure in the city’s levee system could result in flooding that could upset stored hazardous materials and spread pesticides, oil, gasoline, and other hazardous materials in floodwaters, creating hazardous conditions for the public and the environment. Construction of the proposed action would protect against HTRW effects, such as these, that could occur during and after a severe flood.

The proposed project would temporarily increase the transport of materials generally regarded as hazardous that are used in construction activities. It is anticipated that limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, hydraulic fluids, and other similarly related materials would be brought onto the project site, used, and stored during the construction period. However, transportation of hazardous materials on area roadways would be regulated by California Highway Patrol (CHP) and Caltrans. Storage and use of hazardous materials would be done in accordance with applicable Federal, State and local regulations. Because the proposed project is required by law to implement and comply with existing hazardous material regulations, impacts related to hazards associated with the routine, transport, use, disposal, and risk of upset would be less-than-significant.

The proposed Morrison Creek-UPRR project is expected to have no effect on HTRW conditions within the project area because there are no existing HTRW sites in the project area and Corps determined that the existing SMUD power station site poses no adverse impacts to construction due to its distance from the project area.

3.1.5 Socioeconomics

This discussion is based on the results of the U.S. Census taken in 2000 and 2010. This discussion has not significantly changed from the 2004 EA or 2004 SEIR. According to the 2010 census, the population of Sacramento City was 466,488 (U.S. Census Bureau, 2010). The ethnic composition of Sacramento City in 2010 was about 35 percent white, 14 percent African American, 18 percent Asian, 27 percent Hispanic or Latino, and 6 percent other (exceeds 100 percent because individuals may report more than one race) (U.S. Census Bureau, 2010.) Based on the 2000 census, the 2009 population estimate for Sacramento County was 1,400,949 (U.S. Census Bureau, 2010). According to the 2010 census the population in Sacramento County in 2010 was 1,418,788 (U.S. Census Bureau, 2010). Growth is expected in the south Sacramento area because of the availability of land and close proximity to urban Sacramento. Commercial development and public services will continue to expand to support the increased residential population in the area.

The rate of unemployment in Sacramento City for the year 2000 was 7.9 percent (U.S. Census Bureau, 2010). The current unemployment rate estimate for 2010 is 9.7 percent (U.S. Census Bureau, 2010). The 2000 median household income was \$43,816, and the per capita income was \$21,142 (U.S. Census Bureau, 2010). The 2009 estimate for median household family income was \$66,098 and the per capita income estimate was \$27,033 (U.S. Census Bureau, 2010).

Even though the proposed project would provide flood protection in the project area to a point that it can safely contain a flood event with less than a 1% chance of occurrence in any given year, there is a lack of available land in the regional project area for growth and development because the regional area is already built out and/ or planned for development. The proposed project would not result in the construction of new homes or the displacement of existing homes and would not induce substantial growth within the area, displace housing, or displace persons. Therefore, the proposed project would not affect socioeconomics or growth in the area. The designated land uses, growth rates, employment opportunities, and housing values would continue to be determined by local government regulations and regional economic conditions in the South Sacramento area.

The proposed Morrison Creek-UPRR project would not have any environmental effects on the socioeconomic condition of the area because it would not result in an increase in population, or limit either current or future opportunities for agriculture, business, employment, or housing opportunities. The proposed action would provide flood protection to the community and would not affect minorities or low-income populations.

3.1.6 Topography, Geology, Soils, and Mineral Resources

The Sacramento Valley is generally flat and open with little natural relief. Elevations in the valley range from about sea level to about 400 feet above mean sea level (msl). Nearly level flood plains occur along the rivers and smaller creeks of the project area and vicinity. The project would not change the location and general topography of Morrison Creek. As a result, the project would have no significant effect on the topographic features of the area.

The project area is situated on vast alluvial deposits that have slowly accumulated over the last 100 million years. The materials have been derived from igneous, metamorphic, and sedimentary parent rock materials from the Sierra Nevada to the east, transported by major streams, and deposited in successive clay, silt, sand, and gravel layers on the valley floor. Geologic formations underlying the Sacramento Valley downstream range in age from pre-cretaceous to recent. Due to the limited size and scope of the project, there would be no environmental effect on the geologic features in the project area.

Dominant soils in the project area are the Clear Lake Clay and Galt Clay soils, formed in alluvium derived from mixed rock sources. Slopes in this series range from 0 to 2 percent. These soils are moderately deep and consist of a silt loam at the surface, with a subsoil of claypan underlain by cement hardpan. Soils in the project area would be disturbed during construction due to excavation and stockpiling of soil material and reuse of the stockpiled material to construct the project. Although there would be a small change in the topography of the permeable surface due to the reshaping of the existing ground to include a floodwall and patrol road, there would not be an increase in non-point source runoff as a result of the project. As a result, there would be no significant adverse effects on soils due to the project.

According to the City of Sacramento General Plan, the County's mineral resources primarily consist of sand and gravel construction aggregates, as well as clay. The proposed project is located in an area classified MRZ-3 and is not considered to contain significant mineral deposits. The proposed project is not located on or near a mineral extraction site and would not result in the loss of availability of mineral resources or otherwise prevent the extraction of important mineral resources. Therefore, the proposed project would not result in the loss or availability of mineral resources.

The closest known active seismic fault is the Dunnigan Hills fault, located approximately 20 miles northwest of the City of Sacramento. Inactive faults in the vicinity include the Midland fault located approximately 20 miles west of the City of Sacramento and the Bear Mountain fault zone located east of

Sacramento County. Seismic conditions associated with fault activity include groundshaking, liquefaction, settlement, and seiche. The project does not include construction of any structures intended for human occupancy and the floodwall would be constructed to minimize potential failure in the event of ground shaking. For these reasons, the project would not expose people to potential adverse effects resulting from fault activity. The project would have no effect on local faults or potential seismic activity in the area.

3.1.7 Public Services, Utilities, and Service Systems

Public services in the project area include law enforcement, fire protection, medical assistance, and utilities. The Sacramento City Police Department provides law enforcement and police protection, while the Sacramento City Fire District provides fire and emergency medical service. The nearest fire station is on Wyndham Drive, approximately one mile from the project area. The nearest hospitals are Kaiser Permanente or Methodist Hospital, also located approximately one mile from the project area. The Sacramento City Unified School District provides public elementary, middle, and high schools for residents. Northeast of the project area on Deer Creek Drive is Union House Elementary School. The access routes and traffic management plan (discussed in Section 3.6.2) would be developed to ensure that public services and elementary school activities are not disrupted during construction. As a result, the project would have no effects on public services and schools. In addition, the project would not result in an increase in population, and because of the size and scope of the project, it would not increase the demand for public services (e.g., parks, fire, police, or other public facilities).

Utilities are provided by Pacific Gas and Electric (gas) and SMUD (electricity). The City of Sacramento Department of Utilities provides and maintains water, sewer, solid waste, storm collection, and storm drainage services. No long-term interruption of utilities or services would take place in the project area. Construction would require temporarily accessing the existing potable water supply, sanitary sewer, or storm sewer systems. Excavated material from the project not used as backfill for the maintenance road would be temporarily staged in the TWAE and would be disposed of at an appropriate waste site authorized to accept such waste. Old concrete would be removed and disposed of at an appropriate waste site authorized to accept concrete waste. Natural gas supply and electrical transmission lines would not be affected. Consultation with the respective utility operators is ongoing and will determine any actions that may be needed to ensure continued utility service. As a result, the proposed project would avoid impacts to existing utilities and service systems in the area. In addition, the project would not result in an increase in population that would result in an increase demand for utilities and service systems. Therefore, the proposed project would not affect utilities and service systems in the area, or result in the need for new or altered infrastructure.

3.1.8 Environmental Justice

Environmental justice is defined by the U.S. Environmental Protection Agency (EPA) Office of Environmental Justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” Fair treatment means that “no group of people, including racial, ethnic, or socioeconomic group, shall bear a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies.” Analysis of project effects on environmental justice is required by NEPA.

The proposed action would provide flood risk benefits to the entire community. There would not be disproportionately high and adverse effects on the health or environment of minority or low-income populations. The proposed action would not have any adverse environmental effects on the

socioeconomic condition of the area because it would not limit either current or future opportunities for business, employment, or housing opportunities. The proposed action would provide flood protection to the community and would not disproportionately affect minorities or low-income populations in the area.

3.2 Aesthetics/Visual Resources

This section evaluates the effects of the proposed alternatives on the aesthetics in the project area. This evaluation is based on the changes in character and quality of views as compared to existing conditions.

3.2.1 Existing Conditions

Aesthetic resources are those natural resources, landforms, vegetation, and structures in the environment that generate one or more sensory reaction from viewers. In the project area, viewers are mainly property owners adjacent to the Morrison Creek-UPRR project site. The regional viewshed in the area includes large areas of residential, commercial, and industrial urban development. The project area is not located within a local, State or Federally-designated scenic vista. The nearest designated scenic resource is State Route 160 (SR 160), located approximately two miles west of the project area.

The viewshed in the project area includes fallow farmland, developed, natural, and disturbed areas. On the east side of Morrison Creek are landscaped homes, driveways, and neighborhood streets. The railroad embankment and the west levee of Morrison Creek are visible to those residents living directly east of the creek. The creek banks are vegetated with sparse willow cover and non-native grasses and forbs. The top of the Morrison Creek west levee has three feet of riprap that is visible from some of the homes. The banks of Morrison Creek above the railroad bridge and Unionhouse Creek adjacent to the project area are regularly maintained and include very little woody vegetation. On the west side of the Morrison Creek west levee between the railroad bridge and the confluence of Morrison Creek and Unionhouse Creek is fallow farmland with very little tree cover. The SRCSD facilities are visible south of the project area across Morrison and Unionhouse Creeks.

3.2.2 Environmental Effects

Significance Criteria

Effects on aesthetics and visual resources were considered significant if an alternative would result in any of the following:

- A substantial adverse effect on scenic views.
- Substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings near a State Scenic Highway.
- Substantial degradation to the existing visual character or quality of the site and its surroundings.
- A substantial increase in light or glare which would adversely affect daytime or nighttime views in the area.

No Action

Under the no action alternative, the Corps would not construct the Morrison Creek-UPRR project. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. The no action alternative would have no effect on aesthetics or visual resources in the project area. The basic components, character, and quality of the regional and local viewsheds would be expected to remain the same although some open areas could be replaced with urban development in the region.

Proposed Action - Construct Landside Floodwall

Construction of the landside floodwall would have both short-term and long-term effects on the aesthetics in the project area. During construction, the presence and use of equipment, trucks, and worker vehicles would disrupt the current viewshed in the project area. Residents north of Unionhouse Creek and east of Morrison Creek would be aware of the movement of vehicles in the proximity of their back property lines. Residences at the south end of the project area would be more than 50 feet away from the construction footprint, but residences at the northern end would be within 25 feet of construction. However, all direct construction activities would be below the top of the existing precast wall and therefore would be shielded from residents. The only exception would be at the southern end of the project site where the ground level rises, lifting construction into the residences visibility. Because construction activities would be limited to daylight hours, no external lighting would be required and temporary construction light and glare impacts would not occur. All equipment, trucks, and worker vehicles would be removed once construction is completed. Once completed, the height of the floodwall would be below the existing precast wall, and would not be seen from private properties except at the northern and southern ends of the project site (See Plate 4) due to the higher ground elevation and lower height of the residential fencing.

Site preparation for the Landside Floodwall would not involve removing any trees or shrubs, but would involve clearing non-native groundcover. All construction activities would be contained to the UPRR right of way between the existing precast wall and the UPRR tracks, which is currently degraded and lacking in visual appeal.

Once construction is completed, all disturbed areas would be restored. Disturbed areas would be reseeded with native grasses and forbs to promote revegetation. The staging area adjacent to the project area would also be reseeded and planted with native grasses and forbs and the SMUD staging area would be returned to pre-project conditions. The grasses, as well as annuals and some small shrubs, would be expected to grow relatively quickly and improve that aspect of the viewshed within a year or two. As a result, the project would not be considered a significant effect on the visual character of the area.

Plate 5 shows photos of the project area. Unionhouse Creek and Morrison Creek are channelized just upstream of the project and are urban in nature. Construction of the proposed project would not significantly change the assessment of visual effects conducted in the 1998 EIS/EIR, 2004 EA, or 2004 SEIR.

Since construction activities would be short-term, there would be no permanent significant effects on aesthetics or the public view as a result of construction. Residents and motorists in the area would have a limited view of the proposed maintenance road and floodwall due to existing barriers and fences that would minimize any adverse effects of the visual quality of the proposed project. Because the project area is not located within a local, state or federally designated scenic vista or within the vicinity of historic properties, there would be no impact to scenic vistas or other designated scenic resources. Lastly, exterior

lighting for the floodwall will not be required and permanent impacts associated with light and glare would be less than significant.

Graffiti, however, is an ongoing problem in the project area. The new floodwall would provide additional areas for graffiti. Graffiti would be removed by local maintaining agencies per their standard maintenance procedures. Residents in the area may have a limited view of any graffiti on the flood wall due to presence of the existing precast wall and the railroad embankment. This would minimize any adverse effects of the visual quality of the proposed project. In addition, since there would be area for graffiti to exist, but access to the area would be restricted to the public and limited to inspections and maintenance crews, any potential impacts associated with the long-term operation of the project would be considered less-than-significant on the visual character of the area.

3.2.3 Mitigation

There would be no significant short or long-term effects on aesthetics or visual resources in the project area. As a result, adverse effects to aesthetics would be considered less than significant and no additional mitigation would be required.

3.3 Noise

This section evaluates the effects of the proposed alternatives on the noise levels in the project area. The effects of vibration on buildings are also considered.

Sound is energy that is transmitted through the air as the result of a disturbance or vibration, which may evoke an auditory sensation. Noise is generally defined as sound that is loud, unpleasant, unexpected, or disagreeable. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency, or pitch), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. Because of the ability of the human ear to detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Typical sounds range from 40 dBA (very quiet) to 100 dBA (very loud). Conversation is roughly 60 dBA at three to five feet. As background noise levels exceed 60 dBA, speech intelligibility becomes increasingly difficult. Noise becomes physically discomforting at 110 dBA. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level.

Noise Exposure and Community Noise

While a noise level is a measure of noise at a given instant in time, noise exposure is a measure of sound experienced over a period of time. Community noise varies over time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of (1) many distant, unidentifiable noise sources that constitute relatively stable background noise throughout a typical day, and (2) short duration single event noise sources that are readily identifiable to the individual. Because of the noise level variability, the measurement of noise exposure over a period of time is required to accurately characterize community noise and evaluate cumulative effects on noise. The

noise descriptors most often used to describe traffic, community, and environmental noise are defined below (Caltrans 1998):

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level for a specified period of time. The L_{max} may also be referred to as the peak (noise) level.

DNL: The day/night average sound level is the 24-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night. Noise between 10:00 p.m. and 7:00 a.m. is weighted by adding 10 dBA to take into account the greater annoyance of nighttime noise (formerly called L_{dn}).

CNEL (community noise equivalent level): Similar to the DNL, the CNEL adds a 5-dBA penalty for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to the 10-dBA penalty added with the DNL. When the same 24-hour noise data are used, the CNEL value is typically about 0.5 dBA higher than the DNL value.

Local Noise Regulations and Management

Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans. General plans recognize that different types of land uses have different sensitivities toward their noise environment. Residential areas are generally considered to be the most sensitive type of land use to noise, and industrial/commercial areas are generally considered to be the least sensitive.

Noise ordinances set forth the specific standards and procedures for addressing particular noise sources and activities. Local noise ordinances typically set forth standards related to construction activities, nuisance-type noise sources, and industrial property-line noise levels. Noise in the project area is regulated by the City of Sacramento via the General Plan (2009) and the City of Sacramento Noise Ordinance (2007).

City of Sacramento General Plan

The Health and Safety Element of the City General Plan establishes specific goals and policies for noise sources. The City's goal is to eliminate or minimize noise effects of future development on existing land uses and enforce the City of Sacramento Noise Ordinance to control non-transportation noise sources. The applicable policies include:

- | | |
|-------------------------|---|
| Goal A, Policy 2 | Require mitigation measures to reduce noise exposure to the "Normally Acceptable Levels" except where such measures are not feasible. |
| Goal C, Policy 1 | Review projects that may have noise generation potential to determine what impact they may have on existing uses. Additional acoustical analysis may be necessary to mitigate identified impacts. |
| Goal C, Policy 2 | Enforce the Sacramento Noise Ordinance as the method to control noise from sources other than transportation sources. |

Goal D, Policy 2 Encourage the incorporation of the latest noise control technologies in all projects.

City of Sacramento Noise Ordinance

The City’s Noise Control Ordinance sets limits for exterior noise levels on designated agricultural and residential property. The ordinance is primarily concerned with regulating noise other than noise generated by transportation noise sources such as passing cars, trains, or aircraft flyovers. The ordinance limits the duration of sound based on many factors, including the type of source, ambient noise levels, and time of day, by using a system of noise criteria not to be exceeded based on the duration of noise over any given hour. The City’s exterior noise standards that would apply to the project are described in Tables 3.3-1 to 3.3-3 below (City of Sacramento, 2007b). The City’s noise standards also include exemptions for the following activities: noise sources due to the erection (including excavation), demolition, alteration or repair of any building or structure provided. However, the operation of an internal combustion engine shall not be exempt pursuant to this subsection if such engine is not equipped with suitable exhaust and intake silencers which are in good working order.

Table 3.3-1. City Noise Ordinance: Baseline Exterior Noise Standards

Time Period	Exterior Noise Level Standards (dBA)
7 a.m. – 10 p.m.	55
10 p.m. – 7 a.m.	50

Table 3.3-2. City Noise Ordinance: Maximum Allowable Intrusive Noise

Cumulative Duration of the Intrusive Sound	Allowance Decibels (dBA)
Cumulative period of 30 minutes per hour	0
Cumulative period of 15 minutes per hour	+5
Cumulative period of 5 minutes per hour	+10
Cumulative period of 1 minute per hour	+15
Level not to be exceeded for any time per hour	+20

Table 3.3-3. City Noise Ordinance: Periods During Which Construction Activities are Exempted

Days of the Week	Exempted Periods
Monday - Saturday	7 a.m. – 6 p.m.
Sunday	9 a.m. – 6 p.m.

Vibration

Construction equipment can create seismic waves that radiate along the surface of the earth and downward into the earth. Surface waves can be felt as ground vibration. Ground vibration can result in effects ranging from annoyance to people to damage of structures. Varying geology and distance result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes decrease with increasing distance from the vibration source.

Potential annoyance and physical damage to buildings from vibration are the primary issues associated with groundborne vibration. Table 3.3-4 shows the human response to continuous groundborne vibration (Whiffen, 1971). Table 3.3-5 shows damage potential thresholds for vibration generated by construction activities (AASHTO, 1990).

Table 3.3-4 Human Response to Continuous Vibration from Traffic

Peak Particle Velocity (PPV) (in/sec)	Human Response
0.4-0.6	Unpleasant
0.2	Annoying
0.1	Begins to annoy
0.08	Readily perceptible
0.006-0.019	Threshold of perception

Source: Whiffen, 1971.

Table 3.3-5 AASHTO Maximum Vibration Levels for Preventing Damage

Type of Situation	Limiting Velocity (in/sec)
Historic sites or other critical locations	0.1
Residential buildings with plastered walls	0.2-0.3
Residential buildings in good repair with gypsum board walls	0.4-0.5
Engineered structures without plaster	1-1.5

Source: AASHTO, 1990

3.3.1 Existing Conditions

Sources and Levels of Noise

The primary sources of noise in and near the project area are traffic on area roadways, train traffic, occasional planes and helicopters, residential and recreational activities, and natural sounds such as wind and wildlife. However, the overall ambient noise level is defined mainly by road and rail traffic.

Sensitive Land Uses and Receptors

Some land uses are considered more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses.

Noise sensitive land uses in the project area are primarily residential uses, generally 30 to 80 feet from the proposed project site. Unionhouse Elementary School is over a third of a mile from the proposed project site, and the nearest community park is over a half mile away. Commercial uses occur at Meadowview Road and Franklin Boulevard, three quarters of a mile from the proposed project site. Noise sensitive receptors in the project area include residents and wildlife. The project area is approximately three miles southeast of the Sacramento Executive Airport and lies outside of the airport

noise restriction area. The proposed project would not expose people residing or working in the project area to excessive noise levels associated with air traffic.

Vibration

Existing vibration sources in the project area include trains on the UPRR tracks and planes flying over the area into the Executive Airport northwest of the proposed project site.

3.3.2 Environmental Effects

Significance Criteria

Adverse effects on noise are considered significant if an alternative would result in any of the following:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels exceeding current standards.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels.
- For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

No Action

Under the no action alternative, the Corps would not construct the Morrison Creek-UPRR project. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. Existing sources of noise, and sensitive land uses and receptors would be expected to remain the same as current conditions.

Proposed Action - Construct Landside Floodwall

Noise and vibration impacts would be limited to the construction phase of the project. No operational noise or vibration impacts would occur. Construction activities associated with this project would result in short-term increases in ambient noise and vibration. Sensitive receptors that could be affected by this increase include residents and wildlife. Based on their distance from the project site, residents and other sensitive receptors in the project area are anticipated to experience noise levels between 80 and 90 dBA, similar to those described in Tables 3.3-6 and 3.3-7 previously. Construction equipment that would be used for the proposed project includes: excavators, loaders, graders, dozers, rollers, water trucks, haul trucks, and maintenance trucks. It is anticipated that there would be twenty haul trips per day on average. Construction noise and vibration would temporarily increase above existing

levels at nearby sensitive receptor locations. Construction activities associated with the project would be temporary in nature and related noise and vibration impacts would be short-term. Construction of the project would occur between the hours of 7 a.m. and 6 p.m., Monday through Saturday, and 9 a.m. to 6 p.m. on Sunday. The noise associated with the construction activities would typically fall within Sacramento City’s construction exemption for noise, limited to the hours described above (Sacramento City Ordinance Code). During that time, residents would be exposed to increases in noise. Construction activities could substantially increase ambient noise and vibration levels at nearby sensitive receptors, but would be reduced to less than significant with the incorporation of mitigation described in Section 3.3.3.

Construction activity noise levels at and near the project areas would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises (such as pile driving), which can be particularly annoying. Table 3.3-6 shows typical noise levels during different construction phases. Table 3.3-7 shows typical noise levels produced by various types of construction equipment.

The project area is approximately three miles southeast of the Sacramento Executive Airport and lies outside of the airport noise restriction area. The proposed project is the installation of a floodwall and would not expose people residing or working in the project area to excessive noise levels associated with air traffic.

Table 3.3-6 Typical Construction Phase Noise Levels

Construction Phase	Noise Level (dBA, L_{eq})^a
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

^a Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

Source: U.S. Environmental Protection Agency, 1971.

Table 3.3-7 Typical Noise Levels From Construction Equipment

Construction Equipment	Noise Level (dBA, L_{eq} at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Grader	85
Scraper	89
Jack Hammer	88
Dozer	87
Paver	89
Generator	81
Pile Driver	101
Backhoe	85

Source: Cunniff, 1977, Federal Transit Administration 1995

3.3.3 Mitigation

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. Implementation of these mitigation measures would reduce noise effects to less-than-significant.

- Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools.
- Construction equipment, haul trucks, and worker vehicles shall be turned off when not in use for more than five minutes.
- Residences adjacent to the project area and along the haul routes identified in Section 3.2.2 shall be notified by the Corps and or its partners about the type and schedule of construction.

Compliance with the local noise ordinance would minimize the exposure of residents to excessive noise. With the implementation of the above mitigation measures, adverse effects are expected to be less than significant.

3.4 Air Quality

This section describes the existing air quality conditions in and near the project area, the project effects, and mitigation measures. This includes the regional setting, regulatory setting, existing air quality, sensitive receptors, environmental effects, and mitigation.

3.4.1 Existing Conditions

Regional Setting

The air quality of a given area is determined by the amount of pollutants released into the atmosphere and the atmosphere's ability to transport and dilute the pollutants. The most important determinants of air pollution transport are wind, atmospheric stability, and terrain.

The project area is located in the city of Sacramento, which is under the jurisdiction of the Sacramento Metropolitan Air Quality Management District (SMAQMD). The project area is included in the Sacramento Air Quality Management Area, part of the Federally-delineated Sacramento Valley Air Basin (SVAB). The air basin is bound by the Cascade Range on the north, the Sierra Nevada on the east, and the Coast and Diablo Ranges on the west. The project area is about 53 miles north of the Carquinez Strait, a sea level gap between the Coast and Diablo Ranges. Air enters the air basin through the Carquinez Strait and moves across the Delta, bringing with it pollutants from the San Francisco Bay Area.

The SVAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. During winter, the North Pacific storm track intermittently dominates Sacramento Valley weather, and fair weather alternates with periods of extensive clouds and precipitation. Periods of dense and persistent low-level fog, which is most prevalent between storms, are also characteristic of winter weather in the valley. The frequency and persistence of heavy fog in the valley diminishes with the approach of spring. The average yearly temperature range for the Sacramento Valley is 20°F to 115°F, with summer high temperatures often exceeding 90°F and winter low temperatures occasionally dropping below freezing.

Because the Sacramento Valley is shaped like a bowl, ozone pollution presents a serious problem when an inversion layer traps pollutants close to the ground, causing unhealthy air quality levels. Vehicles and other mobile sources, including trucks, locomotives, buses, motorcycles, agricultural equipment and construction equipment cause approximately 70 percent of our region's air pollution problem during the summer (SMAQMD, 2010).

Federal Air Quality Management

Air quality in the United States is governed by the Federal Clean Air Act (CAA), which resulted in the adoption of Federal air pollution standards, known as National Ambient Air Quality Standards (NAAQS). The California Clean Air Act (CCAA) of 1988 altered the structure and administration of air quality management programs in California, and is administered by the California Air Resources Board (CARB) at the State level, and by the Air Quality Management Districts at the regional and local levels. The Sacramento Metropolitan Air Quality Management District (SMAQMD) is the agency principally responsible for monitoring the attainment and maintenance of Federal and State standards in the Morrison Creek-UPRR project area. SMAQMD is also subject to regulations and attainment goals and standards of the SVAB, CARB, and Environmental Protection Agency (EPA). The EPA has established and continues to update the NAAQS for specific "criteria" air pollutants, including: ozone (O₃), lead (Pb), nitrogen dioxide (NO₂), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), coarse particulate matter (PM₁₀), and particulate matter of respirable size (PM_{2.5}). Primary NAAQS define levels of air quality which the EPA has determined necessary to provide an adequate margin of safety to protect public health, including the health of sensitive populations such as children and the elderly. Federal NAAQS are shown in Table 3.4.1.

The Federal CAA requires states to classify air basins as either "attainment" or "non-attainment" with respect to criteria air pollutants. Areas are classified as in attainment or in non-attainment with respect to CAAQS and NAAQS. These classifications are made by comparing actual monitored air pollutant concentrations to State and Federal standards. If a pollutant concentration is lower than the state or Federal standard, the area is considered to be in attainment of the standard for that pollutant. If pollutant levels exceed a standard, the area is considered a non-attainment area. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated as unclassified. This typically occurs in non-urbanized areas, where pollutant levels may be less closely monitored.

Counties or regions that are designated as Federal non-attainment areas for one or more criteria air pollutants prepare a plan that demonstrates how the area will achieve attainment of the standards by the Federally-mandated deadlines.

Federal Conformity Requirements

Federal projects are subject to either the Transportation Conformity Rule (40 CFR 51, Subpart T), which applies to Federal highway and transit projects, or the General Conformity Rule (GCR) (40 CFR 51, Subpart W), which applies to all other Federal projects. Because the project is not a Federal highway or transit project, it is subject to the GCR.

The purpose of the GCR is to ensure that Federal projects conform to applicable State Implementation Plans (SIPs) so that they do not interfere with strategies used to attain the NAAQS. The rule applies to Federal projects in non-attainment areas for any of six criteria pollutants for which the EPA has established these national standards and in areas designated as "maintenance" areas. The rule covers direct and indirect emissions of criteria pollutants or their precursors that result from a Federal

project, are reasonably foreseeable, and can be practicably controlled by the Federal agency through its continuing program responsibility.

Table 3.4-1 State and Federal Ambient Air Quality Standards

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards ¹		Federal Standards ²		
		Concentration ³	Method	Primary	Secondary	Method
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m ³)		0.070 ppm (147 µg/m ³)		
Respirable Particulate Matter (PM ₁₀)	24 Hour	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m ³		—		
Fine Particulate Matter (PM _{2.5})	24 Hour	No Separate State Standard		35 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m ³	Gravimetric or Beta Attenuation	15.0 µg/m ³	Same as Primary Standard	
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m ³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m ³)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m ³)		35 ppm (40 mg/m ³)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m ³)		—	—	
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	Gas Phase Chemiluminescence	53 ppb (100 µg/m ³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m ³)		100 ppb (188 µg/m ³)	None	
Sulfur Dioxide (SO ₂)	24 Hour	0.04 ppm (105 µg/m ³)	Ultraviolet Fluorescence	—	—	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method) ⁹
	3 Hour	—		—	0.5 ppm (1300 µg/m ³) (see footnote 9)	
	1 Hour	0.25 ppm (655 µg/m ³)		75 ppb (196 µg/m ³)	—	
Lead ₁₀	30 Day Average	1.5 µg/m ³	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m ³	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	—		0.15 µg/m ³		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m ³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence			
Vinyl Chloride ₁₀	24 Hour	0.01 ppm (26 µg/m ³)	Gas Chromatography			

¹ Values not to be exceeded

² Values not to be exceeded more than once a year

³ ppm = parts per million; µg/m³ = micrograms per cubic meter;

California Air Resources Board (09/08/10)

Federal Attainment Status

The project area lies within Sacramento County, which forms part of a multicounty region referred to as the Sacramento Federal Ozone Non-Attainment Area (SFNA). The SFNA includes all of Sacramento and Yolo Counties, the Sacramento Valley portion of Solano County, parts of El Dorado and Placer Counties, and the southern portion of Sutter County. The SFNA has been designated as “severe” non-attainment for the national 1-hour and 8-hour average ozone standard (Table 3.4-2).

Sacramento County is also designated as non-attainment for the national PM₁₀ and PM_{2.5} standards. Sacramento County is “attainment” or “unclassified” with respect to the other ambient air quality standards. A designation of “unclassified” indicates that there is insufficient data for determining attainment or non-attainment (CARB, 2005).

State Attainment Status

In addition to being subject to the requirements of the CAA, air quality in California is also governed by more stringent regulations under the CCAA. The California air pollutant standards are known as the California Ambient Air Quality Standards (CAAQS) and are generally more stringent than the NAAQS. CAAQS are also shown in Table 3.4.1. Existing compliance (i.e., area “attainment”) with the NAAQS and CAAQS for criteria pollutants is discussed below.

Under the CCAA, which has been patterned after the Federal CAA, areas are designated as attainment or non-attainment with respect to the State standards. Sacramento County is designated as non-attainment for State ozone, PM₁₀, and PM_{2.5} standards (Table 3.4-2). Sacramento County is designated as attainment or unclassified for all other criteria pollutants.

Table 3.4-2 Sacramento Air Quality Standards Attainment Status

Parameter	California Standard	Federal Standard
O ₃	Non-Attainment Classification = Serious (1 hour and 8 hour Standards)	Non-Attainment, Classification = Severe - 15* (8 hour Standard)
PM ₁₀	Non-Attainment (24 hour Standard and Annual Mean)	Non-Attainment**, Classification = Moderate (24 hr std)
PM _{2.5}	Non-Attainment (Annual Standard)	Non-Attainment (24 hour Standard)
CO	Attainment (1 hour and 8 hour Standards)	Attainment (1 hour and 8 hour Standards)
NO ₂	Attainment (1 hour Standard)	Attainment (Annual Standard)***
SO ₂	Attainment (1 hour and 24 hour Standards)	Attainment (3 hour, 24 hour, and Annual Standards)****
Lead	Attainment (30 Day Standard)	Attainment (Calendar Quarter)
Visibility Reducing	Unclassified	No Federal Standard

Parameter	California Standard	Federal Standard
Particles	(8 hour Standard)	
Sulfates	Attainment (24 hour Standard)	No Federal Standard
Hydrogen Sulfide	Unclassified (1 hour Standard)	No Federal Standard

* A formal request for voluntary reclassification from “serious” to “severe” for the 8-hour ozone nonattainment area with an associated attainment deadline of June 15, 2019, was submitted from the Air Resources Board to EPA on February 14, 2008. EPA approved the request effective June 4, 2010.

** Air Quality meets Federal PM-10 Standards. The AQMD must request redesignation to attainment and submit a maintenance plan to be formally designated to attainment.

*** NO2 - New 1-hour standard 100ppb, effective 4/12/2010 (Designation expected 4/12/2011.)

**** SO2 - New 1-hour standard 75ppb, effective 8/23/2010

California Area Designations based upon AQ Data collected during 2001-2003.
Source: Sacramento Metropolitan Air Quality Management District, 2010

Local Air Quality Management

The regional and county air districts are primarily responsible for developing local air quality plans and regulating stationary emission sources and facilities. The project area lies within the jurisdiction of the SMAQMD, the agency empowered to regulate air pollutant emissions from stationary sources in Sacramento County. As noted earlier, the Federal CAA and the CCAA require plans to be developed for areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM10 standard). Plans are also required under Federal law for areas designated as “maintenance” for national standards. Such plans are to include strategies for attaining these standards.

The 1994 Sacramento Regional Clean Air Plan is the current Federal air quality ozone plan for the Sacramento metropolitan area. It predicts attainment of the national 1-hour ozone standard (SMAQMD et al., 1994). To attain the standard, the 1994 ozone plan relies heavily on local air districts’ stationary-source control programs and on statewide mobile-source control programs. With respect to the national carbon monoxide standard, the revised plan includes a “maintenance” plan that demonstrates how Sacramento County will continue to maintain carbon monoxide concentrations below the standard. The most recent update is the 2009 Triennial Report, adopted January 28, 2010, which identifies “all feasible measures” that the SMAQMD will analyze or adopt over the next three years (SMAQMD, 2011).

These attainment plans depend heavily on SMAQMD’s permit authority, which is exercised through SMAQMD’s Rules and Regulations. With respect to the construction phase of the project, applicable SMAQMD regulations would relate to construction equipment, particulate matter generation, architectural coatings, and paving materials. Equipment used during project construction would be subject to the requirements of SMAQMD Regulation 2 (Permits), Rule 201 (General Permit Requirements); and Regulation 4 (Prohibitory Rules), Rule 401(Ringelmann Chart/Opacity), Rule 402 (Nuisance), Rule 403 (Fugitive Dust), Rule 404(Particulate Matter), Rule 405 (Dust and Condensed Fumes), Rule 420 (Sulfur Content of Fuels), Rule 442 (Architectural Coatings), and Rule 453 (Cutback and Emulsified Asphalt Paving Materials).

City of Sacramento General Plan

The Air Quality Section of the City of Sacramento General Plan Update (City of Sacramento, 2009) contains the following air quality goals and polices that would apply to the project.

Goal. Improve the health and sustainability of the community through improved regional air quality and reduced greenhouse gas emissions that contribute to climate change.

Policies

Policy ER 6.1.1: Work with California Air Resources Board and the Sacramento Metropolitan Air Quality Management District to meet State and Federal ambient air quality standards.

Policy ER 6.1.2: Development projects shall be reviewed to ensure incorporation of feasible measures that reduce construction and operational emissions for ROG, NO_x, PM₁₀ and PM_{2.5} through project design.

Policy ER 6.1.3: Development projects that exceed SMAQMD ROG and NO_x operational thresholds shall incorporate design or operational features that reduce emissions equal to 15 percent.

Policy ER 6.1.11: Coordinate with SMAQMD to ensure projects incorporate feasible mitigation measures if not already provided for through project design.

County of Sacramento General Plan

The Air Quality Element of the County of Sacramento General Plan (County of Sacramento, 2010) contains the following air quality goals, objectives, and policies that would apply to the proposed haul routes through the County of Sacramento.

Goal. Air quality which protects and promotes the public health, safety, welfare, and environmental quality of the community.

Objectives. A safe and healthful environment for pollution sensitive residential land uses and sensitive receptors.

- A reduction in motor vehicle emissions through a decrease in the average daily trips and vehicle miles traveled.
- Compliance with Federal and State air quality standards.
- A reduction in releases of ozone depleting compounds in order to ensure the protection of the stratospheric ozone layer.

Policies

Policy AQ-17: Require that development projects be located and designed in a manner which will conserve air quality and minimize direct and indirect emission of air contaminants.

Policy AQ-19: Identify the air quality effects of development proposals to avoid significant adverse effects and require appropriate mitigation measures or offset fees.

Policy AQ-20: Submit development proposals to AQMD for review and comment in compliance with California Environmental Quality Act prior to consideration by the appropriate decision-making body.

Policy AQ-22: Provide for buffers between sensitive land uses and sources of air pollution or odor.

Policy AQ-37: Maximize air quality benefits through selective use of vegetation in landscaping and through revegetation of appropriate areas.

Existing Conditions

Air quality in the Sacramento metropolitan area primarily reflects emissions generated within the metropolitan area. However, it is also affected by wind-driven pollutant transport from the San Francisco Bay Area and the San Joaquin Valley (CARB, 1996). Conversely, emissions generated within the Sacramento area occasionally contribute to air quality problems in the Mountain Counties Air Basin, upper Sacramento Valley, San Joaquin Valley, and the San Francisco Bay Area. The air quality attainment status for criteria pollutants in Sacramento County are summarized in Table 3.4-2 (SMAQMD, 2010). EPA classified Sacramento County as a partial non-attainment area for the Ozone, PM₁₀ and PM_{2.5} standards. With the new designation, an attainment plan will be submitted to EPA by 2012.

Criteria Air Pollutants

Air quality studies generally focus on five pollutants most commonly measured and regulated, and referred to as criteria air pollutants: ozone, CO, inhalable PM (PM₁₀ and PM_{2.5}), NO₂, and SO₂. Because ozone, a photochemical oxidant, is not emitted into the air directly from sources, emissions of ozone precursors, including NO_x and reactive organic gasses (ROG), are regulated with the aim of reducing ozone formation in the lowermost region of the troposphere.

Ozone and NO₂ are considered regional pollutants because they (or their precursors) affect air quality on a regional scale: NO₂ reacts photochemically with ROG to form ozone, and this reaction occurs at some distance downwind of the source of pollutants. Pollutants such as CO, PM₁₀, and PM_{2.5} are considered to be local pollutants because they tend to disperse rapidly with distance from the source.

The principal characteristics surrounding these pollutants are discussed below. Toxic air contaminants (TACs) and greenhouse gasses (GHGs) are also discussed below, although no air quality standards exist for these pollutants.

Ozone

Ozone is an oxidant that attacks synthetic rubber, textiles, and other materials and causes extensive damage to plants by leaf discoloration and cell damage. It is also a severe eye, nose, and throat irritant and increases susceptibility to respiratory infections. Ozone is not emitted directly into the atmosphere, but is formed through a photochemical reaction in the atmosphere. Ozone precursors, including ROG and NO_x, are emitted by mobile sources and stationary combustion equipment and react in the presence of sunlight to form ozone.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary

photochemical compounds, like ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials.

Once formed, ozone remains in the atmosphere for one or two days. Ozone is then eliminated through chemical reaction with plants (reacts with chemicals on the leaves of plants), rainout (attaches to water droplets as they fall to earth), and washout (absorbed by water molecules in clouds and later falls to earth with rain). The SVAB is designated as a non-attainment area for ozone, based on both Federal and State standards.

Carbon Monoxide

Carbon Monoxide (CO) is essentially inert to most materials and to plants but can significantly affect human health because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter, when periods of light wind combine with the formation of ground-level temperature inversions—typically from evening through early morning. These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Particulate Matter

PM₁₀ and PM_{2.5} represent fractions of particulate matter that can be inhaled into the air passages and the lungs and that can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, grading and construction, and motor vehicle use. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others such as vehicular traffic have a more regional effect. Very small particles of certain substances (sulfates and nitrates) can cause lung damage directly or can contain adsorbed gases (chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

PM₁₀ concentrations in Sacramento County are a result of a mix of rural and urban sources including agricultural activities, industrial emissions, dust suspended by vehicular traffic, and secondary aerosols formed by reactions in the atmosphere. Particulate concentrations near residential sources generally are higher during the winter when more fireplaces are used and when meteorological conditions prevent the dispersion of directly emitted contaminants.

Nitrogen Dioxide

NO₂ is a brownish gas that contributes to the formation of ground-level ozone pollution. NO₂ increases respiratory disease and irritation and may reduce resistance to certain infections. The majority of ambient NO₂ is not directly emitted but is formed rather quickly from the reaction of nitric oxide (NO) and oxygen in the atmosphere. NO and NO₂ are the primary pollutants that make up the group of pollutants referred to as NO_x. In the presence of sunlight, complex reactions of NO_x with ozone and other air pollutants produce the majority of NO₂ in the atmosphere. NO₂ is one of the NO_x emitted from high-temperature combustion processes, such as those occurring in trucks, cars, and power plants. Indoors, home heaters and gas stoves also produce substantial amounts of NO₂.

Sulfur Dioxide

SO₂ is a colorless, irritating gas with a “rotten egg” smell formed primarily by the combustion of sulfur-containing fossil fuels. SO₂ is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives and off-road diesel equipment. SO₂ also is emitted from several industrial processes, such as petroleum refining and metal processing.

Toxic Air Contaminants

TACs are a category of air pollutants that have been shown to affect human health but are not classified as criteria pollutants. TACs are generated by various kinds of sources, including stationary sources such as dry cleaners and gas stations; combustion sources; mobile sources such as diesel trucks, ships, and trains; and area sources such as farms, landfills, and construction sites. Significant health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) non-carcinogenic, and long-term (chronic) non-carcinogenic. To date, CARB has identified 21 TACs and adopted EPA’s list of hazardous air pollutants (HAPs) as TACs.

Sensitive Receptors

The NAAQS and CAAQS apply at publicly accessible areas, regardless of whether those areas are populated. For the purposes of air quality analysis, sensitive land uses are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (e.g., 24-hour, 8-hour, and 1-hour). Typical sensitive receptors are residences, hospitals, and schools.

Sensitive land uses adjacent to the project area are primarily residential subdivisions and isolated single-family residences. Other sensitive land uses in the area include Union House Elementary School which is a third of a mile from the project site.

Residential areas are also sensitive to poor air quality because people usually stay home for extended periods of time. The nearest residences are located on either side of the project area, the nearest having approximately 25 feet between their houses and excavation areas. Residential uses also occur along the haul routes. Construction traffic to and from the project site would use SR 99 to Cosumnes River Boulevard to Franklin Boulevard and I-5 to Pocket/Meadowview Road to Franklin Boulevard.

3.4.2 Environmental Effects

This section evaluates the effects of the proposed alternatives on the air quality in the project area. This is a quantitative evaluation of the types and levels of emissions associated with the construction activities.

Significance Criteria

Adverse effects on air quality were considered significant if an alternative would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

The following analysis discusses the first four criteria; the fifth is not discussed because the project would not involve development of the types of land uses typically associated with odor issues. Land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, and dairies. Operation of the proposed project would not generate any odors. Diesel exhaust emissions could cause temporary odors, but would be less than significant due to the temporary nature of the odor source.

No Action

Under the no action alternative, the Corps would not construct the Morrison Creek-UPRR project. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. The existing air quality would remain the same. The Sacramento area would continue to be designated by the EPA as being in non-attainment for ozone and PM₁₀, and designated by the State as being in non-attainment for ozone, PM₁₀, and PM_{2.5}.

Proposed Action - Construct Landside Floodwall

Air quality effects fall into two categories: short-term construction-related effects and long-term operations-related effects. Short-term construction activities would primarily result in the generation of ROG, NO_x, and PM₁₀. The project would not include any long-term operational emission sources other than the nominal vehicle emissions associated with routine inspection and maintenance of the proposed project.

Short-term construction emissions were calculated by obtaining an inventory of required construction equipment and the hours of operation and horsepower of each piece of equipment for each construction phase. These data were then incorporated into the SMAQMD Road Construction Emissions Model. Additional information on the air emission calculations is included in Appendix C.

SMAQMD's standard emission thresholds and the EPA's de minimis conformity thresholds were then used to determine the significance of the calculated air quality emissions. The amount of each pollutant generated during construction of each proposed alternative was compared to these thresholds. The results of this comparison are described below, as well as other criteria used to determine the overall significance of the proposed project on air quality.

According to 40 CFR 93.153, conformity determinations are required only of Federal actions that occur in nonattainment areas and result in generation of emissions that exceed established de minimis levels, shown below in Table 3.4.3.

Table 3.4.3: Federal De Minimis Levels

Pollutant	Area Type	Tons/Year
Ozone (VOC or NO _x)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Carbon monoxide, SO ₂ and NO ₂	All nonattainment & maintenance	100
PM-10	Serious nonattainment	70
	Moderate nonattainment and maintenance	100

Source: EPA 2008

SMAQMD has established daily construction and operations emissions thresholds for ROG and NO_x for development projects within its jurisdiction. Because SMAQMD does not have construction thresholds for CO, sulphur oxides (SO_x), or PM₁₀, the analysis conducted for the project alternatives used the Federal emissions thresholds for these criteria pollutants. Table 3.4.4 summarizes the SMAQMD emissions thresholds applicable to this project.

Table 3.4.4 Criteria Air Pollutant Emission Thresholds

Pollutant	SMAQMD Thresholds (lbs/day)
NO _x	85 (construction)
	65 (operation)
ROG	65 (operation)

Source: SMAQMD 2008

Construction of the proposed Morrison Creek-UPRR Landside Floodwall is not expected to have any long-term effects on air quality since the operational activities (including inspection and maintenance) are expected to be similar to existing conditions. However, construction would result in direct, short-term effects on air quality. The two types of short-term emissions would be combustion emissions and dust emissions. The nearest sensitive receptors would be adjacent residences described above.

Combustion emissions and the production of dust would result from the use of construction equipment, truck haul trips, and worker vehicle trips to and from the construction site. Exhaust emissions from these sources would include ROG, CO, NO_x, and PM₁₀. Exhaust emissions would vary depending on the type of equipment, the duration of its use, and the number of construction worker and haul trips to and from the construction sites. Combustion and dust emissions from heavy equipment and construction worker commute trips would vary from day to day, and would contribute incrementally to regional ozone concentrations over the construction period; however, they would not be expected to be at levels that would affect a substantial number of people.

Table 3.4.5 shows that emissions of ROG, NO_x, CO, and PM₁₀ resulting from construction of the Morrison Creek-UPRR Floodwall Project would each be less than the de minimis thresholds established by the EPA for conformity analyses. Consequently, the proposed action does not require an in-depth conformity analysis to evaluate ambient air quality concentrations and instead is presumed to conform to the region's ozone State implementation plan. Additionally, the short-term construction-related emissions

of ROG, NO_x, CO, and PM₁₀ would not exceed the significance thresholds established by the SMAQMD and thus would be less than significant. Because project construction emissions would be below State and Federal ambient air quality standards, implementation of the proposed project would not conflict with the implementation of any State or Federal air quality attainment plan. Additional information on the air emission calculations is included in Appendix C.

Table 3.4-5 Estimated Air Emissions for Construction of the Morrison Creek-UPRR Flood Project

	ROG	NO_x	CO	PM₁₀	PM_{2.5}	CO₂
Total emissions (lbs/day) Site Preparation & Construction	9	76	55	4	3	10,100
SMAQMD thresholds (lbs/day)	N/A	85	N/A	N/A	N/A	N/A
Total project emissions (tons)	.5	2	3	.5	.5	334
Federal de minimis standards (tons/year)	25	25	100	100	N/A	N/A

Note: Estimates rounded. See Appendix C

3.4.3 Mitigation

Reducing NO_x Emissions from Off-Road Diesel Powered Equipment

The project would provide a plan for approval by SMAQMD demonstrating that the heavy-duty (greater than 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, would achieve a project wide fleet-average 20 percent NO_x reduction and 45 percent particulate reduction as compared to the most recent CARB fleet average at time of construction.

The project representative would submit to SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that would be used an aggregate of 40 or more hours during any portion of the construction project. The inventory would include the horsepower rating, engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory would be updated and submitted monthly throughout the duration of the project, except that an inventory would not be required for any 30-day period in which there is no construction activity. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative would provide SMAQMD with the anticipated construction timeline, including start date, and name and phone number of the project manager and onsite foreman.

Controlling Visible Emissions from Off-Road Diesel Powered Equipment

The project would ensure that emissions from all off-road diesel powered equipment used on the project site do not exceed 40 percent opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) would be repaired immediately, and SMAQMD would be notified within 48 hours of identification of non-

compliant equipment. A visual survey of all in-operation equipment would be made at least weekly, and a monthly summary of the visual survey results would be submitted throughout the duration of the project, except that the monthly summary would not be required for any 30-day period in which no construction activity occurs. The monthly summary would include the quantity and type of vehicles surveyed, as well as the dates of each survey. The SMAQMD and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section would supercede other SMAQMD or State rules or regulations.

Controlling PM10 Emissions

The PM10 effects from construction activities would be considered less than significant if the maximum actively disturbed area per day is less than fifteen acres and Basic Construction Emission Control Practices (BCECP) or BMP's are implemented (Appendix B of SMAQMD's Guide to Air Quality Assessment for Sacramento County). The maximum actively disturbed area for this project is expected to be approximately 5.5 acres total; therefore, implementation of the BCECP's listed below would be required. Implementation of the BCECP's and BMPs listed below would reduce air emissions and ensure that the project emissions would remain at less-than-significant levels.

- Equipment operation, activities, or processes performed by the contractor would be in accordance with all Federal and State air emission and performance laws and standards.
- Dust particles, aerosols, and gaseous by-products from construction activities, and processing and preparation of materials would be controlled at all times, including weekends, holidays, and hours when work is not in progress. The contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control would be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The contractor would comply with all State and local visibility regulations.
- All on-street trucks hauling soil, sand, and other loose materials would be covered or would maintain at least two feet of freeboard. Any haul trucks that would be traveling along freeways or major roadways should be covered. Exposed surfaces, graded areas, and storage piles would be watered at least twice daily to reduce generation of dust. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Vehicle speeds on unpaved roads would be limited to 15 miles per hour (mph).
- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes [required by California Code of Regulations, Title 13, sections 2449(d)(3) and 2485]. Provide clear signage that posts this requirement for workers at the entrances to the site.

The Corps would also prepare a dust and particulate suppression plan and submit it to the SMAQMD for review before initiating construction activities. The plan would include as many of the following mitigation measures, as applicable, depending on the maximum actively disturbed area during construction (Appendix B of SMAQMD's Guide to Air Quality Assessment for Sacramento County).

- Water exposed soil at least three times daily (55 percent mitigation factor) and additionally as required to prevent fugitive dust.
- Maintain at least two feet of freeboard for on-street trucks hauling soil, sand, or other loose materials or cover loads (1 percent mitigation factor).

- Water soil piles three times daily (55 percent mitigation factor) and additionally, as required, to prevent fugitive dust.
- Keep soil moist at all times (75 percent mitigation factor) and additionally as required to prevent fugitive dust.
- Use emulsified diesel or diesel catalysts on applicable heavy duty diesel construction equipment.
- Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, and/or other options as they become available.
- Improve fuel efficiency from construction equipment by minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than five minutes.
- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
- Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power.
- Use a CARB-approved low carbon fuel for construction equipment.
- Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes.

3.5 Climate Change

This section evaluates the effects of the proposed alternatives on greenhouse gas emissions and climate change.

3.5.1 Existing Conditions

Regulatory Setting

Federal Laws, Policies, and Plans

Currently, NEPA does not have formal guidance on how agencies would consider the effects of climate change. On February 18, 2010, the Council on Environmental Quality released draft guidance on the consideration of the effects of climate change and greenhouse gases (GHGs) (CEQ, 2010). However, this guidance has not been finalized.

On September 22, 2009, the EPA released its final GHG Reporting Rule. The GHG Reporting Rule is a response to the 2008 Consolidated Appropriations Act (Public Law 110-161), which required EPA to develop "...mandatory reporting of greenhouse gases above appropriate thresholds in all sectors of the economy..." The GHG Reporting Rule would apply to most entities that emit 25,000 metric tons of carbon dioxide equivalents (CO₂e) or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The GHG Reporting Rule would also mandate recordkeeping and administrative requirements in order for the EPA to verify annual GHG emissions reports.

On December 7, 2009, the EPA signed two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- **Endangerment Finding:** the current and projected concentrations of the six key well-mixed GHGs in the atmosphere threaten the public health and welfare of current and future generations. These GHGs are: carbon dioxide (CO₂), methane (CH₄), NO₂, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).
- **Cause or Contribute Finding:** the combined emissions of these well-mixed GHGs from new motor vehicles and new motor engines contribute to the GHG pollution, which threatens public health and welfare.

State Laws, Policies, and Plans

The most significant climate change legislation in California is Assembly Bill 32 (AB 32). AB 32 was passed by State Legislature, and signed by Governor Schwarzenegger, in 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. The law directs CARB to begin developing plans to significantly reduce statewide GHG emissions by the year 2020. CARB is required to complete the development of these plans by 2011, with the new rules going into effect on January 1, 2012 (CARB, 2010b).

Existing Conditions

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level. Global average surface temperature has increased approximately 1.33 °F over the last one hundred years, with the most severe warming occurring in the most recent decades. In the 12 years between 1995 and 2006, eleven of those years ranked among the warmest in the instrumental record of global average surface temperature (going back to 1850). Continued warming is projected to increase global average temperatures between 2 °F and 11 °F over the next 100 years (IPCC, 2007).

The causes of this warming have been identified as both natural processes and as the result of human actions. Increases in GHG concentration in the Earth's atmosphere are thought to be the main cause of human-induced climate change. GHGs naturally trap heat by impeding the exit of solar radiation that has hit the Earth and is reflected back into space.

The principle GHGs, as listed in the Federal Regulatory Setting description above, include CO₂, CH₄, NO₂, HFCs, PFCs, and SF₆. Each of the principal GSGs has a long atmospheric lifetime (one year to several thousand years). In addition, the potential heat trapping ability of each of these gases vary significantly from one another. Conventionally, GHGs have been reported as CO₂e. CO₂e takes into account the relative potency of non-CO₂ GHGs and converts their quantities to an equivalent amount of CO₂ so that all emissions can be reported as a single quantity.

The primary manmade processes that release GHGs include the following: burning of fossil fuels for transportation, heating, and electricity generation; agricultural practices that release CH₄, such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of these potential gases, such as HFCs, PFCs, and SF₆. Deforestation and land cover conversion have also been identified as contributing to global warming by reducing the Earth's capacity to remove CO₂ from the air and altering the Earth's surface reflectance, allowing more solar radiation to be absorbed.

3.5.2 Environmental Effects

Significance Criteria

It is unlikely that any single project by itself could have a significant impact on the environment with respect to GHGs. However, the cumulative effect of human activities has been clearly linked to quantifiable changes in the composition of the atmosphere, which in turn have been shown to be the main cause of global climate change (IPCC, 2007). Therefore, the analysis of the environmental effects of GHG emissions from this project will be analyzed based on total project emissions.

A quantitative significance threshold for GHG emissions has not yet been established. Instead, each project is evaluated on a case by case basis, using the most up to date calculation and analysis methods. The proposed action could result in a significant impact if it would generate GHG emissions either directly or indirectly that:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Would conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs, including the State goal of reducing GHG emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32.

The following criteria show that the significance of GHG emissions from this project are minimal:

- The relative amounts of GHG emissions over the life of the proposed project are small in comparison to the amount of GHG emissions for major facilities that are required to report GHG emissions (25,000 metric tons of CO₂e/year);
- All applicable best management practices that would reduce GHG emissions are incorporated into the proposed project design.

No Action

Under the no action alternative, the Corps would not construct the Morrison Creek-UPRR project. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. As a result, there would be no additional generation of GHGs associated with construction vehicles and activities. The global climate would continue to change similar to current patterns. In the event of a flood, there would be a possibility of GHG emissions generated throughout the flood fighting and clean-up efforts.

Proposed Action - Construct Landside Floodwall

The proposed project would result in minor temporary emissions of GHGs associated with construction activities. There would be no operational emissions. During construction, the proposed project would generate short-term, less-than-significant CO₂ emissions associated with combustion of gasoline and diesel fuel during site preparation activities. CO₂ is produced by the burning of fossil fuels and would be the predominant GHG generated during this project. Because no major sources exist for the other GHGs during the construction of this project, they are not considered to be significant and no quantitative emission calculations were made for them. CO₂ emission estimations were based on exhaust

emission and were generated using the SMAQMD Road Construction Emission Model (version 6.3.2). The results of this modeling effort can be found in Appendix C.

As shown in Table 3.4-5 in Section 3.4-3 above, it is estimated that construction of the project would generate approximately 10,100 pounds per day of CO₂. It should be noted that although CO₂ emissions are now calculated for climate change assessment, there remains no Federal standard, or State or local threshold to meet, which makes these emissions difficult to fully analyze.

The EPA Reporting Rule is the only quantitative limit that currently exists, which requires facilities to report on any GHG emissions above 25,000 tons per year. Because the emissions generated by this project are significantly below the 25,000 tons per year threshold, it is assumed that they are less than significant. Because project GHG emissions would be less than significant, the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses.

The emissions that would be generated by construction of the proposed project would be temporary in nature. There would be no permanent increase of long-term GHG emissions as a result of project construction. As a result, construction of the Morrison Creek-UPRR project would have no effect on the regional climate. The project would improve flood protection in the south Sacramento area and protect the area if the frequency, and possibly the magnitude, of future flood events increase due to climate change. The project would have no effect on the climate in the project area.

3.5.3 Mitigation

The following BMPs, which are also included in the Air Quality section, would be implemented to further reduce GHG emissions associated with the project:

- Improve fuel efficiency from construction equipment by minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than five minutes.
- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
- Train equipment operators in proper use of equipment.
- Use the proper size of equipment for the job.
- Use equipment with new technologies.
- Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power.
- Use a CARB-approved low carbon fuel for construction equipment.
- Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes.
- Develop a plan to efficiently use water for adequate dust control.

With the implementation of these mitigation measures, the CO₂ emissions would likely be reduced further below the 25,000 ton per year threshold. Since effects from GHG emissions would be temporary, and the CO₂ emission analysis suggests that emissions would be significantly below the

25,000 ton reporting requirement, it is anticipated that the effects on climate change associated with this project would be less than significant.

3.6 Traffic and Circulation

This section evaluates the potential of the proposed alternatives on transportation in the study area. This evaluation includes roadways used by construction workers and haul trucks traveling to and from the construction area. Potential construction effects are increased traffic volumes, safety issues, parking problems, and effects on rail, bus, pedestrian, bicycle, and airport facilities.

The proposed project would be designed and scheduled so that construction would not close a roadway or block a travel lane, block a transit route, block a pedestrian sidewalk or bicycle lane, remove parking spaces in an area of limited parking, create on-street parking demand where on-street parking is limited or is not permitted, create an operational safety hazard, or block emergency vehicle access. As a result, this transportation evaluation focuses on effects that would significantly increase traffic on nearby roadways or close or interfere with the operation of a rail line.

3.6.1 Existing Conditions

Streets around the project area consist primarily of major arterial roadways and local residential roadways. Within the project area, access roads consist of gravel levee maintenance roads and dirt roads. These roads are gated and not accessible by public vehicles.

Two major freeways serve the project area: I-5 and SR 99. Haul trucks and construction workers from outside of the south Sacramento area would access the area via one of these two roadways. Major arterial roadways that would connect vehicles to the project area from the freeways include Meadowview Road, Mack Road, Franklin Boulevard, and Cosumnes River Boulevard. None of these roadways are designated as truck routes. The average daily trips (ADT) for these roadways are shown on Table 3.6-1 below.

Table 3.6-1. Average Daily Trips for Major Roadways in the Project Area.

Roadway	Limits	ADT	A.M. Peak	P.M. Peak	Count Year
Meadowview Road	at Freeport Boulevard	12,191	1,012	932	2008
Meadowview Road	Addison Way to 24 th Street	11,151	852	901	2008
Meadowview Road	at Brookfield Road	16,397	1,011	1,612	2002
Mack Road	Brooke Meadow Drive to Archean Way	14,342	951	1,394	2002
Franklin Boulevard	Camino Royale Drive to Cosumnes River Boulevard	9,614	620	875	1996
Cosumnes River Boulevard	Franklin Boulevard to Center Parkway	7,477	644	623	2005
Cosumnes River Boulevard/Calvine Road	Bruceville Road to SR 99	16,644	1,299	1,190	2001

Source: City of Sacramento, 2010

The 2010 Sacramento City/County Bikeway Master Plan was adopted in 1995, and has been updated in 2001 and 2004. Based on the Bikeway Master Plan, all of the major roadways connecting to the project area are designated as Class II (on-street) bikeways (Sacramento, 2010). Additionally, all of

these roadways are designated pedestrian routes. With the exception of Cosumnes River Boulevard, all of the roadways have sidewalks for pedestrian access.

Public transportation in Sacramento is provided by the Sacramento Regional Transit District (RT). Within the greater project area, RT provides both bus and light rail services. Four bus routes run along the proposed project haul routes: the 56, 47, 5, and 65 routes. These routes provide riders with access to the nearby Cosumnes River College, Florin High School, and Florin Mall, as well as to downtown Sacramento via light rail. The Meadowview Light Rail Station is located approximately one-half mile from the project area at the corner of Meadowview Road and Tisdale Way. This station provides direct access to downtown Sacramento and north Sacramento, as well as transfer service to Rancho Cordova and Folsom.

The UPRR tracks run parallel to the project area. On this route, the railroad runs freight trains, connecting south to Stockton and beyond. The railroad is located on an elevated berm beside the project area, and therefore would not be affected by the proposed project.

3.6.2 Environmental Effects

Significance Criteria

The effects of construction of the alternatives are considered to be significant, requiring mitigation, if the work causes any of the following:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities
- A substantial deterioration of the physical condition of the nearby roadways.

The effects of construction of the alternatives are considered to be significant, requiring mitigation, if the work causes any of the following:

- Significantly increases traffic on nearby roadways.
- Closes a roadway or blocks a travel lane.

- Blocks a transit route.
- Blocks a pedestrian sidewalk or bicycle lane.
- Closes or interferes with the operation of a rail line.
- Creates an operational safety hazard
- Removes parking spaces in area of limited parking or creates significant on-street parking demand where there is little or no on-street parking.
- Blocks emergency vehicle access.

No Action

Under the no action alternative, the Corps would not construct the Morrison Creek-UPRR project. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. Existing traffic conditions would be expected to remain the same. However, emergency actions taken to prevent flooding may result in changes to traffic flows, or cause damage to the roadway network.

Proposed Action - Construct Landside Floodwall

There would be temporary effects to traffic around the project area resulting from an increase in haul trucks and construction workers' personal vehicles accessing the project area via the described haul routes (See Plate 3). Temporary traffic impacts would include increased traffic on residential roads during commute times. Up to 31 construction workers would be accessing the project area each day, with the majority of vehicles parking in public parking areas in the project vicinity and carpooling to the site. Additionally, there would be up to twenty round-trip truck trips per day associated with borrow, steel, concrete, and disposal material during project construction. These trucks would be spaced out during the day and would not interfere with commuter traffic in the morning and evening, but would increase the number of vehicles accessing the neighborhood. This temporary increase in vehicles would have the potential to increase the time it takes residents to access their homes.

Construction vehicles and haul trucks accessing from I-5 would connect to the project area via Pocket Road/Meadowview Road which turns into Mack Road and crosses Morrison Creek. From Mack Road, vehicles would make a right turn onto Franklin Boulevard then enter the residential neighborhood by making a right turn onto Armadale Drive. At the end of Armadale Drive, vehicles would make a right turn onto Deer Lake Drive. Vehicles would then take a left onto Deer Water Drive. Deertree Court is the first court on the right. The SMUD lot is accessed from the back end of the cul-de-sac.

Haul trucks accessing from SR 99 would take Cosumnes River Boulevard and make a right turn onto Franklin Boulevard, before entering the residential neighborhood by making a left turn on Armadale Drive, then following the directions above.

The staging area and access point for the project site would be the SMUD lot at the back of the cul-de-sac. Trucks would access the project site by driving through the SMUD lot over the levee and onto the dirt road adjacent to the railroad tracks and the project site.

Levee maintenance roads to the north and south of the project are gated gravel roads that are closed to the public. The existing roads in the project area itself are currently dirt roads. No construction vehicles over 6,000 pounds will be permitted on Morrison or Unionhouse Creek Levees.

To exit the project area, haul trucks would return to Franklin Boulevard or Mack Road by leaving the SMUD lot at the end of Deertree Court, turning right on Deer Water Drive, turning left De La Vina Way, then left on Deer Lake Drive and right on Armadale Way (See Plate 3). From Franklin Boulevard, vehicles and haul trucks would use Cosumnes River Boulevard eastbound to SR 99, or they would take Mack Road to Meadowview and return to I-5.

Construction workers would be parking in the SMUD lot between Deertree Court and the project area, along neighborhood streets, or in public parking areas and then carpooling to the site. No vehicles would be permitted to park on Meadowview Road, Mack Road, or Franklin Boulevard, thus reducing any potential impacts to the bike lanes on those roadways.

The proposed project would be designed and scheduled so that construction would not close any roadways or block any travel lanes and would not interfere with emergency access.. There would be an increase in vehicle traffic around the project area during construction, but since these effects would be temporary and the vehicle numbers are limited enough that they are not expected to lower the levels of service in the project area, they would be considered less than significant effects. Haul trucks would move through the neighborhood every forty minutes and construction workers would commute in to the project site in the morning and leave in the evening. Given the daily vehicle trips shown in Table 3.6-1, an increase of 31 construction workers and 20 haul trucks per day would not change the level of service (LOS) on roads in the project area. There is the potential for haul trucks to intermittently and temporarily increase potential traffic safety hazards for vehicles, bicyclists, pedestrians, and transit activities on public roadways and potentially damage the roadways associated with the haul routes, as they are not designated truck routes. Mitigation, as described in Section 3.4.3 below, would address safety concerns, reduce impacts to neighborhood traffic and reduce effects on damaged roadways to less than significant.

The proposed project would not involve aircraft, nor would the project structures intrude into aircraft flight paths or air traffic spaces. Therefore, the proposed project would have no impact on air traffic patterns that results in substantial safety risks.

Since the increased traffic effects would be less than significant, it is also expected that there would be no effects to the local bus routes, or impacts to access to the Meadowview Light Rail Station. Additionally, there would be no effects to the UPRR tracks, as the railroad's elevated berm creates a natural barrier between the tracks and the project area.

3.6.3 Mitigation

Mitigation measures would be incorporated into the construction plans in order to reduce effects to traffic. The contractor would be required to develop a Traffic Control Plan prior to construction, and coordinate all use of public roads with the City of Sacramento, or other responsible agencies. This plan would include the following measures:

- Construction vehicles would not be permitted to block any roadways or driveways.
- Access will be provided for emergency vehicles at all times.
- Signs and flagmen would be used, as needed, to alert motorists, bicyclists, and pedestrians to the presence of haul trucks and construction vehicles at all access points.
- Vehicles would be required to obey all speed limits, traffic laws, and transportation regulations during construction. Vehicles would not exceed 15 miles per hour on unpaved levee roads.

- Construction workers would be encouraged to carpool and park in designated staging areas.
- Closure of levee roads, staging areas, and construction sites would be clearly fenced and delineated with appropriate closure signage.
- The contractor would be required to repair any roads damaged by construction.

With the implementation of the above mitigation measures, all effects to traffic in the project area would be less-than-significant.

3.7 Hydrology and Water Quality

This section addresses the potential for the alternatives to result in adverse effects associated with hydrology and water quality. Following an overview of the existing conditions, the direct and indirect environmental consequences of each alternative are discussed in the context of the regulatory setting. If applicable, measures to avoid, minimize, and/or mitigate adverse effects are presented.

3.7.1 Existing Conditions

Regulatory Setting

Federal and State law mandates a series of programs for the management of surface water quality. The Clean Water Act (CWA) is the Federal law that establishes the baseline that all state and local water quality laws must meet. The CWA also gives states the authority to adopt more stringent water quality programs to manage waters within the state. The State Porter-Cologne Water Quality Control Act, which created the State Water Resources Control Board (SWRCB), regulates the California waterways and establishes pollution prevention plans and penalties.

The project area is within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB), which authorizes discharges into State waterways under the National Pollutant Discharge Elimination System (NPDES) permitting process. NPDES permits apply to stormwater discharges or potential discharge in the project area. Construction activities that disturb more than one acre of land would require a NPDES General Permit for Discharges of Storm Water Associated with Construction Activity, known as a General Construction Permit (GCP). This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must list BMPs that the contractor would use to control storm water runoff and reduce erosion and sedimentation.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into wetlands and waters of the U.S. The Corps and the EPA both have responsibilities in administering this program and typically issue permits for these regulated activities. Morrison Creek falls under the jurisdiction of the Clean Water Act. Although the Corps does not issue itself permits for its own civil works projects, Corps regulations require the Corps to apply the guidelines and substantive requirements of Section 404 to its activities. A 404(b)(1) analysis for the proposed project has not been done because construction would be done in the dry season and avoidance and minimization measures would be implemented.

Section 401 of the Clean Water Act, which is regulated by the RWQCB, controls the discharge of dredged or fill material into waters of the U.S. and wetlands. The Section 401 program is intended to complement Section 404 goals and to encourage basin-level analysis and protection of wetlands and riparian areas.

Surface Water

Morrison Creek experiences low summer flows from urban runoff. The stream reach in the project area was straightened, channelized, and is maintained by the City of Sacramento on an annual basis. Maintenance consists of debris and vegetation removal. The stream reach in the project area has a nearly flat gradient. There is limited published surface water quality data for the upper and lower basins.

The Morrison Creek streams group in south Sacramento County drains a large urban and agricultural watershed with many potential commercial and industrial sources of pollutants. The water quality of the streams is heavily influenced by land uses and their respective stormwater runoff, which dilutes and transports pollutants and sediments. Morrison and Elder Creeks were listed on the 2002 Clean Water Act Section 303(d) list of water quality limited segments. Currently, according to the 2006 CWA Section 303(d) list of water quality limited segments, Morrison and Elder Creek are not listed as impaired.

Because the Morrison Creek streams group is a primary water source for the Beach and Stone Lakes area, the relative water quality of the creeks can directly affect water resources in Beach and Stone Lakes. Summer flows and low stormwater flows are diverted from Morrison Creek into the Sacramento River by the pump structure. However, the pump's limited capacity prevents diversion of all runoff from moderate to high stormwater events, resulting in some polluted runoff flowing into the Beach and Stone lakes area.

Within the project area, surface water drains through two existing piped outlets, one through the Morrison Creek east levee at the north end of the project area, and the other through the Unionhouse Creek north levee at the south end of the project site.

Groundwater

Monitoring wells in and around the SRCSD Regional Wastewater Treatment Plant provide the existing data on groundwater in the project area. Since the same groundwater basin underlies the entire project area, it is assumed that groundwater in the project area has similar characteristics to the groundwater below the treatment plant.

Groundwater elevations in wells at the Treatment Plant show seasonal changes of about five feet. The groundwater system in the project area has very little exchange with the Sacramento River and is considered hydrologically independent. The aquifers are predominantly recharged by infiltration from streams in the watershed.

Between 1990 and 1994, quarterly monitoring was performed for specific conductance, pH, nitrate as elemental nitrogen, chloride, total dissolved solids, arsenic, and chromium. Results from monitoring indicate that (1) the concentrations of these constituents varied from one monitoring well to another, and (2) the concentrations in the upper and lower saturated zones varied dramatically (SRCSD, 1994). Cadmium, copper, nickel, and zinc were analyzed annually, and pesticides and biphenyls were tested every other year. Testing results for these constituents were below detection limits.

3.7.2 Environmental Effects

Significance Criteria

Effects on water quality were considered significant if an alternative would result in any of the following:

- Violate any water quality standards or waste discharge requirements..
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, in a manner that would result in substantial erosion or siltation on- or off-site
- Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river or, by other means, substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map.
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

No Action

Under the no action alternative, the Morrison Creek-UPRR project would not be constructed. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. As a result, the existing water quality in the project area would continue to be affected by local conditions such as stormwater and urban runoff. In the event of a flood, water quality would be affected by decreased quality of surface water runoff.

Proposed Action - Construct Landside Floodwall

The proposed floodwall would be constructed between May and October when flows in Morrison and Unionhouse Creeks are low and there is little summer precipitation. As a result, there is less risk that construction activities would affect downstream waterways. Under this alternative, there is a low risk for water quality in the project area to be degraded by accidental construction actions. Staging and construction activities would disturb surface soils, but are not likely to impact water quality. There are existing drainage ditches at the north and south ends of the project area, with piped outlets through the levees. These outlets would be closed during construction to reduce impacts to water quality. Drainage ditches within the project footprint would be re-contoured to ensure proper drainage after the completion of the project. A drainage system along the east side of the proposed floodwall will connect to the City's storm drain system and drain the area between the proposed floodwall and the backyard fences. If necessary, during high water events, installation of a portable pump will be required at the proposed

floodwall to pump excess drainage water directly into Morrison Creek. Portable pump operation will need to be coordinated with water levels in the storm drain system. The Sacramento City Utilities Department, in conjunction with the Corps, are developing plans to install a monitoring system in Morrison Creek upstream of the project area to detect flood water stages. The proposed construction activities would disturb more than one acre, requiring a NPDES-GCP and development of a SWPPP.

Contamination of surface water and/or channel soils could result from construction activities adjacent to Morrison and Unionhouse Creek. Spills of oil, grease, fuels, hydraulic fluids, or related pollutants could occur during vehicle refueling, parking, and maintenance. Improper handling, storage, or disposal of fuels and materials or improper cleaning of machinery close to or Morrison or Unionhouse Creek could cause surface water quality degradation if these fuels are washed into the creeks. Spills or sediments are not expected to reach the creeks because the contractor would adhere to containment requirements, BMPs, and mitigation measures. In addition, Morrison Creek is 150 feet away from the project area and Unionhouse Creek is over 50 feet from the project area. The creeks are also separated from the project area by existing levees and the UPRR embankment. The construction work would take place during low-flow summer months with very little precipitation, so it is even less likely that construction activities would affect downstream waterways. Staging and construction activities would disturb surface soils, but following construction, revegetation of native grasses and forbs along the project footprint would reduce erosion and sedimentation potential.

Complying with the CWA, Sections 404 and 401 and obtaining the NPDES permit along with implementing the mitigation and BMPs proposed below, minimizes the potential to affect surface water quality.

The hydrologic review for the project determined that there would be no negative downstream hydraulic effects due to the proposed project. Also, hydrologic evaluations of current and future conditions showed that the level of flood protection in the project area will safely contain a flood event with less than a 1% chance of occurrence in any given year. Additionally, the proposed project would not place any housing within a designated 100-year floodplain and would ultimately improve flood protection to residents east of Morrison Creek.

There is a low potential for groundwater quality and ground water levels to be affected by the proposed action. However, contaminants such as petroleum products could be spilled and seep into local groundwater sources. During project construction, implementation of the mitigation measures presented below, including the BMPs proposed, would minimize the potential for a spill to affect groundwater quality in the project area. The proposed construction activities would not change the existing conditions in adjacent creeks or water infiltration into ground water. As a result, there would be little or no change in ground-water recharge or depletion of ground water sources used for other beneficial uses.

In addition, the proposed project only involves the installation of a floodwall and would not expose people or structures to a risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow; therefore, no impact would occur.

3.7.3 Mitigation Measures

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. The contractor would be required to obtain a NPDES permit from the CRWQCB, since the project would disturb one or more acres of land and involve possible storm water pollutant discharges to surface waters. In addition, the contractor would prepare a SWPPP identifying BMPs to be used to avoid or minimize any adverse effects of construction

on surface waters. Implementation of the following BMPs would act as mitigation as they would ensure that the effects on water quality would remain at less-than-significant levels.

- Prepare a SWPPP prior to initiation of construction activities. The SWPPP would be developed in accordance with guidance from the CRWQCB. These plans would also be reviewed and approved by the Corps.
- Implement appropriate measures to prevent any debris, soil, rock, or other construction activities from getting into the water. The contractor will use appropriate measures to control dust on the project site and stockpiles.
- Properly dispose of oil or liquid wastes.
- Fuel and maintain vehicles in specified areas that are designed to capture spills.
- Inspect and maintain vehicles and equipment to prevent dripping of oil and other fluids.
- Schedule construction to avoid as much of the wet season as possible. If rains are forecast during the construction period, erosion control measures would be implemented as described in the SWPPP.
- Train construction personnel in stormwater pollution prevention practices.
- Revegetate and restore areas cleared by construction with native grasses in a timely manner to control erosion.

Additional implementation of the measures in SWPPP would prevent any significant adverse effects to water quality in the project area. The inclusion of the above mitigation measures would reduce any impacts to a less than significant level.

3.8 Cultural and Paleontological Resources

This section discusses cultural and paleontological resources in the study area. Potential effects of the project on cultural and paleontological resources are discussed and compared to the effects identified in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR

3.8.1 Existing Conditions

Discussion of cultural resources has been provided in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR (Corps, 1998 and 2004 and SAFCA, 2004). The lower and upper basins along Morrison Creek were surveyed for cultural resources sites in and adjacent to the project area in reconnaissance studies conducted in 1994 and 1995 (Corps, 2004b). The area of potential effects (APE) in the upper and lower basins was investigated for cultural resources in the 1998 EIS/EIR to include other areas of the project previously not examined in the 1994 or 1995 studies. The project is located entirely on geologically recent alluvial sediments (Wagner et al. 1981). There is no potential for paleontological resources in the area.

3.8.2 Environmental Effects

Significance Criteria

Adverse effects on Cultural and Paleontological Resources were considered significant if an alternative would result in any of the following:

- Cause a substantial adverse change in the significance of a historical resource.
- Cause a substantial adverse change in the significance of a unique archaeological resource.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

No Action

Under the No Action alternative, the Morrison Creek-UPRR project would not be constructed. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. As a result, there would be no change to the existing environment and impacts to cultural and paleontological resources would not occur.

Proposed Action - Construct Landside Floodwall

For the 2004 EA the Corps conducted a records and literature search at the Northwest Information Center at California State University, Sacramento. In 2010, the Corps updated the records and literature search and determined that further investigations were needed in portions of the project area. In August 2010, a Corps Archaeologist performed an intensive pedestrian survey of the UPRR project footprint. This effort confirmed that there were no historic properties or known archeological resources located within the project area. In a letter dated January 7, 2011, the California State Historic Preservation Office (SHPO) concurred with the Corps finding of no historic properties affected.

Construction of the proposed action is anticipated to have minimal or no effect on cultural resources. There were no identified historical or Native American traditional cultural properties within the defined APE for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR and in the course of the Corps' 2010 investigations no historic properties or archeological resources were identified. Therefore, it is likely that there would be no effect to cultural resources. However, construction of the Morrison Creek-UPRR Project could result in damage to previously unidentified buried archaeological and/or human remains during ground disturbing activities of project construction. Disturbance to buried cultural resources would result in a significant effect. Implementation of the mitigation measures presented below would reduce potential effects on cultural resources to less-than-significant.

3.8.3 Mitigation

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR.

The Corps has completed the necessary investigations and has consulted with SHPO and Native American groups. To date, no historic properties or Native American traditional cultural properties have been identified in the APE. However the Sacramento River floodplain contains a high density of archaeological sites within a few miles. Additionally, the river floodplain is a generally aggradational environment so the potential for buried archaeological sites is high. To address these concerns, all initial excavations into intact sediments would be observed by a qualified archaeological monitor. If tree removal occurs, and root excavations bear the potential to impact buried cultural resources, those excavations would also be observed by an archaeological monitor.

If buried cultural resources such as chipped or ground stone, midden deposits, historic debris, building foundations, human bone, or paleontological resources are inadvertently discovered during

ground-disturbing activities, work would be stopped pursuant to 36 CFR 800.13(b), Discoveries Without Prior Planning, to determine the significance of the find and, if necessary, complete appropriate discovery procedures.

If remains of Native American origin are discovered during project construction, it will be necessary to comply with state laws concerning the disposition of Native American burials, which fall within the jurisdiction of the California Native American Heritage Commission (NAHC). If any human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- The Sacramento County coroner has been informed and has determined that no investigation of the cause of death is required; and
- If it is determined that the remains are of Native American origin, the descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code 5097.98; or
- The NAHC has been unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission.

3.9 Vegetation and Wildlife

This section discusses vegetation and wildlife resources in the study area, which includes both the project impact area and the adjacent buffer area, and hereafter is simply referred to as “study area” when there is no need to distinguish between the two areas. The discussion includes descriptions of the biological habitat types, including waters of the U.S. that occur in the study area as well as plant and animal species associated with these habitat types. Potential effects of the project on vegetation and wildlife are discussed and compared to the effects identified in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR.

Corps biologists completed a database search of the California Natural Diversity Database (CNDDDB) and conducted biological surveys of the study area on December 29, 2009, March 31, 2010, and November 18, 2010. The biological surveys conducted for this EA/EIS included: general biological surveys; botanical surveys; and a jurisdictional wetland delineation. The study area was surveyed by walking along the east and west side of the railroad tracks and visually scanning the area, using binoculars where necessary.

3.9.1 Existing Conditions

Morrison Creek is located in southern Sacramento County on land owned and managed by the City of Sacramento. The study area is located in an urban setting surrounded by agriculture land to the west, a neighborhood to the east, and the Bufferlands to the south. The Bufferlands is a 2,650 acre preserve managed by SRCSD to provide a buffer between the Regional Wastewater Treatment Plant and surrounding neighborhoods, as well as habitat for over 200 bird species and other special-status wetland species. The largest land cover type in the Bufferlands is annual grassland habitat, which provides habitat for numerous terrestrial wildlife species as well as valuable foraging habitat for raptors and other bird species. The Bufferlands also contains lakes, creeks, wetlands, and vernal pools that provide valuable aquatic habitat for fish, reptiles, amphibians, waterfowl, and shorebirds.

The dominant terrestrial habitat type in the study area is grassland that has incurred land and soil disturbance and subsequently supports many invasive plant species. This disturbed grassland covers the six acres between the UPRR tracks and the backyard fences in the project area. Aquatic habitat in the area includes Morrison Creek, Unionhouse Creek, and 0.05 acres in the form of two drainage ditches and three disturbed wetlands. Land cover types in the study area and common wildlife species associated with each land cover type are described below. A habitat map of the study area and immediate vicinity can be found in Plate 5. Photos of the project area are in Plate 6. Morrison Creek channel is considered a sensitive natural community; sensitive natural communities are land cover types that are especially diverse, regionally uncommon, or of special concern to Federal, State, and/ or local agencies. Morrison Creek is also considered a waters of the U.S. which is a tributary or wetland with a hydrologic connection to a navigable water. The other wetland features within the study area are considered a potential waters of the U.S and have been delineated by Corps staff, but have not been confirmed by the U.S. Fish and Wildlife Service (USFWS). Because these wetland features are adjacent to Morrison Creek, they are also considered sensitive natural communities.

Terrestrial Habitat Types

Disturbed habitat. This habitat type occurs throughout the entire 5.5 acre project impact area. There are approximately six acres of disturbed habitat between the UPRR embankment and the backyard fences. The disturbed habitat is vegetated primarily with non-native grasses and forbs typical of disturbed areas such as wild oat (*Avena* sp.), bromes (*Bromus* spp.), barley (*Hordeum* spp.), wild radish (*Raphanus sativa*), and Italian thistle (*Carduus pycnocephalus*). Some wildlife species that are tolerant of high levels of human disturbance utilize this habitat type for foraging and cover. Several bird species were observed in this habitat including black phoebe (*Sayornis nigricans*), yellow-billed magpie (*Pica nuttallii*), western kingbird (*Tyrannus verticalis*), house sparrow (*Passer domesticus*), northern mockingbird (*Mimus polyglottos*), and mourning dove (*Zenaida macroura*). Small mammals, such as voles (*Microtus* spp.), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*) and some reptiles, such as northwestern fence lizard (*Sceloporus occidentalis*) and common garter snake (*Thamnophis sirtalis*), are expected to live in and around Morrison and Unionhouse Creeks (including the study area) or use it for a dispersal corridor.

Potential Wetlands and Other Waters of the U.S.

Perennial drainage. Morrison and Unionhouse Creeks are mapped as a perennial drainage by USGS. The National Wetland Inventory map lists Morrison Creek and Unionhouse Creek as palustrine emergent wetland, excavated and temporarily flooded. In the study area Morrison and Unionhouse Creeks are slow moving watercourses with some riparian vegetation and non-native and native vegetation in the channel. Limited vegetation is associated with the channel and includes species such as water primrose (*Ludwigia* sp.), sedge (*Cyperus* sp.), and dock (*Rumex* sp.). Vegetation is cleared from the channel upstream on an annual basis as part of routine maintenance activities to improve water flow; however, large patches of water primrose are present in the channel adjacent to the project area. The upper bank of Morrison Creek adjacent to the water side of UPRR includes sandbar willow (*salix exigua*), box elder (*Acer Negundo*), coyote brush (*Baccharis pilularis*), Italian thistle (*Carduus pycnocephalus*), and fennel (*Foeniculum vulgare*).

Seasonal wetland. A wetland delineation was conducted by Corps staff on November 18, 2010 in accordance with the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual and the Interim Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Arid West Region. A level three, routine onsite determination, as defined in the 1987 Wetland Delineation Manual, evaluated the three parameters that identify and delineate the boundaries of jurisdictional wetlands

including: the dominance of wetland vegetation; the presence of hydric soils; and hydrologic conditions that result in periods of inundation or saturation on the surface from flooding or ponding. The delineation of wetland features in the study area revealed that approximately 0.05 acres of potentially jurisdictional wetlands are present. These seasonal wetlands contain a variety of facultative and obligate wetland plant species including but not limited to curly doc (*Rumex crispus*), rabbit foot grass (*Polypogon monspeliensis*), creeping wild rye (*Elymus triticoides*), pennyroyal (*Mentha pulegium*), and Italian rye grass (*Lolium multiflorum*). The wetland delineation report is included in Appendix D.

3.9.2 Environmental Effects

Significance Criteria

Adverse effects on vegetation and wildlife were considered significant if an alternative would result in any of the following:

- Substantial loss of native vegetation or native vegetation communities.
- Conflict with any local policies or ordinances protecting biological resources such as the Sacramento County Tree Preservation Ordinance;
- Substantial adverse impact on a sensitive natural community including federally protected wetlands and other waters of the U.S. as defined by Section 404 of the Clean Water Act (CWA) including seasonal wetlands, vernal pools, and Unionhouse Creek through direct removal, filling, hydrologic interruption, or other means.
- Substantial reduction in the quality or quantity of important habitat or access to such habitat for wildlife species.
- Substantial net loss of important wildlife habitat over the project life as compared to the existing conditions.

No Action

Under the no action alternative, the Corps would not construct the Morrison Creek-UPRR project. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. There would be no effect to existing vegetation or wildlife in the study area under this alternative. The type of plant communities and wildlife habitats on site would remain the same.

Proposed Action - Landside Floodwall

With the 2011 year project design, no riparian habitat will be removed within the project area, but five acres of non-native grassland will be impacted. Impacts to non-native grassland would not result in the removal of any trees and would not conflict with the Sacramento Tree Preservation ordinance. Similarly, the project would not conflict with an adopted Habitat Conservation Plan. After construction 3.5 acres of the disturbed area will be reseeded with native grasses and forbs, while the other 1.5 acres will be converted to floodwall and maintenance road. This reseeded area will replace a portion of the habitat value lost by construction of the project as it relates to common wildlife species. The net loss of approximately 1.5 acres of disturbed non-native grassland habitat would constitute a less-than-significant loss of habitat if native grasses are planted on the other 4 acres in compensation. Approximately 0.05 acres of potentially jurisdictional seasonal wetland will also be impacted by the project.

The 1998 EIS/EIR disclosed that the flood wall would occur on the waterside of the railroad tracks and would be constructed from within the Morrison Creek channel. Under the 2011 project design, the net loss of acreage of 0.02 and 0.03 acres of seasonal wetland is a reduced amount from the impacts disclosed in the 1998 EIS/EIR, covered in the 2002 Biological Opinion, and mitigated for at Westervelt, Bryte Ranch, and Conservation Resources Conservation Banks between 2005 and 2010. Table 7 below summarizes habitat impacts as a result of the proposed project and identifies whether the impact is temporary or permanent.

Table 3.9-1 Habitat Impacts

Project Impact Area	Habitat Type	Existing Area (Acres)	Area of Impact/ Type
Landside of UPRR tracks	Disturbed-Annual grassland	1.5	acres/ Permanent
	Disturbed-Annual grassland	4	acres/ Temporary -No Impact
	Seasonal wetland	0.03	acres/ Permanent
	Seasonal wetland	0.02	acres/ Temporary

3.9.3 Mitigation

Any previously identified disturbed habitat temporarily impacted by construction would be restored by reseeded the affected area with native grasses and forbs after construction. The temporary and permanent loss of disturbed habitat indicated above in Table 3.9-1 would be less than significant due to the abundance of this habitat type in the vicinity and the replacement of this habitat type with native grassland.

Avoidance and minimization measures in the form of BMPs would be implemented for the wetland features adjacent to Morrison Creek in the project area. As stated in the 1998 EIS/EIR, loss of wetland habitats will be compensated to the degree needed to replace the functional values supported by this habitat. A Habitat Evaluation Procedure (HEP) analysis was performed in 1998 to determine the functional values of wetlands and waters of the U.S. and compensation acreage necessary to offset the loss of these values. The acreage and quality of habitat impacted by the proposed project is less than that evaluated in the 1998 EIS/EIR and covered in the 2002 Biological Opinion (BO # 1-1-01-F-0043). The necessary mitigation identified in the 2002 BO was purchased at mitigation banks between 2000 and 2010. Coordination with FWS is being undertaken, and if determined appropriate, possible mitigation strategies would be identified. These could include, purchasing additional mitigation in a suitable offsite mitigation bank to compensate for any additional potential impacts to waters of the U.S. as a result of the project. With the implementation of proposed mitigation measures, the project would have a less than significant impact on vegetation and wildlife resources, including waters of the U.S.

3.10 Special Status Species

Special-status species are those plants and animals recognized by Federal, State, and/or other agencies or organizations as deserving special consideration because of their rarity or vulnerability to extinction due to habitat loss or population decline. This section discusses special status species that either occur or have the potential to occur in the project area and could potentially be impacted by the project.

3.10.1 Existing Conditions

Regulatory Setting

Certain special status species and their habitats are protected by Federal, State, and/ or local laws and agency regulations. The Federal Endangered Species Act (FESA) of 1973 (50 CFR 17) provides legal protection for plant and animal species in danger of extinction. This act is administered by the USFWS and the National Marine Fisheries Service (NMFS). The California Endangered Species Act (CESA) of 1977 parallels FESA and is administered by the California Department of Fish and Game (CDFG). Other special status species lack legal protection, but have been characterized as “sensitive” based on policies and expertise of agencies or private organizations, or policies adopted by local government. Special-status species are those that meet any of the following criteria:

- Listed or candidate for listing under the Federal Endangered Species Act of 1973 (50 CFR 17).
- Listed or candidate for listing under the California Endangered Species Act of 1977.
- Nesting bird species and active nests of birds listed under the Migratory Bird Treaty Act of 1916.
- Species listed in the Bald and Golden Eagle Protection Act.
- Fully protected or protected species under stated CDFG code.
- Wildlife species of special concern listed by the CDFG.
- Plant species listed as Rare under the California Native Plant Protection Act.
- Plant species listed by the California Native Plant Society (CNPS). The purpose of the CNPS is to call attention to the status of a species that is experiencing decline but not afforded legal protections.
- Species protected by local ordinances such as the Sacramento County Ordinance, Chapter 19.12, Tree Preservation and Protection.
- Species protected by goals and policies of local plans such as the Bufferlands Master Plan.
- Essential Fish Habitat (EFH) listed under the Magnuson-Stevens Act. EFH is defined in the Magnuson-Stevens Act as “. . . those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The act requires that Federal agencies consult with the National Marine Fisheries Service when any activity proposed to be permitted, funded, or undertaken by a Federal agency may have adverse effects on designated EFH.

Special-Status Species Evaluation

Discussions of biological resources have been provided in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR (Corps, 1998 and 2004b). Analysis of special-status species with the potential to be impacted by the overall South Sacramento County Streams Project were conducted in preparation of these previous documents. In addition, environmental studies have been conducted for three other projects in the Bufferlands adjacent to the southern portion of the study area, including: the RT South Line Extension Supplemental Draft EIS/Subsequent Draft EIR Draft Section 4(f) (2007); the Interstate 5/Cosumnes River Boulevard Interchange Project Revised Draft EIR (2006); and the Freeport Regional Water Authority Project EIR/EIS (2004). These documents were reviewed to obtain background information for the preparation of this EA/IS. Studies for biological resources and potential wetlands and other waters of the U.S. were also conducted for this project.

Corps biologists conducted a database search and biological surveys of the study area. The biological surveys conducted for this EA/IS included general biological surveys, botanical surveys, nest

surveys, and a wetland delineation. The surveys were conducted on area on December 29, 2009, March 31, 2010, and November 18, 2010. The study area was surveyed by walking along the eastern edge of the UPRR embankment and visually scanning the study area, using binoculars where necessary. Nest surveys were also conducted within a half mile radius of the project area on February 29, 2011, March 10, 2011, March 17, 2011, and March 31, 2011. The database search consisted of obtaining a list of Federally-listed endangered, threatened, and candidate species that may be affected by projects in the Florin USGS quad via the USFWS website. In addition, a search of the CNDDDB for the Florin USGS quad was conducted. The CNDDDB search indicated that there were no reported occurrences of Federal or State-listed special-status species in the study area. The USFWS and CNDDDB lists are included in Appendix E along with the California Native Plant Society (CNPS) rare and endangered plant list. A list of regionally occurring special-status species was compiled from the USFWS and CNDDDB lists and is also included in Appendix E.

The list of special-status species with the potential to occur in the Morrison Creek-UPRR study area that was obtained from the USFWS, CNDDDB, and CNPS database searches was compared to the lists of special-status species identified in the 1998 EIS/EIR and 2004 SEIR. The following species were found to have the potential to be affected by the overall South Sacramento County Streams Project: Delta smelt (*Hypomesus transpacificus*), winter-run Chinook salmon (*Oncorhynchus*), giant garter snake (*Thamnophis gigas*), California tiger salamander (*Ambystoma californiense*), northwestern pond turtle (*Clemmys marmorata*), California horned lizard (*Phrynosoma coronatum frontale*), western spadefoot toad (*Scaphiopus hammondi*), midvalley fairy shrimp (*Branchinecta mesovallensis*), conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Crampton's tuctoria (*Tuctoria mucronata*), pallid bat (*Antrozous pallidus*), long-eared myotis bat (*Myotis septentrionalis*), American peregrine falcon (*Falco peregrinus*), Swainson's hawk (*Buteo swainsoni*), Western burrowing owl (*Athene cunicularia*), Cooper's hawk (*Accipiter cooperii*), tri-colored blackbird (*Agelaius tricolor*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), Boggs Lake hedge-hyssop (*Grariola heterosepala*), slender Orcutt grass (*Orcuttia tenuis*), Sacramento Orcutt grass (*Orcuttia viscida*), Sanford's arrowhead (*Sagittaria sanfordii*), Suisun marsh aster (*Symphotrichum lentum*), dwarf downingia (*Downingia pusilla*), rose-mallow (*Hibiscus moscheutos*), Ahart's dwarf rush (*Juncus leiospermus*), Delta tule pea (*Lathyrus jepsonii*), legener (*Legenere lomosa*), pincushion navarretia (*Navarretia myersii*), and blue skullcap (*Scutellaria lateriflora*).

The list of regionally-occurring special-status species was compared to the habitats observed in the study area during surveys. Based on the specific habitat requirements of the above-listed special-status species, it was determined that there was no habitat present in the project area for the following species and they are not discussed further in this document: Delta smelt, winter-run Chinook salmon, American peregrine falcon, northwestern pond turtle, conservancy fairy shrimp, long-eared myotis bat, tri-colored blackbird, loggerhead shrike, California horned lizard, western spadefoot toad, Boggs Lake hedge-hyssop, slender Orcutt grass, Sacramento Orcutt grass, Crampton's tuctoria, Suisun marsh aster, dwarf downingia, rose-mallow, Ahart's dwarf rush, Delta tule pea, legener, pincushion navarretia, and blue skullcap. Table 3.3.1 lists the Federal and State listed special-status species that were identified as having the potential to occur in the study area or the immediate vicinity and could be impacted by construction activities. Species with potential to occur in the project area are also discussed in the following paragraphs.

Table 3.10-1 Regionally Occurring Special Status Species with the Potential to be Impacted by the Proposed Project

Species	Status: Federal/ State/ Local	General Habitat	Potential to Occur
Invertebrates			
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	FT/--/--	A variety of vernal pool and other seasonally ponded habitats.	Low. The seasonal wetlands within the project area provide low quality habitat for this species. Several reported occurrences on the Florin USGS quad.
<i>Branchinecta mesovallensis</i> Midvalley fairy shrimp	--/SSC/--	A variety of vernal pool and other seasonally ponded habitats.	Low. The seasonal wetlands within the project area provide low quality habitat for this species. Several reported occurrences on the Florin USGS quad.
<i>Lepidurus packardi</i> Vernal pool tadpole shrimp	FE/--/--	A variety of vernal pool and other seasonally ponded habitats.	Low. The seasonal wetlands within the project area provide low quality habitat for this species. Several reported occurrences on the Florin USGS quad.
Reptiles			
<i>Thamnophis gigas</i> Giant garter snake	FT/ST/--	Marshes, sloughs, drainage ditches, and creeks containing suitable cover, often associated with rice fields.	Medium. Morrison and Unionhouse Creeks provide a dispersal corridor for this species during flood events. No documented occurrences in Morrison or Unionhouse Creeks. Reported occurrence on the Florin USGS quad.
Birds			
<i>Accipiter cooperii</i> Cooper's hawk	--/SSC/--	Nests in medium to tall trees usually located in a riparian or wooded area.	High. Potential nesting and foraging habitat for this species occurs in and adjacent to the project area. This species was observed adjacent to the project area during surveys.
<i>Athene cunicularia</i> Western burrowing owl	--/SSC/--	Grasslands or other habitats with low growing vegetation and mammal	High. Potential nesting and foraging habitat for this species occurs in and

Species	Status: Federal/ State/ Local	General Habitat	Potential to Occur
		burrows for denning.	adjacent to the project area. This species is known to occur along the banks of Unionhouse Creek and in the Bufferlands.
<i>Buteo swainsoni</i> Swainson's hawk	--/ST/--	Nests in large trees in open areas adjacent to suitable foraging habitat such as grasslands, grain or alfalfa fields, or livestock pastures.	High. Potential nesting and foraging habitat for this species occurs adjacent to the project area. This species was observed adjacent to the project area during surveys.
<i>Elanus leucurus</i> White-tailed kite	--/FP/--	Nests in medium to tall trees in foothill or valley grasslands, as well as in lowlands next to marsh or riparian habitat.	High. Potential nesting and foraging habitat for this species occurs adjacent to the project area. This species was observed adjacent to the project area during surveys.
Plants			
<i>Sagittaria sanfordii</i> Sanford's arrowhead	--/--/1B.2	Assorted, shallow, freshwater, marshes and swamps including sloughs and drainage ditches.	Low. There are reported occurrences of this species on the Florin quad, however it was not observed in the project area during surveys.
Listing Status: Federal Listing Status under the Federal Endangered Species Act FE = Federal Endangered FT = Federal Threatened SSC = State Species of Special Concern		State Listing Status under the California Endangered Species Act ST = State Threatened FP = Fully Protected Local Listing Status according to the California Native Plant Society 1B = Rare, threatened, or endangered in California and elsewhere 1B.2 = Fairly endangered in California (20-80% occurrences threatened)	

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, including one exceeding 25 acres, it tends to occur in smaller pools. It is most frequently found in pools measuring less than 0.05 acre. These are most commonly in grass or mud bottomed swales or basalt flow depression pools in unplowed grasslands. Vernal pool fairy

shrimp is currently known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California (USFWS, 2005).

There are five recorded occurrences in the CNDDDB of vernal pool fairy shrimp on the Florin USGS quad. The closest recorded occurrence to the study area is in a vernal pool complex located along the west side of the UPRR tracks less than one mile south of the study area. The seasonal wetlands located within the study area provides low quality habitat for this species. Fairy shrimp disperse passively during the “resting egg” stage on the feet and in the guts of birds and on the feet of other animals, as well as via wind. Vernal pool fairy shrimp cysts could passively disperse into the seasonal wetlands from known populations in the vicinity.

Midvalley Fairy Shrimp (*Branchinecta mesovallensis*)

This species inhabits shallow ephemeral pools, vernal swales, and various artificial ephemeral wetland habitats in the central portion of the Central Valley (USFWS, 2005).

There are nine recorded occurrences in the CNDDDB of midvalley fairy shrimp on the Florin USGS quad. The closest recorded occurrence to the study area is in a vernal pool complex located along the west side of the UPRR tracks less than one mile south of the study area. The seasonal wetlands located within the study area provides low quality habitat for this species. Fairy shrimp disperse passively during the “resting egg” stage on the feet and in the guts of birds and on the feet of other animals, as well as via wind. Midvalley fairy shrimp cysts could passively disperse into the seasonal wetlands from known populations in the vicinity.

Vernal pool tadpole shrimp (*Lepidurus packardii*)

This species inhabits vernal pools and swales containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County, to the 93-acre Olcott Lake at Jepson Prairie. Pools range from grass-bottomed pools in unplowed grasslands to highly turbid mud-bottomed pools. This species is also often found in manmade ditches along roadsides or railroad tracks in the vicinity of other occurrences. The vernal pool tadpole shrimp is currently distributed across the Central Valley of California and in the San Francisco Bay area (USFWS, 2005).

There are 12 recorded occurrences in the CNDDDB of vernal pool tadpole shrimp on the Florin USGS quad. Six of these occurrences are in roadside ditches and other man-made ditches. The closest recorded occurrence to the study area is in a vernal pool complex located along the west side of the UPRR tracks less than one mile south of the study area. There are also recorded occurrences of this species approximately two miles south of the study area south of Sims Road between Franklin Boulevard and the UPRR tracks. Vernal pool tadpole shrimp occurs in vernal pools and roadside ditches in this location. The seasonal wetlands located within the study area provides low quality habitat for this species. Tadpole shrimp disperse passively during the “resting egg” stage on the feet and in the guts of birds and on the feet of other animals, as well as via wind. Vernal pool tadpole shrimp cysts could passively disperse into the seasonal wetlands from known populations in the vicinity.

California tiger salamander (*Ambystoma californiense*)

California tiger salamanders have a two part life cycle with an aquatic larval stage and a terrestrial adult stage. Adults travel to breeding sites, mate, and lay eggs after the ponds have filled up from winter rains. The adults then leave the pools. With the exception of breeding activity and occasional dispersal trips overland during rains, the adults spend their time underground. The larvae typically require 100 to 120 days or more to complete metamorphosis, after which time they leave their natal pools and

seek suitable underground refugia. California tiger salamanders typically breed in vernal pools and seasonal ponds, including many constructed stockponds, in grassland and oak savannah plant communities from sea level to about 1,500 feet in central California. Adults utilize mammal burrows in upland areas for refugia during dry periods. In the Coastal region, populations are scattered from Sonoma County in the northern San Francisco Bay Area to Santa Barbara County, and in the Central Valley and Sierra Nevada foothills from Yolo to Kern counties (USFWS, 2008).

The study area is located within the current range of California tiger salamander according to the CDFG's California Wildlife Habitat Relationships System (CWHHR). California tiger salamander is considered by the USFWS as having the potential to occur in or be affected by projects in the Florin quad (Appendix E). There are no reported occurrences of California tiger salamander in CNDDDB for the Florin USGS quad and this species has not been observed on the Bufferlands property. The closest documented occurrence of this species is approximately 15 miles southeast of the study area on the Galt quad where this species was observed in 1914. This occurrence is considered extirpated. The seasonal wetlands located along the east side of the railroad tracks in the study area are not large enough to provide breeding habitat for California tiger salamander. The annual grassland habitat may provide potential upland refugia. California tiger salamander could potentially occupy habitat on the west side of the railroad tracks adjacent to the study area. This includes the seasonal wetlands adjacent to the west side of Morrison Creek as well as mammal burrows along the east and west banks of the creek.

Giant Garter Snake (*Thamnophis gigas*)

Giant garter snake (GGS) inhabit agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley. Because of the direct loss of natural habitat, the GGS relies heavily on rice fields in the Sacramento Valley, but also uses managed marsh areas in Federal National Wildlife Refuges and State Wildlife Areas. Habitat requirements consist of: (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and, (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter. GGS are typically absent from larger rivers because of lack of suitable habitat and emergent vegetative cover, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations. GGS feed primarily on small fishes, tadpoles, and frogs. The GGS inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period. GGS typically select burrows with sunny exposure along south and west facing slopes.

There are six reported occurrences of giant garter snakes in CNDDDB on the Florin USGS quad. The closest reported occurrence was on Bufferlands property 1.5 miles downstream of the project area. The majority of the sightings in the region are from the 1980s and early 1990s. However, the closest GGS sighting is from 2005.

A report done by George Hansen for the 1998 EIS/EIR (Corps, 1998) concluded that GGS may venture into upper Morrison Creek and Unionhouse Creek from more suitable habitats during downstream flooding or other dispersal activities, but that the long-term survival of GGS in Unionhouse Creek was unlikely. Unionhouse Creek lacks suitable cover for the snake and does not provide a sufficient prey base, but Morrison Creek adjacent to the project area does provide suitable habitat for GGS. Known occurrences of the snake in the watershed occur southwest of Morrison Creek in the vicinity of Beach and Stone lakes and southeast in Laguna and Elk Grove creeks where suitable habitat for the snake occurs. These sightings are all in water bodies that meet the habitat requirements of the

species including cover such as cattails and willows and sufficient water to provide cover and a prey base for the snake.

Pallid bat (*Antrozous pallidus*) and Townsend's big-eared bat (*Corynorhinus townsendii*)

Pallid bat is found in deserts, grasslands, shrublands, woodlands, and forests. It is most common in open dry habitats with rocky areas for roosting. Pallid bats feed mainly in open areas on beetles and other large insects, often landing on the ground to catch prey. Roosting habitats suitable for pallid bat include caves, rock crevices, buildings, and the undersides of bridges. In order for roosts to be suitable for pallid bat they must adequately protect roosting individuals from high temperatures. Pallid bat is extremely sensitive to human disturbance of roosting sites.

Townsend's big-eared bat is found throughout California in nearly all habitats except alpine and subalpine zones. This species is typically associated with caves or cave-like structures, which it usually uses for roosting habitat. However, this species has been reported roosting in large hollows of redwood trees, in attics and abandoned buildings, in lava tubes, and under bridges (Gruver and Keinath, 2006).

There are no reported occurrences of pallid bat or Townsend's big-eared bat on the Florin USGS quad and no bats were observed during surveys.

Cooper's hawk (*Accipiter cooperii*)

Cooper's hawk nest in deciduous trees or conifers in crotches or cavities that are usually 20 to 50 feet off the ground. The nest is a stick platform lined with bark. Nests are usually placed in second growth coniferous stands or in the deciduous riparian areas that are closest to streams.

There is one record for nesting Cooper's hawk in CNDDDB on the Florin USGS quad. The nest record is from 2005 and is located approximately 1.7 miles south of the project area in the Bufferlands property near Sims Road. Two young hawks were successfully fledged from this nest in 2005. The annual grassland across the creeks from the project area provides potential nesting and foraging habitat for Cooper's hawk. Cooper's hawks have been observed foraging over the annual grassland south of the project area during the biological surveys conducted for this project, but no potential nests were observed in or adjacent to the study area.

Western burrowing owl (*Athene cunicularia*)

Western burrowing owls are often found in open, dry grasslands, agricultural and range lands, and desert habitats. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. Burrowing owls occur at elevations ranging from 200 feet below sea level to over 9,000 feet. In California, the highest elevation where burrowing owls are known to occur is 5,300 feet above sea level in Lassen County. In addition to natural habitats, burrowing owls can be found in urban habitats such as at the margins of airports, golf courses and in vacant urban lots. Burrowing owls nest in burrows in the ground, often in old ground squirrel burrows or badger dens. They are also known to use artificial burrows such as abandoned pipes or culverts. The nesting season for burrowing owls can begin as early as February 1 and continues through August 31. The owl commonly perches on fence posts or on top of mounds outside its burrow. Burrowing owls forage in adjacent grasslands and other suitable habitats primarily for insects and small mammals, and less often for reptiles, amphibians, and other small birds.

There are 11 records for nesting burrowing owls in CNDDDB on the Florin USGS quad. The closest record is located on the south bank of Unionhouse Creek levee a quarter mile from the project area. Several burrowing owls were observed nesting in this location on October 13, 2005. Two other nest

records also occur in the Bufferlands property within a mile of the project area. As many as 18 pairs of burrowing owls have been identified nesting on the Bufferlands in a single season (SRCSD, 2000). Locations on the Bufferlands that are or have been occupied by burrowing owls include the northeastern portion of the Bufferlands in the study area and within 0.25 mile northwest of the project area, the area along the UPRR tracks 0.5 mile south of the project area, the plant process area 0.75 mile south of the project area, and areas south in the vicinity of North Beach Lake over a mile from the project area (SRCSD, 2000).

Although no burrowing owls were observed nesting in or adjacent to the project area, there is potential nesting and foraging habitat for this species along the banks and adjacent to Unionhouse Creek. As of March 30, 2011 there is a nesting pair in the garden area at the end of Detroit Avenue 500 feet outside of the area.

Swainson's hawk (*Buteo swainsoni*)

Swainson's hawk is an uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and the Mojave Desert. Swainson's hawk breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley and forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Swainson's hawks breed in California and over winter in Mexico and South America. Swainson's hawks usually arrive in the Central Valley between March 1 and April 1, and migrate south between September and October. Swainson's hawks nests usually occur in trees near the edges of riparian stands, in lone trees or groves of trees in agricultural fields, and in mature roadside trees. Valley oak, Fremont cottonwood, walnut, and large willow with an average height of about 58 feet, and ranging from 41 to 82 feet, are the most commonly used nest trees in the Central Valley. Suitable foraging areas for Swainson's hawk include native grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Swainson's hawks primarily feed on voles; however, they will feed on a variety of prey including small mammals, birds, and insects.

There are 11 reported occurrences of Swainson's hawk in CNDDB on the Florin USGS quad. The two closest nest records to the project area are located on the Bufferlands property to the southwest. The closest record is approximately 0.55 miles southwest of the project area, where a Swainson's hawk was last reported nesting in 2010. The other record is approximately 1.2 miles southwest of the project area, where a Swainson's hawk was last reported nesting in 2004. The annual grassland across the creeks from the project area provides potential foraging habitat for Swainson's hawk. Swainson's hawks were observed foraging over the annual grassland adjacent to the Unionhouse Creek, but no potential nests were observed in or adjacent to the study area.

White-tailed Kite (*Elanus leucurus*)

The white-tailed kite is a common to uncommon, yearlong resident in coastal and valley lowlands and is rarely found away from agricultural areas. However, it does inhabit herbaceous and open stages of most habitats, mostly west of the Sierra Nevada. The main prey of the white-tailed kite is voles and other small, diurnal mammals, but it occasionally preys on birds, insects, reptiles, and amphibians. White-tailed kites forage in undisturbed, open grasslands, meadows, farmlands and emergent wetlands. Nests are made of loosely piled sticks and twigs and lined with grass, straw, or rootlets and placed near the top of a dense oak, willow, or other tree stand; usually 20 to 100 feet above ground. Nests are located near open foraging areas in lowland grasslands, agricultural areas, wetlands, oak-woodland and savannah habitats, and riparian areas associated with open areas.

There is one reported occurrence of a nesting white-tailed kite in the CNDDDB for the Florin USGS quad. The nest record of April, 2008 is located 0.5 mile east of the project area; nesting here was also observed two years prior to 2008. (Pers. comm. Jennifer Albright, 2008). An additional sighting of nesting white tailed kites was made on March, 2011 on the Bufferlands property roughly 0.75 mile from the project area. Additional white-tailed kite nesting habitat is present within 0.5 mile of the project area. Annual grassland directly across Morrison and Unionhouse Creeks from the project site provides suitable foraging habitat.

Swallows (*Tachycineta Spp.*), Black Phoebes (*Sayornis Nigricans*), and Other Migratory Birds

Swallows, black phoebes, and other migratory birds commonly nest on the underside of bridges and other structures in the vicinity of streams and other watercourses. These species are protected from disturbance during the nesting season by the Migratory Bird Treaty Act. Swallow and black phoebe nests were observed on the undersides of the Franklin Boulevard bridge over Unionhouse Creek, but not on the UPRR bridges in the project area. Swallows were observed flying around the bridges during biological surveys.

Sanford's arrowhead (*Sagittaria sanfordii*)

Sanford's arrowhead is an emergent perennial herb found in assorted, shallow, freshwater marshes and swamps including sloughs and drainage ditches from 0 to 2,133 feet in elevation. It is currently known to occur in Butte, Del Norte, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, Shasta, San Joaquin, Tehama, and Ventura counties. This species blooms between May and October.

Potential habitat for Sanford's arrowhead occurs in Morrison and Unionhouse Creeks just outside the study area. There are 11 reported occurrences of Sanford's arrowhead in CNDDDB for the Florin USGS quad. The closest records are over one mile northeast of the study area in Elder Creek. There are also several records for this species in Unionhouse Creek and Strawberry Creek (a tributary to Unionhouse Creek) two miles east of the project area. This species was not observed in Morrison or Unionhouse Creeks during surveys conducted during the bloom season (May to October). Although surveys were conducted early in the bloom season, this perennial herb would have been evident at the time surveys were conducted if it was present in the creek. Therefore, it was determined that Sanford's arrowhead does not presently occur in the study area.

3.10.2 Environmental Effects

Significance Criteria

Adverse effects on special status species were considered significant if an alternative would result in any of the following:

- Direct or indirect reduction in the growth, survival, or reproductive success of species listed or proposed for listing as threatened or endangered under the Federal or State Endangered Species Acts.
- Direct mortality, long-term habitat loss, or lowered reproduction success of Federally or State-listed threatened or endangered animal or plant species or candidates for Federal listing.
- Direct or indirect reduction in the growth, survival, or reproductive success of substantial populations of Federal species of concern, State-listed endangered or threatened species, plant

species listed by the California Native Plant Society, or species of special concern or regionally important commercial or game species.

- An adverse effect on a species' designated critical habitat.

No Action

Under the no action alternative, the Corps would not construct the Morrison Creek-UPRR project. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. There would be no effects on existing special status species in the project area. The types of species and their associated habitat would be expected to remain the same.

Proposed Action - Construct Landside Floodwall

Construction of the project is not likely to adversely affect the giant garter snake and its habitat or impact habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, and midvalley fairy shrimp. The project could result in indirect impacts to nesting raptors and other migratory birds including Swainson's hawk, Western burrowing owl, white-tailed kite, Cooper's hawk, and bridge nesting swallows and black phoebes. These effects would be considered significant to these special status species.

Effects to Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp, and Midvalley Fairy Shrimp

Construction of the Morrison Creek-UPRR floodwall would occur within one mile of potentially occupied habitat and could potentially result in indirect impacts to these vernal pool branchiopods. Construction activity within one mile of potential habitat would be unlikely to impact these species through hydrologic disruption or decreased water quality of the seasonal wetlands. In addition, constructing in the dry season further reduces the opportunity for hydrologic disruption or subsurface displacement. There are no vernal pools in the project area, but 0.03 acres of seasonal wetlands in the project area provide potential habitat and construction could result in direct and indirect impacts to these species.

Effects to Giant Garter Snake

Construction of the Morrison Creek-UPRR floodwall could potentially cause direct and indirect affects to the GGS. This species is unlikely to reside for long periods of time in the project area; however, it could potentially use the project area as upland or over wintering habitat. In addition, the banks of Morrison and Unionhouse Creeks provide marginal basking habitat and refugia for the GGS. Individual snakes dispersing through the project area or temporarily utilizing the project area for basking habitat could potentially be harmed during site preparation and construction activities. Snake movement through aquatic habitat would not be inhibited during construction of the floodwall. The quality of habitat within the project area could improve with the replacement of non-native grassland with native grassland. One acre of upland habitat for the GGS would be permanently lost as a result of the floodwall and maintenance road. Indirect effects of the project could potentially include physical vibration and an increase in site disturbance during operation of equipment and trucks during construction activities. If snakes are present, construction activities could result in abandonment of burrows, exposing GGS to increased chances of predation or other physical harm.

Effects to Cooper's Hawk

Construction of the Morrison Creek-UPRR floodwall could potentially result in direct and indirect affects to Cooper's hawk. The closest nest record to the project area for Cooper's hawk is from 2005 and is located approximately 1.7 miles south of the Bufferlands property near Sims Road. No Cooper's hawk nests were observed in or adjacent to the project area. However, construction of the project could potentially result in direct and/or indirect affects to Cooper's hawk if this species begins nesting in or adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult hawks.

Effects to Western Burrowing Owl

Construction of the Morrison Creek-UPRR floodwall could potentially result in direct and indirect affects to the burrowing owl. Burrowing owls have utilized the south bank of Unionhouse Creek in and adjacent to the study area for roosting, nesting, and foraging. Construction of the project could potentially result in direct and/or indirect affects to the burrowing owl if this species begins nesting in or adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult owls.

Effects to Swainson's Hawk

Construction of the Morrison Creek-UPRR floodwall could potentially result in direct and indirect affects to Swainson's hawk. Swainson's hawk has been reported nesting within one mile of the project area near the water treatment plant. Construction of the project could potentially result in direct and/or indirect affects to Swainson's hawk if this species begins nesting adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult hawks.

Effects to White-tailed Kite

Construction of the Morrison Creek-UPRR floodwall could potentially result in direct and indirect affects to white-tailed kite. As discussed previously, a white-tailed kite nest was observed on the north side of Unionhouse Creek approximately 0.75 mile east of the project area. Construction of the project could potentially result in direct and/or indirect affects to the white-tailed kite if this species begins nesting in or adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult hawks.

Effects to Nesting Swallows, Black Phoebes and Other Migratory Birds

Construction of the Morrison Creek-UPRR floodwall could potentially result in temporary direct and indirect affects to nesting swallows, black phoebes, and other migratory birds. Swallow nests were observed on the undersides of the Franklin Boulevard over Unionhouse Creek, 0.75 mile from the project area during biological surveys. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by these species during the breeding season.

Effects to Sanford's Arrowhead

Construction of the Morrison Creek-UPRR floodwall could potentially result in direct and indirect affects to this species. This species was not observed in the study area, but Morrison Creek provides potential habitat and this species could colonize the creek from upstream populations prior to

construction. Individuals of this species could be destroyed by construction if it were to colonize the project area prior to construction.

3.10.3 Mitigation

Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp, and Midvalley Fairy Shrimp

Because construction would occur within a mile of potentially occupied habitat for these species, consultation with USFWS has been completed to determine appropriate mitigation measures for any potential direct and indirect impacts to these species that could occur as a result of the proposed project (Appendix E). Mitigation measures may include, but are not limited to: (1) implementing BMPs and adherence to all project permit requirements to prevent water quality impacts to the seasonal wetland; (2) preservation of seasonal wetland habitat for habitat affected at a ratio of 2:1 at a USFWS approved location; and, (3) other appropriate mitigation as determined by USFWS. The proposed mitigation would reduce the effects on vernal pool fairy shrimp, vernal pool tadpole shrimp, and midvalley fairy shrimp to less than significant.

California Tiger Salamander

Mitigation measures proposed for vernal pool fairy shrimp and vernal pool tadpole shrimp are expected to reduce the potential effects on California tiger salamander to less than significant. Prior to construction, the habitat suitability of the project area and adjacent wetlands would be determined in consultation with USFWS. If suitable habitat for California tiger salamander is determined to be present, the Corps would consult with USFWS to determine if additional mitigation measures are needed above those included in this document for vernal pool branchiopods. Additional measures may include, but are not limited to: (1) biological monitoring during initial construction activities in suitable habitat for this species; (2) worker awareness training to inform construction personnel of the potential occurrence of California tiger salamander; and, (3) proper procedures for protecting the species if it is observed during construction. The proposed mitigation would reduce the effects on the California tiger salamander to less than significant.

Giant Garter Snake

Potential giant garter snake upland bank habitat in the project area would be permanently lost due to the construction of the floodwall. The area of the giant garter snake habitat temporarily affected is five acres of marginal upland habitat. The area of the giant garter snake habitat permanently lost is 1.01 acres of marginal upland habitat consisting of the existing vegetated upland adjacent to the backyard fences. Revegetation of 3.5 acres of habitat along the UPRR tracks would provide improved upland habitat.

The Corps is consulting with USFWS under Section 7 of the Endangered Species Act (Appendix E). The following mitigation measures included in the 2004 SEIR would be implemented. The Corps and the non-federal sponsor will ensure implementation of the respective terms and conditions and reasonable and prudent measures identified in the resulting Biological Opinion once it is received. Construction in aquatic habitat or upland habitat within 200 feet of Morrison or Unionhouse Creeks will conform to the USFWS's *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat*, including the requirement that construction be limited to the period between May 1 and October 1, the active period for the snake. Additional measures, such as worker awareness training and biological monitoring for GGS during construction and habitat protection, would be implemented as determined appropriate by USFWS.

The landside floodwall alternative was not covered in previous environmental documents or in the BO, but habitat impacts on the landside of the UPRR tracks would be less than the waterside impacts covered in earlier documents. The Corps has sent letters to USFWS and expects concurrence with this determination. Mitigation for GGS has already been completed for the previously anticipated waterside impacts. The completed mitigation and the proposed mitigation measures would reduce the effects on the giant garter snake to less than significant.

Pallid Bat and Townsend's Big-eared Bat

Preconstruction bat surveys would be conducted to inspect the undersides of the Franklin Boulevard and the UPRR bridges for roosting bats. If no roosting bats are found, no further mitigation would be necessary. If bats are detected within the roost at the time of construction, excluding any bats from roosts would be accomplished by a bat specialist prior to the onset of any construction activities. Exclusionary devices, such as plastic sheeting, plastic, and/ or wire mesh, can be used to allow for bats to exit but not re-enter any occupied roosts. Expanding foam and plywood sheets can be used to prevent bats from entering unoccupied roosts. The proposed mitigation would reduce the effects on special-status bats to less than significant.

Swainson's Hawk, Burrowing Owl, Cooper's Hawk, White-tailed Kite, and other Raptors

If construction is scheduled to occur between March 15 and September 15, preconstruction surveys would be conducted in suitable nesting habitat within 0.5 miles of the project area for Swainson's hawk, within 1,000 feet of the project area for tree nesting raptors including Cooper's hawk and white-tailed kite, and within 500 feet of the project site for burrowing owls, similar to the 1998 EIS/EIR and the 2004 SEIR.

As stated in the 2004 SEIR, surveys shall conform to the Swainson's Hawk Technical Advisory Committee Guidelines and CDFG burrowing owl recommendations, where feasible. Burrowing owl surveys shall be conducted in both the breeding (April 15 to July 17) and non-breeding (December 1 to January 31) seasons. If nesting raptors are recorded within their respective buffers, CDFG would be consulted regarding suitable measures to avoid impacting breeding effort. Mitigation measures would include but are not limited to the following mitigation measures taken from the 2004 SEIR.

An appropriately sized buffer would be maintained around each active raptor nest. The buffer size would be determined in consultation with CDFG. No construction activities would be allowed within this buffer, except as allowed through consultation with CDFG. Depending on conditions specific to each nest, and the relative location and rate of construction activities, it may be feasible for construction to occur as planned within the buffer without impacting breeding effort. In this case, as determined by consultation with CDFG, the nest(s) shall be monitored by a qualified biologist during construction within the buffer. If the monitoring biologist determines that construction will impact the nest, the biologist shall immediately inform the construction manager and CDFG. Construction activities within the buffer will be stopped until either the nest is no longer active or the project receives approval to continue by CDFG.

The proposed mitigation would reduce the effects on the above-listed special-status raptors to less than significant.

Swallows, Black Phoebe, and Other Migratory Birds

If construction is scheduled to occur during the typical nesting season for these birds, March 1 through September 1, a preconstruction survey would need to be conducted within two weeks prior to construction for nesting birds under the Franklin Boulevard and UPRR bridges and in other suitable

habitats. If no nests are detected, no further mitigation would be necessary. If active nests are detected, CDFG would need to be contacted to determine appropriate mitigation measures to prevent impacts to nesting birds.

Alternatively, in order to prevent swallows and black phoebes from nesting under the bridge, a nest survey should be conducted prior to the nesting season in the year that construction is scheduled to commence. In consultation with CDFG, the existing unoccupied nests under the bridge should be removed prior to the nesting season by pressure washer or mechanical means. Nests can only be removed in consultation with CDFG and prior to eggs being laid in the nests. Nest exclusion should be conducted throughout the nesting season consisting of either removing partially built nests weekly through the nesting season or installing exclusionary netting for as long as necessary to prevent swallows from attempting to rebuild the nests.

The proposed mitigation would reduce any temporary effects during construction on nesting migratory birds to less than significant.

Sanford's Arrowhead

As stated in the 1998 EIR/EIS, pre-construction surveys would be conducted in the study area prior to construction. If Sanford's arrowhead is not found, then no further mitigation would be necessary. If Sanford's arrowhead is found in the study area, appropriate mitigation would be determined in consultation with CDFG to avoid impacts to this species. Mitigation could include transplanting any Sanford's arrowhead plants found in the study area to suitable habitats up or downstream. Mitigation would ensure that any impacts to Sanford's Arrowhead remain less than significant.

4.0 GROWTH INDUCEMENT AND CUMULATIVE EFFECTS

4.1 Growth Inducement

NEPA and CEQA require the consideration of cumulative effects of the proposed action combined with the effects of other projects. NEPA defines a *cumulative effect* as an affect on the environment which results from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (CFR 40 Part 1508.7). The CEQA Guidelines define cumulative effects as "two or more individual effects which, when considered together, compound or increase other environmental impacts" (Section 15355).

CEQA Guidelines 15126.2(d) requires discussion of the ways in which alternatives could foster economic or population growth, or the construction of additional housing, either directly or indirectly. Consideration should include actions that would remove obstacles to growth. The CEQA Guidelines state, "It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment." This subsection provides a summary of the affected environment and the potential for growth inducement as a result of implementing the alternatives.

The following discussion is based on the results of the U.S. Census taken in 2000 and 2010 and covered in the Socioeconomics and Growth Inducing Effects section of this EA. This discussion has not significantly changed from the 2004 EA or 2004 SEIR. According to the 2010 census, the population of Sacramento City was 466,488 (U.S. Census Bureau, 2010). The ethnic composition of Sacramento City in 2010 was about 35 percent white, 14 percent African American, 18 percent Asian, 27 percent Hispanic or

Latino, and 6 percent other (exceeds 100 percent because individuals may report more than one race) (U.S. Census Bureau, 2010).

Construction of the project would not significantly affect the socioeconomic conditions in the area. The adjacent residential areas to Morrison and Unionhouse Creeks do not represent economically disadvantaged populations or concentrations of minority populations. In addition, the project would not be considered growth-inducing. Even though the proposed project would provide flood protection in the project area to a point that it can safely contain a flood event with less than a 1% chance of occurrence in any given year, there is a lack of available land in the regional project area for growth and development because the regional area is already heavily built out and/ or planned for development. The designated land uses, growth rates, employment opportunities, and housing values would continue to be determined by local government regulations and regional economic conditions in the regional project area.

4.2 Affected Environment

The geographic area that could be affected by the project varies depending on the type of environmental resources being considered. When the effects of the project are considered in combination with those of other past, present, and future projects to identify cumulative effects, the other projects that are considered may also vary depending on the type of environmental effects being assessed. The following are the general geographic areas associated with the different resources addressed in the analysis:

- Air Quality: regional area under the jurisdiction of the SMAQMD, consisting primarily of Sacramento City and County.
- Climate Change: regional area under the jurisdiction of the CARB, consisting primarily of Sacramento City and County.
- Traffic and Circulation: regional roadways where traffic generated by multiple simultaneous projects may interact on a cumulative basis.
- Vegetation and Wildlife: local area. Habitat in the vicinity of the project area with similar net gains or losses in vegetative habitat, or in areas where affected wildlife could relocate.

The following projects are planned or proposed in the vicinity of the proposed project. These projects have been the subject of environmental review and mitigation or compensation measures have been developed to avoid or reduce any adverse effects to a less than significant status, based on Federal and local agency criteria.

Cosumnes River Boulevard Extension (City of Sacramento). The I-5/ Cosumnes River Boulevard Interchange Project includes extending Cosumnes River Boulevard from its westerly terminus at Franklin Boulevard to a new interchange at I-5, and then farther west to an at-grade intersection with Freeport Boulevard in the currently unincorporated town of Freeport. Just west of the Morrison Creek Bridge, the Cosumnes River Boulevard alignment would travel north and then west until reaching the interchange location. The Lower Northwest Interceptor, the Freeport Regional Water Authority Project pipeline, and other various utilities have been constructed along the Cosumnes River Boulevard extension alignment. The Sacramento Regional Transit proposed Phase 2 light rail transit alignment would be located to the north and generally parallel to the roadway extension. Vehicular access to the Franklin Boulevard light rail station and park-and-ride lot would be provided by the Cosumnes River Boulevard extension. The City of Sacramento in conjunction with the State of California Department of Transportation (Caltrans) and the Federal Highways Administration (FHWA) completed a Draft EIS/ EIR for the Cosumnes River Boulevard Extension Project in February 2006 (State Clearinghouse #

2002022072). A Final EIS/EIR was completed in April 2007 and a Notice of Determination (NOD) was issued in May 2007. FHWA issued its Record of Decision on October 26, 2007 (Federal Register No. 20070442). Construction is scheduled to begin in summer 2012 or 2013 (City of Sacramento, DOT, 2006).

South Sacramento Corridor Phase 2. Sacramento Regional Transit District (RT) proposes to extend light rail transit (LRT) service 4.3 miles from the South Sacramento Corridor Phase 1 terminus at Meadowview Road. The Federal Transit Authority and RT completed a Supplemental Draft EIS / Subsequent EIR in January 2007 (RT, 2007) to supplement the 1994 South Sacramento Corridor Alternative Analysis DEIS/DEIR. The final EIS/EIR was issued in September 2008 and the ROD was signed in February 2009. The proposed alignment would travel southward along the Union Pacific Rail Road (UPRR) right-of-way, turning east crossing the UPRR and Unionhouse Creek, continuing east to the north of the proposed extension of Cosumnes River Boulevard, crossing Franklin Boulevard and traveling along the northern side of Cosumnes River Boulevard, then turning south along the western side of Bruceville Road and terminating at Cosumnes River College. This project, called the Locally Preferred Alternative Phase 2 (LPAP2), includes four new stations at: Morrison Creek, Franklin, Center Parkway, and Cosumnes River College. Three new park-and-ride lots would provide over 2,700 spaces: Morrison Creek with 50 spaces, Franklin with 650 spaces, and Cosumnes River College with 2000 spaces.

Grade-separated pedestrian/bike crossings are proposed at the Franklin and Center Parkway stations. A grade separation for the light rail line is under consideration for Meadowview Road, Franklin Boulevard, and Cosumnes River Boulevard. Vehicle maintenance for the LPAP2 LRT vehicles would occur at RT's central maintenance facility. RT has acquired additional LRT vehicles to operate on the LPAP2. RT is currently finalizing a supplemental and construction is scheduled to begin in spring 2012, starting with the parking garage at Cosumnes River College and the bridges over Franklin Blvd. and Morrison Creek (RT, 2011).

The projects listed above are required to evaluate the effects of the proposed project features on environmental resources in the area. In addition, mitigation or compensation measures must be developed to avoid or reduce any adverse effects to less than significant based on Federal and local agency criteria. Those effects that cannot be avoided or reduced to less than significant are more likely to contribute to cumulative effects in the area. Table 4.1-1 shows the relationship between the proposed project impacts and the impacts identified in the other local project's environmental documentation.

Table 4.1-1 Projects with Potential to Contribute to Cumulative Impacts

Project	Potential Resource Impacts									
	Land Use and Community Impacts	Vegetation and Wildlife	Special Status Species	Air Quality	Water Resources and Quality	Traffic and Circulation	Noise	Aesthetics/Visual Resources	Cultural Resources	Hazardous and Toxic Waste
South Sacramento County Streams Project	√	√	√	√	√	√	√	√	√	√
Cosumnes River Boulevard Extension	√	√	√	√	√	√	√	√	√	√
South Sacramento Corridor Phase 2	√	√	√	√	√	√	√	√	√	√

Source: (Corps, 1998), (Corps, 2004b), (SAFCA, 2004), (City of Sacramento, 2006), (Freeport Regional Water Authority, 2003), (SRCSD, 2003), (RT, 2007), and (SASD, 2008)

4.2.1 Potential for Growth Inducement

The proposed Morrison Creek-UPRR floodwall project would not directly remove obstacles to growth, result in population increases, or encourage and facilitate other activities that could significantly affect the environment. New development must be consistent with the existing City of Sacramento General Plan policies and zoning ordinances regarding land use, open space, conservation, flood protection, and public health and safety. Due to the current land use in and around the project area, there is no land available to promote growth. Land use in the project area would remain the same; therefore, there would be no growth-inducing effects as a result of implementation of the proposed alternative.

4.3 Cumulative Effects

NEPA and CEQA require consideration if two or more past, present, or reasonable foreseeable actions, when combined, have a cumulatively considerable effect on the environment. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The NEPA regulations define a cumulative effect as:

“The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless

of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor or collectively significant actions taken over a period of time” (40 CFR 1508.7).

The CEQA Guidelines require that an IS or EIR discuss cumulative effects “when they are significant” (Section 15130). The CEQA Guidelines define cumulative effects as “two or more individual effects which, when considered together, compound or increase other environmental impacts” (Section 15355). Additionally, the CEQA Guidelines state: “The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to the other closely related past, present, and reasonable foreseeable probable future projects” (Section 15355).

The following analysis is focused on considering the potential for those effects identified in Chapter 3 to make a considerable contribution to significant adverse cumulative effects. The Morrison Creek-UPRR Project would not cause long term adverse affects on the resources discussed in Chapter 3. However, some of the resources have the potential to incur temporary, short-term effects during construction. An initial assessment of potential cumulative effects indicated that air quality, climate change, traffic and circulation, and vegetation, wildlife and special status species have the potential to contribute to cumulative effects. The potential cumulative effects to these resources, in combination with potential effects from the local projects described above, are discussed below.

4.3.1 Air Quality

According to SMAQMD, a project is considered to have a significant cumulative effect if:

- The project requires a change in the existing land use designation (general plan amendment or rezone), and
- Projected emissions (ROG or NO_x) or emission concentrations (criteria pollutants) of the proposed project are greater than the emissions anticipated for the site if developed under the existing land use designation.
- The project individually would result in a significant effect on air quality.

Construction of the proposed project is not expected to have any long-term effects on air quality since the operational activities (including inspection and maintenance) are expected to be similar to existing conditions. However, construction would result in direct, short-term effects on air quality mainly related to combustion emissions and dust emissions. Implementation of mitigation measures during construction would reduce emissions to the extent possible. Since the project would not require a change in the existing land use designation, long-term projected emissions of criteria pollutants would be the same with or without the project. In addition, the project individually would not result in a significant effect on air quality.

However, construction of the Morrison Creek-UPRR Floodwall Project has the potential to overlap with construction of the Cosumnes River Boulevard Extension Project as well as the RT South Line Phase 2 Extension Project. These concurrent construction activities could have a significant cumulative effect on air quality. It is expected that effects from these projects would be similar to the current project in that effects would be primarily due to construction activities. Therefore, construction of these projects would increase emissions of criteria pollutants, including VOC, NO_x, CO, SO₂, and PM emissions.

Individually these projects would mitigate emissions below significance threshold levels. If these construction projects are implemented concurrently, the combined cumulative effects could be above CEQA thresholds for air quality emissions and *de minimus* thresholds. To address these potential

cumulative effects, the Corps would coordinate the scheduling and sequence of construction activities with the City of Sacramento, RT, and SMAQMD. Coordination on this level would reduce any potential cumulative air quality effects to less than significant.

4.3.2 Vegetation, Wildlife, and Special Status Species

Construction of the Morrison Creek-UPRR Floodwall would directly and indirectly affect GGS and could directly and indirectly affect potential habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, midvalley fairy shrimp, and the California tiger salamander. Design refinements completed during the fall of 2008 as a part of a separate project impacted approximately three acres of potential GGS habitat. To address these cumulative effects, the Corps completed consultation with the USFWS and purchased mitigation credits in 2009, and implemented mitigation measures to reduce impacts. Mitigation measures in this EA/IS have also been prescribed to offset potential impacts to GGS along with habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, midvalley fairy shrimp, and the California tiger salamander. Therefore, there would be no significant cumulative effects to GGS or other special status species as a result of the proposed project.

The project could also result in direct and indirect impacts to nesting raptors and other migratory birds, including Swainson's hawk, Western burrowing owl, white-tailed kite, Cooper's hawk, swallows, and black phoebes. Mitigation measures in this EA/IS have been prescribed to offset potential impacts to nesting raptors and other migratory birds. As a result, cumulative effects are not anticipated for nesting raptors and migratory birds. The other projects described above (Cosumnes River Boulevard Extension Project and the RT South Line Phase 2 Extension) are located in the vicinity of the study area and would result in short-term disturbances of wildlife habitat. In addition, some permanent loss of wildlife habitat at each of the respective project sites would occur. However, each of these projects is juxtaposed with nearby quality habitat that could support temporary and permanent relocation of the displaced wildlife species.

All projects would produce temporary effects on vegetation and habitat associated with clearing and grubbing of the existing surfaces. The new transportation corridors created by the Cosumnes River Boulevard Extension Project and the RT projects would result in permanent loss of habitat. These projects have completed environmental documents to mitigate for this loss of habitat. To compensate for the loss of this vegetation, mitigation sites would be planted with transplanted trees and elderberry shrubs, and other associated native plants. At the conclusion of construction of the Morrison Creek-UPRR floodwall project, the site would be restored, and it is anticipated that wildlife species would be able to return to the project area. The vegetation loss associated with the seasonal wetlands, annual grassland and the trees in the other project areas would not have a significant cumulative effect on vegetation in the Sacramento region.

4.3.3 Climate Change

It is unlikely that a single project would have a significant effect on the environment with respect to GHGs. However, the cumulative effect of human activities has been clearly linked to quantifiable changes in the composition of the atmosphere, which, in turn, have been shown to be the main cause of global climate change (IPCC, 2007). While the emissions of one single project will not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative effect with respect to global climate change.

With respect to global warming, CO₂ is tracked as a contributor to GHG emissions. SMAQMD emission models calculate air emissions based on construction phase, duration, type of equipment, project

area, and other input criteria. The air quality analysis in Section 3.4.3 includes CO₂ emissions, which can also be found in Appendix C.

It is expected that effects from the local projects are similar to the proposed action. On an individual basis, these projects would mitigate emissions below significant threshold levels. If these construction projects are implemented concurrently, the combined cumulative effects could be above reporting requirements for GHG emissions. If this were the case, without consideration for scheduling and sequence of activities, concurrent construction projects in the Sacramento area could have temporary, adverse cumulative effects on GHG. To address these potential cumulative effects, the Corps would attempt to coordinate the scheduling and sequence of construction activities with the City of Sacramento and SMAQMD. Coordination on this level would reduce any potential cumulative effects to climate change to less-than-significant.

4.3.4 Traffic and Circulation

Construction activities associated with the proposed project would contribute to an overall increase in traffic volumes on the existing and planned roadway network on a localized and temporary basis only. The project would likely overlap with the Cosumnes River Boulevard Extension Project as well as the RT South Line Phase 2 Extension project. All three projects have the potential to use the same local roadways and major transportation corridors for construction traffic as well as haul trucks. These roads include I-5, SR 99, Cosumnes River Boulevard, Franklin Boulevard, Mack Road, and Freeport Boulevard.

The proposed construction activities would have short-term effects on traffic levels on local and regional roadways, which would temporarily decrease their LOS. While construction of the projects would temporarily increase traffic counts on roadways within the vicinity of the project, the volume of trucks associated with these projects would not be of sufficient magnitude to affect the LOS on these roadways. The Corps would coordinate the scheduling and sequence of construction activities with the City of Sacramento and RT to reduce adverse effects on traffic and circulation. Following construction, the proposed project would not contribute to cumulative regional traffic and transportation impacts associated with other projects in the region. Minimization practices at all sites and the relative distances between multiple projects would reduce cumulative effects on local traffic and circulation to less than significant.

5.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

The following subsections discuss compliance with relevant federal and state regulations. Summaries of the regulation are followed by statements of compliance.

5.1 Federal Requirements

American Indian Religious Freedom Act

Full Compliance. This act requires Federal agencies to make reasonable efforts to locate and coordinate with organizations, and communities of American Indians to ensure that religious rights are accommodated during project planning, construction, and operation. The Corps coordinated with American Indians in the project area (Appendix H).

Archaeological Resources Protection Act of 1979, 16 U.S.C. 470, et seq.

Full Compliance. This act prohibits the removal, sale, receipt, and interstate transportation of archaeological resources obtained illegally (without permits) from public lands. The proposed project would not occur on public lands (federal lands or Indian lands) or involve any such archaeological resources.

Clean Air Act of 1972, as amended, 42 U.S.C. 7401, et seq.

Full Compliance. Federal activities resulting in the discharge of air pollutants must conform to National Ambient Air Quality Standards and the State Implementation Plan unless the activity is explicitly exempted by EPA regulations. As discussed in section 3.4 the Corps completed an analysis of air quality effects from the proposed action and has determined that the estimated emissions would not exceed Federal *de minimus* thresholds or violate any Federal air quality standard. The Corps has determined that the proposed project would have no significant adverse effect on the future air quality of the area. Implementation of BMPs and mitigation measures would be implemented to reduce equipment emissions (including NO_x) and PM₁₀ to the extent possible. The Corps would also coordinate with other projects to avoid cumulative effects. Thus, the Corps has determined that the proposed project would have no significant effects on the future air quality of the area, and a conformity determination would not be required. A copy of the Draft EA/IS was provided to the SMAQMD.

Clean Water Act of 1972, as amended, 33 U.S.C. 1251, et seq.

Full compliance. The proposed project is not expected to adversely affect surface or ground water quality or deplete ground water supplies. BMPs would be implemented to avoid erosion or accidental spills. The Corps has determined that the proposed project would have no significant effects on the future water quality of the area. As there will be no in-water work, a Section 401 Water Quality Certification Application is not required to be filed with the CVRWQCB. Section 402 regulates point source discharge of pollutants into “navigable water” through the NPDES. Since the project would disturb more than one acre of land, the contractor would be required to obtain a NPDES permit from the CVRWQCB. As part of the permit, the contractor would be required to prepare a SWPPP identifying BMPs to be used to avoid or minimize any adverse effects from construction on surface waters. The Corps has determined that the proposed action would not have any significant effects on the future water quality of the area. The proposed action will not occur in an aquatic environment or waters of the United States. The construction would include temporary and permanent fill of 0.03 acres of wetland habitat, however, since these wetlands are artificial and considered non-jurisdictional, and construction would not impact waters of the U.S., compliance with Clean Water Act Section 404(b)(1) is not required. A copy of the Draft EA/IS was provided to the CVRWQCB.

Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, et seq.

Partial Compliance. Section 7 states that all Federal agencies shall, in consultation with the Secretary of the Interior/Commerce, ensure Federal actions do not jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat.

As discussed in Section 3.10, a list of threatened and endangered species that may be affected by the project was obtained from the USFWS website on June 24, 2010 (Appendix E). The Federally-listed species that have the potential to be affected by the project include; vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and giant garter snake. The Corps is currently coordinating with USFWS to determine if the current project description has fewer impacts than the project described in the 2002 Biological Opinion (Ref# 1-1-01-F-0043). Mitigation for the authorized project was

completed in 2010. A letter re-initiating consultation and requesting concurrence is currently being reviewed. Once the concurrence letter is received from USFWS the proposed project will be in *Full Compliance*. A summary of the coordination between the Corps and USFWS is included in Appendix F and Appendix G.

The project has the potential to result in adverse impacts to the following Federally-listed threatened and endangered species and/or their habitats: vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and GGS. In accordance with Section 7(c), the Corps is requesting re-initiation of consultation with USFWS to amend the existing Biological Opinion (Ref# 1-1-01-F-0043) for the GGS issued for the South Sacramento County Streams Project on April 15, 2002 stating that the project may affect, but is not likely to adversely affect the GGS. In addition, the Corps is consulting consultation with USFWS for vernal pool fairy shrimp, vernal pool tadpole shrimp, and California tiger salamanders to ensure that the project does not result in adverse impacts on these species.

The Biological Opinion for GGS and consultation for the other Federally-listed species will identify all required terms and conditions, reasonable and prudent measures, and reporting requirements. If any additional mitigation for GGS is required, it will likely include, but is not limited to, implementing the USFWS's Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat during construction in aquatic habitat or upland habitat within 200 feet of Morrison or Unionhouse Creeks including the requirement that construction be limited to the period between May 1 and October 1, the active period for the snake. Additional measures such as worker awareness training and biological monitoring for GGS during construction and habitat protection will be implemented as determined appropriate by USFWS.

If necessary, mitigation for vernal pool fairy shrimp and vernal pool tadpole shrimp may include implementing BMPs and adhering to all project permit requirements in order to prevent water quality impacts to the seasonal wetland. Mitigation measures may also include preservation of seasonal wetland habitat for habitat affected at a ratio of 2:1 at a USFWS approved location and other appropriate mitigation as determined by USFWS. Habitat suitability of the project area and adjacent wetlands for California tiger salamander will also be determined in consultation with USFWS. If suitable habitat for California tiger salamander is determined to be present, the Corps will consult with USFWS to determine if additional mitigation measures are needed above those included in this document for vernal pool branchiopods. Additional measures may include, but are not limited to: (1) biological monitoring during initial construction activities in suitable habitat for this species; (2) worker awareness training to inform construction personnel of the potential occurrence of California tiger salamander; and, (3) proper procedures for protecting the species if it is observed during construction.

As the action agency, the Corps has made the determination that there would be no effect on any listed species under the jurisdiction of the National Marine Fisheries Service. As a result, no formal consultation was required with the National Marine Fisheries Service under Section 7 of the Endangered Species Act.

Executive Order 11988 (Floodplain Management)

Full Compliance. Executive Order 11988 (May 24, 1977) requires Federal agencies to prepare floodplain assessments for proposed actions located in or affecting floodplains. If an agency proposes to conduct an action in a floodplain, it must consider alternatives to avoid adverse effects and incompatible development in the floodplain. If the only practicable alternative involves constructing in a floodplain, the agency must minimize potential harm to or in the floodplain and explain why the action is proposed in the floodplain. This EA/IS is proposed to improve existing flood protection facilities and does not directly or indirectly propose floodplain development.

Executive Order 11990, Protection of Wetlands

Full compliance. Each Federal agency, to the extent permitted by law, shall avoid undertaking or providing assistance for new construction located in wetlands unless there is no practicable alternative to such construction and the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. The proposed project is not expected to adversely affect wetlands. There are three 0.01 acre wetlands and two 0.01 acre drainage ditches in the project area that will be impacted by construction. BMPs will be implemented and all project permit requirements will be adhered to in order to prevent water quality impacts to wetlands in the vicinity of the project area. The contractor would be required to obtain a NPDES permit from the CRWQCB, since the project would disturb one or more acres of land and involve possible storm water discharges to surface waters. In addition, the contractor would prepare a SWPPP identifying BMPs to be used to avoid or minimize any adverse effects of construction on surface waters.

Executive Order 12898, Federal Action to Address Environmental Justice in Minority Population and Low-Income Populations.

Full Compliance. This Executive Order states that Federal agencies are responsible to conduct their programs, policies, and activities that substantially affect human health of the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination under such programs, policies, and activities because of their race, color, or national origin. The proposed action would benefit the city of Sacramento as a whole and would not have a disproportionately adverse effect on any populations. All nearby residents would benefit from the proposed flood control measures of the project.

Farmland Protection Policy Act

Full compliance. Federal agencies are required to contact the Natural Resource Conservation Service for identification of prime or unique farmland that might be impacted by proposed actions. Prior to conversion of designated farmland to nonagricultural uses, agencies must consider alternatives to lessen any identified adverse effects. There are no prime and unique farmlands in the project area.

Fish and Wildlife Coordination Act

Partial Compliance. The Fish and Wildlife Coordination Act in general requires Federal agencies to coordinate with USFWS and state fish and game agencies whenever streams or bodies of water are controlled or modified. This coordination is intended both to promote the conservation of wildlife resources by providing equal consideration for fish and wildlife in water project planning and to provide for the development and improvement of wildlife resources in connection with water projects. Federal agencies undertaking water projects are required to include recommendations made by USFWS and state fish and game agencies in project reports, and give full consideration to these recommendations. Coordination under the Fish and Wildlife Coordination Act is currently in process with Resource agencies. USFWS is expected to provide recommendations for the proposed project. Input on the proposed project was solicited from CDFG in June 2011. The CDFG and USFWS have been provided copies of the Draft EA/IS for review. Once coordination with CDFG and USFWS is complete the proposed project would be in *Full Compliance*.

Magnuson Fishery Conservation and Management Act

Full Compliance. This legislation requires that all Federal agencies consult with NOAA Fisheries regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect EFH. EFH is defined as “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The proposed action would have no effect on special-status fish species or their habitats. Morrison and Unionhouse Creeks do not currently support special-status fish species except during flood events. In addition, Morrison and Unionhouse Creeks are not designated as EFH or Critical Habitat therefore no mitigation is necessary for fisheries.

Migratory Bird Treaty Act (15 U.S.C 701-18h).

Full compliance. This act prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation promulgated by the Secretary of the Interior. Construction would be timed to avoid destruction of active bird nests or young of birds that breed in the area. If this is not feasible, a qualified biologist would survey the area prior to initiation of construction. If active nests are located, a protective buffer would be delineated and the entire area avoided, preventing disturbance of nests until they are no longer active.

National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, et seq.

Full Compliance. This act requires that proposals for legislation and other major Federal actions significantly affecting the quality of the human environment include a statement on the environmental impacts of the proposed action. This EA/IS is in full compliance with this act because this document has been released for public comment and comments received during the public review period have been incorporated into this EA/IS. A comments and responses appendix is included in the Final EA/IS. The Final EA/IS will be accompanied by a signed FONSI. These actions provide full compliance with this act.

National Historic Preservation Act

Full Compliance. Federal agencies with jurisdiction over a proposed Federal or Federally-assisted undertaking shall take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. The project is in compliance with Section 106 of this act. Discussion of cultural resources has been provided in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR (Corps, 1998 and 2004 and SAFCA, 2004) and in this Supplemental EA/IS. The project area was surveyed for cultural resources sites in reconnaissance studies conducted in 1994, 1995, 1998 (Corps, 2004b) and in 2010. The Corps conducted a records and literature search at the Northwest Information Center at California State University, Sacramento. Based on the records and literature search, there are no recorded prehistoric or historic archeological sites or historic structures within the APE. No properties are listed on, or eligible for, the National Register of Historic Places. The Corps also requested and received concurrence with this determination from the State Historic Preservation Officer (SHPO). Concurrence with the finding of no historic properties affected was received from the SHPO on January 27, 2011 (see Appendix H).

Noise Control Act of 1972

Full compliance. Federal agencies with jurisdiction over any property or facility or engaged in any activity resulting, or which may result in, the emission of noise shall comply with Federal, State, interstate, and local requirements respecting control and abatement of environmental noise. The proposed project would comply with all Federal, State, and local laws.

Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.).

Full compliance. This act establishes the National Wild and Scenic River System and requires consideration of the impacts and consultation with the responsible agencies prior to implementation of proposed action. No Wild and Scenic Rivers are located within the project area.

5.2 State of California Requirements

California Department of Fish and Game Code, Section 1601/1603 Streambed Alteration Agreement.

Full compliance. Requires a streambed alteration agreement for any activity that would “divert or obstruct the natural flow of water, or change the bed, channel or bank of any river, stream, or lake, or proposing to use any material from a streambed.” This project does not impact a streambed.

California Department of Fish and Game Code B, Sections 3503, 3503.5, 3513, 3511, 4700, 5050, and 5515.

Full compliance. This code states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, protects all birds of prey and their eggs and nests, and states it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act. It designates certain species (birds, mammals, reptiles, amphibians, and fish) as fully protected species that may not be taken or possessed at any time. Construction would be timed to avoid destruction of active bird nests or young of birds that breed in the area. If this is not feasible, a qualified biologist would survey the area prior to initiation of construction. If active nests are located, a protective buffer would be delineated and the entire area avoided, preventing disturbance of nests until they are no longer active.

California Endangered Species Act.

Full Compliance. Section 2080 of the Fish and Game Code prohibits "take" of any species that the California Fish and Game Commission determines to be an endangered species or a threatened species. The California Endangered Species Act (CESA) allows for take incidental to otherwise lawful development projects. This act requires the non-Federal agency to consider the potential adverse affects of State-listed species. As a joint NEPA/CEQA document, this EA/IS has considered the potential effects and has provided conservation measures where appropriate. There would be no adverse effect to State-listed species.

California Environmental Quality Act

Full Compliance. This act requires state and local public agencies to prepare an environmental impact report for discretionary actions that may have significant effects on the environment “that cannot be mitigated or avoided”. This joint NEPA/CEQA document will fully comply with CEQA requirements. Adoption of a Negative Declaration or Mitigated Negative Declaration by SAFCA will provide full compliance. A draft Mitigated Negative Declaration has been included in this document.

6.0 SUMMARY OF FINDINGS

Based on the information presented in this Environmental Assessment and Initial Study, the preferred alternative would not have a significant adverse effect on environment. A Finding of No Significant Impact (FONSI) is recommended to comply with the National Environmental Policy Act (NEPA). A Mitigated Negative Declaration (MND) is recommended to comply with the California Environmental Protection Act (CEQA). Pending execution of the FONSI and MND, no further documentation would be required to comply with the NEPA or CEQA.

7.0 DOCUMENT PREPARATION AND REVIEW

Preparation

U.S. Army Corps of Engineers, Sacramento District

Sarah Ross, Biological Sciences Environmental Manager
Anne Baker, Social Sciences Environmental Manager
S. Joe Griffin, Archaeologist

Review

U.S. Army Corps of Engineers, Sacramento District

Anne Baker, Social Sciences Environmental Manager
Nancy Sandburg, Biological Sciences Environmental Manager
Josh Garcia, Environmental Analysis Section Chief
Lisa Clay, Agency Council

SAFCA

ESA Water

Catherine McEfee, Vice President
Paul Garcia, Managing Associate

Department of Water Resources

Patrick Luzuriaga, Project Manager
Lance Salisbury, Environmental Scientist

Resources Agencies

U.S. Fish and Wildlife Service

Doug Weinrich, Habitat Conservation Division Chief

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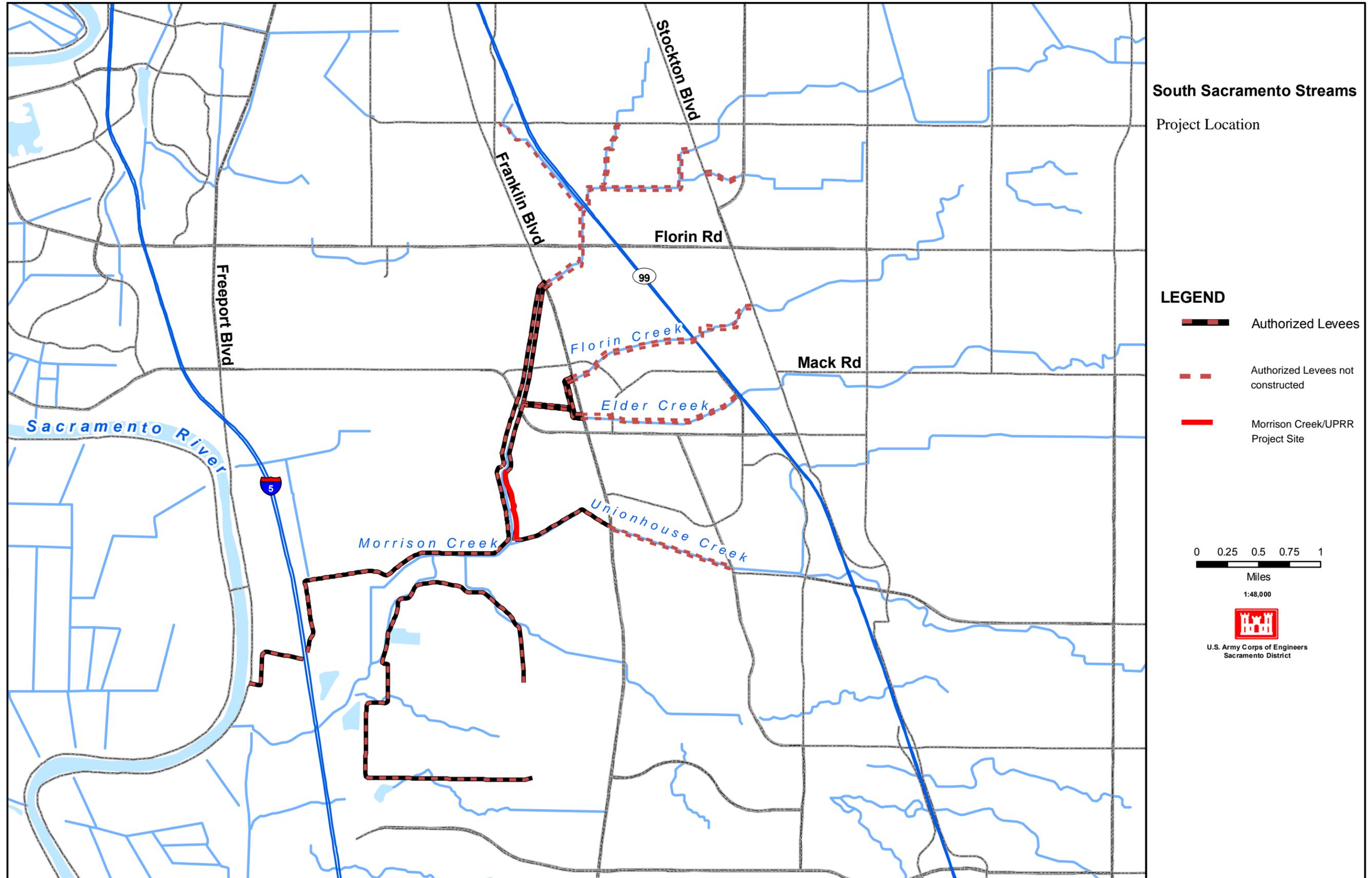
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Personal Communication:

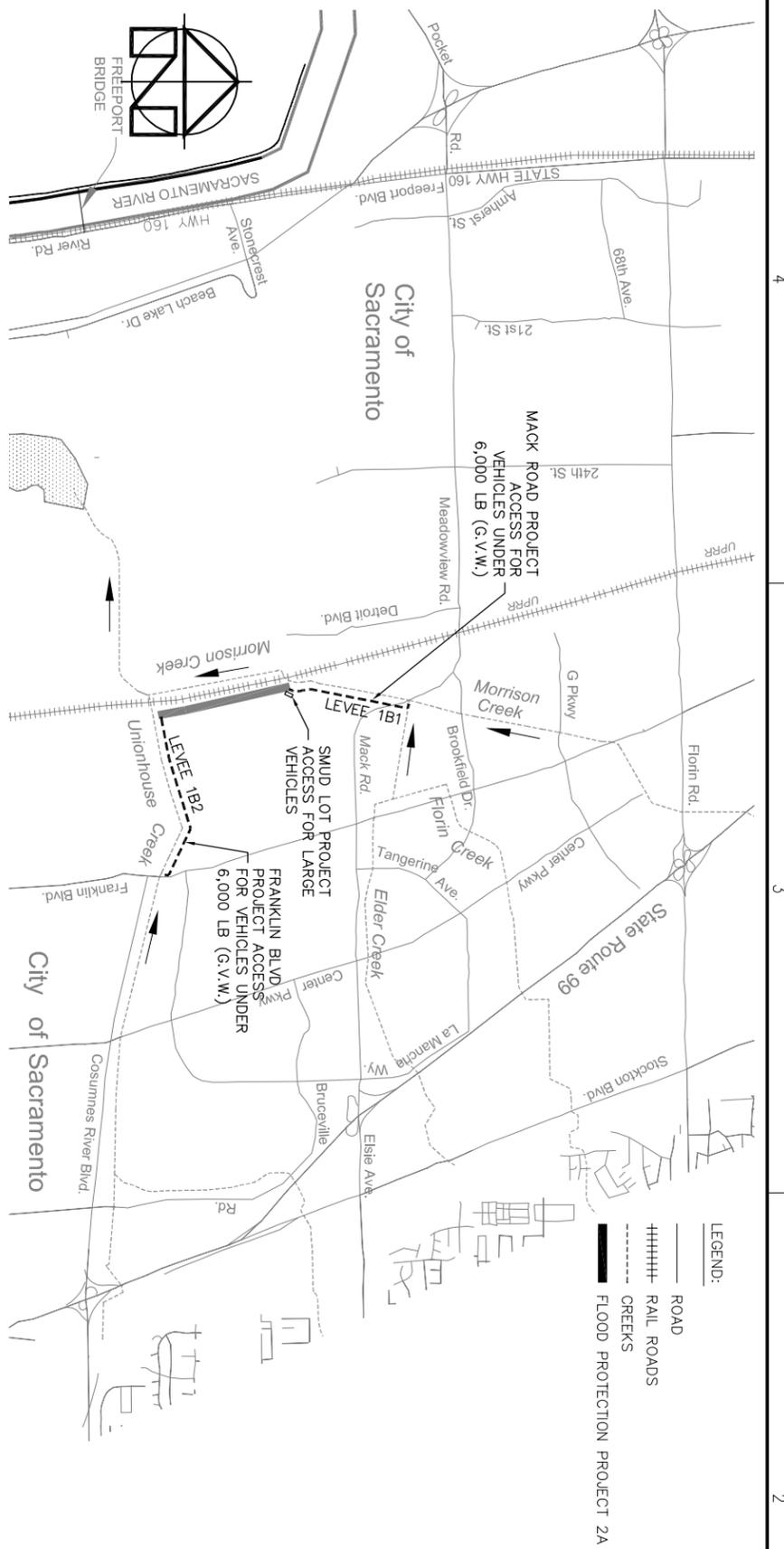
Jennifer Albright. Natural Resource Specialist. Sacramento Regional County Sanitation District. Conversation on April 23, 2008.

PLATES

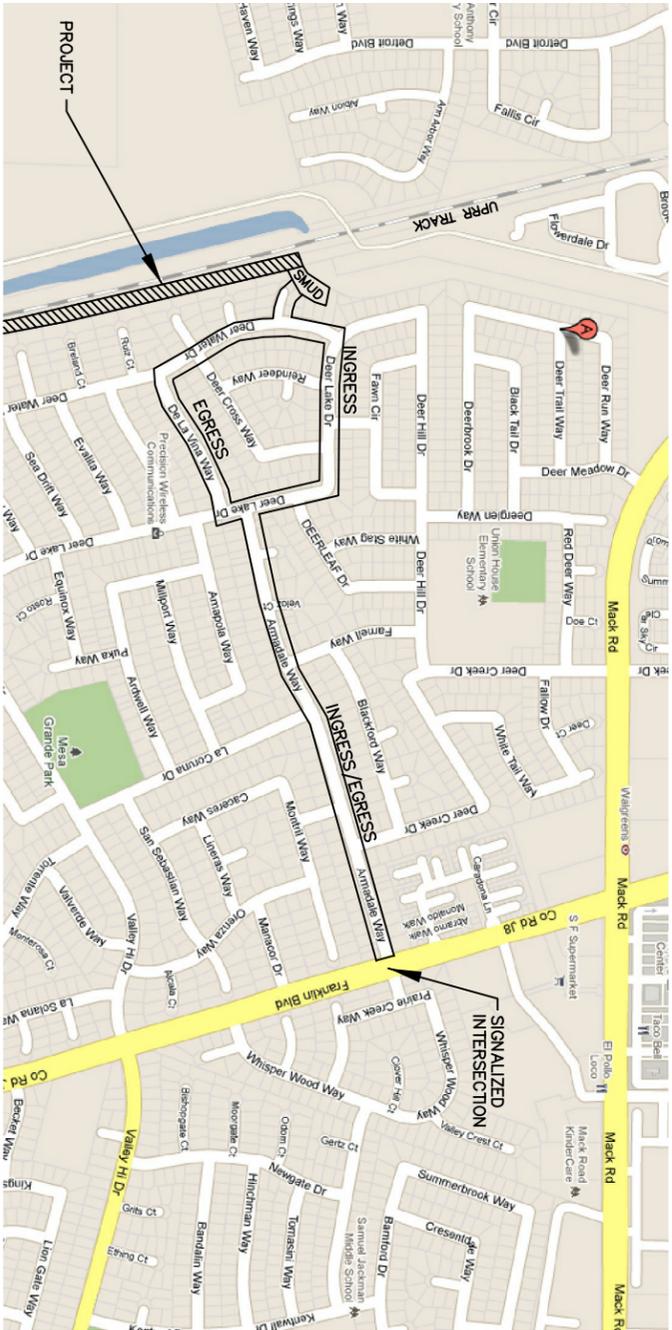
Project Vicinity Map



Haul Routes and Site Access



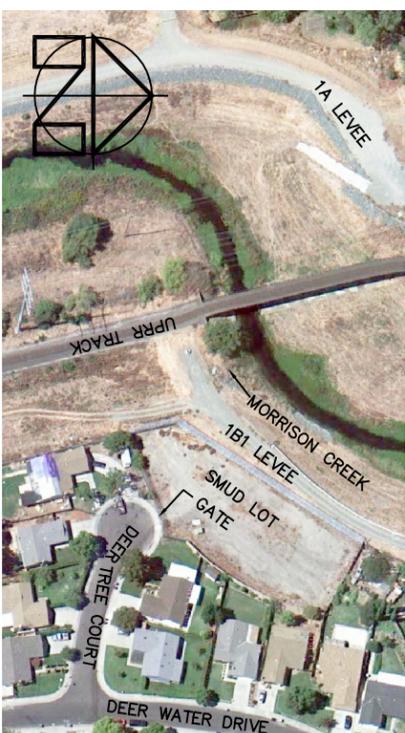
ACCESS - FLOOD PROTECTION PROJECT 2A
SCALE: 1"=2000'



HAUL ROUTE - FLOOD PROTECTION PROJECT 2A
SOUTH SACRAMENTO COUNTY STREAMS PROJECT
SCALE: 1"=500'



SMALL VEHICLE ACCESS AT MACK ROAD
AND MORRISON CREEK
SCALE: 1"=100'



LARGE VEHICLE ACCESS AT SMUD LOT
SCALE: 1"=100'



SMALL VEHICLE ACCESS AT FRANKLIN BLVD
AND UNIONHOUSE CREEK
SCALE: 1"=100'

Sheet reference number: **G-008**
Sheet 8 of 61

SOUTH SACRAMENTO COUNTY STREAMS CONTRACT 2A
SACRAMENTO COUNTY, CALIFORNIA
MORRISON CREEK AT UNION PACIFIC RAILROAD LANDSIDE ALIGNMENT
CONSTRUCTION HAUL ROUTE

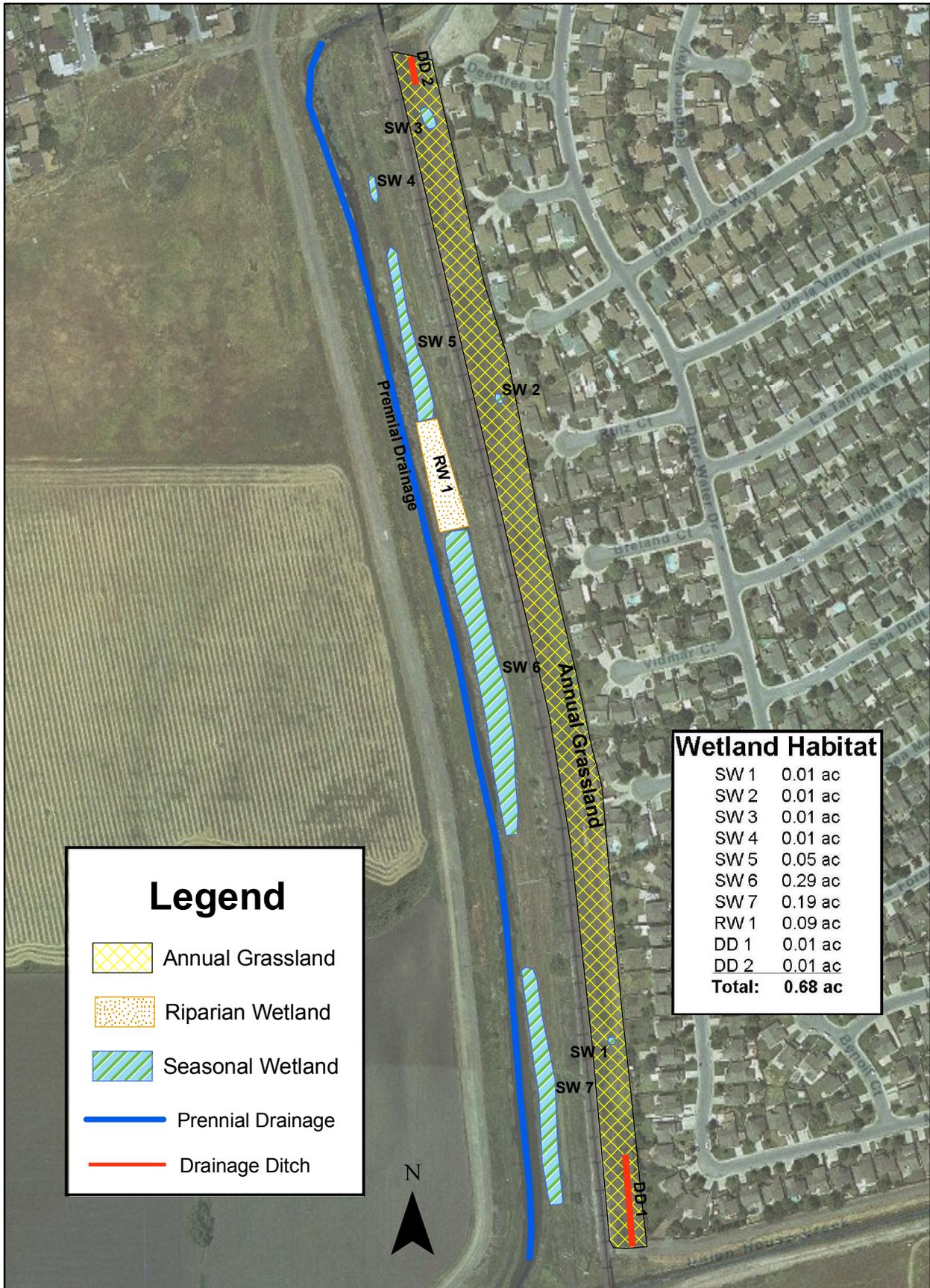
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA
MGE ENGINEERING INC.
7415 Greenhaven Dr. Suite 100
Sacramento, California 95831
916.421.1000

Designed by: DAVID I. BROTCHE, PE	Date: 06/10/2011	Rev.
Dwn by: ABM	Spec No.: 1699	Design file no: 6-4-2214
Reviewed by: R. SENNETT, SE, PE	Submitted by: /S/ DAVID I. BROTCHE	Drawing Code:
File name:	Plot date:	Dwg scale:

Symbol	Description	Date	Approved

US Army Corps of Engineers
Sacramento District

Morrison Creek UPRR Habitat Map



Legend

-  Annual Grassland
-  Riparian Wetland
-  Seasonal Wetland
-  Prennial Drainage
-  Drainage Ditch

Wetland Habitat

SW 1	0.01 ac
SW 2	0.01 ac
SW 3	0.01 ac
SW 4	0.01 ac
SW 5	0.05 ac
SW 6	0.29 ac
SW 7	0.19 ac
RW 1	0.09 ac
DD 1	0.01 ac
DD 2	0.01 ac
Total:	0.68 ac

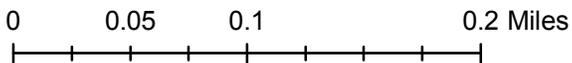


Plate 5

Photos



Photo 1. View of project area from Unionhouse Creek looking north. (21/21/09)



Photo 2. View of project area looking south. (12/21/09)



Photo 3. View of northern half of project area from UPRR tracks. (12/21/09)



Photo 3. View of southern half of project area from UPRR tracks. (12/21/09)

APPENDICES

APPENDIX A

INITIAL STUDY/ ENVIRONMENTAL CHECKLIST

INITIAL STUDY/ENVIRONMENTAL CHECKLIST

Initial Study

1. **Project Title:** South Sacramento County Streams Morrison Creek-Union Pacific Railroad Flood Damage Reduction Project
2. **Lead Agency Name and Address:** Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814
3. **Contact Person and Phone Number:** Lizette Longacre
Natural Resource Specialist
916.874.6451
4. **Project Location:** Reach of Morrison Creek in the City of Sacramento, south of Meadowview Road and west of Franklin Boulevard.
5. **Project Sponsor's Name and Address:** Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 9581
6. **General Plan Designation(s):** Suburban Neighborhood Low Density
7. **Zoning Designation(s):** R-1 – Standard Single Family

8. Description of Project:

The U.S. Army Corps of Engineers (Corps) proposes to construct approximately 3000 feet of floodwall, 100 feet of levee and 900 feet of retaining wall on the east side of Morrison Creek and the Union Pacific Rail Road (UPRR) tracks (Morrison Creek/UPRR project or proposed project). The Corps proposes to excavate existing material, construct the floodwall, retaining wall, and levee, and then seed with native grasses. This project would be constructed in 2012. For a detailed introduction to the proposed project, including the project description, project location and purpose and need, please refer to Section 1.0 Introduction and Section 2.0 Project Alternatives of the Environmental Assessment (EA). Subsection 2.3 provides a detailed description of the Proposed Action – landside Floodwall for Morrison Creek/UPRR project.

9. Surrounding Land Uses and Setting.

The South Sacramento County Streams drainage basin lies southeast of the City of Sacramento. A portion of the basin lies within the Sacramento city limits, while the remainder is within the Sacramento County boundary (see Plate 1 of the EA). The proposed project is located in the lower basin within the city of Sacramento limits, south of Meadowview Road and west of Franklin Boulevard; and is on the east side of Morrison Creek between the UPRR trestle that crosses Morrison Creek downstream to the confluence with Unionhouse Creek.

Environmental Factors Potentially Affected

The proposed project could potentially affect the environmental factor(s) checked below. The following pages present a more detailed checklist and discussion of each environmental factor.

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Aesthetics | <input checked="" type="checkbox"/> Agriculture and Forestry Resources | <input checked="" type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources | <input checked="" type="checkbox"/> Geology, Soils and Seismicity |
| <input checked="" type="checkbox"/> Greenhouse Gas Emissions | <input checked="" type="checkbox"/> Hazards and Hazardous Materials | <input checked="" type="checkbox"/> Hydrology and Water Quality |
| <input checked="" type="checkbox"/> Land Use and Land Use Planning | <input checked="" type="checkbox"/> Mineral Resources | <input checked="" type="checkbox"/> Noise |
| <input checked="" type="checkbox"/> Population and Housing | <input checked="" type="checkbox"/> Public Services | <input checked="" type="checkbox"/> Recreation |
| <input checked="" type="checkbox"/> Transportation and Traffic | <input checked="" type="checkbox"/> Utilities and Service Systems | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

DETERMINATION: (To be completed by Lead Agency)

On the basis of this initial study:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

M. Holly Gilchrist
Signature

7/7/11
Date

M. HOLLY GILCHRIST
Printed Name

SAFCA
For

Environmental Checklist

Aesthetics

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
1. AESTHETICS — Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.2 of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for aesthetic resources.

- a,b) The project area is not located within a local, state or federally designated scenic vista. The nearest designated scenic resource is State Route 160 (SR 160), located approximately two miles west of the project area on the other side of Interstate 5 (I-5). Furthermore, as described in subsection 3.2.2 of the EA, the proposed project would not involve removing any trees or shrubs. As described in subsection 3.8.1 of the EA, there are no historic properties in the project area. Therefore, construction and operation of the proposed project would not result in a substantial adverse effect on a scenic vista and would not damage a scenic resource and **no impact** would occur.
- c) As described in subsection 3.2 Aesthetics/Visual Resources of the EA, construction of the landside floodwall would have both short-term and long-term effects on the aesthetics in the project area. Temporary changes to the visual character of construction areas would result when construction equipment, materials, and crews are introduced. Construction activity would also temporarily alter local visual resources until construction is complete and the disturbed areas are restored or stabilized. Since construction activities would be short-term, there would be no permanent significant effects on aesthetics or the public view as a result of construction. Residents and motorists in the area would have a limited view of the proposed maintenance road and floodwall due to existing barriers and fences that would minimize any adverse effects of the visual quality of the proposed project. Therefore, the proposed project would have a **less-than-significant-impact** on the existing visual character or the quality of the site and its surroundings.

- d) The proposed project involves the construction of a landside floodwall and it would not create new sources of light or glare and **no impact** would occur.

Agricultural and Forest Resources

<u>Issues (and Supporting Information Sources):</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporation</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>
2. AGRICULTURAL AND FOREST RESOURCES —				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.1.2 of the EA describes land use effects of the proposed project.

- a) As stated in subsection 3.1.2 of the EA, there are no prime and unique farmlands within the project area. According to the City of Sacramento General Plan, no Farmland of Statewide Importance is located within the project area. As a result, the proposed project would have **no impact** on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.
- b) According to the City of Sacramento General Plan, the project area is not enrolled in or restricted by a Williamson Act contract; therefore there **no impact** would occur.

- c,d) As stated in subsection 3.1.2 of the EA, the City and the County’s General Plan have designated the project area as railroad right-of-way. Surrounding uses are characterized as urban (residential) and no forest land or timberland exists on or adjacent to the project area; therefore, **no impact** would occur.
- e) As discussed under Checklist Items 2a through d, there are no designated farmlands and the project area is primarily urbanized and is designated as railroad right-of-way in the City of Sacramento and Sacramento County General Plans. Therefore, the proposed project would not result in the conversion of agricultural or forest land to non-agricultural or forest uses and **no impact** would occur.

References

City of Sacramento, 2009. Sacramento 2030 General Plan. Adopted March 3, 2009.

Air Quality

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
3. AIR QUALITY —				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.				
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Subsection 3.4 of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for air quality.

- a-c) As discussed in subsection 3.4.3, the proposed project would not generate long-term operational emissions other than the nominal vehicle emissions associated with routine

inspection and maintenance activities. Construction activities would result in short-term generation of elevated levels of reactive organic gases (ROG), nitrogen oxides (NO_x) and particulate matter (PM₁₀). The nearest sensitive receptors would be adjacent residences. Table 3.4.5 in the EA shows that emissions of ROG, NO_x, carbon monoxide (CO), and PM₁₀ resulting from construction activities would not exceed the significance thresholds established by the Sacramento Metropolitan Air Quality Management District (SMAQMD). In addition, because the disturbed area would exceed five acres, incorporation of Best Management Practices (BMPs) listed would ensure that emissions stay below SMAQMD thresholds. Furthermore, the Corps would prepare a dust and particulate suppression plan and submit it to the SMAQMD for review prior to initiating construction activities.

As also described in subsection 3.4.3, proposed project construction emissions would not exceed the de minimis thresholds established by the United States Environmental Protection Agency (US EPA); therefore, it is presumed that the proposed project would conform with the region's ozone State Implementation Plan. Air emissions associated with construction activities would not violate air quality standards or obstruct implementation of an applicable air quality plan and, therefore, would be **less-than-significant**.

- d) As described in subsection 3.4.2 of the EA, sensitive land uses adjacent to the project area are primarily residential subdivisions and isolated single-family residences. Other sensitive land uses in the area include Union House Elementary School which is a third of a mile from the project site. As identified in Environmental Checklist Item 3a-c, the proposed project would result in nominal increases in operational air emissions and construction emissions would not exceed SMAQMD thresholds with incorporation of BMPs. Therefore, exposure of sensitive receptors to increased emissions would be **less than significant**.
- e) Land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, and dairies. Operation of the proposed project would not generate any odors. Construction of the proposed project could result in the production of combustion emissions and dust; however, they would not be expected to be at levels that would affect a substantial number of people. This is considered a **less-than-significant** impact.

Biological Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
4. BIOLOGICAL RESOURCES — Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsections 3.1.3 (fisheries), 3.9 (vegetation and wildlife), and 3.10 (special-status species) of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for biological resources.

- a) As described in subsection 3.10 of the EA, there are special-status species that have the potential to occur in the project area (see the discussion in subsection 3.10.1 and Table 3.10-2 of the EA). As described in subsection 3.10.2 of the EA, the proposed project could have the potential to impact several special-status species and their habitat including: vernal pool fairy shrimp, giant garter snake (GGS), Copper's hawk, burrowing owl, Swainson's hawk, white-tail kite, swallows, black phoebes and other migratory birds and Sanford's arrowhead. As discussed in subsection 3.1.3 of the EA, because there is no direct hydrologic connection between Morrison Creek and the Sacramento River and Mokelumne River, no listed fish species would be impacted.

Mitigation Measures

Subsection 3.10.3 of the EA presents mitigation measures that require pre-construction surveys to identify the presence of special-status species. These measures also recommend measures to protect special-status species in coordination with the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG).

With the implementation of these mitigation measures impacts to special-status species would be **less than significant**.

- b) Subsection 3.9.1 discusses the existing riparian habitat in the project area. As described in subsection 3.9.2 of the EA, construction of the proposed project would not result in the removal of any riparian habitat within the project area. Five acres of non-native grassland would be impacted. After construction three and a half acres of the disturbed area would be reseeded with native grasses and forbs, while the other one and a half acres would be converted to floodwall and maintenance road. The net loss of approximately one and a half acres of disturbed non-native grassland habitat would constitute a less than significant loss of habitat if native grasses are planted on the other four acres in compensation.

Mitigation Measures

Subsection 3.9.3 of the EA presents mitigation measures to restore areas disturbed during construction activities with native grasses. Other measures include avoiding and minimizing impacts to wetlands through the use of BMPs.

With implementation of these mitigation measures impacts to riparian habitat would be **less than significant**.

- c) Subsection 3.9.1 discusses the potential wetlands located in the project area: including Morrison Creek and Unionhouse Creek. As described in section 3.9.2 of the EA, construction of the proposed project would result in the temporary loss of 0.02 acres of seasonal wetland and the permanent loss of 0.03 of seasonal wetland. The amount of seasonal wetland affected is a reduced amount from in the 1998 EIS/EIR, covered in the 2002 Biological Opinion, and mitigated for at conservation banks between 2005 and 2010.

Mitigation Measures

Implementation of the mitigation measures presented in Subsection 3.9.3 of the EA described in Environmental Checklist Item 4b would reduce impacts to wetlands to a **less-than-significant** level.

- d) As discussed in sections 3.10.2 and 3.1.3 of the EA, construction and operation of the proposed project would not substantially interfere with the movement of any native or migratory fish or wildlife species, established wildlife corridors, or impede the use of native wildlife nursery sites. Therefore, this is a **less-than-significant** impact.

- e) The proposed project would comply with all local policies or ordinances protecting biological resources. As described under Environmental Checklist Item 4b, no riparian habitat would be removed (no trees). Because the project would comply with applicable local policies or ordinances protecting biological resources, this would be **a less than significant** impact.
- f) The proposed project is located within the UPRR right of way and is not located within any habitat conservation plan. Therefore, the proposed project would have **no impact**.

Cultural Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
5. CULTURAL RESOURCES — Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

Subsection 3.8 of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for cultural resources.

- a-d) As described in subsection 3.8.1 of the EA, no historic properties or known archeological resources exist in the project area. The Corps has completed the necessary investigations and has consulted with SHPO and Native American groups. To date, no historic properties or Native American traditional cultural properties have been identified in the APE. However the Sacramento River floodplain contains a high density of archaeological sites within a few miles. However, the river floodplain is a generally aggradational environment as a result of the deposition of sediment over time, so there is a potential for unknown and undiscovered buried archaeological and paleontological sites. Construction of the proposed project is anticipated to have no effect on known cultural resources; however, construction of the proposed project could result in damage to previously unidentified buried archaeological, paleontological and/or human remains during ground disturbing activities of project construction. Disturbance to buried cultural resources would be significant.

Mitigation Measures

Subsection 3.8.2 of the EA presents mitigation that includes measures to identify, document and protect previously unidentified buried cultural and paleontological resources.

With implementation of these mitigation measures impacts to cultural resources would be **less than significant**.

Geology, Soils, and Seismicity

<u>Issues (and Supporting Information Sources):</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporation</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>
6. GEOLOGY, SOILS, AND SEISMICITY — Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.1.6 of the EA discusses topography, geology, and soils effects of the proposed project.

- a) As described in subsection 3.1.6 of the EA, the closest known active seismic fault is the Dunnigan Hills fault, located approximately 20 miles northwest of the City of Sacramento. Seismic conditions associated with fault activity include groundshaking, liquefaction, settlement, and seiche. The project does not include construction of any structures intended for human occupancy and the floodwall would be constructed to minimize potential failure in the event of ground shaking. Therefore, the proposed project would not expose people to potential adverse effects resulting from fault activity and this would be a **less-than-significant** impact.

- b, c, d) As described in subsection 3.1.6, dominant soils in the project area are the Clear Lake Clay and Galt Clay soils, formed in alluvium derived from mixed rock sources. Slopes in this series range from 0 to 2 percent. These soils are moderately deep and consist of a silt loam at the surface, with a subsoil of claypan underlain by cement hardpan. Soils in the project area would be disturbed during construction due to excavation and stockpiling of soil material and reuse of the stockpiled material to construct the project. Although there would be a small change in the topography of the permeable surface due to the reshaping of the existing ground to include a floodwall and patrol road, there would not be an increase in non-point source runoff as a result of the project. As a result, there would be **less-than-significant** impact on soils and erosion associated with implementation of the proposed project.

- e) Septic tanks would not be used as part of the proposed project; therefore, there is **no impact** associated with the installation and use of septic systems.

Greenhouse Gas Emissions

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
7. GREENHOUSE GAS EMISSIONS — Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Subsection 3.5 of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for greenhouse gas emissions and climate change.

- a, b) As discussed in subsection 3.5.2 of the EA, CO₂ would be the predominant greenhouse gas (GHG) produced from the construction of the proposed project and no major sources of other greenhouse gases would exist. Construction of the proposed project is estimated to produce CO₂ levels well below the EPA Reporting Rule. In addition, emissions generated by the proposed project would be temporary in nature and would not result in a permanent increase in long-term GHG emissions. Therefore, effects on climate change associated with construction and operation of the proposed project would be less than significant. Although not required, mitigation measures presented in subsection 3.5.3 would further reduce GHG emissions associated with the proposed project efficiency of equipment to reduce emissions.

Hazards and Hazardous Materials

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
8. HAZARDS AND HAZARDOUS MATERIALS — Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Subsection 3.1.4 of the EA discusses hazardous, toxic and radioactive waste effects of the proposed project.

- a, b) The proposed project would temporarily increase the transport of materials generally regarded as hazardous that are used in construction activities. It is anticipated that limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, hydraulic fluids, and other similarly related materials would be brought onto the project site, used, and stored during the construction period. However, transportation of hazardous materials on area roadways would be regulated by California Highway Patrol (CHP) and Caltrans. Storage and use of hazardous materials would be done in accordance with applicable federal, State and local regulations. Because the proposed project is required by law to implement and comply with existing hazardous material regulations, impacts related to hazards associated with the routine, transport, use, disposal, and risk of upset would be **less-than-significant**.
- c) As described in subsection 3.4.2, the proposed project is not located within one-quarter mile of an existing or proposed school. Therefore, there would be no risk of exposure attributed to hazardous materials used or stored at the proposed project site and **no impact** would occur.
- d) Subsection 3.1.4 of the EA fully describes findings of the Environmental Site Assessment (ESA) that was conducted in January 2011. Only one Recognized Environmental Condition (REC) was found within one mile of the proposed project. The site, a SMUD power station, was found to pose no adverse impact to construction due to the distance from the project area by the Corps. As a result, **no impact** would occur.
- e, f) The proposed project is located approximately three miles south of the Sacramento Executive Airport. The proposed project is not located within either the airport height restriction area or the airport safety restriction area. Furthermore, the proposed floodwall would be four feet high and, therefore, would not affect airport safety and **no impact** would occur.
- g) As described in subsection 3.6.2 of the EA, the proposed project would be designed and scheduled so that construction would not close a roadway or block a travel lane, block a transit route, block a pedestrian sidewalk or bicycle lane, an operational safety hazard, or block emergency vehicle access. Therefore, the proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan and this would be a **less-than-significant** impact.
- h) The proposed project is located in an urbanized area and designated as a non-very high fire hazard severity zone by the Fire and Resource Assessment Program of Cal Fire (2008). The risk of wildland fire is considered to be low and; therefore, this impact would be **less-than-significant**.

References

Cal Fire, 2008. Very High Fire Hazard Severity Zones in LRA. October, 2008.

SACOG, 1999. Sacramento Executive Airport Comprehensive Land Use Plan. Amended May, 1999.

Hydrology and Water Quality

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
9. HYDROLOGY AND WATER QUALITY — Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, in a manner that would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.7 of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for hydrology and water quality.

- a, f) The construction of the proposed project could result in contamination of surface water or groundwater from spills of oil, grease, fuels, hydraulic fluids, or related pollutants that could occur during vehicle refueling, parking, and maintenance. However, as stated in subsection 3.7.2 of the EA, the contractor would be required to adhere to containment requirements, BMPs, and mitigation measures. In addition, Morrison Creek is 150 feet away from the project and Unionhouse Creek is over 50 away. Both creeks are separated from the project area by existing levees and the UPRR embankment. Furthermore, construction activities would take place during low-flow summer months when very little precipitation occurs which would further limit runoff potential and the area disturbed would be revegetated with native grasses and forbs to reduce the erosion potential.

Mitigation Measures

Subsection 3.7.3 of the EA presents mitigation that requires the contractor to obtain coverage under the Construction Activities National Pollutant Discharge Elimination System (NPDES) permit from the Central Valley Regional Water Quality Control Board (CVRWCQB) and prepare a Stormwater Pollution Prevention Plan (SWPPP) identifying BMPs to be used to avoid or minimize any adverse effects of construction activity runoff on surface waters.

With the implementation of these mitigation measures impacts to receiving water quality would be **less than significant**.

- b) As described in subsection 3.7.2 of the EA, the proposed project would not change the existing conditions in adjacent creeks or water infiltration into groundwater. As a result, there would be little or no change in ground-water recharge or depletion of ground water sources used for other beneficial uses. Therefore, this impact is considered **less than significant**.
- c, d, e) As described in subsection 3.7.2, a hydraulic review for the proposed project determined that there would be no negative downstream hydraulic effects. Furthermore, hydrologic evaluations showed that the level of flood protection in the project areas would safely contain a flood event with less than a 1% chance of occurring. Installation of a floodwall would not substantially alter the drainage pattern or the rate or amount of surface runoff over that which currently exists and would not result in on-site or off-site flooding or exceed existing drainage infrastructure capacity. Therefore, this impact is considered **less than significant**.

- g, h) The proposed project would not place any housing within a designated 100-year floodplain. The proposed project would be constructed to provide flood protection to residents east of Morrison Creek. Therefore, **no impact** would occur.
- i) As described in subsection 3.7.2 of the EA and Environmental Checklist Item 9e, hydrologic review determined that current and future conditions showed that the level of flood protection in the project area will safely contain a flood event with less than a 1% chance of occurrence in any given year. Therefore, this impact would be **less than significant**.
- j) The proposed project involves the installation of a floodwall and would not expose people or structures to a risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow; therefore, **no impact** would occur.

Land Use and Land Use Planning

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
10. LAND USE AND LAND USE PLANNING — Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.1.2 of the EA describes land use effects of the proposed project.

- a) As described in subsection 3.1.2 of the EA, the proposed project is located on land that is designated as railroad right-of-way; therefore, the project would not divide an established community and **no impact** would occur.
- b) The City and the County's General Plan have designated the project area as railroad right-of-way. The proposed project does not propose changes to land use designations and would have no adverse effects to existing or proposed land uses within the project area; therefore, **no impact** would occur.

- c) The proposed project is not located within any applicable habitat conservation plan or natural community conservation plan and therefore would not result in a conflict with either type of conservation plan. **No impact** would occur.

References

City of Sacramento, 2009. Sacramento 2030 General Plan. Adopted March 3, 2009.

Mineral Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
11. MINERAL RESOURCES — Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

- a, b) According to the City of Sacramento General Plan, the County's mineral resources primarily consist of sand and gravel construction aggregates, as well as clay. The proposed project is located in an area classified MRZ-3 and is not considered to contain significant mineral deposits. The proposed project is not located on or near a mineral extraction site and would not result in the loss of availability of mineral resources or otherwise prevent the extraction of important mineral resources. Therefore, the proposed project would not result in the loss or availability of mineral resources and **no impact** would occur.

References

City of Sacramento, 2009. Sacramento 2030 General Plan. Adopted March 3, 2009.

Noise

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
12. NOISE — Would the project:				
a) Result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.3 of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for noise.

a,b,d) As described in subsection 3.3.1 of the EA, noise levels in the proposed project area are attributed to traffic on area roadways, train traffic, occasional planes and helicopters, residential and recreational activities, and natural background noise (wind, wildlife, etc). Noise sensitive uses in the project area include residential uses which are generally 30 to 80 feet from the proposed floodwall location and the Unionhouse Elementary School which is over a third of a mile away. As described in subsection 3.3.2 of the EA, construction activities would result in short-term increases in noise levels. Anticipated noise levels are estimated to be between 80 and 90 dBA based on the type of equipment used (see Table 3.3-7 of the EA). Construction activities would occur during the times established in the City of Sacramento Noise Ordinance to minimize effects to nearby residents. Never the less, even though increased noise levels would comply with the City Noise Ordinance and would be temporary, they could represent a substantial increase above ambient noise levels.

Mitigation Measures

Subsection 3.3.3 of the EA presents mitigation measures that require contractors to operate and maintain construction equipment to minimize noise levels.

With the implementation of these mitigation measures increased noise levels associated with construction activities would be **less than significant**.

- c) As stated in subsection 3.3.2 of the EA, construction activities associated with the proposed project would result in short-term increases in ambient noise and would not result in a permanent increase in ambient noise levels. Therefore, **no impact** would occur.
- e,f) The project area is approximately three miles southeast of the Sacramento Executive Airport and lies outside of the airport noise restriction area. The proposed project is the installation of a floodwall and would not expose people residing or working in the project area to excessive noise levels associated with air traffic. Therefore, **no impact** would occur.

Population and Housing

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
13. POPULATION AND HOUSING — Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing units, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.1.5 describes socioeconomic and growth-inducing effects of the proposed project.

- a, b, c) Subsection 3.1.5 of the EA discusses the existing setting related to the population of the City of Sacramento. Despite the fact that the proposed project would provide increased flood protection in the project area, the lack of available land in the regional project area for growth and development is limited because the regional area is already built out and/or planned for development. The proposed project would not result in the construction of new homes or the displacement of existing homes and, therefore, would not induce substantial growth within the area, displace housing, or displace persons. Therefore, **no impact** would occur.

Public Services

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
14. PUBLIC SERVICES — Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
i) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
v) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.1.7 describes public service effects of the proposed project.

- a. i-v) The access routes and traffic management plan, discussed in subsection 3.6.2, would be developed to ensure that public services and elementary school activities are not disrupted during construction. In addition, the project would not result in an increase in population, and because of the size and scope of the project it would not increase the demand for the kinds of public services (e.g., parks, fire, police, or other public facilities) that would support new residents. Therefore, **no impact** would occur.

Recreation

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
15. RECREATION — Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.1.1 describes recreation resource effects of the proposed project.

- a, b) As described in subsection 3.1.1 of the EA, there are no existing recreational facilities located adjacent to the construction area, and the area is not accessible to the public. Construction would not restrict access to or interrupt use of any recreational facilities. The project would not result in an increase in population so it would not result in a need to upgrade or build new recreation facilities. Therefore, **no impact** would occur.

Transportation and Traffic

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
16. TRANSPORTATION AND TRAFFIC — Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location, that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Subsection 3.6 of the EA presents a description of the existing conditions, environmental effects and mitigation measures, as appropriate for traffic and circulation.

- a, b, e) As discussed in subsection 3.6.2 of the EA, construction of the proposed project would have temporary effects to traffic around the project area resulting from an increase in haul

trucks and construction workers' personal vehicles accessing the project area via the described haul routes. The haul trucks would be spaced out during the day and would not interfere with commuter traffic in the morning and evening, but would increase the number of vehicles accessing the neighborhood. This temporary increase in vehicles would have the potential to increase the time it takes residents to access their homes. The proposed project would be designed and scheduled so that construction would not close any roadways or block any travel lanes. There would be an increase in vehicle traffic around the project area during construction, but since these effects would be temporary and the vehicle numbers are limited enough that they are not expected to lower the levels of service in the project area.

Mitigation Measures

Mitigation as described in subsection 3.6.3 would require the development and implementation of a traffic control plan prior to construction, and would coordinate all use of public roads with the City of Sacramento, or other responsible agencies.

With the implementation of these mitigation measures impacts associated with temporary construction traffic would be **less than significant**.

- c) As discussed under Environmental Checklist Item 12e, the project area is located approximately three miles south of the Sacramento Executive Airport. The proposed project is the installation of a floodwall and construction and operation would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks; therefore, **no impact** would occur
- d) The proposed project would not introduce unsafe design features or incompatible uses into the area. The physical and traffic characteristics of area roadways (e.g., traffic signal and stop-control, and sidewalks) would safely accommodate traffic related to construction activities at the project site. Therefore, **no impact** would occur.
- f) As discussed in subsection 3.6.2 of the EA, the increased traffic effects would be less than significant, it is also expected that there would be no effects to the local bus routes, or impacts to access to the Meadowview Light Rail Station. Additionally, there would be no effects to the UPRR tracks, as the railroad's elevated berm creates a natural barrier between the tracks and the project area. Therefore, **no impact** would occur.

Utilities and Service Systems

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
17. UTILITIES AND SERVICE SYSTEMS —				
Would the project:				
a) Conflict with wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider that would serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

Subsection 3.1.8 describes public utilities and service system effects of the proposed project.

- a-e) As described in subsection 3.1.8 of the EA, there would be no long-term interruption of utilities or service systems. Construction would require temporarily accessing the existing water supply, wastewater and drainage systems. The proposed project would not result in an increase in population that would result in an increase demand for utilities and service systems. Therefore, implementation of the proposed project would not result in the construction of new facilities or expansion of existing facilities. Therefore, **no impact** would occur.
- f, g) As described in subsection 3.1.8 of the EA, construction of the proposed project would result in the disposal of some excavated material that is not used as backfill. The excess excavated material and old concrete would be removed and disposed of at the appropriate waste facility. The amount of material that would need to be disposed of is anticipated to be minimal and would not exceed the facility's capacity. In addition, the proposed project would comply with all federal, state, and local statutes and regulations related to solid waste. Therefore, the proposed project would have a **less -than-significant impact** on solid waste disposal.

Mandatory Findings of Significance

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporation</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
18. MANDATORY FINDINGS OF SIGNIFICANCE — Would the project:				
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

- a) As identified and discussed under Environmental Checklist Items 3 (Air Quality), 4 (Biological Resources), 5 (Cultural Resources), 9 (Hydrology and Water Quality), 12 (Noise), and 16 (Transportation and Traffic), implementation of the proposed project could result in potentially significant impacts in these resource areas that could have the potential to degrade the quality of the environment, and impact biological and cultural resources. Implementation of mitigation measures incorporated into the proposed project would reduce the identified impacts to a **less-than-significant level**.
- b) As discussed in subsection 4.2 of the EA, the proposed project would not cause long term adverse affects on the resources discussed in Chapter 3 of the EA. However, some of the resources have the potential to incur temporary, short-term effects during construction. An initial assessment of potential cumulative effects indicated that air quality, climate change, traffic and circulation, and vegetation, wildlife and special-status species have the potential to contribute to significant cumulative effects; however, implementation of mitigation measures presented in subsection 3.4.4, 3.5.3, 3.6.3, 3.9.3 and 3.10.3 of the EA would reduce the project's contribution to potentially significant cumulative impacts for these resource topics to less than considerable. Therefore, cumulative impacts would be **less than significant**.
- c) See Environmental Checklist Items 18a and b.

APPENDIX B

HTRW PHASE 1 SITE ASSESSMENT

Hazardous, Toxic and Radioactive Waste Phase I Environmental Site Assessment

Morrison Creek-Union Pacific Railroad Flood Damage Reduction Project Sacramento, California

February 2011



Prepared by:

Environmental Chemistry Section
U.S. Army Corps of Engineers, Sacramento District



**Hazardous, Toxic and Radioactive Waste
Phase I Environmental Site Assessment**

**Morrison Creek-Union Pacific Railroad Flood Damage Reduction Project
Sacramento, California**

February 2011

Prepared by:

Environmental Chemistry Section
U.S. Army Corps of Engineers, Sacramento District

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EDR DataMap ® -Area Study

Figure 1: Site Map

Figure 2: Locations of Transformer and Pump Station

APPENDICES

APPENDIX A: Map and Figures

APPENDIX B: Topographic Maps

APPENDIX C: Aerial Photographs

APPENDIX D: EDR DataMap Area Study

APPENDIX E: Site Reconnaissance Photos

ACRONYMS

AAI	All Appropriate Inquiries
AST	Aboveground Storage Tank
ASTM	American Society of Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESPK	U.S. Army Corps, Sacramento District
CESPK-ED-EC	CESPK Environmental Chemistry Section
CFR	Code of Federal Regulations
EDR	Environmental Data Resources, Inc.
ER	Engineering Regulation
ESA	Environmental Site Assessment
HTRW	Hazardous, Toxic, or Radioactive Waste
msl	mean sea level
PCB	Polychlorinated Biphenyls
ppm	part per million
RECs	Recognized Environmental Conditions
SMUD	Sacramento Municipal Utility District
SRWWTP	Sacramento Regional Waste Water Treatment Plant
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers, Sacramento District (CESPK) plans to construct a reinforced concrete flood wall with an adjacent patrol road, both approximately 3,000-feet in length, along Morrison Creek in Sacramento, CA. This construction project is part of the Morrison Creek-Union Pacific Railroad Flood Damage Reduction Project.

In January 2011, CESPCK-ED-EC (Environmental Chemistry Section, CESPCK) conducted a Hazardous, Toxic and Radioactive Waste (HTRW), Phase I Environmental Site Assessment (ESA). The purpose of Phase I ESA was to: (1) satisfy the requirements of the USACE (Engineering Regulation) ER 1165-2-132; (2) identify and document any Recognized Environmental Conditions (RECs) that may impact the construction project; (3) demonstrate “due diligence” in conducting all appropriate inquiries under the Comprehensive Environmental Response, Comprehensive and Liability Act (CERCLA); and (4) provide useful information for the construction contractor when planning for worker safety and health.

One REC was identified. It was from a SMUD (Sacramento Municipal Utility District) power station where PCB (Polychlorinated Biphenyls) release was confirmed in 1987. However, CESPCK-ED-EC concluded that the REC pose no adverse impact to the construction project because it is approximately one mile from the project site, physically secured behind brick walls and cyclone fencing, and under management control.

Based on the findings of this ESA, CESPCK-ED-EC concludes that no further environmental actions are warranted for the project site.

1.0 INTRODUCTION

1.1 PURPOSE

The U.S. Army Corps of Engineers, Sacramento District plans to construct a 3,000-foot long reinforced concrete flood wall with an adjacent patrol road along Morrison Creek in Sacramento, CA. This construction project is part of the Morrison Creek-Union Pacific Railroad Flood Damage Reduction Project.

In January 2011, CESP/ED-EC performed a HTRW, Phase I ESA of the project site and its surrounding area according to the general guidelines given by USACE ER 1165-2-132, *“Hazardous, Toxic and Radioactive Waste Guidance (HTRW) for Civil Works Projects”*, ASTM E 1527-05, *“Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process”* and the EPA *“All Appropriate Inquiries (AAI)”* standards.

The purpose of Phase I ESA was to: (1) satisfy the requirements of the USACE ER 1165-2-132; (2) identify and document any Recognized Environmental Conditions (RECs) that is presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of those substances or products into structures on the property or into the ground, groundwater water, or surface water of the property; (3) demonstrate “due diligence” in conducting all appropriate inquires under the Comprehensive Environmental Response, Comprehensive and Liability Act (CERCLA); and (4) provide useful information for the construction contractor when planning for worker safety and health.

1.2 DETAILED SCOPE-OF-SERVICES

The ESA consists of three parts: (1) reviewing a regulatory list of REC sites, historical literature, aerial photographs, and websites; (2) interviewing people who are

knowledgeable about the current and past use of the project site and the surrounding area; and (3) conducting a site reconnaissance.

Note: The Phase I ESA was limited to identifying and documenting REC sites at the project site and its surrounding area. No sampling or testing of the soil, water, air, or building materials was performed.

1.3 SIGNIFICANT ASSUMPTIONS

The following significant assumptions were made when conducting the ESA in January 2011:

- All information that was obtained for this ESA, i.e., the regulatory list of REC sites, historical literatures, aerial photographs, websites, interviews, and site reconnaissance, is considered to be the best available information about the project site and its surrounding area.
- No information search, no matter how extensive and exhaustive it may be, can absolutely identify all hazardous substances or petroleum products or all conditions above and below ground.
- The petroleum stains that were observed on the railroad tracks are considered to be in a *de minimis* condition as defined by ASTM 1527-05 and is not considered being a REC.
- In the past, pesticides (e.g. DDT) were likely used on farmland near the project site and on the wetland of the site for pest control purpose. It is likely that there is some concentration of these substances present today in the soil near and on the site. Pesticides routinely and historically applied for pest control purpose are considered to be in a *de minimis* condition as defined by ASTM 1527-05 and are not considered being a REC.

1.4 LIMITATION AND EXCEPTION

The findings and conclusion of this ESA are based only on the best information that is available during the time of the assessment. The possibility exists where subsequent information might be discovered and could alter the findings and the conclusion of this ESA. According to AAI standards, this ESA is valid for one year from its date of completion.

1.5 SPECIAL TERMS AND CONDITIONS

The current Morrison Creek-Union Pacific Railroad Flood Damage Reduction Project does not involve purchase of property for commercial purposes, and as such, the conditions for the ASTM specifications are not completely applicable. The ASTM standard is used as a guide and sections that are not applicable are deleted or modified to meet the requirements of the project. Where applicable, the format and guidance recommended by ASTM is followed as stated in standard E 1527-05.

1.6 USER RELIANCE

This Phase I ESA is intended for use only as the complete document, and may be distributed and relied upon by USACE and its assignee. This report is subject to the Significant Assumptions, Limitation and Exception, and other restriction as defined in this ESA.

2.0 PROJECT SITE AND PROJECT DESCRIPTION

2.1 PROJECT SITE AND SURROUNDING AREA

The project site is located at the Morrison Creek watershed in the lower Sacramento Valley. The topography consists of high and low terraces, hills, and a small area of the foothills. Most of the Morrison Creek watershed lies south and east of the City of Sacramento. During flood conditions, water is pumped from Morrison Creek into the Sacramento River by the City of Sacramento. The land along Morrison Creek consists of agricultural land and seasonal wetland.

The **project site** is defined as being the proposed 3,000-feet of reinforced concrete flood wall as shown in green color on the EDR DataMap® -Area Study (Appendix A). The **surrounding area** (also known as the **study area**) is defined as being the area encompassed by a one-mile radius of the project site. This area consists mostly of farmland west of the project site and residential housing east of the project site. The project site is located in southern Sacramento County (Figure 1, Appendix A) on land that is owned and managed by the City of Sacramento. The project site's boundaries are as follows:

- North: The project site is bounded to the north by the Union Pacific Railroad (UPRR) Trestle over Morrison Creek. Beyond are the residential housings
- South: The project site is bounded to the south by the UPRR Trestle over Unionhouse Creek. Beyond is an open space.
- East: The project site is bounded to the east by a residential sound wall. Beyond are the residential housings and the Deer Water Drive.
- West: The project site is bounded to the west by Morrison Creek. Beyond are farmland and open space.

The coordinates of the center of the project site is Latitude 38⁰27'56.53" N, Longitude 121⁰27'41.37"W, and Elevation 18 feet above the mean sea level (msl). The rectangular project site is approximately 3,500 feet by 200 feet or 700,000 square feet.

2.2 PROJECT DESCRIPTION

Historically, the southern portion of the Sacramento urbanized area has been vulnerable to occasional flooding from the Sacramento-San Joaquin Delta, Morrison Creek, Florin Creek, Elder Creek and Unionhouse Creek.

Recent flooding in 1952, 1955, 1962, 1963, 1982, 1985, and 1986 have damaged homes, businesses, and agricultural land as well as disrupted transportation and public facilities.

To control the flooding from these creeks, Congress authorized the South Sacramento County Streams Projects in Section 101 (a) (8) of Public Law 106-53 in the Water Resource Development Act of 1999.

In 2011, CESPCK plans to construct a flood control project along Morrison Creek and parallel to the Union Pacific railroad track in 2011. The flood control project would consist of constructing an approximately 3,000-foot long reinforced-concrete flood wall with an adjacent patrol road between the upstream abutment of the Union Pacific Railroad (UPRR) Trestle over Unionhouse Creek and the downstream abutment of the UPRR Trestle over Morrison Creek. Also, a patrol road parallel to the wall will be constructed.

3.0 RECORDS REVIEW

3.1 STANDARD ENVIRONMENTAL RECORD SOURCES

ASTM E 1527-05 requires that an ESA consists of a “diligent” and reasonable search of all available information that pertains to the current and past uses of the project site and its surrounding area, the waste disposal practices, and the environmental compliance history.

CESPK-ED-EC hired a contractor, Environmental Data Resources, Inc. (EDR), to conduct a database search. The database search consisted of consulting five sources of information:

- (1) Forty-seven Federal records databases
- (2) Thirty-six State and Local records databases
- (3) Five Tribal records databases
- (4) Six Historical Topographic Maps from 1894-1975
- (5) Nine aerial photographs from 1937-2005

On January 19, 2011, EDR submitted a report, “Morrison Creek-Union Pacific Railroad Flood Damage Reduction Project, Inquiries Number: 2969286s”.

3.2 PHYSICAL SETTING – SOURCE OF INFORMATION

Based on the EDR DataMap ® -Area Study (Appendix A), the project site is located parallel to Morrison Creek and the Union Pacific railroad track. The project site is a seasonal wetland that harbors non-native grasses and native plants such as perennial ryegrass, slender wild oats, soft chess and foxtail. Records show that the project site has a railroad track since 1894.

3.3 HISTORICAL USE INFORMATION ON THE PROJECT SITE

CESPK-ED-EC reviewed the EDR report of the use of the project site from 1894 to 2005.

Below are its findings.

3.3.1 Topographic Maps (enclosed in Appendix B)

A summary of the review of the historical topographic maps for the years 1894, 1909, 1947, 1953, 1968 and 1975 is presented below.

1894: A Central Pacific Railroad track; undisturbed adjoining areas; and generally flat land; no visible land development.

1909: A Western Pacific Railroad track; many levees and un-improved roads in the adjoining areas.

1947: No change on the railroad track and the project site; no significant changes on the un-improved roads or levees; and the first appearance of Interstate Highways 50 and 99 east of the project site.

1953: No change on the railroad track and the project site; no significant changes on the un-improved roads and levees; and the first appearance of Franklin Boulevard.

1968: No change on the railroad track and the project site; no significant changes on the un-improved roads and levees; significant commercial and residential development northwest and northeast of the surrounding area; and first appearance of Sewage Disposal plant beyond the 1-mile radius of the project site.

1975: No change on the railroad track and the project site; significant changes to the un-improved roads and levees; and more dense commercial and

residential development at the north end of the project site and at the northeast and northwest of the surrounding area.

From the review of the topographical maps, CESPCK-ED-EC concludes that the project site has had only railroad tracks since 1894. The surrounding area has undergone extensive residential and commercial developments, including the installation of roads, highways and levees.

3.3.2 Aerial Photographs (enclosed in Appendix C)

The historical aerial photographs for the years 1937, 1947, 1952, 1961, 1971, 1981, 1993, 1998 and 2005 were reviewed. Aerial photographs were taken to identify building locations, sizes, structures, and foundations; land usage; and known REC sites such as above-ground fuel storage tanks, landfills, and power transformer stations. A summary is presented below.

1937: No building structures on the project site; a railroad track runs through the project site; building developments northwest of the surrounding area; undeveloped or agricultural land next to the railroad track; and two trestle bridges located north and south of the project site.

1947: No noticeable changes from the 1937 photograph.

1952: No noticeable changes on the project site; first appearance of levees and roads in the surrounding area adjacent to, and south of the project site; first appearance of a levee running southeast of the project site; more buildings constructed northwest of the project site; graded agricultural land west of the project site; and the undeveloped land east of the project site.

1961: Similar to the 1952 photograph except for land developments northwest of the surrounding area.

1971: Similar to the 1961 photograph except for commercial and residential developments northwest of the surrounding area.

1981: No noticeable changes on the project site and first appearance of housing developments northeast of the surrounding area.

1993: No noticeable changes on the project site and extensive housing developments east of the surrounding area from the north to the south Trestle bridges.

1998: No significant changes from the 1993 photograph.

2005: No significant changes from the 1998 photograph.

From the review of the topographical maps, CESPCK-ED-EC concludes that the project site has had only railroad tracks since 1937. The surrounding area has undergone extensive residential and commercial developments, including the construction of roads, highways and levees since 1952.

3.3.3 Historical Record Database Search (enclosed in Appendix D)

EDR conducted a computerized radius search of Tribal, State and Federal environmental record databases to identify only one REC site located about one mile north end of the project site. This REC site is physically secured behind brick walls and cyclone fencing, under management control, is notated as a red triangle shown on EDR DataMap® -Area Study and is tabulated below.

Site	Address	Owner	Contamination	Distance
Power Transformer Station	Meadowview Rd, Sacramento, Ca	SMUD	Confirmed PCB release Sample results = 7,800 ppm (part per million)	Approximately 1 mile from site

From the review of the historical record database search, CESPCK-ED-EC concludes that this existing REC site is not likely impact the project site or the surrounding area because it is physically secured and under management control and is located about one-mile from the project site.

3.3.4 Historical Literatures and Website Queries

CESPK-ED-EC reviewed the following sources of the historical literature and website queries for known REC sites:

1. <http://www.parks.ca.gov>
2. <http://www.swrcb.ca.gov/>
3. <http://www.epa.gov/superfund/sites/npl/index.htm>
4. [http://www.calrecycle.ca.gov/SWFacilities/.](http://www.calrecycle.ca.gov/SWFacilities/)
5. <http://www.dtsc.ca.gov/sitecleanup/>
6. <http://www.epa.gov/superfund/sites/cursites/>
7. http://www.safca.org/documents/SouthSacStreamsProject/MAP.SACRAMENTO%20AREA%20LEVEE%20INVENTORY_sssg_tags_v7_36x36.pdf
8. <https://www.fbo.gov/?s=opportunity&mode=form&id=7c2109e50b09af4c238f9415ddd93&tab=core& cview=0>

From the review of the historical literature and website queries, CESP-K-ED-EC did not find any additional REC sites other than the one cited in Section 3.3.3.

4.0 SITE RECONNAISSANCE

After reviewing EDR's report, CESPKE-ED-EC conducted a site reconnaissance on January 27, 2011. The reconnaissance consisted of driving and walking through the project site and its surrounding and using professional judgment in assessing structures such as earthen berms, ground scars, debris, fuel tanks, building foundations, and power transformers and identifying known REC sites.

The reconnaissance consisted of two parts: (1) drive through the open space and the commercial and residential areas of the surrounding area and assess the aforementioned structures; and (2) walk and drive throughout the project site. Mr. Bryan Young of Sacramento Regional County Sanitation District allowed CESPKE-ED-EC to enter the project site, park their vehicle near the south UPRR Trestle at Unionhouse Creek, and walk to the north UPRR Trestle at Morrison Creek, crisscrossing through the project site and over the railroad tracks.

CESPKE-ED-EC's observation and evaluation of adjoining properties were limited to features and conditions that were visible from public right-of-way. The reconnaissance photographs (enclosed in Appendix E) and a summary are presented below.

Photos 1 and 2: Typical project site physical conditions with the Morrison Creek at the westside and the residential sound well at the eastside.

Photo 3: Union Pacific Railroad (UPRR) Trestle over Morrison Creek located north of project site.

Photo 4: UPRR Trestle over Unionhouse Creek at the project located south of project site.

Photos 5 and 6: The known REC site that was identified in EDR's database search. This was the SMUD PCB transformer station (hereby designated as "Power Transformer Station #1") located near upstream of Morrison Creek. The station was locked and appeared to be very well maintained.

Photos 7 and 8: An above-ground fuel tank inside the pump station (hereby designated as "Pump Station #1"). The tank's size is about 200 gallons and the station was locked and appeared to be very well maintained.

Photos 9 and 10: An above-ground fuel tank inside the water pump station (hereby designated as "Pump Station #2"). The tank's size is about 200 gallons and the station was locked and appeared to be very well maintained.

Photos 11 and 12: A power transformer station (hereby designated as "Power Transformer Station #2"). The transformers are not known to have or not have any PCB. The station was locked and appeared to be very well maintained.

Photos 13 and 14: Petroleum stains on the railroad tracks.

Note: Figure 2 of Appendix A shows locations of Power Transformers #1 and #2 and Pump Station #1 and #2.

Based on the site reconnaissance, CESP-K-ED-EC concludes the following:

- The REC site at the SMUD power transformer station is physically secured, under management control, and is located about one-mile upstream from the project site. CESP-K-ED-EC believes it would not adversely impact the project.
- The two above-ground fuel tank sites do not have any reports of petroleum leaks. The sites appear to be very well maintained, locked and located about one mile

and upstream from the project site. CESPKE-ED-EC believes it will not adversely impact the project.

- The other SMUD power transformer station does not have any report of the presence of PCB. The station appears to be very well maintained, locked and located about one mile and upstream from the project site. CESPKE-ED-EC believes it would not adversely impact the project.
- The petroleum stains on the railroad tracks are small and considered to be in a *de minimis* condition as defined by ASTM 1527-05 and are not considered being a REC. CESPKE-ED-EC believes they would not adversely impact the construction project.

5.0 INTERVIEWS

During the ESA, CESP-K-ED-EC attempted to interview four persons who are knowledgeable about the past and present history of the project site and its surrounding area. As of this date, only two persons responded. The following presents the results of the two completed interviews and two incomplete interviews.

INTERVIEW #1

Name: Mr. Ken Mills
Hazardous Substance Specialist
California Dept of Toxic Substances
Phone: 916-255-3710

Contacted by: Kee Chan, CESP-K-ED-EC

Date: January 26, 2011

Mr. Mills was interviewed on the phone by Mr. Chan on January 26, 2011.

The list of questions and answers as follows:

(1) Do you know of spills or other chemical release that have taken place on or near the railroad track?

Yes _____ No X

(2) Do you know of any environmental cleanups that have taken place?

Yes _____ No X

Continue:

(3) Do you know of specific chemicals that are present or once were present on or near the track?

Yes _____ No X

(4) Do you have any other knowledge or experience with the area that may be pertinent to the environmental professional (for example, copies of any available documents, correspondence, etc)?

Yes _____ No X

INTERVIEW #2

Name: Mr. Ben Salo
Hazardous Substance Specialist
Union Pacific Railroad
Phone: 916-789-5241

Contacted by: Kee Chan, CESP-K-ED-EC

Date: February 1, 2011

Mr. Chan left messages on Mr. Salo's phone on January 27 and 28.

This interview will be updated upon receiving response from Mr. Salo.

INTERVIEW #3

Name: Mr. Ray Jones
Fire Chief
Sacramento Fire Department
Phone: 808-1601

Contacted by: Kee Chan, CESP-K-ED-EC

Mr. Chan left messages on Mr. Jones' phone on January 27 and 28.

This interview will be updated upon receiving response from Mr. Jones.

INTERVIEW #4

Name: Mike Wochick
Senior Waste Management Engineer
Department of Resources Recycling and Recovery (CalRecycle)
Phone: 916-341-6289

Contacted by: Kee Chan, CESP-K-ED-EC

Date: February 1, 2011

(1) Do you know of spills or other chemical release that have taken place on or near the railroad track?

Yes _____ No X_____

(2) Do you know of any environmental cleanups that have taken place?

Yes _____ No X

(3) Do you know of specific chemicals that are present or once were present on or near the track?

Yes _____ No X

(4) Do you have any other knowledge or experience with the area that may be pertinent to the environmental professional (for example, copies of any available documents, correspondence, etc)?

Yes _____ No X

Mr. Wochick said there may be an abandoned landfill inside the Sacramento Regional Waste Water Treatment Plant (SRWWTP). However, since SRWWP is not within the 1-mile radius of the project site, CESPCK-ED-EC does not believe any investigation of this landfill is warranted, per ASTM E-1725.

CESPCK-ED-EC concludes that the people who are knowledgeable about the present and past history of the project site do not know of any HTRW sites within the project site and surrounding area.

6.0 FINDINGS

A summary of this ESA is presented below:

- The project site is a wetland that is bounded by UPRR Trestle bridge over Morrison Creek in the north, UPRR Trestle bridge over Unionhouse Creek in the south, Morrison Creek in the west and a residential sound wall in the east. The rectangular project site is about 700,000 square feet.
- The project site appears to have been vacant since 1894; the surrounding area has been developed into farmland since 1937; and a mixture of farmland, commercial and residential areas since 1952.
- The project site has had a railroad track since 1894 and the adjacent areas have had levees since 1909.
- One REC site, a SMUD power transformer station where PCB release was confirmed in 1987 and was identified within one-mile radius of the project site. The site is physically secured behind brick walls and cyclone fencing
- Two above-ground fuel tank sites, another power transformer station and petroleum stains on the railroad tracks were identified. These stains are small and considered to in a *de minimis* condition as defined by ASTM 1527-05 and are not considered being a REC.

7.0 CONCLUSION

Based on the ESA, CESPKE-ED-EC concludes the following:

- (1) One REC site, a SMUD power transformer station containing PCB, was identified. Since the site is physically secured behind brick walls and cyclone fencing, under management control, and located at about one-mile from the project site. CESPKE-ED-EC concluded that the site would have no adverse impact on the construction project.
- (2) A numbers of petroleum stains were found on the railroad tracks. These stains are small and considered to be in a *de minimis* condition as defined by ASTM 1527-05 and are not considered being a REC. CESPKE-ED-EC concluded that the stains would have no adverse impact on the construction project.
- (3) Based on the findings, CESPKE-ED-EC concludes no further environmental actions are warranted for the project site.

8.0 ENVIRONMENTAL PROFESSIONAL STATEMENT

This section lists the qualifications of the environmental personnel who conducted and wrote this ESA.

Mr. John Esparza is the chief of the CESPCK-ED-EC. He supervised Mr. Chan and Mr. Kellogg during the ESA process and reviewed the report. He has over 20 years of experience in the environmental field, including 15 years of experience dealing with Phase I Environmental Site Assessments.

Mr. Kee Chan and Mr. Tom Kellogg of the CESPCK-ED-EC performed the site reconnaissance. Both persons have over 15 years of work experience in conducting environmental site investigations, characterizations, and assessments. Mr. Chan performed the records review and wrote the report.

Mr. Esparza, Mr. Chan, and Mr. Kellogg have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. They have developed and performed all appropriated inquires in conformance with the standards and practices set forth in 40 CFR Part 312.

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312.

Date

John Esparza, R.E.A. No. 06249
Chief, Environmental Chemistry Section

9.0 REFERENCES

- (1) ASTM, E 1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Phases I ESA).
- (2) Email (RE: Scope of Work: SOW L2L0960 105701 New 12-09-10 HTRW Assessment S. Sac Co) from Sarah Ross, CESPKE-ER-EA to Yuen Kee Chan, CESPKE-ED-EC. December 10, 2010.
- (3) EPA, Standards and Practices for All Appropriate Inquiries, Code of Federal Regulations 40 CFR Part 312 (<http://www.epa.gov/fedrgstr/EPA-WASTE/2005/November/Day-01/f21455.htm>)
- (4) U.S. Army Corps of Engineer ER 1165-2-132 Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects. 26 June, 1992.
- (5) U.S. Army Corps of Engineer, Sacramento District. Final Environment Impact Statement/Environmental Impact Report, South Sacramento County Steams Investigation, California. March 1998.
- (6) U.S. Army Corps of Engineer, Sacramento District. Draft Environment Assessment/Initial Study, South Sacramento County Steams Project Unionhouse Creek Channel Upgrades. October 2008.

APPENDIX C

SMAQMD ROAD CONSTRUCTION EMISSIONS MODEL

Road Construction Emissions Model, Version 6.3.2

Emission Estimates for -> South Sac- Morrison Creek-UPRR											
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)	
Grubbing/Land Clearing	8.0	38.6	72.3	4.1	3.1	1.0	3.0	2.8	0.2	9,070.5	
Grading/Excavation	8.8	55.2	76.3	4.2	3.2	1.0	3.1	2.9	0.2	10,116.3	
Drainage/Utilities/Sub-Grade	5.1	27.3	44.6	3.1	2.1	1.0	2.1	1.9	0.2	6,182.7	
Paving	6.8	29.2	63.0	2.4	2.4	-	2.2	2.2	-	8,465.0	
Maximum (pounds/day)	8.8	55.2	76.3	4.2	3.2	1.0	3.1	2.9	0.2	10,116.3	
Total (tons/construction project)	0.3	1.7	2.7	0.2	0.1	0.0	0.1	0.1	0.0	366.7	
Notes: Project Start Year -> 2012 Project Length (months) -> 4 Total Project Area (acres) -> 4 Maximum Area Disturbed/Day (acres) -> 0 Total Soil Imported/Exported (yd ³ /day)-> 320											
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified. Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.											
Emission Estimates for -> South Sac- Morrison Creek-UPRR											
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)	
Grubbing/Land Clearing	3.6	17.5	32.9	1.9	1.4	0.5	1.4	1.3	0.1	4,122.9	
Grading/Excavation	4.0	25.1	34.7	1.9	1.5	0.5	1.4	1.3	0.1	4,598.3	
Drainage/Utilities/Sub-Grade	2.3	12.4	20.3	1.4	1.0	0.5	1.0	0.9	0.1	2,810.3	
Paving	3.1	13.3	28.6	1.1	1.1	-	1.0	1.0	-	3,847.7	
Maximum (kilograms/day)	4.0	25.1	34.7	1.9	1.5	0.5	1.4	1.3	0.1	4,598.3	
Total (megagrams/construction project)	0.3	1.6	2.5	0.1	0.1	0.0	0.1	0.1	0.0	332.6	
Notes: Project Start Year -> 2012 Project Length (months) -> 4 Total Project Area (hectares) -> 1 Maximum Area Disturbed/Day (hectares) -> 0 Total Soil Imported/Exported (meters ³ /day)-> 245											
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified. Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.											

Road Construction Emissions Model Data Entry Worksheet

Version 6.3.2



Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	South Sac- Morrison Creek-UPRR	
Construction Start Year	2012	Enter a Year between 2005 and 2025 (inclusive)
Project Type		1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	4.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	0.57	miles
Total Project Area	3.5	acres
Maximum Area Disturbed/Day	0.1	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	160.0	yd ³ /day
Soil Exported	160.0	yd ³ /day
Average Truck Capacity	21.0	yd ³ (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of		Program Calculated					
	Construction Months	Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	0.50	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	1.50	1.60	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade	1.50	1.40	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.50	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Totals	4.00	4.00						

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions	User Override of	
	Soil Hauling Defaults	Default Values
Miles/round trip	30.00	30
Round trips/day	15.00	15
Vehicle miles traveled/day (calculated)	450	

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.93	11.59	6.20	0.45	0.38	1868.60
Emission rate (grams/trip)	10.89	7.79	185.47	0.02	0.01	209.04
Pounds per day	1.7	12.0	18.6	0.4	0.4	1866.2
Tons per construction period	0.03	0.20	0.31	0.01	0.01	30.79

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions	User Override of Worker					
	Commute Default Values	Default Values				
Miles/ one-way trip	20.00	20				
One-way trips/day	2.00	2				
No. of employees: Grubbing/Land Clearing	20.00	4				
No. of employees: Grading/Excavation	31.00	6				
No. of employees: Drainage/Utilities/Sub-Grade	31.00	6				
No. of employees: Paving	20.00	5				
	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.135	0.244	2.515	0.033	0.018	426.920
Emission rate - Grading/Excavation (grams/mile)	0.132	0.235	2.427	0.033	0.018	426.640
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.132	0.235	2.427	0.033	0.018	426.640
Emission rate - Paving (grams/mile)	0.132	0.235	2.427	0.033	0.018	426.640
Emission rate - Grubbing/Land Clearing (grams/trip)	0.839	0.359	8.253	0.130	0.012	192.050
Emission rate - Grading/Excavation (grams/trip)	0.809	0.343	7.916	0.130	0.012	192.280
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.809	0.343	7.916	0.130	0.012	192.280
Emission rate - Paving (grams/trip)	0.809	0.343	7.916	0.130	0.012	192.280
Pounds per day - Grubbing/Land Clearing	0.386	0.493	5.886	0.081	0.034	786.123
Tons per const. Period - Grub/Land Clear	0.002	0.003	0.032	0.000	0.000	4.324
Pounds per day - Grading/Excavation	0.375	0.475	5.672	0.081	0.034	785.670
Tons per const. Period - Grading/Excavation	0.006	0.008	0.094	0.001	0.001	12.964
Pounds per day - Drainage/Utilities/Sub-Grade	0.375	0.475	5.672	0.081	0.034	785.670
Tons per const. Period - Drain/Util/Sub-Grade	0.006	0.008	0.094	0.001	0.001	12.964
Pounds per day - Paving	0.375	0.475	5.672	0.081	0.034	785.670
Tons per const. Period - Paving	0.002	0.003	0.031	0.000	0.000	4.321
tons per construction period	0.017	0.021	0.251	0.004	0.001	34.572

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values		
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day		
Grubbing/Land Clearing - Exhaust	2.00	1	15.00	40		
Grading/Excavation - Exhaust	2.00	1	15.00	40		
Drainage/Utilities/Subgrade	2.00	1	15.00	40		
	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.97	12.07	6.48	0.47	0.39	1866.20
Emission rate - Grading/Excavation (grams/mile)	0.93	11.59	6.20	0.45	0.38	1868.60
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.92	11.59	6.20	0.45	0.38	1868.60

Pounds per day - Grubbing/Land Clearing	0.06	0.80	0.43	0.03	0.03	123.32
Tons per const. Period - Grub/Land Clear	0.00	0.01	0.01	0.00	0.00	2.03
Pound per day - Grading/Excavation	0.06	0.77	0.41	0.03	0.02	123.48
Tons per const. Period - Grading/Excavation	0.00	0.01	0.01	0.00	0.00	2.04
Pound per day - Drainage/Utilities/Subgrade	0.06	0.77	0.41	0.03	0.02	123.48
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.01	0.01	0.00	0.00	2.04

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max	Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day	Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		0.1	1.0	0.0	0.2	0.0
Fugitive Dust - Grading/Excavation		0.1	1.0	0.0	0.2	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0.1	1.0	0.0	0.2	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	<i>Program-estimate</i>							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1.00	Excavators	0.66	3.26	4.97	0.29	0.27	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1.00	Generator Sets	1.76	6.71	24.04	0.69	0.63	3014.38
	1.00	Graders	0.85	3.85	6.60	0.38	0.35	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
	1.00	Off-Highway Trucks	1.34	3.84	11.76	0.43	0.39	1559.66
	2.00	Other Construction Equipment	0.51	2.37	3.51	0.30	0.27	359.73
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1.00	1 Rubber Tired Dozers	1.62	7.37	14.14	0.59	0.55	1245.79
	1.00	Rubber Tired Loaders	0.59	2.72	4.63	0.27	0.25	458.86
	0.00	1 Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1 Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	1.00	Tractors/Loaders/Backhoes	0.21	2.15	1.39	0.06	0.06	327.38
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
		Grubbing/Land Clearing	7.6	32.3	71.0	3.0	2.8	8161.0
		Grubbing/Land Clearing	0.0	0.2	0.4	0.0	0.0	44.9

Grading/Excavation		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	<i>Program-estimate</i>							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00

		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0	Cranes	0.67	2.33	6.30	0.23	0.22	739.64
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1	Excavators	0.63	3.26	4.70	0.28	0.26	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Generator Sets	1.75	6.69	23.29	0.67	0.61	3014.38
1.00	1	Graders	0.81	3.85	6.25	0.36	0.33	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
2.00	0	Other Construction Equipment	0.49	2.37	3.36	0.28	0.26	359.72
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Rubber Tired Dozers	1.57	7.13	13.55	0.57	0.52	1245.79
1.00	1	Rubber Tired Loaders	0.57	2.71	4.38	0.25	0.23	458.86
0.00	1	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Tractors/Loaders/Backhoes	0.19	2.14	1.25	0.05	0.04	327.38
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	6.7	30.5	63.1	2.7	2.5	7341.0
	Grading	tons per phase	0.1	0.5	1.0	0.0	0.0	121.1

Drainage/Utilities/Subgrade	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
			Override of Default Number of Vehicles	<i>Program-estimate</i>	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Cement and Mortar Mixers	0.04	0.20	0.24	0.01	0.01	32.44
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Generator Sets	1.75	6.69	23.29	0.67	0.61	3014.38
1.00	1	Graders	0.81	3.85	6.25	0.36	0.33	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00

2.00		Other Construction Equipment	0.49	2.37	3.36	0.28	0.26	359.72	
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00	
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	1	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00	
1.00		Rollers	0.54	2.08	3.37	0.29	0.27	299.86	
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	
1.00		Rubber Tired Loaders	0.57	2.71	4.38	0.25	0.23	458.86	
0.00	1	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	1	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	
1.00		Skid Steer Loaders	0.31	1.22	1.25	0.09	0.09	133.01	
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	
1.00		Tractors/Loaders/Backhoes	0.19	2.14	1.25	0.05	0.04	327.38	
0.00	1	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	
		Welders	0.00	0.00	0.00	0.00	0.00	0.00	
		Drainage	pounds per day	4.7	21.3	43.4	2.0	1.8	5273.5
		Drainage	tons per phase	0.1	0.4	0.7	0.0	0.0	87.0

Paving	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles	Type						
Override of Default Number of Vehicles	Program-estimate		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Generator Sets	1.75	6.69	23.29	0.67	0.61	3014.38
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
2.00		Off-Highway Trucks	2.59	7.62	22.31	0.81	0.74	3119.33
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1	Rollers	0.54	2.08	3.37	0.29	0.27	299.86
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Rubber Tired Dozers	1.57	7.13	13.55	0.57	0.52	1245.79

		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	6.4	23.5	62.5	2.3	2.1	7679.4
	Paving	tons per phase	0.0	0.1	0.3	0.0	0.0	42.2
Total Emissions all Phases (tons per construction period) =>			0.3	1.2	2.5	0.1	0.1	295.3

Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C285 through C317, E285 through E317, and G285 through G317.

Equipment	Default Values		Default Values		Default Values	
	Horsepower		Load Factor		Hours/day	
Aerial Lifts	60		0.46		8	
Air Compressors	106		0.48		8	
Bore/Drill Rigs	291		0.75		8	
Cement and Mortar Mixers	10		0.56		8	
Concrete/Industrial Saws	19		0.73		8	
Cranes	399		0.43		8	
Crushing/Proc. Equipment	142		0.78		8	
Excavators	168		0.57		8	
Forklifts	145		0.30		8	
Generator Sets	549		0.74		8	
Graders	174		0.61		8	
Off-Highway Tractors	267		0.65		8	
Off-Highway Trucks	479		0.57		8	
Other Construction Equipment	75		0.62	5.00	8	
Other General Industrial Equipment	238		0.51		8	
Other Material Handling Equipment	191		0.59		8	
Pavers	100		0.62		8	
Paving Equipment	104		0.53		8	
Plate Compactors	8		0.43		8	
Pressure Washers	1		0.60		8	
Pumps	53		0.74		8	
Rollers	95		0.56		8	
Rough Terrain Forklifts	93		0.60		8	
Rubber Tired Dozers	357		0.59		8	
Rubber Tired Loaders	157		0.54		8	
Scrapers	313		0.72		8	
Signal Boards	20		0.78		8	
Skid Steer Loaders	44		0.55		8	
Surfacing Equipment	362		0.45		8	
Sweepers/Scrubbers	91		0.68		8	
Tractors/Loaders/Backhoes	108		0.55		8	

Trenchers		63		0.75		8
Welders		45		0.45		8

APPENDIX D

WETLAND DELINEATION

Wetland Delineation Report
South Sacramento County Streams –
Morrison Creek UPRR

Prepared for:

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Prepared by:

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DECEMBER, 2010

INTRODUCTION

This report presents the results of a field determination of potential aquatic and wetland resources on the South Sacramento County – Morrison Creek UPRR parcel (Study Area), located in Sacramento County, California that could be considered potentially jurisdictional wetlands and “other waters” of the U.S. under Section 404 of the U.S. Clean Water Act.

The U.S. Army Corps of Engineers (USACE) proposes to construct a flood protection wall along the East side of Morrison Creek within the Study Area. The flood wall will be constructed on either the East or West side of the Union Pacific Railroad tracks.

The Study Area is located in Section 11, Township 7 North, Range 5 East, MDB&M Survey, 38°28'01.96" North and 121°27'42.12" West, approximately 0.75 mile west of Franklin Boulevard and 0.5 mile southwest of Mack Road in South Sacramento, Sacramento County, California.

METHODOLOGY

A field delineation of wetlands and “other waters of the U.S.” were conducted on November 18, 2010 by Ms. Jinnah Benn and Ms. Sarah Ross of the USACE. The delineation effort was conducted in accordance with the 1987 *U.S. Army Corps of Engineers Wetlands Delineation Manual* and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*.

A Level 3, routine onsite determination, as defined in the 1987 *Wetland Delineation Manual*, evaluated the three parameters that identify and delineate the boundaries of jurisdictional wetlands including: (1) the dominance of wetland vegetation; (2) the presence of hydric soils; and (3) hydrologic conditions that result in periods of inundation or saturation on the surface from flooding or ponding. The Jepson Manual was used to identify vascular plant species observed during the field delineation. The *National List of Plant Species That Occur in Wetlands: California (Region 0)* was used to determine the wetland indicator status of plant species observed. The *Soil Survey of Sacramento County, California* and the *Field Office Official List of Hydric Soil Map Units for Sacramento County, California* were used to identify soil types that occur within the Study Area.

A total of eight data points were taken within the Study Area. The percent dominance by hydrophytic vegetation was recorded at these sample areas, along with the presence of positive hydrologic indicators. Soils were examined (via soil test pits) to determine composition, matrix color, and the presence/absence of redoximorphic concentrations. *Wetland Determination Data Form – Arid West Region* can be viewed in Appendix A; representative site photographs can be viewed in Appendix B.

The presence, distribution and extent of wetlands and “other waters of the U.S.” within the Study Area was determined using the parameters established by the Corps. If all three parameters (vegetation, soils, and hydrology) are met for an area, they may be under the jurisdiction of the Corps under Section 404 of the Clean Water Act and/or the Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act. The Corps is ultimately responsible for making a determination of the limit of their jurisdiction for the purposes of assessing impact to waters of the U.S. (including wetlands).

RESULTS

The Western Pacific Railroad line runs through the center of the Study Area dividing it into two halves. The eastern half is bordered by a housing development and the western half is bordered by Morrison Creek. The railroad is built on top of a large levee which has greatly altered the natural hydrology of the Study Area.

Vegetation

The Study Area lies within the Sacramento Valley Subdivision of the California Floristic Province and lies within the *Mediterranean California* (LRR C) region. The majority of the Study Area consists of vegetative assemblages associated with disturbed habitats including non-native Mediterranean weeds and grasses. There is a riparian corridor along Morrison Creek that consists of hydromorphic woody plant species (mostly willow species). The seasonal wetlands within the Study Area contained a variety of facultative and obligate wetland plant species including but not limited to curly dock (*Rumex crispus*), rabbit foot grass (*Polypogon monspeliensis*), common cocklebur (*Xanthium strumarium*), hyssop loosestrife (*Lythrum hyssopifolium*), creeping wild rye (*Elymus triticoides*), Bermuda grass (*Cynodon dactylon*), pennyroyal (*Mentha pulegium*), and Italian rye grass (*Lolium multiflorum*).

Soils

The NRCS 1985 soil survey map shows that the following soil types occur within the Study Area: 114 – Clear Lake clay, partially drained, 0 to 2 percent slopes, frequently flooded; 115 – Clear Lake clay, hardpan substratum, drained, 0 to 1 percent slopes; and 141 – Egbert clay, partially drained, 0 to 2 percent slopes. All three soil types have hydric components and hydric inclusions. Soil pits revealed a clay pan layer between 9 to 12 inches deep. The majority of the soil pits had manganese concretions which are a redoximorphic feature.

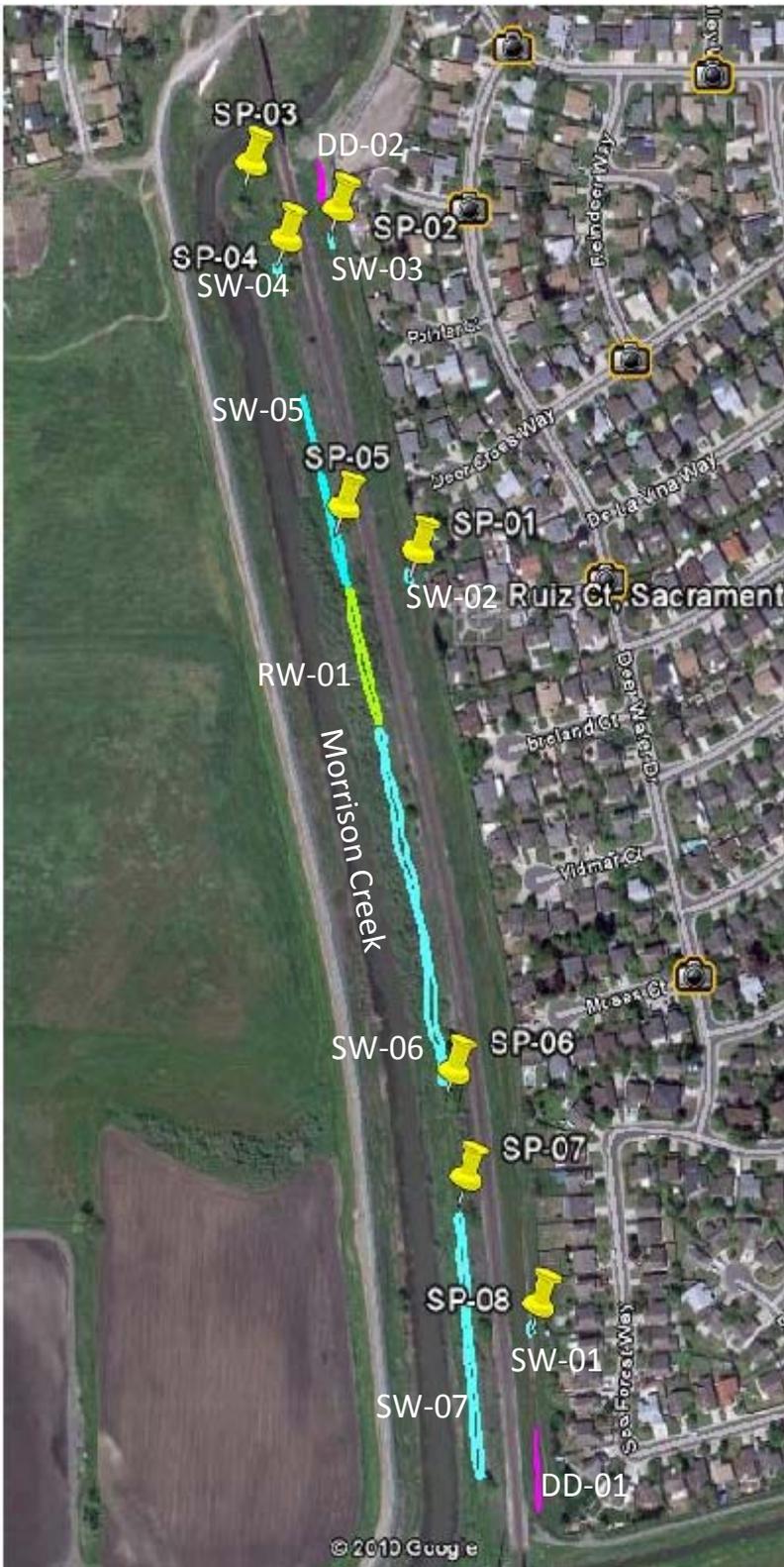
Hydrology

Water enters the west side of the Study Area overflow from Morrison Creek during storm events. Water enters the east side of the Study Area primarily in the form of direct precipitation and sheet-flow runoff from the surrounding uplands and hardscape surfaces. The railroad track and adjacent access roads have altered the natural hydrology and serve to “trap” water causing extended periods of inundation.

SUMMARY OF FINDINGS

The delineation of wetland features in the Study Area revealed that approximately 0.68 acre of potentially jurisdictional wetlands are present within the Study Area, as depicted on the Wetland Delineation Map. All other depressional features examined did not meet the criteria of a wetland.

South Sac. Co. Streams – Morrison Creek UPRR Wetland Delineation Map



Legend:

Wetlands Habitat:

SW – 01	0.01 acre
SW – 02	0.01 acre
SW – 03	0.01 acre
SW – 04	0.01 acre
SW – 05	0.05 acre
SW – 06	0.29 acre
SW – 07	0.19 acre
RW – 01	0.09 acre
DD – 01	0.01 acre
DD – 02	<u>0.01 acre</u>
Total:	0.68 acre



APPENDIX B – REPRESENTATIVE SITE PHOTOGRAPHS



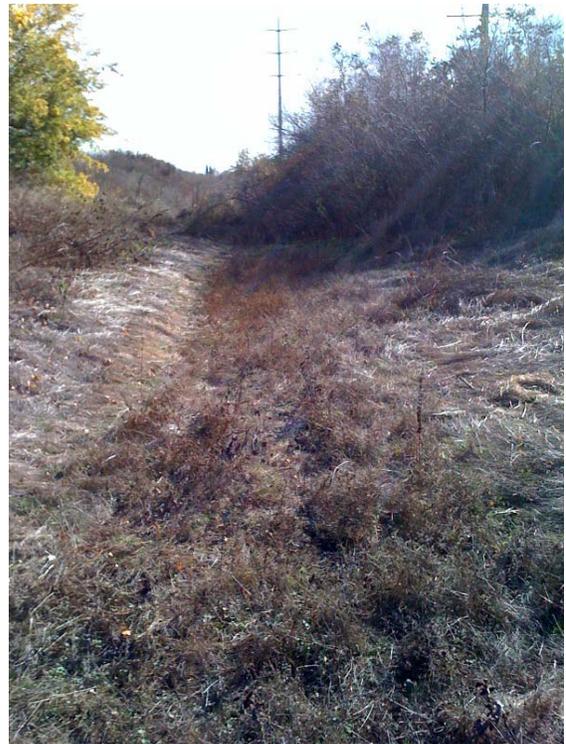
Seasonal Wetland 07 Looking North



Seasonal Wetland 05 Looking South



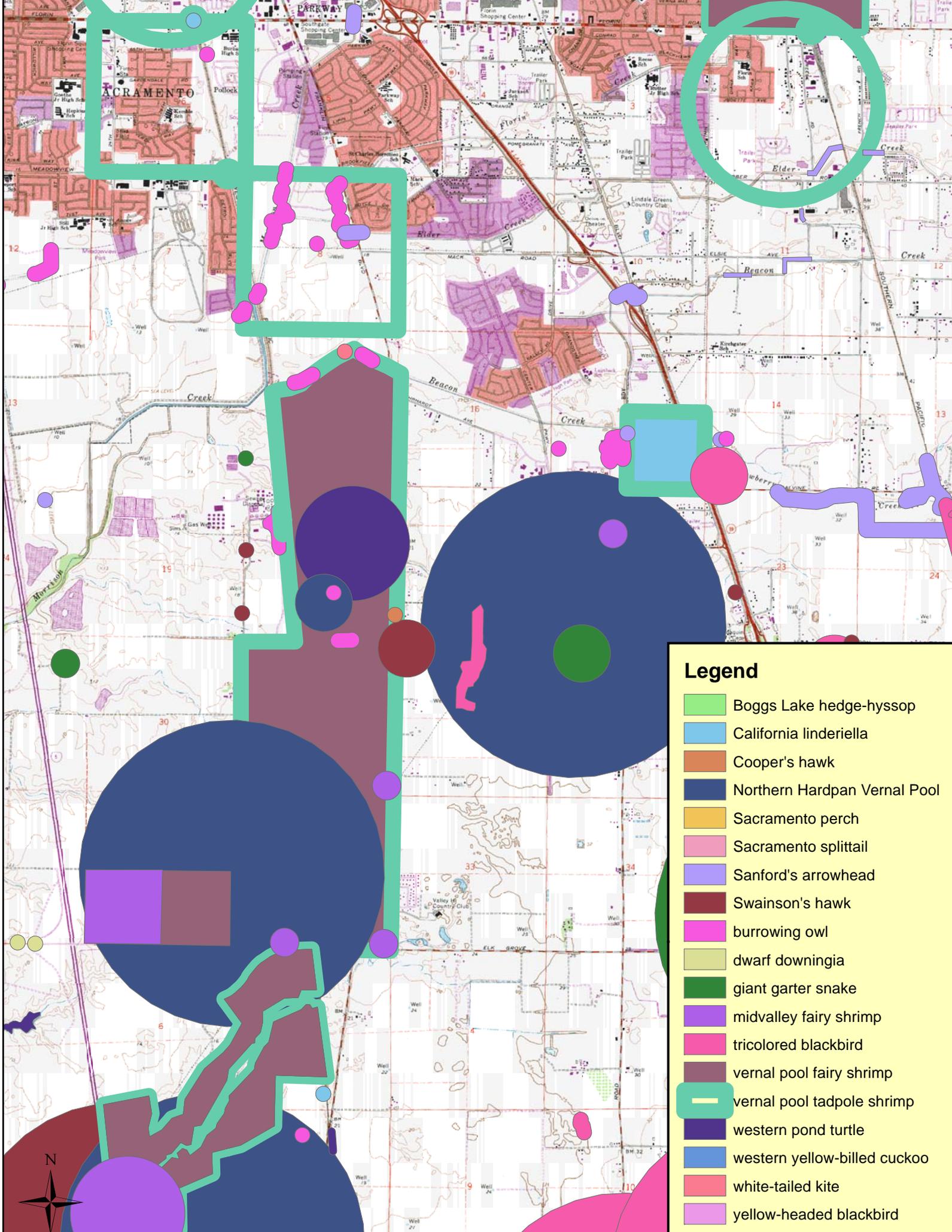
Drainage Ditch 01 Looking North



Riparian Wetland Looking South

APPENDIX E

SPECIAL STATUS SPECIES LISTS



- Legend**
- Boggs Lake hedge-hyssop
 - California linderiella
 - Cooper's hawk
 - Northern Hardpan Vernal Pool
 - Sacramento perch
 - Sacramento splittail
 - Sanford's arrowhead
 - Swainson's hawk
 - burrowing owl
 - dwarf downingia
 - giant garter snake
 - midvalley fairy shrimp
 - tricolored blackbird
 - vernal pool fairy shrimp
 - vernal pool tadpole shrimp
 - western pond turtle
 - western yellow-billed cuckoo
 - white-tailed kite
 - yellow-headed blackbird



CNPS STATUS and RARITY REPORT

Sacramento County

Scientific Name	Common Name	CNPS	STATE	State Rank	FEDERAL	Global Rank
<u>Carex comosa</u>	bristly sedge	List 2.1	None	S2?	None	G5
<u>Centromadia parryi</u> ssp. <u>rudis</u>	Parry's red tarplant	List 4.2	None	S3.2	None	G4T3
<u>Cicuta maculata</u> var. <u>bolanderi</u>	Bolander's water-hemlock	List 2.1	None	S2	None	G5T3T4
<u>Clarkia biloba</u> ssp. <u>brandegeae</u>	Brandegee's clarkia	List 1B.2	None	S3	None	G4G5T3
<u>Downingia pusilla</u>	dwarf downingia	List 2.2	None	S3.1	None	G3
<u>Eriogonum apricum</u> var. <u>apricum</u>	lone buckwheat	List 1B.1	Endangered	S2.1	Endangered	G2T2
<u>Eryngium pinnatisectum</u>	Tuolumne button-celery	List 1B.2	None	S3.2	None	G3
<u>Fritillaria agrestis</u>	stinkbells	List 4.2	None	S3.2	None	G3
<u>Gratiola heterosepala</u>	Boggs Lake hedge-hyssop	List 1B.2	Endangered	S3.1	None	G3
<u>Helianthemum suffrutescens</u>	Bisbee Peak rush-rose	List 3.2	None	S2.2	None	G2Q
<u>Hesperervax caulescens</u>	hogwallow starfish	List 4.2	None	S3.2	None	G3
<u>Hibiscus lasiocarpus</u> var. <u>occidentalis</u>	woolly rose-mallow	List 1B.2	None	S2.2	None	G4
<u>Juncus leiospermus</u> var. <u>ahartii</u>	Ahart's dwarf rush	List 1B.2	None	S1.2	None	G2T1
<u>Lasthenia ferrisiae</u>	Ferris' goldfields	List 4.2	None	S3.2	None	G3
<u>Lathyrus jepsonii</u> var. <u>jepsonii</u>	Delta tule pea	List 1B.2	None	S2.2	None	G5T2
<u>Legenere limosa</u>	legenere	List 1B.1	None	S2.2	None	G2
<u>Lilaeopsis masonii</u>	Mason's lilaeopsis	List 1B.1	Rare	S3.1	None	G3
<u>Limosella subulata</u>	Delta mudwort	List 2.1	None	S2.1	None	G4?Q
<u>Navarretia eriocephala</u>	hoary navarretia	List 4.3	None	S3.3	None	G3
<u>Navarretia myersii</u> ssp. <u>myersii</u>	pincushion navarretia	List 1B.1	None	S1.1	None	G1T1



United States Department of the Interior
FISH AND WILDLIFE SERVICE

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



June 9, 2010

Document Number: 100609104108

Sarah Ross
US Army Corps of Engineers
1325 J Street
Sacramento, CA 95628

Subject: Species List for South Sacramento County Streams

Dear: Ms. Ross

We are sending this official species list in response to your June 9, 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 September 07, 2010.

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



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: 100609104108

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 packardii

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)

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:

FLORIN (496B)

County Lists

Sacramento County

Listed Species

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (E)

Branchinecta lynchi

Critical habitat, vernal pool fairy shrimp (X)

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

Critical habitat, valley elderberry longhorn beetle (X)

valley elderberry longhorn beetle (T)

Elaphrus viridis

delta green ground 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)

Plants

Castilleja campestris ssp. succulenta
Critical habitat, succulent (=fleshy) owl's-clover (X)

Oenothera deltoides ssp. howellii
Antioch Dunes evening-primrose (E)

Orcuttia tenuis
Critical habitat, slender Orcutt grass (X)
slender Orcutt grass (T)

Orcuttia viscida
Critical habitat, Sacramento Orcutt grass (X)
Sacramento Orcutt grass (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 September 07, 2010.

APPENDIX F

SPECIAL STATUS SPECIES COORDINATION



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO
1-1-01-F-0043

Read copy
Wenric

April 15, 2002

Mr. Tom Cavanaugh
Department of the Army
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814

Subject: Formal Section 7 Consultation for the South Sacramento County Streams Project, Sacramento County, California

Dear Mr. Cavanaugh:

This is in response to the U.S. Army Corps of Engineers' (Corps) October 30, 2001, request to re-initiate formal consultation with the U.S. Fish and Wildlife Service (Service) on the South Sacramento County Streams Investigation, Sacramento County, California. Your request was received in our office on October 31, 2001. This document represents the Service's biological opinion on the effects of the action on the threatened vernal pool fairy shrimp (*Brachinecta lynchi*), the endangered vernal pool tadpole shrimp (*Lepidurus packardii*), the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle), and the threatened giant garter snake (*Thamnophis gigas*) (snake), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act).

This biological opinion is based on information provided in (1) the *March 1998 South Sacramento County Streams Investigation Final Environmental Impact Statement (FEIS)*; (2) the *October 2001 Final Supplemental Environmental Impact Report/Environmental Assessment for the South Sacramento County Streams Project Camray Borrow Site and Additional Aspects of Levee Work on North Beach Lake Levee*; (3) the *January 2001 Proposal for Wetland, GGS, Riparian Scrub, and Vernal Pool Mitigation at the SRWTP Bufferlands*; (4) the *August 2000 Proposed Monitoring Plan for Replacement Seasonal Wetlands, Emergent Marsh, Riparian Scrub, and Upland GGS Habitats Resulting from Impacts Associated with the Bradshaw Interceptor Project and North Beach Lake/SRWTP Levee Improvement Project*, (5) a March 13, 2001, field investigation (6) correspondence between the Service and the Corps from 1996 to 2002 as outlined below in the consultation history section; (7) a telephone conversation on February 14, 2002. A complete administrative record of this consultation is on file in this office.

Consultation History

March 8, 1996. The Corps sent a letter to the Service requesting consultation on the proposed project.

October 18, 1996. The Corps informed the Service that Sacramento Area Flood Control Agency (SAFCA) had constructed part of the project around the Sacramento Regional Wastewater Treatment Plant (SRWTP) from August through November, 1996.

May 7, 1998. The Service sent a letter to SAFCA identifying conservation measures necessary to compensate for impacts of the unauthorized take of listed species.

April 23, 1998. The Service sent a letter to the Corps pointing out the interrelated and interdependent relationship between SAFCA's unauthorized action and the South Sacramento County Streams Investigation (SSCI) project. The Service requested that the Corps withdraw its request for consultation on the SRWTP Levee Improvement Project (1-1-96-F-0070) and include the unauthorized action in the consultation on the SSCI Project.

June 5, 1998. The Corps complied with the Service's April 23, 1998 request.

October 26, 1999. The Service sent a letter to the Corps and terminated formal consultation because of unresolved negotiations and actions not being undertaken to compensate for the unauthorized activities.

June 14, 2000. The Corps received a letter from SAFCA showing the Board Resolution approving the purchase of 2.08 acres of vernal pool creation credits.

January 16, 2001. The Corps sent a letter to the Service requesting reinitiation of formal consultation on the proposed project.

February 23, 2001. The Service sent a letter to the Corps requesting additional information on project description and project impacts.

March 13, 2001. Doug Weinrich (Service), Brian Cordone (Service), Jane Rinck (Corps), Phillip Brozek (Corps), and the Sacramento Regional Wastewater Treatment Bufferland's staff performed a site visit to discuss project impacts.

October 30, 2001. The Corps sent a letter to the Service with additional project information and requested reinitiation of formal consultation on the proposed project.

February 14, 2002. Phone conversation between Jane Rinck from the Corps and Brian Cordone of the Service clarifying the proposed vernal pool compensation for the project. It was

determined that 0.75 acre of vernal pool project impacts would be compensated by preserving 2.25 acres vernal pool habitat instead of the 1.5 acres stated in the Corps' October 2001 additional project information packet.

BIOLOGICAL OPINION

Description of the Proposed Action

The Corps and the SAFCA propose to increase flood protection to the South Sacramento County area by modifying existing levees and channels along portions of Morrison, Elder, Unionhouse, and Florin creeks; retrofitting bridges over these creeks; and constructing a new levee and floodwall at the Sacramento Regional Wastewater Treatment Plant. This proposed project also includes a restoration component which is intended to compensate for species and habitat impacts. The following is a description of the proposed work in the four work areas. See Figure 2-1 in the FEIS for a graphical representation of where and the type of work to be performed. This project alternative was developed to eliminate national flood insurance requirements for structures and property threatened by streams in the study area, and provide a consistent high level of flood protection to all index areas. This alternative was designed to eliminate areas of the Federal Emergency Management Agency (FEMA) 100-year floodplain which currently receive flows from the Morrison Creek system and Beach-Stone Lakes. However, this alternative would not eliminate areas which also receive flooding from other sources such as the American and/or Sacramento Rivers. This alternative would provide protection for a 1 in 500 annual event for all of the index areas and would meet FEMA reliability requirements.

Flood Control Work

Area 1 - Pocket Area

The North Beach Lake levee would be raised along most of its alignment from the Sacramento River to Unionhouse Creek. In addition, the west levee on Morrison Creek would be raised from Unionhouse Creek to Union Pacific Rail Road (UPRR). These levees would be raised a maximum of 4 feet from 18 to 21 feet in elevation. Except at the west end of the Beach Lake levee and near UPRR tracks, the levee would be raised along the existing alignment. The levees would have a 16-foot wide crown to accommodate local maintenance equipment. The landward side of the levee would be built out about 23 feet and would have a 2 horizontal to 1 vertical sideslope. Borrow sites 1 and 2 identified in Figure 2 of the FEIS for the proposed project would be used. Due to limited right-of-way, floodwall or sheetpile wall would be used instead of levee raising on 3,400 linear feet of the North Beach Lake levee immediately east of I-5. The sheetpile wall would be located on the waterside of the levee and extend 3 to 4 feet above the top of the levee. The sheetpile walls would be installed from the top of the levee.

The west end of the North Beach Lake levee would be realigned to the south so that it would tie into the Sacramento River two-thirds of a mile south of Freeport. The new levee segment would tie into the existing Sacramento River levee about 2,000 feet south of the existing North Beach Lake levee terminus and would be about 2,000 feet long. The new levee segment would be 11 feet in elevation and have a 16-foot wide crown. The west end of the existing North Beach Lake levee would remain in place. The newly constructed levee segment and the existing North Beach Lake levee would protect State Route 160 and other structures from flooding.

Along Morrison Creek at the UPRR crossing, a removable stop log structure would be replaced at the crossing to contain high water that exceeds the elevation of the railroad tracks. This structure would pass the 1 in 100 annual flood event at the Morrison Creek crossing. On the west side of the Morrison Creek levee between the UPRR and Franklin Boulevard, floodwalls or sheetpile walls would be used instead of levee raising due to limited right of way. The floodwall or sheetpile walls would be placed on the levee crown on the waterside of the existing service road. The top of the sheetpile wall would be 1.5 feet above the top of the levee. The service road on top of the levee segment between the UPRR and Franklin Boulevard would remain at the existing width of 12 feet. Floodwalls or sheetpile walls would be constructed from inside the creek channel. Existing ramps to access the channel would be used when possible or temporary ramps would be constructed if needed. Staging areas for this location would be in the creek channel. The top of the levee would be cleared of vegetation and transported to the nearest dump or land fill. Cranes would be used to lift material and equipment to wall locations on the tops of the levees or banks. Channels would be dewatered by temporary coffer dams and diversion of streamflow upstream of construction. A tarp would be laid on the channel bottom to protect the concrete low-flow liner and any vegetation on the channel bottom. Gravel or other material to support construction equipment would be graded on top of the tarp. As construction is completed in a stream section, the support material and coffer dam would be removed, and the channel bottoms would be restored to pre-project conditions.

Area 2- Sacramento Regional Wastewater Treatment Plant

The existing ring levee around the treatment plant would be raised 4 feet from 18 to 22 feet in elevation. The total length of the levee raising would be about 24,000 feet. About one third of the work would consist of levee raising with earth fill material. The levee would be extended 43 feet on the land or treatment plant side to avoid wetland habitat on the waterside of the levee. A floodwall would be placed on top of the existing levee for about 9,000 feet due to limited right of way at the southwest corner of the treatment plant levee. The floodwall would be made of reinforced concrete, placed on the top of the levee service road, and located on the water side of the levee. Construction in Area 2 would take place from the top of the levee, and the floodwall would extend 3 feet above the top of the existing levee. A new levee section would be added to the ring levee and would extend 5,000 feet along the southern perimeter of the treatment plant. The new levee would have a 15-foot wide service road to accommodate plant operation and maintenance equipment. This new levee would tie into Dwight Road near UPRR. At the northeast terminus of the ring levee near Laguna Creek and UPRR, a 2,300-foot long concrete

floodwall would be constructed. The floodwall would be 4 to 8 feet high and 1-foot wide and would extend south and tie into high ground near the railroad tracks. Borrow material for the levee raising in this area would be taken from existing stockpiles on the treatment plant site. Equipment and staging areas would also be located on treatment plant lands.

Area 3 - Between Morrison and State Route 99

Morrison Creek. The predominant flood control measure along Morrison creek would be floodwalls or sheetpile walls on both levees and on the channel banks of incised channels. Along the east bank of Morrison Creek from Unionhouse Creek to the UPRR bridge, seepage and weakening of the railroad embankment would be corrected by constructing a floodwall or sheetpile wall 300 feet long on the waterside of the embankment. The top of the wall would be about 3.6 feet above the top of the levee. Construction would be done using the in-channel methods described for Area 1.

Farther up the east bank of Morrison Creek levee from UPRR bridge to Franklin Boulevard, there is an existing levee at an elevation of 19 feet. A floodwall or sheetpile wall 8,600 feet long would be placed along the waterside edge of the service road to strengthen the levee. The top of the wall would be about 3.6 feet above the existing top of the levee, and the width of the road would remain at 12 feet. In-channel construction methods would be used as described for Area 1.

The channel of Morrison Creek is incised from Franklin Boulevard to State Route 99. In this area, there would be floodwalls or sheetpile walls sunk into streambanks for about 4,000 feet. The walls would be placed inside the fence line that marks the existing channel right of way. The height of the wall would extend 2.5 feet above the top of the channel bank. To reduce the risk of wall failure, the wall would be placed at a depth of about 10 feet. In-channel construction methods would be used as described for Area 1.

The bridges on Morrison Creek are affected by pressure flow when backwater extends up the creek from Beach-Stone Lakes. To prevent water from leaving the channel under pressure flow, the Brookfield Drive, G parkway, Franklin Boulevard, Center Parkway, and Florin Road bridges would be retrofitted with concrete infill walls, concrete aprons, parapet walls, and drains.

Elder Creek. The predominant flood control measure on this creek would be floodwalls or sheetpile walls. In the leveed areas, from the confluence with Morrison Creek to Franklin Boulevard, about 2,500 feet of floodwall or sheetpile walls would be placed on both sides of the channel on the waterside edge of the service road on top of the levee. The top of the wall would be at the top of the existing levee height.

At the incised portion of Elder Creek, from Franklin Boulevard to State Route 99, about 3,836 feet would be improved with floodwalls or sheetpile walls. The floodwall or sheetpile wall would be placed in the channel bank inside the fence line that marks the existing channel right of way.

The height of the walls would be about 2.5 to 3 feet above the top of the channel bank. A total of 6,336 feet of floodwalls or sheetpiles would be constructed on Elder Creek. In-channel construction methods would be used as described for Area 1. The Franklin Boulevard, Tangerine Avenue, and Center Parkway bridges on Elder Creek would be retrofitted with concrete infill walls, concrete aprons, parapet walls, and drains.

Florin Creek. The predominant flood control measure would be floodwalls or sheetpile walls. Florin Creek is an incised channel. About 7,392 feet of improvements would be constructed on both banks, from the confluence of Elder Creek with State Route 99. The floodwall or sheetpile wall would be placed in the channel bank inside the fence line that marks the existing channel right of way. The height of the walls would be about 1 to 2 feet above the top of the channel bank. In channel construction methods would be used as described for Area 1. Two bridges would be retrofitted on Florin Creek with concrete infill walls, concrete aprons, parapet walls, and drains. These bridges are located on Brookfield Drive and Persimmon Avenue. The State Route 99 bridge would be retrofitted with parapet walls.

Unionhouse Creek. On Unionhouse Creek, the predominant flood control measure would be floodwalls or sheetpile walls. About 4,725 feet of the north levee below Franklin Boulevard would be improved with floodwalls or sheetpile walls that would be placed along the waterside edge of the service road to strengthen the levee. The top of the wall would be at the existing top of the levee. About 5,280 feet of the parkway would be improved on both banks with sheetpile walls. The walls would be placed inside the fence line that marks the existing channel right of way. The height of the walls would be about 2 to 2.5 feet above the top of the channel bank. In-channel construction methods would be used as described for Area 1. The Franklin Boulevard and Center Parkway bridges would be retrofitted with parapet walls to pass water more efficiently under the bridges during pressure flow conditions.

Area 4- Between State Route 99 and Stockton Boulevard

Morrison Creek. This reach of Morrison Creek is an incised channel, and flood control measures would consist of floodwalls or sheetpile walls on portions of both sides of the channel between State Route 99 and Stockton Boulevard. Where the top of the bank is low, a total of 7,000 linear feet of sheetpile wall would be constructed. The wall would be placed inside the fence line that marks the existing channel right of way and the construction would be done from inside the channel as described for Area 1. The wall heights would be about 2.2 feet above the top of the channel bank. The Sky Footbridge and Riza Footbridge would be retrofitted with concrete infill walls and concrete aprons. Steiner Drive and Stockton Boulevard bridges would be retrofitted with concrete infill walls, concrete aprons, parapet walls, and drains.

Florin Creek. This reach of Florin Creek is an incised channel, and flood control measures would consist of sheetpile walls on both sides of the channel for a total of 7,000 linear feet. The wall would be placed inside the fence line that marks the existing channel right of way, and the construction would be done from inside the channel as described for Area 1. The wall heights

would be about 5.5 feet above the top of the channel bank. No bridges would be retrofitted in this area of the creek.

Restoration Work

Four areas of the Bufferlands were identified for restoration opportunities which are detailed on Map 1 of the *Proposal for Wetland, GGS, Riparian Scrub, and Vernal Pool Mitigation at SRWTP Bufferlands, dated January 2001*. These areas include Black Crown Lake, Upper Beach Lake West, Upper Beach Lake East, and Nicolaus Pond. Habitats proposed to be restored at these sites include riparian forest and oak woodland (59.2 acres), emergent marsh (1.1 acres), oak savannah and perennial grassland (138.5 acres), aquatic habitat (40.2 acres), and seasonal wetland (9.5 acres). Table 1 below shows the amount and habitat type to be restored at each restoration area.

Table 1. Amount, location, and type of habitat, to be restored for the South Sacramento County Streams Investigation Project.

Habitat Type	Black Crown Lake	Upper Beach Lake West	Upper Beach Lake East	Nicolaus Pond
Riparian Forest and Oak Woodland	24.9 Acres	6.9 Acres	20 Acres	7.4 Acres
Emergent Marsh	0.5 Acre	n/a	n/a	0.6 Acre
Oak Savannah and Perennial Grassland	29 Acres	63 Acres	37.5 Acres	9 Acres
Aquatic Habitat	24 Acres	n/a	n/a	16.2 Acres
Seasonal Wetland	n/a	n/a	n/a	9.5 Acres

Restoration activities would occur on a total of 248.5 acres in the Bufferlands. Restoration activities would include planting, installation of large woody debris, installation of nesting structures, and construction of a water control structure. All ground disturbing restoration work in potential giant garter snake habitat would begin after May 1 and end on or before October 1.

Prior to seeding of native grasses, the soil would be prepared by discing, mowing, burning (optional), and herbicide application. These measures were designed to reduce competition with broadleaf weeds and annual grasses. These measures would be implemented 3 to 12 months prior to seeding of native grasses. Discing would be done to a depth of 4 to 6 inches, and all herbicides and burning plans would be government-approved. Site preparation in currently vegetated areas would consist of mowing, hand weeding, and spot herbicide applications. The native grass seed would be installed using a trux drill seeder. In areas where slope or soils are not conducive to drill seeding, seeding would be accomplished by hand or mechanically

broadcast followed by harrowing. Straw mulch would then be applied to prevent erosion. Native grasses would be seeded prior to the installation of woody and herbaceous plants.

The woody and herbaceous plantings would include both pole cuttings and container plants. Native grasses would be seeded prior to the installation of woody and herbaceous plants by broadcasting, hydroseeding, and/or drilling the seed. Woody and upland herbaceous plantings would have 3-foot diameter water basins and irrigation systems. The plants would be installed in augured or hand dug planting pits ranging in size from 2 to 4 feet deep and 1 to 2 feet in diameter.

Large woody debris would be installed in designated areas around Nicolaus Pond and Black Crown Lake. The material used for the installation of large woody debris would consist of dead trees that have washed in during the flood events at the Bufferlands. Ground excavation and helical anchors would be used to secure the large woody debris. All excavated areas would be seeded with native grasses after installation is complete. Nesting structures would be located in each of the restoration areas and would be mounted on galvanized poles or wood posts at heights of 4 to 20 feet.

A new water control structure would be constructed at Nicolaus Pond in order to allow active water level management. Controlling the pond's annual fluctuations would allow Bufferlands staff to better manage the existing seasonal wetlands and plant additional emergent marsh vegetation. About 200 to 250 feet would be excavated waterside of the control structure, and extra soil would be used to enhance giant garter snake upland habitat. All work associated with the water control structure would be done during the giant garter snake's active season. All excavated areas would be seeded with native grasses after installation is completed.

Restoration Maintenance

Project maintenance would generally include a 3-year maintenance establishment period performed by the installation contractor and long term monitoring would be done by Bufferland biologists. Native grass establishment maintenance would include reducing competition with broadleaf weeds, annual grasses, and other non natives by mowing, herbicide applications, and reseeded of native grasses. Maintenance in areas currently supporting healthy stands of native herbaceous vegetation would consist of mowing, hand weeding, and spot herbicide applications.

Maintenance for upland herbaceous and woody container plantings would consist of regular irrigations and hand weeding within individual water basins. Planting areas not meeting the minimum survival percentage outlined in the *Proposed Monitoring Plan for replacement Seasonal Wetlands, Emergent Marsh, Riparian Scrub, and Upland GGS Habitats Resulting from Impacts Associated with the Bradshaw Interceptor Project and North Beach Lake/SRWTP Levee Improvement project, dated August 2000*, would require the replacement of dead plants or plants in poor health. The contractor would be responsible for irrigation, maintenance and cleanliness of the project site. Maintenance for large woody debris would include preventing excessive

erosion and ensuring that the debris would remain secured in place. Nesting structures would be replaced or repaired if damaged and would be kept clean for the 3 year maintenance period.

Long term monitoring (5 to 10 years) would be conducted by Bufferlands biologists and would include monitoring plant survival and vigor along with overall success of the restoration. Plantings, large woody debris, and nesting structures would be replaced as needed. These restoration sites would remain in the Bufferlands established special status species monitoring program.

Corps' Proposed Conservation Measures

General

Giant garter snake restoration/replacement would be monitored for 5 years, and 4 monitoring reports would be provided to the Service. The first monitoring report would be done upon completion of the restoration/replacement, then yearly for the first 2 years, and a final report at year 5. Monitoring reports would include photo documentation, when the restoration/replacement was completed, what materials were used, and plantings. Recommendations for remedial actions would also be included.

Camray Borrow Site

Prior to any work at the borrow site, contractor worker awareness training by a Service approved biologist would be mandatory for a construction related personnel. If new construction personnel are added to the project, the contractor would ensure that the personnel would receive the mandatory training prior to starting work. Adverse effects to 3 elderberry shrubs (*Sambucus* spp.) at the borrow site would be avoided by installing orange mesh fencing 100 feet from the shrubs prior to beginning work at the site. Additionally, the borrow site and haul road through the borrow site would be watered one to three times daily to reduce dust. A speed limit of 15 miles per hour would be posted along the borrow site. The southern area of the borrow site would be surveyed this year for elderberry shrubs and beetle occupancy. The data acquired from the survey would then be provided to the Service.

Activities Along the Haul Route

1. The haul route would be watered one to three times daily to reduce dust. At no time would the water be sprayed within the dripline of elderberry plants in order to avoid attracting Argentine ants.
2. During a part of the beetle's active season, from April 15 to June 15, no hauling activities would occur.
3. A 15 mph speed limit would be posted at the haul route and borrow site.

elderberry or
all?

Mr. Tom Cavanaugh

4. Concrete "K" rails, about 3 to 4 feet high, would be installed adjacent to shrubs on the haul route.
5. For impacts to the elderberry shrubs at 0 to 5 feet away from the disturbance the Corps would implement the Service's July 9, 1999, *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Guidelines).
6. For impacts to elderberry shrubs at 5 to 25 feet away from the disturbance, the Service's Guidelines would be implemented without transplantation of the affected plants.
7. For impacts to elderberry shrubs at 25 to 100 feet away from the disturbance, the Service's Guidelines would be implemented at 1/2 the ratios without transplantation of the affected plants.
8. An information database would be created and site specific monitoring of the elderberry shrubs and beetle populations would be conducted. Prior to construction activities, baseline monitoring for noise, vibration, and airborne dust would be conducted within elderberry habitats along the haul road. Noise would be measured twice a day using a noisemeter; vibration would be measured twice a day using a ground vibration monitor and dust would be measured using airborne particulate monitor. Measurements would be taken from ground level up to 20 feet in height. Data would be gathered and compared with and without concrete "K" rails in place. During the 6-month construction period, monitoring for noise, vibration, and airborne dust would be done once every two weeks. Monitoring would also be done post construction once a year for 3 years and be entered into a database. The monitoring plan would include objectives, specific number and locations of measurements, database formulation, results and conclusions.

Upper Basin

The standard avoidance and minimization measures for the giant garter snake would be included in the project for work in the upper basin to avoid any adverse effects to giant garter snakes and their habitat.

North Beach Lake Levee

For impacts to elderberry plants at 0 to 5 feet away from the disturbance, the Corps has proposed to implement the Service's Guidelines and transplant the elderberry plants. However, for impacts to elderberry plants from 5 to 100 feet away from the disturbance, the Corps has proposed to use Service Guidelines without transplantation of the affected plants. The standard avoidance and minimization measures for the giant garter snake will be included in the project for work in the upper basin to avoid any adverse effects to giant garter snakes and their habitat. Compensation for vernal pool impacts was determined using the programmatic agreement for

vernal pool species (preservation at a non bank site 3:1= 2.25 acres, creation at a bank site 1:1= 0.75 acre).

SRWTP - Advanced Unauthorized Work

Compensation for the advanced unauthorized work was determined by the Service in the May 7, 1998 letter to SAFCA and confirmed in a February 9, 1999 meeting with the Service. The Corps and SAFCA will create 1.6 acres of giant garter snake aquatic habitat and preserve 3.2 acres of upland snake habitat as the settlement for the past direct effects to the snake. In addition, the Corps and SAFCA will preserve of 4.1 acres of vernal pool habitat and purchase 2.08 acres of vernal pool creation credits as the settlement for the past direct effect to vernal pool crustaceans.

Restoration Work

- All earth disturbing activities would be conducted during the giant garter snake's active season between May 1 and October 1.
- All construction-related personnel would attend worker awareness training prior to work starting. The training would be done by a biologist approved by the Service and will include species such as the vernal pool fairy shrimp, vernal pool tadpole shrimp, beetle, and the giant garter snake.
- All work areas that have been identified as potential giant garter snake habitat would be surveyed for snakes 24 hours prior to construction activities and again if a lapse in construction activity of 2 weeks or greater has occurred.
- All construction equipment would adhere to the posted 15-mph speed limit.
- In work areas adjacent to water, work would begin at the farthest point from the water, gradually working towards the water to allow any giant garter snakes to escape to aquatic habitat.

Conservation Area

The Corps has proposed to combine the giant garter snake wetland creation and upland compensation for both the proposed work at the North Beach Lake levee and the unauthorized work already constructed at the SRWTP. The compensation would be constructed at the SRWTP bufferlands as described in the *Proposal for Wetland, Giant Garter Snake, Riparian Scrub, and Vernal Pool Mitigation at SRWTP Bufferlands, dated January 2001*.

The compensation plan proposal for the Bufferlands includes the creation of 0.71 acre of seasonal wetlands, 0.23 acre of emergent marsh, 1.6 acres of giant garter snake aquatic habitat, 3.2 acres of giant garter snake upland habitat, and 0.19 acre of riparian habitat. The

compensation would be located at two locations at the Bufferlands, the Fishhead Lake complex near Franklin Boulevard and/or an area near Laguna Creek 1/4 mile north of Fishhead Lake. The compensation for the South Sacramento Streams County Streams Investigation project would be combined with similar compensation needs for seasonal wetlands, and giant garter snake upland preservation associated with the Sacramento Regional County Sanitation District's Bradshaw Interceptor project. Therefore, the compensation complex at the Bufferlands would include a total of 2.15 acres of seasonal wetlands, 0.23 acre of emergent marsh, 1.6 acres of giant garter snake aquatic habitat creation, 7.1 acres of giant garter snake upland habitat preservation, and 0.19 acre of riparian habitat.

The vernal pool compensation for the unauthorized work at the SRWTP (2.08 acres creation, and 4.1 acres preservation) would be accomplished as follows. On May 18, 2000, SAFCA purchased 2.08 acres of vernal pool creation credits from Conservation Resources, LLC. Additionally, 4.1 acres of vernal pool habitat would be preserved at the Bufferlands. The proposed preservation location of vernal pool habitat would be the Sims Field Vernal Pool Complex located north of Sims Road and west of Franklin Road in Sacramento County.

Status of the Species and Environmental Baseline

Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

A final rule was published in the **Federal Register** on September 19, 1994, (U. S. Fish and Wildlife Service 1994) to list vernal pool fairy shrimp as threatened and vernal pool tadpole shrimp as endangered under the Act. Additional information on the life history and ecology of these animals may be found in the final rule, Eng *et al.* (1990), Simovich *et al.* (1992), Helm (1998), and Witham *et al.* (1998). Vernal pool fairy shrimp are restricted to vernal pools, swales, and other seasonal wetlands in California and southern Oregon. Vernal pool tadpole shrimp are restricted to similar habitats in California's Central Valley and San Francisco Bay area.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp have delicate elongate bodies; large, stalked, compound eyes; no hard shell (i.e., no carapace); and 11 pairs of swimming legs. Typically less than 1 inch long, they swim or glide gracefully upside-down by means of complex, wavelike beating movements while feeding on algae, bacteria, protozoa, rotifers, and detritus. Female vernal pool fairy shrimp carry eggs in a pear-shaped, ventral brood sac until the eggs are either dropped or sink to the pool bottom with the female when she dies. The "resting" or summer eggs are known as cysts. The cysts which remain after pools dry are able to withstand heat, cold, and prolonged desiccation. When pools refill in the same or subsequent seasons, some, but not all, of the cysts may hatch, resulting in a cyst bank in the soil that may include cysts from several breeding seasons (Donald 1983). Vernal pool fairy shrimp develop rapidly and may become sexually mature within two weeks after hatching (Gallagher 1996, Helm 1998). Such quick maturation permits fairy shrimp populations to persist in short-lived, shallow bodies of water (Simovich *et al.* 1992).

Vernal pool fairy shrimp inhabit alkaline pools, ephemeral drainages, rock outcrop pools, ditches, stream oxbows, stock ponds, vernal pools, vernal swales, and other seasonal wetlands (Helm 1998). Occupied habitats range in size from rock outcrop pools as small as nine square feet to large vernal pools up to 11 acres; the potential ponding depth of occupied habitat ranges from 1.2 inches to 48 inches. The vernal pool fairy shrimp has been collected from early December to early May. Known populations of vernal pool fairy shrimp in California extend from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County and along the central coast range from northern Solano County to Pinnacles National Monument in San Benito County. Several additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County, one in the mountain grasslands of northern Santa Barbara County, one on the Santa Rosa Plateau in Riverside County, and one near Rancho California in Riverside County. Additional populations occur in southern Oregon.

Vernal pool tadpole shrimp

Vernal pool tadpole shrimp have large, shield-like carapaces that cover most of their body; dorsal, compound eyes; and a pair of long cercopods, one on each side of a flat caudal plate, at the end of their last abdominal segment. With a carapace typically less than 1 inch long, vernal pool tadpole shrimp are primarily bottom-dwelling animals that move with legs down while feeding on detritus and living organisms, including fairy shrimp and other invertebrates (Pennak 1989). Females deposit eggs on vegetation or other objects on the pool bottom. Although some eggs may hatch quickly, others remain dormant as cysts to hatch during later rainy seasons (Ahl 1991). When winter rains refill inhabited wetlands, tadpole shrimp reestablish from dormant cysts and may become sexually mature within three to four weeks after hatching (Ahl 1991, Helm 1998). Reproductively mature adults may be present in pools until the habitats dry up in the spring (Ahl 1991, Simovich *et al.* 1992, Gallagher 1996). Vernal pool tadpole shrimp inhabit alkaline pools, clay flats, ditches, freshwater marshes, stream oxbows, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands (Helm 1998). Occupied habitats range in size from vernal pools as small as two square meters to large vernal lakes up to 89 acres; the potential ponding depth of occupied habitat ranges from 1.5 inches to 59 inches.

Vernal pool tadpole shrimp populations occur in the Central Valley in California, ranging from east of Redding in Shasta County south to Tulare County, and a vernal pool complex located on the San Francisco Bay National Wildlife Refuge in the City of Fremont, Alameda County.

The vernal pool fairy shrimp and tadpole shrimp are ecologically dependent on seasonal fluctuations in their habitat, such as absence or presence of water during specific times of the year, durations of inundation, and other environmental factors that include specific salinity, conductivity, dissolved solids, and pH levels. Water chemistry is one of the most important factors in determining the distribution of fairy shrimp and tadpole shrimp (Belk 1977, Simovich *et al.* 1992). The genetic characteristics of these species, and ecological conditions, such as watershed continuity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools (Fugate 1992). Therefore, the most accurate indication of

the distribution and abundance of these species is the number of inhabited vernal pool complexes. Individual vernal pools occupied by these species are most appropriately referred to as subpopulations. The pools and, in some cases, pool complexes supporting these species are usually small. Man-caused and unforeseen natural catastrophic events such as long-term drought, non-native predators, off-road vehicles, pollution, berming, and urban development, threaten their extirpation at some sites.

The primary historical dispersal method for the vernal pool tadpole shrimp and vernal pool fairy shrimp may have been large-scale flooding resulting from winter and spring rains which allowed the animals to colonize different individual vernal pools and other vernal pool complexes. This dispersal mechanism may no longer function in some areas due to the construction of dams, levees, and other flood control measures, and widespread urbanization within significant portions of the range of this species. Waterfowl and shorebirds are now considered the primary dispersal agents for vernal pool tadpole shrimp and vernal pool fairy shrimp (Brusca and Brusca 1992, Simovich *et al.* 1992). The eggs of these crustaceans are either ingested (Krapu 1974, Swanson *et al.* 1974, Driver 1981, Ahl 1991) and/or adhere to the legs and feathers where they are transported to new habitats.

The status of the vernal pool tadpole shrimp and the vernal pool fairy shrimp in the action area of south Sacramento County has been greatly affected by land conversions to agriculture and urban developments. Existing vernal pool habitats within the area are highly degraded and fragmented by construction of many subdivisions and agriculture land conversions, especially to vineyards in the more recent years. Conservation strategies for the area have resulted in small isolated preserves which often are not functioning as the highly integrated vernal pool complexes which are necessary for the dispersal of genetic material between pools. Tadpole shrimp are known to inhabit the two largest seasonal wetlands on the project site.

Environmental Baseline

The listed vernal pool crustaceans are imperiled by habitat loss caused by a variety of human-caused activities, primarily urban development, water supply/flood control projects, and conversion of land to agricultural use. Only a small proportion of the habitat of these species is protected from these threats. Holland (1978) estimated that between 60 and 85 percent of the habitat that once supported vernal pools, the endemic habitat of the vernal pool fairy shrimp, had been destroyed by 1973. In the ensuing years, a substantial amount of remaining habitat has been converted for human uses. Rapid urbanization of the Central Valley of California currently poses the most severe threat to the continued existence of the listed vernal pool crustaceans.

The habitat of the listed vernal pool crustaceans is highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated vernal pool crustacean populations. Ecological theory predicts that such populations will be highly susceptible to extinction due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986; Goodman 1987a,b). If an

extinction event occurs in a population that has been fragmented, the opportunities for recolonization are thought to be greatly reduced due to physical (geographical) isolation from other (source) populations.

The proposed project is located in the Southeastern Sacramento Valley Vernal Pool Region, one of 17 vernal pool regions in the State of California defined by the California Department of Fish and Game in the California Vernal Pool Assessment Preliminary Report (Keeler-Wolf *et al.* 1998). Of these regions, it is the most threatened by development. The regions were identified according to biological, geomorphological, and soils information. According to the report, "One of the primary assumptions is that these regions are ecologically distinct and that they encompass the full range of variability of vernal pools and species in the state" (Keeler-Wolf *et al.* 1998).

The Southeastern Sacramento Valley Vernal Pool Region contains almost 15% of the remaining vernal pool grasslands in the State of California, and supports 35% of the known occurrences of the vernal pool fairy shrimp documented in the California Natural Diversity Database. Of the projects authorized by the Service to take vernal pool fairy shrimp and vernal pool tadpole shrimp since the species were federally listed in 1994 to 2000, almost 80% (121 projects) were located within this region. These projects resulted in the loss of more than 37,500 acres of vernal pool grasslands, out of a total of almost 56,000 acres of uplands containing vernal pool fairy shrimp and vernal pool tadpole shrimp habitat.

Sacramento County has vernal pools that occur on three different geological landforms; low terrace, high terrace, and volcanic mudflows. Soil series that support vernal pools include San Joaquin, and Hedge (low terrace), Corning, Fiddymont, Red Bluff, and Redding (high terrace), and Pentz-Haldseville (volcanic mudflow). The project site occurs on the San Joaquin soils series, a low terrace formation; it occurs inside the Urban Services Boundary (USB) of Sacramento County. Of the total 793 acres of low terrace vernal pools in Sacramento County, approximately 358 acres are inside the USB and 435 acres of low terrace vernal pools are outside the USB. The low terrace pools are second in number to high terrace vernal pools which total 1,103 acres in Sacramento County. Volcanic mudflow pools occupy 179 acres in Sacramento County and 140 acres of vernal pools are situated on a small variety of other lands forms.

Developments within the Sacramento County have resulted in both direct and indirect impacts to vernal pools, and have contributed to the loss of vernal pool fairy shrimp and vernal pool tadpole shrimp populations. Although the reduction of federally listed vernal pool crustacean populations has not been quantified, the acreage of lost habitat continues to grow. General and Specific Plans for the Sacramento area have identified significant, unavoidable impacts to biological communities, including elimination of vernal pools, intermittent drainages and other seasonal wetlands. Despite these impacts, city and county governments continue to implement development projects within the area. A habitat conservation plan (HCP) for South Sacramento County has been discussed and funded inadequately and irregularly since 1994, but completion of the HCP is not currently envisioned due to funding shortfalls.

Valley Elderberry Longhorn Beetle

The beetle was listed as a threatened species under the Act on August 8, 1980 (45 FR 52803). Critical habitat for the species was designated and published at 50 CFR §17.95. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the beetle. Critical habitat for this species has been designated along the lower American River at Goethe and Ancil Hoffman parks (American River Parkway Zone) and at the Sacramento Zone, an area about a half mile from the American River downstream from the American River Parkway Zone. In addition, an area along Putah Creek, Solano County, and the area west of Nimbus Dam along the American River Parkway, Sacramento County, are considered essential habitat, according to the Valley Elderberry Longhorn Beetle Recovery Plan (Service 1984). These areas support large numbers of mature elderberry shrubs with extensive evidence of use by the beetle.

The beetle is dependent on its host plant, elderberry, which is a locally common component of the remaining riparian forests and savannah areas and, to a lesser extent, the mixed chaparral-foothill woodlands of the Central Valley. Use of the elderberry shrubs by the animal, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just prior to the pupal stage. Observations made within elderberry shrubs along the Cosumnes River and in the Folsom Lake area indicate that larval galleries can be found in elderberry stems with no evidence of exit holes; the larvae either succumb prior to constructing an exit hole or are not far enough along in the developmental process to construct an exit hole. Larvae appear to be distributed in stems which are 1.0 inch or greater in diameter at ground level. The *Valley Elderberry Longhorn Beetle Recovery Plan* (Service 1984) and Barr (1991) contain further details on the beetle's life history.

Population densities of the beetle are probably naturally low (Service 1984); and it has been suggested, based on the spatial distribution of occupied shrubs (Barr 1991), that the beetle is a poor disperser. Low density and limited dispersal capability cause the beetle to be vulnerable to the negative effects of the isolation of small subpopulations due to habitat fragmentation.

When the beetle was listed as threatened, the species was known from less than 10 localities along the American River, the Merced River, and Putah Creek. By the time the *Valley Elderberry Longhorn Beetle Recovery Plan* was issued, additional species localities had been found along the American River and Putah Creek. As of 1998, the California Natural Diversity Database (CNDDDB) included 181 occurrences for this species in 44 drainages throughout the Central Valley, from a location along the Sacramento River in Shasta County, southward to an area along Caliente Creek in Kern County (CNDDDB 1998). The beetle continues to be threatened by habitat loss and fragmentation, predation by Argentine ants (*Linepithema humile*), and possibly other factors such as pesticide drift, non-native plant invasion, and grazing.

The following paragraphs analyze the effects of past and ongoing factors leading to the current status of the species, its habitat and ecosystem, throughout the species' range. They include an

analysis of impacts from projects that have received incidental take authorization for the beetle since the species was listed, and an evaluation of conservation efforts aimed at minimizing these impacts, based on the best available information.

Habitat loss has been ranked as the single greatest threat to biodiversity in the United States (Wilcove *et al.* 1998). In the 1980 final rule to list the beetle as threatened, habitat destruction was cited as the primary factor contributing to the need to federally list the species. As stated in the final rule, by the time the species was listed its habitat had largely disappeared throughout much of its former range due to agricultural conversion, levee construction, and stream channelization. The 1984 recovery plan reiterated that the primary threat to the beetle was loss and alteration of habitat by agricultural conversion, grazing, levee construction, stream and river channelization, removal of riparian vegetation, riprapping of shoreline, plus recreational, industrial and urban development (Service 1984).

Riparian forests, the primary habitat for the beetle, have been severely depleted throughout the Central Valley over the last two centuries as a result of expansive agricultural and urban development (Katibah 1984, Thompson 1961, Roberts *et al.* 1977). Since colonization, these forests have been "...modified with a rapidity and completeness matched in few parts of the United States" (Thompson 1961). As of 1849, the rivers and larger streams of the Central Valley were largely undisturbed. They supported continuous bands of riparian woodland four to five miles in width along some major drainages such as the lower Sacramento River, and generally about two miles wide along the lesser streams (Thompson 1961). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line (Katibah 1984). A large human population influx occurred after 1849, however, and much of the Central Valley riparian habitat was rapidly converted to agriculture and used as a source of wood for fuel and construction to serve a wide area (Thompson 1961). By as early as 1868, riparian woodland had been severely impacted in the Central Valley, as evidenced by the following excerpt:

This fine growth of timber which once graced our river [Sacramento], tempered the atmosphere, and gave protection to the adjoining plains from the sweeping winds, has entirely disappeared - the woodchopper's axe has stripped the river farms of nearly all the hard wood timber, and the owners are now obliged to rely upon the growth of willows for firewood. (Cronise 1868, *in* Thompson 1961).

The clearing of riparian forests for fuel and construction made this land available for agriculture (Thompson 1977). Natural levees bordering the rivers, once supporting vast tracts of riparian habitat, became prime agricultural land (Thompson 1961, 1977). As agriculture expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping further reduced riparian habitat to small, isolated fragments (Katibah 1984). In recent decades, these riparian areas have continued to decline as a result of ongoing agricultural conversion as well as urban development and stream channelization. As of 1989, there were over 100 dams within the Central Valley drainage basin, as well as thousands of

miles of water delivery canals and streambank flood control projects for irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and recreation (Frayer *et al.* 1989). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths currently measurable in yards rather than miles.

Some accounts state that the Sacramento Valley supported approximately 775,000 to 800,000 acres of riparian forest as of approximately 1848, just prior to statehood (Smith 1977, Katibah 1984). No comparable estimates are available for the San Joaquin Valley. Based on early soil maps, however, more than 921,000 acres of riparian habitat are believed to have been present throughout the Central Valley under pre-settlement conditions (Katibah 1984). Another source estimates that of approximately 5,000,000 acres of wetlands in the Central Valley in the 1850s, approximately 1,600,000 acres were riparian wetlands (Warner and Hendrix 1985, Frayer *et al.* 1989).

California Department of Fish and Game (CDFG) riparian vegetation distribution map illustrates that by 1979, about 102,000 acres of riparian vegetation was remaining in the Central Valley. This represents a decline in acreage of approximately 89% as of 1979 (Katibah 1984). More extreme figures were given by Frayer *et al.* (1989), who reported that woody riparian forests in the Central Valley had declined to 34,600 acres by the mid-1980s (from 65,400 acres in 1939). Although these studies have differing findings in terms of the number of acres lost (most likely explained by differing methodologies), they attest to a dramatic historic loss of riparian habitat in the Central Valley. As there is no reason to believe that riparian habitat suitable to the beetle (occupied by elderberry shrubs) would be destroyed at a different rate than other riparian habitat, we can assume that the rate of loss for beetle habitat in riparian areas has been equally dramatic.

A number of studies have focused on riparian loss along the Sacramento River, which supports some of the densest known populations of the beetle. Approximately 98% of the middle Sacramento River's historic riparian vegetation was believed to have been extirpated by 1977 (McGill 1979). The State Department of Water Resources estimated that native riparian habitat along the Sacramento River from Redding to Colusa decreased from 27,720 acres to 18,360 acres (34%) between 1952 and 1972 (McGill 1979, Conrad *et al.* 1977). The average rate of riparian loss on the middle Sacramento River was 430 acres per year from 1952 to 1972, and 410 acres per year from 1972 to 1977. In 1987, riparian areas as large as 180 acres were observed converted to orchards along this river (McCarten and Patterson 1987).

Barr (1991) examined 79 sites in the Central Valley supporting beetle habitat. When 72 of these sites were re-examined by researchers in 1997 (Collinge *et al.* 2001), seven no longer supported beetle habitat. This represents a decrease in the number of sites with beetle habitat by approximately nine percent in six years. There is no comparable information on the historic loss of non-riparian beetle habitat such as elderberry savanna and other vegetation communities where elderberry occurs (oak or mixed chaparral-woodland, or grasslands adjacent to riparian habitat). However, all natural habitats throughout the Central Valley have been heavily impacted within the last 200 years (Thompson 1961), and we can therefore assume that non-riparian beetle habitat

also has suffered a widespread decline. This analysis focuses on loss of riparian habitat because the beetle is primarily dependent upon riparian habitat. Adjacent upland areas are also likely to be important for the species, but this upland habitat typically consist of oak woodland or elderberry savanna bordering willow riparian habitat (Barr 1991). The riparian acreage figures given by Frayer *et al.* (1989) and Katibah (1984) included the oak woodlands concentrated along major drainages in the Central Valley, and therefore probably included lands we would classify as upland habitat for the beetle adjacent to riparian drainages.

Between 1980 and 1995, the human population in the Central Valley grew by 50%, while the rest of California grew by 37%. The Central Valley's population was 4.7 million by 1999, and it is expected to more than double by 2040. The American Farmland Trust estimates that by 2040 more than 1 million cultivated acres will be lost and 2.5 million more put at risk (Ritter 2000). With this growing population in the Central Valley, increased development pressure is likely to result in continuing loss of riparian habitat.

While habitat loss is clearly a large factor leading to the species' decline, other factors are likely to pose significant threats to the long term survival of the beetle. Only approximately 20% of riparian sites with elderberry observed by Barr (1991) and Collinge *et al.* (2001) support beetle populations (Barr 1991, Collinge *et al.* 2001). Jones and Stokes (1988) found 65% of 4,800 riparian acres on the Sacramento River to have evidence of beetle presence. The fact that a large percentage of apparently suitable habitat is unoccupied suggests that the valley elderberry longhorn beetle is limited by factors other than habitat availability, such as habitat quality or limited dispersal ability.

Destruction of riparian habitat in central California has resulted not only in a loss of acreage, but also in habitat fragmentation. Fahrig (1997) states that habitat fragmentation is only important for habitats that have suffered greater than 80% loss. Riparian habitat in the Central Valley, which has experienced greater than 90% loss by most estimates, would meet this criterion as habitat vulnerable to effects of fragmentation. Existing data suggests that beetle populations, specifically, are affected by habitat fragmentation. Barr (1991) found that small, isolated habitat remnants were less likely to be occupied by beetles than larger patches, indicating that beetle subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge *et al.* (2001) consistently found beetle exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated shrubs do not typically provide long-term viable habitat for this species. Local populations of organisms often undergo periodic colonization and extinction, while the metapopulation (set of spatially separated groups of a species) may persist (Collinge 1996).

Habitat fragmentation can be an important factor contributing to species declines because; (1) it divides a large population into two or more small populations that become more vulnerable to direct loss, inbreeding depression, genetic drift, and other problems associated with small populations; (2) it limits a species' potential for dispersal and colonization; and (3) it makes

habitat more vulnerable to outside influences by increasing the edge:interior ratio (Primack 1998). These factors, as they relate to the beetle, are discussed below.

Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer 1981, Lande 1988, Primack 1998). While a large area may support a single large population, the smaller subpopulations that result from habitat fragmentation may not be large enough to persist over a long time period. As a population becomes smaller, it tends to lose genetic variability through genetic drift, leading to inbreeding depression and a lack of adaptive flexibility. Smaller populations also become more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors.

Species that characteristically have small population sizes, such as large predators or habitat specialists, are more likely to become extinct than species that typically have large populations (Primack 1998). Also, a species with low population density (few individuals per unit area) tends to have only small populations remaining if its habitat is fragmented. Populations of species that naturally occur at lower density become extinct more rapidly than do those of more abundant species (Bolger *et al.* 1991). The species may be unable to persist within each fragment, and gradually die out across the landscape.

The beetle, a specialist on elderberry plants, tends to have small population sizes, and to occur in low densities (Barr 1991, Collinge *et al.* 2001). Collinge *et al.* (2001) compared resource use and density of exit holes between the beetle and a related subspecies, the California elderberry longhorn beetle (*Desmocerus californicus californicus*). The beetle tended to occur in areas with higher elderberry densities, but had lower exit hole densities than the California elderberry longhorn beetle. With extensive riparian habitat loss and fragmentation, these naturally small populations are broken into even smaller, isolated populations. Once a small population has been extirpated from an isolated habitat patch, the species may be unable to re-colonize this patch if it is unable to disperse from nearby occupied habitat.

Insects with limited dispersal and colonization abilities may persist better in large habitat patches than small patches because small fragments may be insufficient to maintain viable populations and the insects may be unable to disperse to more suitable habitat (Collinge 1996). Studies suggest that the beetle is unable to re-colonize drainages where the species has been extirpated, because of its limited dispersal ability (Barr 1991; Collinge *et al.* 2001). Huxel and Hastings (1999) used computer simulations of colonization and extinction patterns for the beetle based on differing dispersal distances, and found that the short dispersal simulations best matched the 1997 census data in terms of site occupancy. This data suggests that in the natural system dispersal and, thus, colonization is limited to nearby sites. At spatial scales greater than 10 kilometers, such as across drainages, beetle occupancy appears to be strongly influenced by regional extinction and colonization processes, and colonization is constrained by limited dispersal (Collinge *et al.* 2001). Except for one occasion, drainages examined by Barr that were occupied in 1991 remained occupied in 1997 (Collinge *et al.* in 2001). The one exception was Stoney Creek, which was

occupied in 1991 but not in 1997. All drainages found by Barr (1991) to be unoccupied in 1991 were also unoccupied in 1997. This data suggests that drainages unoccupied by the beetle remain so.

Habitat fragmentation not only isolates small populations, but also increases the interface between habitat and urban or agricultural land, increasing negative edge effects such as the invasion of non-native species (Huxel 2000, Soule 1990) and pesticide contamination (Barr 1991). There are several edge effect-related factors that may be related to the decline of the beetle.

Recent evidence indicates that the invasive Argentine ant poses a risk to the long-term survival of the beetle. Surveys along Putah Creek found beetle presence where Argentine ants were not present or had recently colonized, and beetle absence from otherwise suitable sites where Argentine ants had become established (Huxel 2000). The Argentine ant has negatively impacted populations of other native arthropod species (Holway 1995; Ward 1987). Predation on eggs, larvae, and pupae are the most likely impacts these ants have on the beetle. In Portugal, Argentine ants have been found to be significant egg predators on the eucalyptus borer (*Phorocantha semipunctata*), a cerambycid like the beetle. Egg predation on the beetle could lead to local extirpations, as indicated by a population viability study suggesting that egg and juvenile mortality are significant factors affecting probability of extinction for the beetle (Huxel 2000, Collinge 2001). The Argentine ant has been expanding its range throughout California since its introduction around 1907, especially in riparian woodlands associated with perennial streams (Holway 1995, Ward 1987). Huxel (2000) states that, given the potential for Argentine ants to spread with the aid of human activities such as movement of plant nursery stock and agricultural products, this species may come to infest most drainages in the Central Valley along the valley floor, where the beetle is found.

Direct spraying and drift of pesticide, including herbicides and/or insecticides, in or near riparian areas (which is done to control mosquitos, crop diseases, invasive and/or undesirable plants, or other pests) is likely to adversely affect the beetle and its habitat. Although there have been no studies specifically focusing on the effects of pesticides on the beetle, the beetle is likely to be adversely affected by pesticides since pesticides often affect numerous non target invertebrate species. As of 1980, the prevalent land use adjacent to riparian habitat in the Sacramento Valley was agriculture, even in regions where agriculture was not generally the most common land use (Katibah *et al.* 1984), therefore, the species is likely vulnerable to pesticide contamination from adjacent agricultural practices. Recent studies of major rivers and streams documented that 96% of all fish, 100% of all surface water samples and 33% of major aquifers contained one or more pesticides at detectable levels (Gilliom 1999). Pesticides were identified as one of the 15 leading causes of impairment for streams included on the Federal Water Pollution Control Act, as amended (Clean Water Act), section 303(d) lists of impaired waters. As the beetle occurs primarily in riparian habitat, the contamination of rivers and streams affects this species and its habitat. Pesticides have been identified as one of a number of potential causes of pollinator species' declines and declines of other insects beneficial to agriculture (Ingraham *et al.* 1996);

therefore it is likely that the beetle, typically occurring adjacent to agricultural lands, has suffered a decline due to pesticides.

Competition from invasive non-native plants such as giant reed (*Arundo donax*) negatively affects riparian habitat supporting the beetle. It has an extensive root system allowing it to resprout rapidly after any disturbance and out-compete native riparian vegetation. Giant reed also introduces a frequent fire cycle into the riparian ecosystem, disrupting natural riparian dynamics and eventually forming homogenous climax communities. The extent to which giant reed has affected elderberry specifically, however, has not been studied.

Grazing by livestock damages or destroys elderberry plants and inhibits regeneration of seedlings. Cattle readily forage on new growth of elderberry, which may explain the absence of beetles at manicured elderberry stands (Service 1984). Habitat fragmentation exacerbates problems related to non-native species invasion and cattle grazing by increasing the edge-to-interior ratio of habitat patches, facilitating the penetration of these influences.

All of the above effects to the species has resulted in a dramatic reduction to species numbers. A search of the CNDDDB shows that there are a total of 20 occurrences in Sacramento County. Of the 20 occurrences in Sacramento County, 20 are presumed extant.

Giant Garter Snake

The Service published a proposal to list the giant garter snake as an endangered species on December 27, 1991 (56 FR 67046). The Service reevaluated the status of the snake before adopting the final rule. The snake was listed as a threatened species on October 20, 1993 (58 FR 54053).

Description

The giant garter snake is one of the largest garter snakes and may reach a total length of at least 64 inches (160 centimeters). Females tend to be slightly longer and proportionately heavier than males. The weight of adult female snakes is typically 1.1-1.5 pounds (500-700 grams). Dorsal background coloration varies from brownish to olive with a checkered pattern of black spots, separated by a yellow dorsal stripe and two light-colored lateral stripes. Background coloration and prominence of a black-checkered pattern and the three yellow stripes are geographically and individually variable (Hansen 1980). The ventral surface is cream to olive or brown and sometimes infused with orange, especially in northern populations.

Historical and Current Range

This species formerly occurred throughout the wetlands that were extensive and widely distributed in the Central Valley. Fitch (1941) described the historical range of the snake as extending from the vicinity of Sacramento and Contra Costa Counties southward to Buena Vista

Lake, near Bakersfield, in Kern County. Prior to 1970, the snake was recorded historically from 17 localities (Hansen and Brode 1980). Five of these localities were clustered in and around Los Banos, Merced County. The paucity of information makes it difficult to determine precisely the species' former range. Nonetheless, these records coincide with the historical distribution of large flood basins, fresh water marshes, and tributary streams. Destruction of wetlands for agriculture and other purposes apparently extirpated the species from the southern one-third of its range by the 1940s -1950s, including the former Buena Vista Lake and Kern Lake in Kern County, and the historic Tulare Lake and other wetlands in Kings and Tulare Counties (Hansen and Brode 1980, Hansen 1980). Surveys over the last two decades have found the snake as far north as the Butte Basin in the Sacramento Valley. As recently as the 1970s, the range of the snake extended from near Burrell, Fresno County (Hansen and Brode 1980), northward to the vicinity of Chico, Butte County (Rossman and Stewart 1987).

Essential Habitat Components

Endemic to wetlands in the Sacramento and San Joaquin valleys, the snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields, and the adjacent uplands. The snake feeds on small fishes, tadpoles, and frogs (Fitch 1941, Hansen 1980). Essential habitat components consist of: (1) wetlands with adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (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 uplands for escape cover (vegetation, burrows) and underground refugia (crevices and small mammal burrows) (Hansen 1980).

Reproductive Ecology

The breeding season extends through March and April, and females give birth to live young from late July through early September (Hansen and Hansen 1990). Brood size is variable, ranging from 10 to 46 young, with a mean of 23 (Hansen and Hansen 1990). At birth young average about 20.6 cm snout-vent length and 3-5 grams. Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own. Although growth rates are variable, young typically more than double in size by one year of age, and sexual maturity averages three years in males and five years for females (58 **FR** 54053).

Movements and Habitat Use

The snake typically inhabits small mammal burrows and other soil crevices throughout its winter dormancy period (November to mid-March). The snake also uses burrows as refuge from extreme heat during their active period. While the snakes usually remain in close proximity to wetland habitats, the Biological Resource Division (BRD) has documented snakes using burrows as much as 165 feet (50 meters) away from the marsh edge to escape extreme heat (Wylie *et al.*

1997). Overwintering snakes have been documented to use burrows as far as 820 feet (250 meters) from the edge of marsh habitat. Snakes typically select south- and west-facing burrows as hibernacula (58 FR 54053).

In studies of marked snakes in the Natomas Basin, snakes moved about 0.25 to 0.5 mile per day (Hansen and Brode 1993). However, total activity varies widely between individuals, and individual snakes have been documented moving up to 5 miles (8 kilometers) over the period of a few days in response to dewatering of habitat (Wylie *et al.* 1997). In agricultural areas, snakes were documented using rice fields in 19-20 percent of the observations, marsh habitat in 20-23 percent of observations, and canal and agricultural waterway habitats in 50-56 percent of the observations (Wylie 1999). Telemetry studies have also shown that active snakes use uplands extensively—more than 31 percent of observations were in uplands (Wylie 1999). Almost all snakes observed in uplands during the active season were near vegetative cover, where cover exceeded 50 percent in the area within 0.5 m (1.6 ft) of the snake; less than 1 percent of observations were of snakes in uplands with less than 50 percent cover nearby (Wylie 1999).

Reasons for Decline and Threats to Survival

The current distribution and abundance of the snake is much reduced from former times. Loss of habitat due to agricultural activities and flood control have extirpated the snake from the southern one third of its range in former wetlands associated with the historic Buena Vista, Tulare, and Kern lakebeds. These lakebeds once supported vast expanses of ideal snake habitat, consisting of cattail and bulrush dominated marshes. Vast expanses of bulrush and cattail floodplain habitat also typified much of the Sacramento Valley historically (Hinds 1952). Prior to reclamation activities beginning in the mid to late 1800s, about 60 percent of the Sacramento Valley was subject to seasonal overflow flooding in broad, shallow flood basins that provided expansive areas of snake habitat (Hinds 1952). Valley floor wetlands are subject to the cumulative effects of upstream watershed modifications, water storage and diversion projects, as well as urban and agricultural development; all natural habitats have been lost and an unquantifiable but small percentage of semi-natural wetlands remain extant. Only a small percentage of extant wetlands currently provide habitat suitable for the snake.

Ongoing maintenance of aquatic habitats for flood control and agricultural purposes eliminate or prevent the establishment of habitat characteristics required by snakes and can fragment and isolate available habitat, prevent dispersal of snakes among habitat units, and adversely affect the availability of the garter snake's food items (Hansen 1988, Brode and Hansen 1992). In many areas, the restriction of suitable habitat to water canals bordered by roadways and levee tops renders snakes vulnerable to vehicular mortality. Fluctuation in rice and agricultural production affects stability and availability of habitat. Recreational activities, such as fishing, may disturb snakes and disrupt basking and foraging activities. Nonnative predators, including introduced predatory gamefish, bullfrogs (*Rana catesbeiana*), and domestic cats (*Felis catus*) also threaten snake populations. While large areas of seemingly suitable snake habitat exist in the form of duck clubs and waterfowl management areas, water management of these areas typically does not

provide the summer water needed by snakes. Although snakes on national wildlife refuges are relatively protected from many of the threats to the species, degraded water quality continues to be a threat to the species both on and off refuges. A number of land use practices and other human activities currently threaten the survival of the snake throughout the remainder of its range. Although some snake populations have persisted at low levels in artificial wetlands associated with agricultural and flood control activities, many of these altered wetlands are now threatened with urban development.

Status with Respect to Recovery

The draft recovery plan for the snake subdivided its historic range into four recovery units (Service 1999). These are: (1) the Sacramento Valley unit, extending from the vicinity of Red Bluff south to the confluence of the Sacramento and Feather Rivers; (2) the Mid-Valley unit, extending from the American and Yolo Basins south to Duck Creek near the City of Stockton; (3) the San Joaquin Valley unit, extending south from Duck Creek to the Kings River; and (4) the South Valley unit, extending south of the Kings River to the Kern River Basin. Portions of Mid-Valley recovery unit are within the action area.

The Sacramento Valley Recovery Unit at the northern end of the species' range is known to support relatively large, stable populations of the snake. This unit contains three populations (Butte Basin, Colusa Basin, and Sutter Basin) and a large amount of suitable habitat, in protected areas on state refuges and refuges of the Sacramento National Wildlife Refuge (NWR) Complex in the Colusa and Sutter Basins, and along waterways associated with rice farming (Service 1999).

The Mid-Valley Recovery Unit, directly to the south of the Sacramento Valley Recovery Unit, includes seven populations: American Basin, Yolo Basin–Willow Slough, Yolo Basin–Liberty Farms, Sacramento Area, Badger Creek/Willow Creek, Caldoni Marsh, and East Stockton. The status of the seven snake populations in the Mid-Valley Recovery Unit is very uncertain. The East Stockton population may be extirpated, and is not considered recoverable as a result of urban encroachment into habitat (Service 1999). Five of the remaining six populations within the recovery unit are very small, highly fragmented and isolated, and, except for the Badger Creek/Willow Slough population, are also threatened by urbanization. This latter population is within a small isolated area. Within the Mid-Valley unit, only the American Basin population supports a sizeable snake population which is dependent largely upon rice lands.

The remaining two recovery units are located to the south in the San Joaquin Valley, where the best available data indicate that the snake's status is precarious. The San Joaquin Valley Recovery Unit contains three historic snake populations: North and South Grasslands; Mendota Area; and Burrel/Lanare Area (Service 1999). This recovery unit formerly supported large snake populations, but numbers have declined severely in recent decades, and recent survey efforts indicate numbers are very low compared to Sacramento Valley populations.

No surviving snake populations are known from the fourth recovery unit, the South Valley Recovery Unit, at the southern end of the snake's historic range; this unit includes only extirpated populations, including the historic but lost Tulare and Buena Vista lakes.

The draft recovery criteria require multiple, stable populations within each of the four recovery units, with subpopulations well-connected by corridors of suitable habitat. Currently, only the Sacramento Valley Recovery Unit, at the northern end of the species' range, is known to support relatively large, stable populations. Habitat corridors connecting populations or subpopulations, even for the Sacramento Valley Recovery Unit, are not present and/or protected.

In 1994, the BRD (then the National Biological Survey) began a study of the life history and habitat requirements of the snake in response to an interagency request from the Service. Since April of 1995, the BRD has further documented occurrences of snakes within some of the known populations. The BRD has studied snake subpopulations at the Sacramento and Colusa NWRs within the Colusa Basin, at Gilsizer Slough within the Sutter Basin, the Badger Creek area of the Cosumnes River Preserve within the Badger Creek-Willow Creek area, and the Natomas area within the American Basin (Wylie *et al.* 1997, Wylie 1999). These subpopulations represent the largest known extant subpopulations. With the exception of the American Basin, these subpopulations are largely protected from many of the threats to the species. Outside of these protected areas, snakes in these populations are still subject to all the threats identified in the final listing rule. The remaining nine populations identified in the final rule are distributed discontinuously in small isolated patches and are vulnerable to extirpation by stochastic environmental, demographic, and genetic processes. The 13 extant populations are largely isolated from each other, with any dispersal corridors between them limited and not protected. When small populations are extirpated, the recolonization is unlikely in most cases, given the isolation from larger populations and the lack of dispersal corridors between them.

Environmental Baseline

Surveys over the last two decades have located the giant garter snake as far north as the Butte Basin in the Sacramento Valley. Currently, the Service recognizes 13 separate populations of giant garter snake, with each population representing a cluster of discrete locality records. The 13 extant population clusters largely coincide with historical riverine flood basins and tributary streams throughout the Central Valley (Hansen 1980, Brode and Hansen 1992): (1) Butte Basin, (2) Colusa Basin, (3) Sutter Basin, (4) American Basin, (5) Yolo Basin-Willow Slough, (6) Yolo Basin-Liberty Farms, (7) Sacramento Basin, (8) Badger Creek-Willow Creek, (9) Caldoni Marsh, (10) East Stockton-Diverting Canal and Duck Creek, (11) North and South Grasslands, (12) Mendota, and (13) Burrell-Lanare. These populations span the Central Valley from just southwest of Fresno (Burrell-Lanare) north to Chico (Hamilton Slough). The 11 counties where the giant garter snake is still presumed to occur are: Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo.

Since April of 1995, the BRD has further documented occurrences of giant garter snakes within some of the 13 populations identified in the final rule. The BRD has studied populations of giant garter snakes at the Sacramento and Colusa National Wildlife Refuges within the Colusa Basin, at Gilsizer Slough within the Sutter Basin, and at the Badger Creek area of the Cosumnes River Preserve within the Badger Creek-Willow Creek area. These populations, along with the American Basin population of giant garter snakes represent the largest extant populations. With the exception of the American Basin, these populations are largely protected from many of the threats to the species. Outside of these protected areas, giant garter snakes in these population clusters are still subject to all threats identified in the final rule. The remaining nine population clusters identified in the final rule are distributed discontinuously in small isolated patches and are vulnerable to extirpation by stochastic environmental, demographic, and genetic processes. All 13 population clusters are isolated from each other with no protected dispersal corridors. Opportunities for recolonization of small populations which may become extirpated is unlikely given the isolation from larger populations and lack of dispersal corridors between them.

The current distribution and abundance of the giant garter snake is much reduced from former times. Agricultural and flood control activities have extirpated the giant garter snake from the southern one third of its range in former wetlands associated with the historic Buena Vista, Tulare, and Kern lakebeds. These lakebeds once supported vast expanses of ideal giant garter snake habitat, consisting of cattail and bulrush dominated marshes. Vast expanses of bulrush and cattail floodplain habitat also typified much of the Sacramento Valley historically (Hinds 1952). Prior to reclamation activities beginning in the mid to late 1800s, about 60 percent of the Sacramento Valley was subject to seasonal overflow flooding in broad, shallow flood basins that provided expansive areas of giant garter snake habitat (Hinds 1952). Valley floor wetlands are subject to the cumulative effects of upstream watershed modifications, water storage and diversion projects, as well as urban and agricultural development; all natural habitats have been lost and an unquantifiably small percentage of seminatural wetlands remain extant. Only a small percentage of extant wetlands currently provides habitat suitable for the giant garter snake.

The giant garter snake currently is only known from a small number of populations. The status of these populations and the threats to these snakes and their habitats are detailed in the final rule that listed the giant garter snake as threatened (58 FR 54053). A number of land use practices and other human activities currently threaten the survival of the giant garter snake throughout the remainder of its range. Although some giant garter snake populations have persisted at low levels in artificial wetlands associated with agricultural and flood control activities, many of these altered wetlands are now threatened with urban development. Cities within the current range of the giant garter snake that are rapidly expanding include: (1) Chico, (2) Yuba City, (3) Sacramento, (4) Galt, (5) Stockton, (6) Gustine, and (7) Los Banos.

There are ten records of the giant garter snake within 5 miles of the proposed project area in the California Natural Diversity Data Base.

Effects of the Proposed Action

The proposed project’s effects on general fish and wildlife resources, federally listed species and the proposed compensation for project impacts are summarized in Table 2 below.

Table 2. General habitat project effects and proposed compensation for the South Sacramento County Streams Investigation Project.

Cover Type and Location	Project Effects	Proposed Compensation
Upper Basin		
Morrison Creek Riparian Scrub-shrub Seasonal Wetland (creek channel non-snake habit) Upland Agriculture	temporary losses* temporary losses* temporary losses* 1.8 acres	0.71 acre seasonal wetland** 0.71 acre seasonal wetland** none proposed none proposed
Elder Creek Seasonal wetland (creek channel) Upland	temporary losses* temporary losses*	0.71 acre seasonal wetland** none proposed
Florin Creek Seasonal wetland (creek channel) Upland	temporary losses* temporary losses*	0.71 acre seasonal wetland** none proposed
Lower Basin		
North Beach Lake Levee Riparian scrub shrub Agriculture Farmed wetland (vernal pool species assumed present) Upland giant garter snake refugia	0.11 acre 8.6 acres 0.75 acre temporary disturbance	0.19 acre riparian scrub-shrub none proposed preservation of 2.25 acres at a non-bank site) and creation of 0.75 acres of vernal pools at a bank site standard avoidance and minimization measures
Treatment Plant Emergent marsh (non-snake habitat) Vernal pool Upland/Agricultural Giant garter snake habitat	0.23 acre 1.04 acres 4.2 acres 1.6 acres	0.23 acre of emergent marsh preservation of 4.1 acres and creation of 2.08 acres of vernal pool*** none proposed creation of 1.6 acres of aquatic habitat and preserve 3.2 acres of upland
Bufferlands Restoration Areas Giant garter snake habitat	4.9 acres	9.5 acres of seasonal wetland preserved 1.1 acre of emergent marsh created
Total	18.33	

*=temporary loss of seasonal wetland loss and riparian scrub-shrub in the upper basin creeks totaled, 0.71 AAHU's.

**=0.71 acre of seasonal wetland mitigation was constructed at the Bufferlands in 2000.

***=vernal pool creation credits purchased by SAFCA on May 18, 2000.

Vernal Pool Tadpole and Vernal Pool Fairy Shrimp

The proposed project would result in the fill of 0.75 acre of vernal pool crustacean habitat at the North Beach Lake Levee site. As a result of the advanced unauthorized work at the Treatment Plant, an additional 1.04 acres of vernal pool crustacean habitat was filled. No adverse effects would occur to both vernal pool species as a result of the restoration work. However, compensation for project impacts would benefit both species with the preservation of 6.35 acres of vernal pool habitat under a conservation easement at the Sims Field Vernal Pool Complex and the purchase of 2.83 acres of vernal pool creation credits at a Service approved conservation bank.

Valley Elderberry Longhorn Beetle

The proposed action may adversely affect all beetles inhabiting 72 elderberry shrubs that contain at least one stem measuring 1.0 inch or greater in diameter at ground level in the project area. Any beetle larvae occupying these plants may be directly affected when the seven shrubs are removed.

Transplantation of elderberry shrubs that are or could be used by beetle larvae may adversely affect the beetle. Beetle larvae may be killed or the beetles' life cycle may be interrupted during or after the transplanting process. For example:

1. Transplanted elderberry shrubs may experience stress or become unhealthy due to changes in soil, hydrology, microclimate, or associated vegetation. This may reduce their quality as habitat for the beetle, or impair their production of quality stems in the future.
2. Elderberry shrubs may die as a result of transplantation.
3. Branches containing larvae may be cut, broken, or crushed as a result of the transplantation process.

No adverse effects to the beetle would occur as a result of the restoration work as all construction activity would be greater than 100 feet away from any elderberry shrubs. However, the restoration work would increase habitat for the beetle by including 27.4 acres of riparian habitat mixed with elderberry shrubs. Planting additional native species at the conservation area may serve to attract the beetle. Using local natives may increase the colonization rate for the beetle, because the beetle may have evolved characteristics that select for a specific species of local elderberry or other specific local native riparian species. Recent studies by Longcore *et al.* (1997) have found that some species of native insects may be killed or unable to use plant species from different geographic areas, even when they are native species, because different plant populations may contain varying amounts of chemicals, some of which may be toxic to herbivorous insects. Thus, only locally collected native plant species should be used for restoration or other activities

that are intended to benefit the beetle.

Giant Garter Snake

As a result of the unauthorized work, 1.6 acres of potential giant garter snake habitat was permanently eliminated. Project construction and restoration activities would permanently impact 4.9 acres of suitable giant garter snake upland habitat. Construction activities associated with the proposed restoration activities such as mowing or discing, may cause temporary disturbance to giant garter snake habitat. Additional impacts include trapping of snakes by erosion control matting, and accidental release of deleterious fluids (Stuart *et al.* 2001). The temporary disturbance of suitable giant garter snake habitat (9.8 acres) may also cause incidental take of the snake. The avoidance and minimization measures identified above should reduce or avoid effects to the giant garter snake. The restoration work will result in the permanent loss of giant garter snake upland basking habitat from the conversion of stream and lake edge habitat into riparian and shaded riverine aquatic habitat. The loss of submerged and shoreline vegetation will reduce the amount of cover subjecting giant garter snakes to a greater likelihood of predation, if appropriate shoreline vegetation is not replanted. Appropriate shoreline vegetation can provide cover, foraging, basking, and other behaviors. Upland plants can provide a buffer between the water and human activities such as walking or fishing, disturbed soils that are not replanted quickly may provide optimum soil conditions for colonization by yellow star thistle (*Centaurea solstitialis*). Star thistle can form a dense impenetrable barrier that may preclude giant garter snakes from moving through. Overall, the restoration work would benefit the giant garter snake by providing 9.5 acres of improved seasonal wetland habitat and the creation of 1.1 acres of emergent marsh habitat.

Cumulative Effects

Cumulative effects are those impacts of future State, Tribal, county, local agency, and private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section, because they require a separate consultation pursuant to section 7 of the Act. Our agency is aware of other projects currently under review by State, county, and local authorities where biological surveys have documented the occurrence of the federally proposed or listed species. These projects include such actions as urban expansion, water transfer projects that may not have a Federal nexus, and continued agricultural development. The cumulative effects of these known actions pose a significant threat to the eventual recovery of these species.

An undetermined number of future land use conversions and routine agricultural practices are not subject to Federal permitting processes and may alter the habitat or increase incidental take of vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, giant garter snakes and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) unpredictable fluctuations in aquatic habitat due to water management; (2) dredging and clearing vegetation from irrigation canals; (3) discing or mowing upland habitat; (4)

increased vehicular traffic on access roads adjacent to aquatic habitat; (5) use of burrow fumigants on levees and other potential upland refugia; (6) human intrusion into habitat; (7) diversion of water; and (8) rip rapping or lining of canals and stream banks.

Conclusion

After reviewing the current status of the vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, giant garter snake, the environmental baseline for the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of these four species. The action area is outside the designated critical habitat area for the beetle, therefore none will be destroyed or adversely modified. No critical habitat has been designated for the vernal pool fairy shrimp, vernal pool tadpole shrimp, or the giant garter snake; therefore, none will be affected or adversely modified.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4 (d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. 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 the Service 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 the Service 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. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and the section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take**Vernal Pool Tadpole and Vernal Pool Fairy Shrimp**

The Service expects that incidental take of vernal pool crustaceans will be difficult to detect or quantify for the following reasons: the cryptic nature of the organisms and the relatively small body size make the finding of a dead specimen unlikely, the secretive nature of the species, losses may be masked by seasonal fluctuations in numbers or other causes, and the species occurs in habitat that makes them difficult to detect. Due to the difficulty in quantifying the number of individuals that will be taken as a result of the proposed action, the Service is quantifying take incidental to South Sacramento County Streams Investigation Project as the amount of habitat that will become unsuitable or less suitable for the species as a result of the action.

Vernal pool crustacean habitat totaling 0.75 acre will become unsuitable as a result of the direct impacts from the construction of the proposed project. The Service has developed this Incidental Take Statement based on the premise that the proposed conservation measures and the reasonable and prudent measures will be implemented. Upon implementation of the proposed conservation measures and the reasonable and prudent measures, incidental take in the form of killing or harm of all vernal pool crustaceans inhabiting 0.75 acre of vernal pools, associated with South Sacramento County Streams Investigation will become exempt from the prohibitions described under section 9 of the Act.

Valley Elderberry Longhorn Beetle

The Service expects that incidental take of the beetle will be difficult to detect or quantify. The cryptic nature of this species and its relatively small body size make the finding of an injured or dead specimen unlikely. The species occurs in habitats that make them difficult to detect. Due to the difficulty in quantifying the number of beetles that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of beetles inhabiting elderberry stems greater than one inch in diameter at ground level. Take is further described in terms of the host plant's occupancy by beetles, and by the riparian or upland location of the shrub.

Upon implementation of the Corps proposed conservation measures and the reasonable and prudent measures, the Corps may incidentally take all beetles inhabiting the 146 elderberry stems greater than one inch in diameter at ground level, on 72 elderberry shrubs (see Appendix 1), and will become exempt from the prohibitions described under section 9 of the Act.

Giant Garter Snake

The Service anticipates that incidental take of the snake will be difficult to detect or quantify for the following reasons: giant garter snakes are cryptically colored, secretive, and known to be sensitive to human activities. Snakes may avoid detection by retreating to burrows, soil crevices, vegetation, or other cover. Individual snakes are difficult to detect at a distance. Most

close-range observations represent chance encounters that are difficult to predict. It is not possible to make an accurate estimate of the number of snakes that will be harassed, harmed or killed during construction activities (staging areas, work on canal banks, soil borrow areas, and vehicle traffic to and from borrow areas). In instances when take is difficult to detect, the Service estimates take in numbers of habitat acres lost or affected as a result of the action. Therefore, the Service anticipates that all giant garter snakes inhabiting 9.8 acres of giant garter snake habitat affected may be harassed, harmed, or killed by modification and degradation of habitat as a result of the proposed project. Additionally, all giant garter snakes inhabiting suitable habitat within 200 linear feet of the project will be harassed.

Upon implementation of the proposed conservation measures and the following reasonable and prudent measures, incidental take associated with the South Sacramento County Streams Investigation Project on these acres in the form of harm, harassment, or mortality to giant garter snake from habitat loss and disturbance will become exempt from the prohibitions described under section 9.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the vernal pool fairy shrimp, vernal pool tadpole shrimp, beetle, and the giant garter snake. The critical habitat for the beetle will not be adversely modified or destroyed by the proposed action. Critical habitat has not been proposed or designated for the vernal pool fairy shrimp, vernal pool tadpole shrimp or the giant garter snake; therefore, none will be adversely modified or destroyed.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of listed species:

1. The effects of habitat loss to vernal pool crustaceans from the proposed South Sacramento County Streams Investigation Project shall be minimized.
2. Minimize the effects of habitat loss and project impacts to the beetle and to elderberry shrubs (habitat) throughout the proposed project area.
3. Harassment, harm, or take of giant garter snakes during construction activities associated with implementing the South Sacramento County Streams Investigation Project shall be minimized.
4. Impacts of temporary and degradation of habitat of giant garter snakes shall be minimized and, to the greatest extent practicable, habitat restored to its pre-project condition. Temporal and permanent loss of habitat shall be compensated.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the Corps will ensure implementation of the following terms and conditions, which implements the reasonable and prudent measures described above. These terms and conditions are non-discretionary:

The following terms and conditions implement reasonable and prudent measure number one:

- Vernal Pool
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- a. The Corps shall implement the conservation measures described in the project description of pages 9-12 of this biological opinion.
 - b. Prior to ground breaking, the Corps will establish a conservation area in perpetuity as habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp through a Service- approved conservation easement, Service-approved management plan, and an endowment fund of sufficient amount to manage the conservation area in perpetuity.

The following terms and conditions implement reasonable and prudent measure number two:

- VELB*
- a. The Corps shall implement the conservation measures described in the project description of pages 9-12 of this biological opinion.
 - b. Prior to ground breaking, the Corps shall plant an additional 198 elderberry seedlings and 255 associated native species at the Bufferlands conservation area. To provide adequate area for these additional seedlings, the Corps shall secure a 1.67-acre conservation area for the beetle through a conservation easement.
 - c. The Corps shall comply with the Service's Guidelines and all of the proposed conservation measures.
 - d. Prior to ground breaking, the Corps shall transplant, between November 1 and February 15, the seven elderberry plants on the project site to the conservation area. The transplanted shall be in accordance with the Service's Guidelines. *may have to do this fall*
 - e. All plant stock shall consist of native California species collected from local sources within a ten (10) mile radius of the project site, unless otherwise approved by the Service.
 - f. Only certified weed-free straw/hay bales, if bales are used, shall be used for erosion control.
 - g. Prior to ground breaking the Corps shall establish the conservation area in perpetuity as habitat for the beetle through a Service-approved conservation easement, Service-approved management plan, and an endowment fund of sufficient size to manage the

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conservation area in perpetuity. The easement shall include land (buffer) 100 feet away from any elderberry plants within the conservation area.

GGG The following terms and conditions implement reasonable and prudent measure number three:

- a. Construction activity within giant garter snake habitat shall be conducted between May 1 and October 1.
- b. Between April 15 and October 1 any dewatered habitat must remain dry for at least 15 consecutive days prior to excavating or filling of the dewatered habitat.
- c. Construction personnel shall receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s). Proof of such training shall be submitted to the Service prior to start of construction. Include the Service file number 1-1-01-F-0043.
- d. Project area shall be surveyed by a Service-approved biologist for giant garter snake 24 hours prior to construction activities, and resurveyed if a lapse of two weeks or greater has occurred. The monitoring biologist shall have the authority to stop construction activities if a snake is encountered during construction until appropriate corrective measures have been completed or until the snake is determined to be unharmed. Snakes should be allowed to move away from the area on their own. Sightings will be immediately reported to the Service at (916) 414-6600.
- e. Plastic mono-filament, jute, or cord netting (erosion control matting) shall not be used for erosion control or other purposes at the project site as the giant garter snake may be entrapped or killed in it.

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GGG The following terms and conditions implement reasonable and prudent measure number four:

- a. To minimize and compensate for permanent loss of 1.6 acres of suitable snake habitat, the Corps will acquire 1.6 acres of giant garter snake aquatic habitat and 3.2 acres of giant garter snake upland habitat. In accordance with the Service's Giant Garter Snake Replacement and Restoration Guidelines, areas temporarily disturbed will be restored similar to that of adjacent or nearby habitats.
- b. Prior to ground breaking, the Corps will establish a conservation area in perpetuity as habitat for the giant garter snake through a Service-approved conservation easement, Service-approved management plan, and an endowment fund of sufficient size to manage the conservation area in perpetuity.
- c. Movement of heavy equipment to and from the project site shall be restricted to established roadways and haul routes to minimize habitat disturbance.

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- d. After completion of construction activities, any temporary fill and construction debris shall be removed and disturbed areas shall be restored to preproject conditions.] specs
- e. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.
- f. Prior to ground breaking, a Service-approved conservation easement will be placed on all open space preserve areas and all transitional open space within 100 feet of any avoided elderberry bush on the conservation area or areas. The easement(s) will include, but not be limited to, provisions and responsibilities of the permittee(s) for the protection of the vernal pool fairy shrimp, vernal pool tadpole shrimp, beetle, and giant garter snake including any future transfers of the easement or fee interest that may be anticipated.

The conservation easement will specify the purposes for which it is established (i.e., to maintain in perpetuity habitat for the vernal pool fairy shrimp, vernal pool tadpole shrimp, beetle, and the giant garter snake). The document will include a list of prohibited activities that are inconsistent with the maintenance of the preserves and the suitability of the remaining riparian habitats and associated wildlife corridors, including, but not limited to:

1. leveling, grading, or otherwise altering the existing topography, including the exploration for, or development of mineral extraction within the preserves;
2. landscaping, plowing, grazing, keeping domesticated livestock, or cultivation of the preserves;
3. activities that interfere with the natural hydrology of the preserves, including irrigation, excessive pumping of groundwater, manipulation or blockage of natural drainages, or placement of storm water drains within the preserves;
4. carrying out activities that may degrade water quality within the preserves and the watershed, including but not limited to: use of herbicides, pesticides, or rodenticides, or weed abatement activities within the preserve, and failure to adequately treat water entering the preserve from outside sources, such as roads and housing lots;
5. discharging, dumping, disposing, storing, placing or burning of any trash, refuse, rubbish, grass clippings, cuttings, debris, wastes, dredged or fill materials, lawn furniture, or recreational vehicles, within the preserves;
6. placement of any structures within the preserves;

7. building of any roads within the preserves;
8. operating, riding, or using off-road or motorized vehicles within the preserves;
9. killing, removal, alteration, or replacement of existing trees, shrubs, or other native vegetation within the preserves, or planting of non-native vegetation within or adjacent to the preserves;
10. direction of lighting into the preserves;
11. incompatible fire protection activities; and
12. any and all uses which may adversely affect the preserves.

After the conservation easement has been approved by the Service, a true copy of the recorded conservation easement shall be submitted to the Service within 30 days of its recordation.

- g. The Corps shall ensure compliance with the Reporting Requirements below and the Corps must provide the Service with annual reports to describe the progress of implementation of all commitments in the Conservation Measures and Terms and Conditions sections of this biological opinion. The first report is due January 31, the first year after groundbreaking, and annually thereafter until the ten year monitoring period has been completed.

Reporting Requirements

The Sacramento Fish and Wildlife Office is to be notified within three working days of the finding of any dead listed wildlife species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Chief, Endangered Species Division at (916) 414-6620.

The Corps must report to the Service immediately any information about take or suspected take of listed wildlife species not authorized in this opinion. The Corps must notify the Service within 24 hours of receiving such information. Notification must include the date, time, and location of the incident or the finding of a dead or injured animal. The Service contact is the Service's Law Enforcement Division at (916) 414-6660.

Any contractor or employee who during routine operations and maintenance activities inadvertently kills or injures a listed wildlife species must immediately report the incident to their representative. This representative must contact the California Department of Fish and Game immediately in the case of a dead or injured. The California Department of Fish and Game contact for immediate assistance is State Dispatch (916) 445-0045.

The U.S. Fish and Wildlife Service Regional Office in Portland, Oregon, must be notified immediately if any dead or sick listed wildlife species is found in or adjacent to pesticide-treated areas. Cause of death or illness, if known also should be conveyed to this office. The appropriate contact is Richard Hill (503) 231-6241.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1. The Corps should work with the Service to address significant, unavoidable environmental impacts approved by local agencies.
2. The Corps should assist the Service in the implementation of recovery efforts for the vernal pool fairy shrimp, vernal pool tadpole shrimp, beetle, and the giant garter snake.
3. The Corps should work with the Service to develop additional construction related effect studies on threatened and endangered species.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION-CLOSING STATEMENT

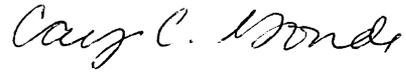
This concludes formal consultation on the South-Sacramento County Streams Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat designated that may be affected by the action; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Mr. Tom Cavanaugh

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If you have any questions regarding this biological opinion on the South Sacramento County Streams project, please contact Justin Ly of my staff at the letterhead address or at 916/414-6645.

Sincerely,



Cay C. Goude
Acting Field Supervisor

cc:

ARD (ES), Portland, OR

Corps of Engineers, Sacramento District, CA (attn: Jane Rinck)

California Department of Fish and Game, Region II, Rancho Cordova, CA

SAFCA, Sacramento, CA

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Appendix 1: Summary of Effects and required compensation for the proposed SSCI project.

Shrub	Stem Size Class			Location	Exit Holes	Conservation Requirements	
	1"-3"	>3-5"	>5"			Elderberry Seedlings	Native Plants
Camry-1	3	1	0	Upland	No	Avoided-0	Avoided-0
Camry-2	6	0	0	Upland	No	Avoided-0	Avoided-0
Camry-3	0	0	0	Upland	No	Avoided-0	Avoided-0
V3-1*	3	1	0	Upland	No	5	5
V3-2*	6	0	0	Upland	No	6	6
V3-3	0	0	0	Upland	No	0	0
T-1	3	0	0	Upland	No	3	3
T-2	0	0	0	Upland	No	0	0
T-3***	6	1	0	Upland	No	4	4
T-4	1	0	0	Upland	No	1	1
T-5	1	0	0	Upland	No	1	1
T-6	0	1	0	Upland	No	2	2
F-1	3	0	0	Upland	No	3	3
V10-1***	2	0	0	Riparian	No	2	2
V10-2***	1	0	0	Riparian	No	1	1
V10-3	2	1	0	Riparian	No	7	7
V10-4	5	0	1	Riparian	Yes	28	56
V10-5	0	0	0	Riparian	No	0	0
V10-6	0	0	1	Riparian	No	4	4
V10-7***	1	1	0	Riparian	No	2.5	2.5
V10-8	0	0	0	Riparian	No	0	0
V10-9	2	0	0	Riparian	No	4	4
V10-10	1	0	0	Riparian	No	2	2
V10-11***	2	0	0	Riparian	No	2	2
V10-12***	1	0	0	Riparian	No	1	1
V10-13	2	0	0	Riparian	No	4	4
V10-14***	4	0	0	Riparian	No	4	4
V10-15	1	0	0	Riparian	No	2	2
V10-16***	1	0	0	Riparian	No	1	1
V10-17***	2	1	0	Upland	Yes	4	8

V10-18***	2	0	1	Upland	No	2.5	2.5
V10-19***	0	0	1	Upland	Yes	3	6
V10-20***	0	1	0	Upland	No	1	1
V10-21***	1	1	0	Upland	No	1.5	1.5
V10-22***	0	0	0	Upland	No	0	0
V10-23	1	0	0	Upland	No	1	1
V10-24***	1	0	1	Upland	No	2	2
V10-25	0	0	1	Upland	No	3	3
V10-26***	0	1	0	Upland	Yes	2	4
V10-27***	2	1	0	Upland	Yes	4	8
V10-28***	0	0	1	Upland	No	1.5	1.5
V10-29***	0	0	1	Upland	No	1.5	2.5
V10-30***	1	1	0	Upland	Yes	3	6
V10-31***	0	0	1	Upland	No	1.5	1.5
V10-32***	2	0	1	Upland	No	2.5	2.5
V10-33***	6	0	0	Upland	No	3	3
V10-34***	2	2	0	Upland	Yes	6	12
V10-35***	3	0	1	Upland	Yes	6	12
V10-36***	3	0	1	Upland	No	3	3
V10-37***	0	0	1	Upland	No	1.5	1.5
V10-38***	1	0	0	Upland	No	0.5	0.5
V10-39	1	0	0	Upland	No	1	1
W-1*	3	1	0	Riparian	No	9	9
W-2*	1	0	0	Riparian	No	2	2
W-3*	0	0	0	Dead	Dead	0	0
W-4*	0	0	1	Riparian	No	4	4
W-5	2	0	0	Riparian	No	4	4
W-6	2	0	0	Riparian	No	4	4
V29-1	1	0	0	Upland	No	1	1
V29-2	2	0	0	Upland	No	2	2
V29-3	1	0	0	Upland	No	1	1
V31-1	2	0	0	Upland	No	2	2
V31-2	1	0	0	Upland	No	1	1
V31-3	0	0	1	Upland	No	3	3

V31-4***	4	0	0	Upland	No	4	4
V31-5***	1	1	0	Upland	No	3	3
V33-1***	2	0	0	Upland	No	2	2
V33-2***	0	0	0	Upland	No	0	0
V33-3***	0	1	0	Upland	No	2	2
V33-4***	0	1	0	Upland	No	2	2
V33-5***	4	1	0	Upland	No	6	6
NL-1*	1	0	0	Upland	No	1	1
Total	112	19	15	na	na	197.5**(198)	254.5**(255)

*Elderberry plants that will be transplanted.

**Fractional numbers were rounded up.

***Service Guidelines were halved.

APPENDIX G

COORDINATION ACT REPORT



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE COORDINATION ACT REPORT
FOR THE

**SOUTH
SACRAMENTO COUNTY STREAMS INVESTIGATION,
CALIFORNIA**

PREPARED FOR:
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT, CALIFORNIA

PREPARED BY:
SACRAMENTO FISH AND WILDLIFE OFFICE
SACRAMENTO, CALIFORNIA

JUNE 2002



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO:

June 24, 2002

Colonel Michael Conrad
District Engineer
Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

Dear Colonel Conrad:

Enclosed is the Fish and Wildlife Service's Fish and Wildlife Coordination Act report for the Corps of Engineers' South Sacramento County Streams Investigation, California. The contents of our report address the proposed flood control improvements and habitat restoration component of the proposed project.

Should you have any questions regarding this report, please contact Doug Weinrich of my staff at (916) 414-6563.

Sincerely,


Michael B. Hoover
Acting Field Supervisor

Enclosure

cc:

AES, Portland, OR
FWS, Stone Lakes NWR, Sacramento, CA
NMFS, Sacramento, CA
COE, Planning Division, Sacramento, CA (Attn: Dan Artho)
CDFG, Director, Sacramento, CA
CDFG, Reg. Mgr., Region II, Rancho Cordova, CA

EXECUTIVE SUMMARY

The Corps of Engineers (Corps) has completed a feasibility investigation to identify specific flood control problems and determine if there are feasible alternatives for solving these problems in the south portion of Sacramento County, California. The watercourses evaluated in the Corps' studies are Morrison Creek, Laguna Creek, Elder Creek, Florin Creek, Unionhouse Creek, and Strawberry Creek. In addition to reducing the risk of flooding and flood damages, the investigation contains objectives to provide ecosystem restoration.

Flood Damage Reduction

The Corps has determined there are feasible flood control improvements which could be made on Morrison Creek (including the North Beach Lake levee), Elder Creek, Florin Creek, Unionhouse Creek, and at the Sacramento Regional Wastewater Treatment Plant to increase flood protection.

Concurrent with the Corps' investigation, the Sacramento Area Flood Control Agency (SAFCA) and the Sacramento Regional County Sanitation District are proposing to construct levee improvements to provide a minimum of 100-year level flood protection for the southern portion of the City of Sacramento; Highway 160 south of the Sacramento city limits; and the Sacramento Regional Wastewater Treatment Plant. These local activities have been incorporated into the Corps' planning alternatives. Section 104 of the Water Resources Development Act of 1986 contains provisions where local interests can apply for credit against their share of the design and construction costs of a project for work carried out after the reconnaissance stage, as long as the work is consistent with the authorized plan. In June 1997, SAFCA completed construction of a ring levee around the treatment plant and has plans to construct improvements on the North Beach Lake levee in the future, possibly ahead of the Corps construction schedule. SAFCA's application for Section 104 credit was tentatively approved by the Corps in September 1996. For the environmental analysis of the Corps' construction alternatives, the study assumes preconstruction conditions for the treatment plant and the North Beach Lake levee.

The project objective of increasing flood protection in the study area would be accomplished by constructing new levees, retrofitting bridges, raising existing levees, and installing floodwalls or sheet pile walls on existing levees or incised channels.

These flood control measures were combined to form three structural alternatives to reduce flooding and flood damages in the study area. Alternative 1 (no action) describes the without-project conditions. Alternative 2 (National Economic Development (NED) plan) maximizes net benefits over costs. The objectives of Alternative 3 (consistent protection plan) are to provide a consistent level of flood protection in the study area, about a 1 in 200 annual event, and eliminate the national flood insurance requirements for structures threatened by high flows from streams in the study area. Alternative 4 (consistent high protection plan) objectives are to provide a high level of flood protection for the study area, about a 1 in 500 annual event, except for the treatment plant, and eliminate the national flood insurance requirements. In all three of the Corps' construction alternatives, the improvements proposed for the treatment plant and the North Beach Lake levee are the same. The only difference with the rest of the work is the height

of the proposed concrete floodwalls or sheetpile floodwalls. The construction footprint is the same in all alternatives.

The impacts of the flood control alternatives of the project on fish and wildlife resources were evaluated using Habitat Evaluation Procedures, best professional judgement, and existing mitigation guidelines for habitats which provide suitable habitat for listed threatened and endangered species, or species proposed for listing. The flood control improvements would have temporary impacts on about 376.61 acres and permanent impacts on about 16.98 acres as summarized by alternative in Table S-1.

The net change in habitat values, in terms of Average Annual Habitat Units and resulting compensation need is summarized in Table S-2. Compensation is currently planned in a mitigation bank which is being planned by SAFCA for future Sacramento County needs. The proposed site for the bank is about 107 acres in size and is located within the study area, just north of Morrison Creek and south of the town of Freeport. The total acreage needed for compensation for this project is 15.11 acres (the specific breakdown by habitat is shown in Table S-2. The Service fully supports the use of mitigation banks provided they are developed and managed in accordance with the Federal Mitigation Banking Guidelines dated December 1, 1995 (Federal Register, November 28, 1995, Volume 60, Number 228).

A biological opinion was issued to the Corps for this project on April 15, 2002. It was the Service's biological opinion that the flood control and restoration improvements are not likely to jeopardize the vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle or the giant garter snake.

Ecosystem Restoration

Ecosystem restoration opportunities for the project exist primarily in the buffer lands which surround the Sacramento Wastewater Treatment Plant. Cover-types in this area consist of agricultural, wetland, and annual grassland. An ecosystem restoration plan was developed by the Corps, Corps consultants, and treatment plant staff. Restoration would include the creation of emergent wetland, riparian woodland, valley oak woodland, savannah, and perennial grassland habitats. Appendix D contains a description of the alternative development and screening.

Table S-1. Summary of impacted areas by location for each flood control alternative of the South Sacramento County Streams Investigation.

Location/ Habitat Affected	Alternative 1 No Action	Alternative 2 Max. Net Benefits		Alternative 3 Consistent Protection		Alternative 4 Cons. High Protection	
		Temp. (acres)	Perm. (acres)	Temp. (acres)	Perm. (acres)	Temp. (acres)	Perm. (acres)
Morrison Creek							
Riparian Scrub-shrub	no change	0.62	0.00	0.62	0.00	0.62	0.00
Seasonal Wetland	no change	39.96	0.00	39.96	0.00	39.96	0.00
Annual Grassland	no change	54.78	0.00	64.78	0.00	64.78	0.00
Agriculture	some future loss	2.26	1.80	2.26	1.80	2.26	1.80
Elder Creek							
Seasonal Wetland	no change	9.69	0.00	9.69	0.00	9.69	0.00
Annual Grassland	no change	13.93	0.00	13.93	0.00	13.93	0.00
Florin Creek							
Seasonal Wetland	no change	5.76	0.00	5.76	0.00	5.76	0.00
Annual Grassland	no change	13.43	0.00	13.43	0.00	13.43	0.00
Unionhouse Creek							
Seasonal Wetland	no change	8.04	0.00	8.04	0.00	8.04	0.00
Annual Grassland	no change	24.52	0.00	24.52	0.00	24.52	0.00
North Beach Lake Levee							
Riparian Scrub-shrub	Some future loss	0.12	0.11	0.12	0.11	0.12	0.11
Agriculture	Some future loss	10.10	8.60	10.10	8.60	10.10	8.60
Farmed Wetland	Some future loss	0.00	0.75	0.00	0.75	0.00	0.75
	Some future loss						
	Some future loss						
Sacramento Regional Wastewater Treatment Plant							
Emergent Marsh	no change	0.00	0.16	0.00	0.16	0.00	0.16
Farmed Wetland	no change	0.00	1.03	0.00	1.03	0.00	1.03
Non-Jurisdictional Wet	no change	0.00	0.07	0.00	0.07	0.00	0.07
Annual Grass/Agric.	no change	106.40	4.20	106.40	4.20	106.40	4.20
Giant garter snake upland		0.00	1.60	0.00	1.60	0.00	1.60
Borrow Sites							
Agriculture	some future loss	87.00	0.00	87.00	0.00	87.00	0.00
TOTALS		396.01	18.32	396.01	18.32	396.01	18.32

Table S-2. Summary of net change in Average Annual Habitat Units and compensation need for each habitat impacted in the South Sacramento County Streams Investigation flood control alternatives.

LOCATION	HABITAT	AAHUs W/O PROJECT	AAHUs W/ PROJECT	NET CHANGE IN AAHUs	COMPENSATION NEED (acres)
North Beach Lake Levee	Rip. scrub-shrub	0.24	0.11	-0.13	0.13
	Annual grassland	---	---	---	re-seed
	Farmed wetland	n/a ¹	n/a	n/a	2.25 ²
Florin Creek	Seasonal wetland	4.44	4.38	-0.05	0.05
	Annual grassland	---	---	---	re-seed
Morrison Creek	Rip. scrub-shrub	0.66	0.61	-0.05	0.05
	Seasonal wetland	47.08	46.43	-0.64	0.64
	Annual grassland	---	---	---	re-seed
Elder Creek	Seasonal wetland	1.16	1.16	0.00	0.00
	Annual grassland	---	---	---	re-seed
Unionhouse Creek	Seasonal wetland	2.65	2.62	-0.03	0.03
	Annual grassland	---	---	---	re-seed
Borrow Sites	Agriculture	---	---	---	re-seed
	Agriculture	---	---	---	re-seed
Treatment Plant	Emergent marsh	0.13	0.01	-0.12	0.16
	Farmed wetland	n/a ¹	n/a	n/a	6.18 ²
	Non-jurisdictional wetland	0.01	0.01	0.00	0.07
	Ann. grassland/ Agriculture	---	---	---	re-seed
	Agriculture	---	---	---	re-seed
	Giant garter snake upland	n/a ¹	n/a	n/a	3.2 ³
	Giant garter snake aquatic	n/a ¹	n/a	n/a	1.6 ³
TOTAL:					
	Riparian scrub-shrub				0.18
	Seasonal wetland				0.72
	Farmed wetland ²				9.18
	Emergent marsh				0.16
	Non-Jurisd. wetland				0.07
	Annual grassland				re-seed
	Agriculture				re-seed
	Giant garter snake upland				3.20
	Giant garter snake aquatic				1.60

1. This habitat was not evaluated using HEP as it is assumed to provide suitable habitat for federally listed threatened and endangered species.
2. Compensation is a 6:1 ratio to compensate for the loss of vernal pool habitat at the treatment plant and 4:1 for loss of vernal pool habitat at the North Beach Lake Levee.
3. Compensation is a 3:1 ratio to compensate for the loss of upland giant garter snake habitat.

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INTRODUCTION

The South Sacramento County Streams Investigation, California addresses flooding problems on Morrison, Elder, Unionhouse, and Florin Creeks; the Sacramento Regional Wastewater Treatment Plant; and the North Beach Lake levee. In addition to reducing the risk of flooding and flood damages, the investigation contains objectives to provide ecosystem restoration components incidental to the flood control objective (Corps of Engineers 1998).

The study area lies within the Morrison Creek Watershed in south Sacramento County and includes a populated area in the southern portion of the City of Sacramento. Figures 1 and 2 show the overall study area and the 100-year flood plain in the south Sacramento area. Significant portions of the study area were flooded in 1952, 1955, 1958, 1962, 1963, 1982, 1986, and 1995. Local runoff from the Morrison Creek watershed causes some flooding due to limited channel capacities and bridge restrictions and contributes to the flood volume in the Beach-Stone Lakes area. The flows of February 1986 resulted from a 25-year peak flow on Morrison Creek, which combined with unusually high water levels in the Beach-Stone Lakes, caused extensive backwater in the study area.

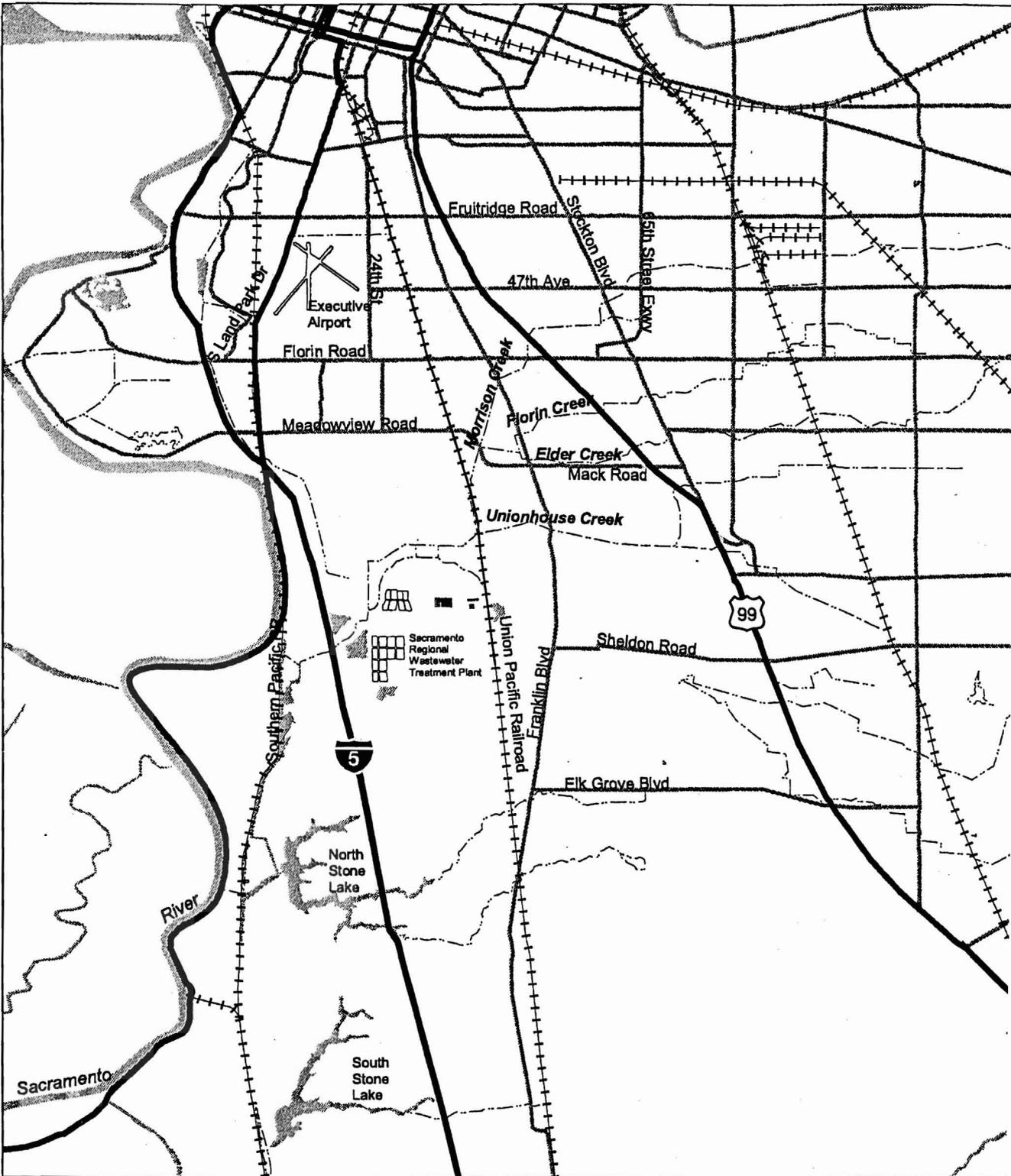
In January 1995, intense rainfall in the watershed resulted in record flows on some creeks in the study area. Overbank flows occurred on Morrison Creek at Center Parkway, Florin Road, and upstream of Highway 99. Overbank flows also occurred on Florin Creek at Center Parkway, and Unionhouse Creek between Center Parkway and Franklin Boulevard. Most damage was caused by severe interior flooding due to intense local showers, clogged drains, and failure of interior drainage pumps. Flow stage was at, or near, the top of the bank or levee on nearly all streams.

The January 1997 regional flood event did not severely test the study area levees and channels. Although the Cosumnes River had record peak flows, the highest stage reached in the Beach-Stone Lakes area did not threaten the treatment plant or the North Beach Lake levee. In addition, the upper portion of the basin did not experience record rainfall.

DESCRIPTION OF THE AREA

The Morrison Creek watershed is sloped and drains into the Beach-Stone Lakes area. The watershed is drained by Morrison, Elder, Unionhouse, Florin, and Laguna Creeks, and smaller tributaries. The principle streams originate in the foothills of the Sierra Nevada while numerous small tributaries originate in the Sacramento Valley floor. All of these streams generally flow westward, and most join Morrison Creek in or near the City of Sacramento, on the west side of the basin. The Beach-Stone Lakes region is a low, flat area surrounded by levees which is frequently flooded. Floodwaters from the Mokelumne and Cosumnes Rivers are major contributors of floodwater to this area.

All of the streams in the Morrison Creek watershed are intermittent under natural conditions. However, many reaches of these streams now experience low summer flows from urban wastewater and agricultural runoff. Most of the streams in the study area have been straightened, channelized, and are maintained by either the City or County of Sacramento. Maintenance



4000 0 4000 8000 Feet

South Sacramento County
Streams Investigation
Figure 1
Study Area

June 1997

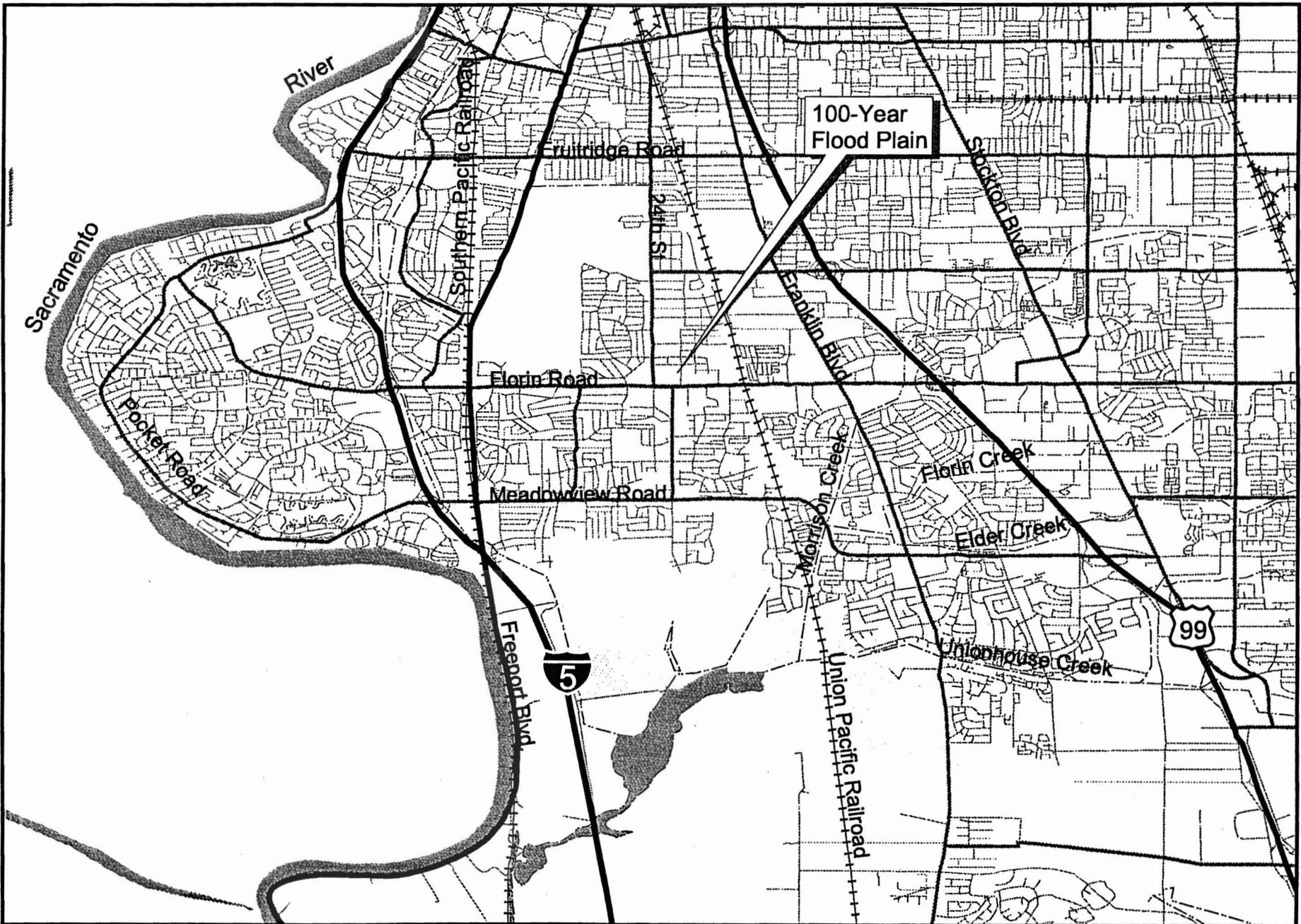


Figure 2. 100-Year Floodplain.

High water in the Beach-Stone Lakes area backs into the lower reaches of these streams causing streamflows to slow and rise. Ring levees have been constructed to protect the Sacramento Regional Wastewater Treatment Plant and a levee has been built on the north side of lower Morrison Creek to protect the urban area of south Sacramento from these backwaters.

DESCRIPTION OF THE PROJECT

The project objective of increasing flood protection in the study area would be accomplished by constructing new levees, retrofitting bridges, raising existing levees, and installing floodwalls or sheet pile walls on existing levees or incised channels. The ecosystem restoration component involves restoring native habitats in the vicinity of the project.

FLOOD CONTROL ALTERNATIVES

The flood control measures described above were combined to form three structural alternatives to reduce flooding and flood damages in the study area. Alternative 1 (no action) describes the without-project conditions. Alternative 2 (NED plan) maximizes net benefits over costs. The objectives of Alternative 3 (consistent protection plan) are to provide a consistent level of flood protection in the study area, about a 1 in 200 annual event, and eliminate the national flood insurance requirements for structures threatened by high flows from streams in the study area. Alternative 4 (consistent high protection plan) objectives are to provide a high level of flood protection for the study area, about a 1 in 500 annual event, except for the treatment plant work which has already been constructed, and eliminating the national flood insurance requirements.

The formulation of these alternatives was done using a risk-based approach. This strategy was developed for analyzing the reliability of the channel and the levee system and for developing and analyzing flood control alternatives. The risk-based approach groups areas with similar hydrologic, hydraulic, and economic characteristics together and then evaluates the area for economic feasibility.

The grouped areas are called index areas. Each index area has an index point, often the weak or low point of a levee or channel. For each index point there is a frequency-flow, flow-stage, and stage-damage relationship which is assigned to the entire index area. The potential flood control measures are evaluated in terms of the three relationships for each index area. Each index area has different hydrologic, hydraulic, and economic characteristics which can lead to different flood control measures and levels of protection being proposed for different index areas.

The index areas are shown in the study area shown in Figure 3 and are described below:

- Index Area 1 is the Pocket Area and the other parts of south Sacramento protected by the North Beach Lake levee.
- Index Area 2 is the Sacramento Regional Wastewater Treatment Plant which is protected by the treatment plant levees.

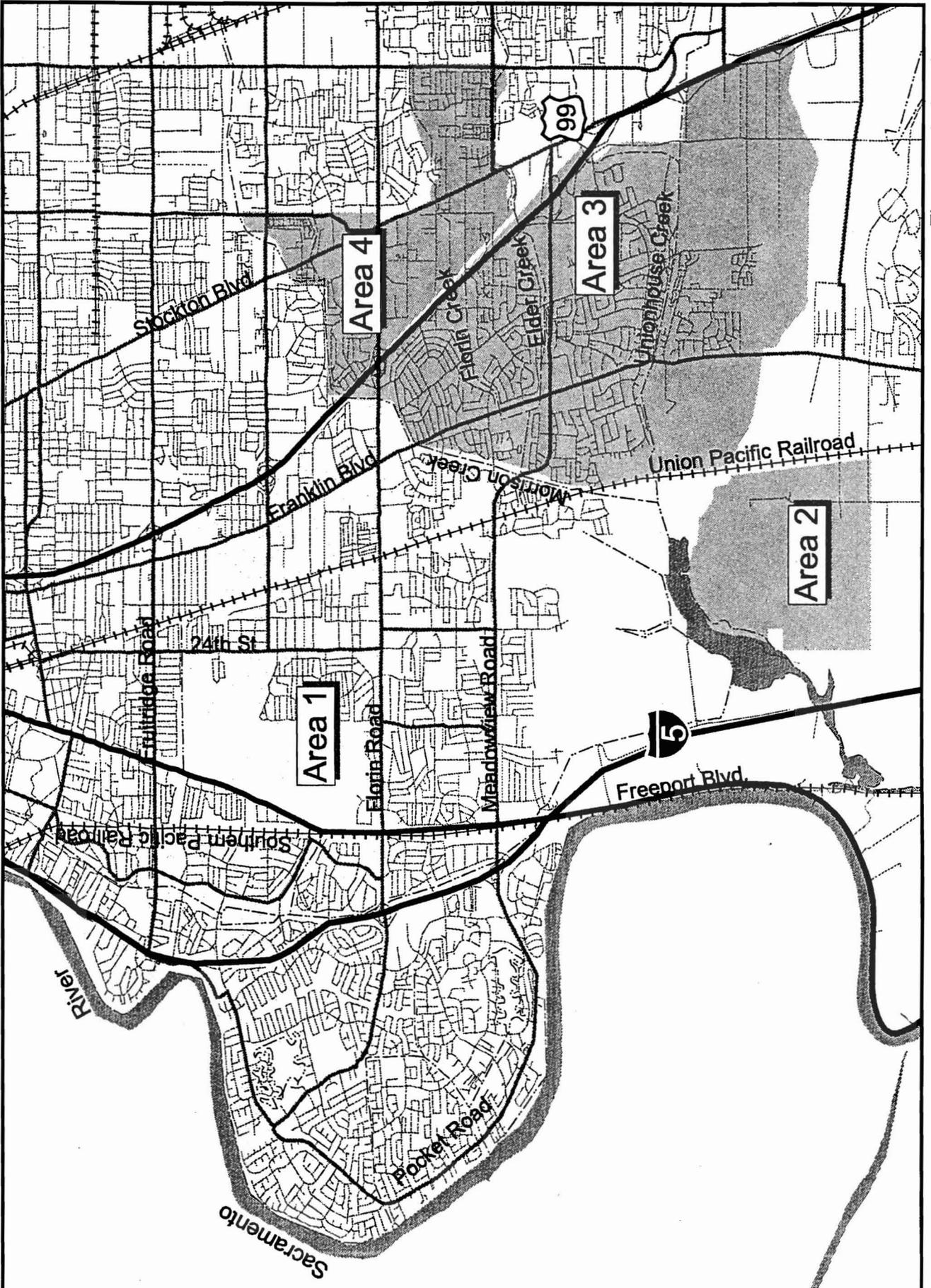


Figure 3. Index Areas.

- Index Area 3 is the area bounded by Morrison Creek on the west and Highway 99 on the east, and includes Unionhouse Creek.
- Index Area 4 includes Morrison Creek and Florin Creeks upstream of Highway 99 and extends east to Stockton Boulevard.

The levee improvement work at the Sacramento Regional Wastewater Treatment Plant described in Alternatives 2, 3, and 4 (Index Area 2) was constructed by SAFCA in 1996. As allowed in section 104 of the Water Resources Development Act of 1986, SAFCA applied for credit for these activities against their share of a future project. This report assumes preconstruction conditions for the treatment plant levee improvements.

Alternative 1 - No Action

The no action alternative assumes that no Federal action would take place, and there would be no Federally-funded flood control improvements made to the study area. Flooding problems would probably continue in the future due to population increases within Sacramento County. The City of Sacramento and Sacramento County's urban services area is projected to be fully urbanized by the year 2045.

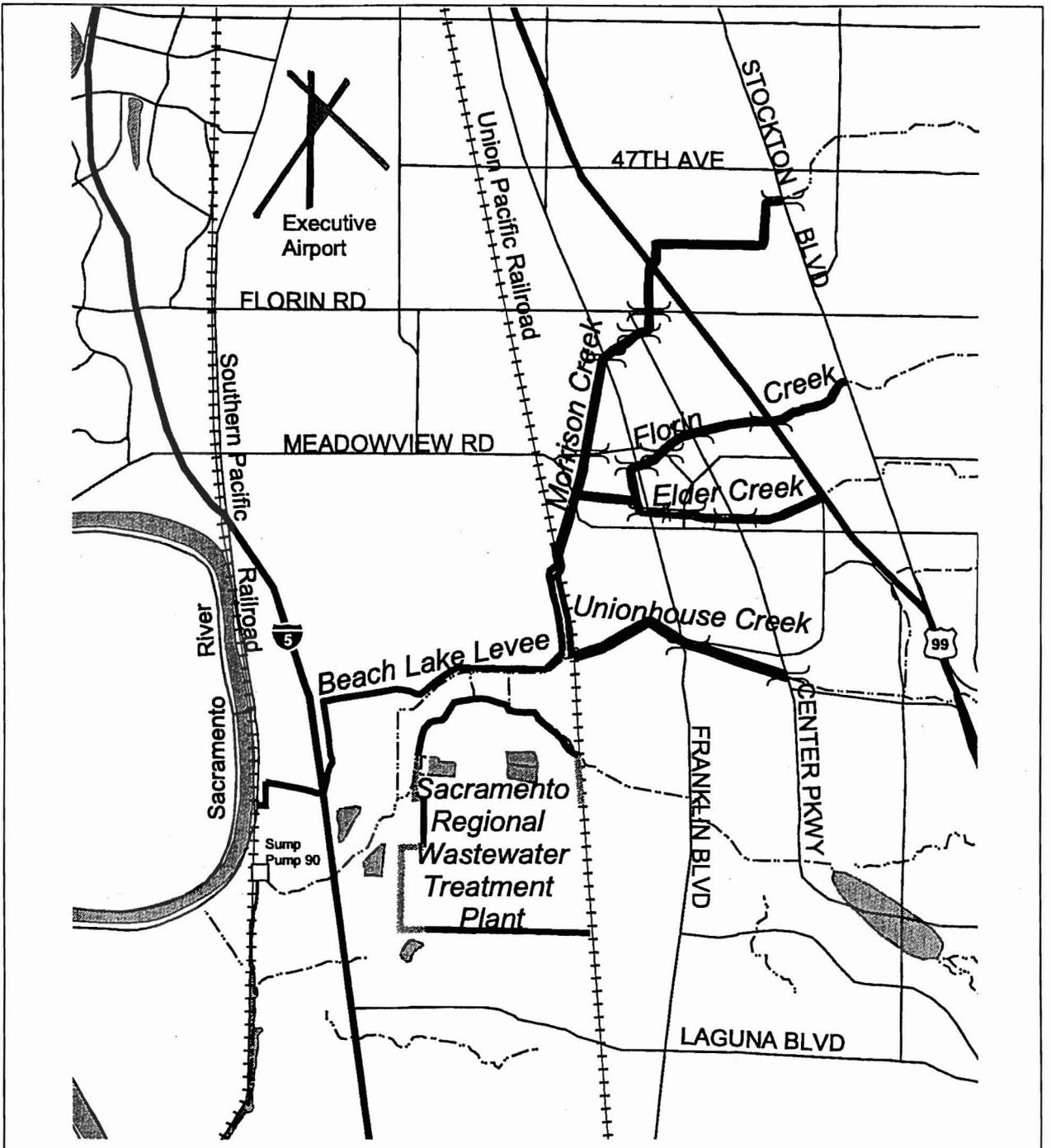
In anticipation of urbanization, the City and County plan to construct or require construction of flood control basins to mitigate increases in future runoff. The County also plans to deepen some of the stream channels in the upper watershed to facilitate gravity drainage. With future improvements for runoff, flood protection levels would remain low in the study area, ranging from a 1 in 15 to 58 year annual event.

Alternative 2 - Maximize Net Benefits Plan (NED Plan)

This alternative maximizes the net benefits and is the most cost effective plan. It combines the most cost effective alternative for each index area. In achieving the most cost effective plan for each index area the level of flood protection varies in each area. The NED plan provides index areas 1 and 2 with 1 in 500 annual events and in index areas 3 and 4 with 1 in 200 annual event protection. The proposed work in the four index areas is shown on Figure 4 and described below.

Index Area 1 - Pocket Area

The North Beach Lake Levee would be raised along most of its alignment from the Sacramento River to Unionhouse Creek. In addition, the west levee on Morrison Creek would be raised a maximum of 4 feet from 18 to 22 feet in elevation. The levee would be raised along the existing alignment, except at the west end of the Beach Lake levee and near the Union Pacific Railroad tracks (see below). The levee would typically have a 16-foot wide crown to accommodate maintenance equipment. The landward side would be built out about 23 feet. Two borrow sites would be used during construction. Site 1 is 18 acres in size and Site 2 covers 69 acres. The estimated depth of excavation at the borrow sites would be about two feet, and the topsoil would be stockpiled on the site for reuse. Due to limited right-of-way, floodwall or sheetpile wall would be used instead of



Legend

-  Floodwall
-  New Levee
-  Raise Levee
-  Sheetpile Wall or Floodwall
-  Bridge Retrofit



500 0 500 1000 Feet



**South Sacramento County
Streams Investigation**

**Figure 4
Alternatives**

March 1997

levee raising on 3,400 linear feet of the Beach Lake levee immediately east of Interstate 5. The sheetpile wall would be located on the waterside of the levee, and extend 3 to 4 feet above the top of the levee. This work would take place from the top of the levee.

The west end of the Beach Lake levee would be realigned to the south so that it would tie into the Sacramento River about two-thirds of a mile south of the town of Freeport. The new levee would be about 2,000 feet long, have a 16-foot crown width, and be 11 feet high.

Along Morrison Creek at the Union Pacific Railroad track crossing, a removable stop log structure would be placed at the crossing to contain high water that exceeds the elevation of the railroad tracks. This structure would pass the 100-year flood event at the Morrison Creek crossing.

On the west side of Morrison Creek levee, between the Union Pacific Railroad tracks and Franklin Boulevard, a concrete floodwall would be used instead of levee raising due to limited right-of-way. The concrete floodwall would be placed on the waterside levee crown of the existing service road and would be about one-half foot high. To avoid disruption to adjacent residences and businesses, the concrete floodwalls would be constructed using in-channel methods. Channels would be temporarily dewatered by coffer dams. A tarp would be placed over the channel bottom and then covered with gravel to protect the concrete low flow channel. As construction is completed in a stream section, the support material would be removed and the channel restored to pre-project conditions. There would be no bridge retrofit work in Index Area 1.

Index Area 2 - Sacramento Regional Wastewater Treatment Plant

The treatment plant is surrounded by a ring levee which would be raised 4 feet, from 18 to 22 feet in elevation. The total length of levee raising would be 24,000 feet. About one-third of the work would consist of raising the existing levee with earth fill material. The levee would be extended on the land or treatment plant side to avoid wetland habitat on the waterside of the levee. A floodwall would be placed on top of the existing levee for about 9,000 feet due to a limited right-of-way at the southwest corner of the treatment plant. The floodwall will be made of reinforced concrete and be placed on the waterside crown of the levee. The wall would be constructed from the levee and extend 3 feet high. A new levee section would be added to the ring levee and would extend 5,000 feet along the southern perimeter of the treatment plant. This new levee would tie into Dwight Road near the Union Pacific Railroad tracks. At the northeast terminus of the ring levee near Laguna Creek and the Union Pacific Railroad tracks, a 2,300-foot-long concrete floodwall would be constructed. The floodwall would be 4 to 8 feet high and 1 foot wide. Work would occur from the treatment plant side of the wall. Borrow material would be taken from existing stockpiles on treatment plant lands.

Index Area 3 - Between Morrison Creek and Highway 99

Morrison Creek -The predominant flood control measure along Morrison Creek would be floodwalls or sheetpile walls on both levees, and on the channel banks of incised channels. Some of the reaches on Morrison, Elder, and Unionhouse Creeks are leveed while other reaches, generally above Franklin Boulevard, have incised channels. An incised channel is a natural channel which has been cut or deepened over time. The channel banks rise above the streambed on both sides of the creek, and the tops of the banks are at ground level. There are no manmade levees on incised channels, but the channel banks can be used to implement flood control measures such as sheetpile or concrete floodwalls. Since the channel banks are at ground level, the elevation of the channel banks vary with the natural topography. As a result, the heights of sheetpile or concrete floodwalls on incised channels will vary. The sheetpile or concrete floodwall heights described for Alternatives 2, 3, and 4 are maximum heights.

Along the east bank of Morrison Creek from Unionhouse Creek to the Union Pacific Railroad bridge, seepage and weakening of the railroad embankment would be corrected by constructing a 300-foot-long slurry wall or sheetpile wall on the waterside of the embankment. The wall would be about 1 foot tall and would be constructed from the channel using the in-channel methods previously described for Index Area 1.

Farther up the east bank of the Morrison Creek levee from the Union Pacific Railroad bridge to Franklin Boulevard, there is an existing levee at an elevation of 19 feet. An 8,600-foot-long floodwall or sheetpile wall would be placed along the waterside edge of the service road to strengthen the levee. The top of the wall would be about 1 foot above the existing top of the levee. In-channel construction methods would be used.

The Morrison Creek channel is incised from Franklin Boulevard to Highway 99. In this area, there would be about 4,000 feet of sheetpile or concrete floodwalls sunk into the streambanks. The walls would be placed inside the fence line that marks the existing channel right-of-way. The height of the wall would extend about 1 foot above the top of the channel bank and be about 10 feet deep.

The bridges on Morrison Creek are affected by pressure flow when backwater extends up the creek from the Beach-Stone Lakes area. To prevent water from leaving the channel under pressure flow, the Brookfield Drive, G Parkway, Franklin Boulevard, Center Parkway, and Florin Road bridges would be retrofitted with concrete infill walls, concrete aprons, parapet walls and drains.

Elder Creek - On Elder Creek, the predominant flood control measure would be floodwalls or sheetpile walls. In leveed areas from the confluence with Morrison Creek to Franklin Boulevard (about 2,500 feet), the floodwall or sheetpile wall would be placed on both sides of the channel on the waterside edge of the service road on top of the levee. The top of the wall would be at the top of the existing levee.

In order to reduce the potential of levee failure some of the concrete floodwall would be changed to rehabilitation of levee and channel slopes as well as raising and widening levees. This would occur along Elder Creek downstream of Franklin Boulevard for 250 linear feet along the left bank and about 420 feet on the right bank, continuing at the confluence of Elder and Florin Creeks.

The incised portion of Elder Creek from Franklin Boulevard to Highway 99 would be improved with floodwalls or sheetpile walls placed on the channel bank inside the fence marking the existing right-of-way. The walls would be about 1.5 feet above the top of the channel bank. A total of 1.2 miles of floodwalls or sheetpile wall would be constructed on Elder Creek. In-channel construction methods would be used. The following bridges would be retrofitted with concrete infill walls, concrete aprons, parapet walls, and drains: Franklin Boulevard, Tangerine Avenue, and Center Parkway.

Florin Creek - On Florin Creek, the predominant flood control measure would be sheetpile walls. Florin Creek is an incised channel, and about 1.4 miles of improvements would be constructed on both banks from the confluence of Elder Creek to Highway 99. The sheetpile wall would be placed on the channel bank inside the fence line that marks the channel existing right-of-way. The wall would be about one foot high and in-channel construction methods would be used. Two bridges would be retrofitted with concrete infill walls, concrete aprons, parapet walls, and drains at Brookfield Drive and Persimmon Avenue. The Center Parkway and Highway 99 bridges would be retrofitted with parapet walls only. Downstream of Franklin Boulevard instead of concrete floodwalls, the levees would be raised and widen on both sides of the creek for about 3,000 linear feet until Florin Creek joins Elder Creek.

Unionhouse Creek - On Unionhouse Creek, the predominant flood control measure would be floodwalls or sheetpile walls. The north levee downstream of Franklin Boulevard would be improved with about 4,700 feet of floodwalls or sheetpile walls that would be placed along the waterside edge of the service road to strengthen the levee. The top of the wall would be at the existing top of the levee. About 60 feet of the north levee immediately downstream of Franklin Boulevard the alternative would raise and widen the existing levee. The incised channel portion of Unionhouse Creek from Franklin Boulevard to Center Parkway would be improved on both banks with metal sheetpile walls for about 5,280 feet. The walls would be placed inside the fence line that marks the existing right-of-way and would be about 1.5 feet high. In-channel construction methods would be used. The Franklin Boulevard and Center Parkway bridges would be retrofitted with parapet walls to pass water more efficiently during pressure flow conditions.

Index Area 4 - Between Highway 99 and Stockton Boulevard

Morrison Creek - This reach of Morrison Creek is an incised channel and flood control measures would consist of floodwalls or metal sheetpile walls on portions of both sides of the channel between Highway 99 and Stockton Boulevard. The levee heights vary in this reach and portions of the this reach would contain the design flow without improvements.

Where the top of the bank is low, a total of 7,000 linear feet of sheetpile wall would be constructed. The wall would be placed inside the fence line that marks the existing channel right-of-way and in-channel construction methods would be used. The wall heights would be about 2.2 feet above the top of the channel bank. Sky Footbridge and Riza Footbridge would be retrofitted with concrete infill walls and concrete aprons. Steiner Drive and Stockton Boulevard bridges would be retrofitted with concrete infill walls, concrete aprons, parapet walls, and drains.

Florin Creek¹ - This reach of Florin Creek is an incised channel and flood control measures would consist of metal sheetpile walls on both sides of the channel. The walls would extend from Highway 99 and Stockton Boulevard on both sides of the channel for about 7,000 linear feet. The wall would be placed inside the fence that marks the existing right-of-way using in-channel construction methods. The wall heights would be about 5.0 feet above the channel bank. No bridges would be retrofitted.

Alternative 3 (Consistent Protection Plan)

Alternative 3 was formulated to meet two objectives: (1) eliminate the national flood insurance requirements for structures and property threatened by streams in the study area, and (2) provide the same level of flood protection to all index areas. Alternative 3 would provide protection for a 1 in 200 annual event for all of the index areas.

Index Area 1 - Pocket Area

Levee improvements would include raising the North Beach Lake levee from 18 to 21 feet in elevation along most of its alignment from the Sacramento River to Unionhouse Creek. A floodwall or sheetpile wall would be used instead of levee raising on 3,400 linear feet of the North Beach Lake levee immediately east of Interstate 5. The height of the floodwall or sheetpile wall would be at the top of the levee. The west end of the North Beach Lake levee would be realigned as described in Alternative 2. The west side of Morrison Creek between the Union Pacific Railroad tracks and Franklin Boulevard would be improved with floodwall or sheetpile wall; the elevation would be about one-half foot above the top of the levee. The borrow sites are the same as those described in Alternative 2.

Index Area 2 - Sacramento Regional Wastewater Treatment Plant

The levee around the treatment plant would be improved by levee raising, constructing floodwalls, and building a new levee section as previously constructed by SAFCA. The construction easements, levee alignments, and borrow and staging areas would be the same as in Alternative 2.

¹ See Discussion Section of this report for project changes in this reach. Final design will be determined during the pre-construction engineering and design (PED) phase of the project.

Index Area 3 - Between Morrison Creek and Highway 99

Morrison Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. In the leveed portion of Morrison Creek, the height of the walls would be about 2.6 to 3.6 feet above the top of the levee. The same stop log structure described in Alternative 2 would be installed at the railroad crossing. The sheetpile walls in the incised channel portion of Morrison Creek (Franklin Boulevard to Highway 99) would be one foot above the top of the channel bank.

Elder Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. In the leveed portion of Elder Creek, the height of the walls would be at the top of the levee. The sheetpile walls in the incised portion of Elder Creek (Franklin Boulevard to Center Parkway) would be 1.5 feet above the top of the channel bank.

Florin Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. Florin Creek is an incised channel, and the height of the walls would be one foot above the top of the bank.

Unionhouse Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. In the leveed portion of Unionhouse Creek the height of the walls would be the same as in Alternative 2. The sheetpile walls in the incised portion of Unionhouse Creek (Franklin Boulevard to Center Parkway) would be 1.5 feet above the top of the channel bank.

Index Area 4 - Between Highway 99 and Stockton Boulevard

Levee improvements would consist of floodwalls or metal sheetpile walls along the incised channels. The wall heights would be the same as described in Alternative 2. The bridge retrofit work would also be the same as in Alternative 2.

Alternative 4 - (Consistent High Protection Plan)

Alternative 4 was formulated to meet two objectives: (1) eliminate the national flood insurance requirements for structures and property threatened by streams in the study area, and (2) provide a consistent high level of flood protection to all index areas. Alternative 4 would provide protection for a 1 in 500 annual event for all of the index areas.

Index Area 1 - Pocket Area

Levee improvements would include raising the North Beach Lake levee from 18 to 21 feet in elevation along most of its alignment from the Sacramento River to Unionhouse Creek. A floodwall or sheetpile wall would be used instead of levee raising on 3,400 linear feet of the North Beach Lake levee immediately east of Interstate 5. The west end of the North Beach Lake levee would be realigned as described in Alternative 2. In

addition, the levee improvements and new levee on Morrison Creek, along with the borrow sites and construction methods would be the same as described for Alternative 2.

Index Area 2 - Sacramento Regional Wastewater Treatment Plant

The levee around the treatment plant would be improved by levee raising, constructing floodwalls, and building a new levee section as previously constructed by SAFCA. The construction easements, levee alignments, and borrow and staging areas would be the same as in Alternative 2.

Index Area 3 - Between Morrison Creek and Highway 99

Morrison Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. In the leveed portion of Morrison Creek, the height of the walls would be about 3.6 feet above the top of the levee. The same stop log structure described in Alternative 2 would be installed at the railroad crossing. The sheetpile walls in the incised channel portion of Morrison Creek (Franklin Boulevard to Highway 99) would be 2.5 feet above the top of the channel bank. Construction methods would be the same as in Alternative 2.

Elder Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. In the leveed portion of Elder Creek, the height of the walls would be one foot above the top of the levee. The sheetpile walls in the incised portion of Elder Creek (Franklin Boulevard to Center Parkway) would be 2.5 to 3.0 feet above the top of the channel bank.

Florin Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. Florin Creek is an incised channel, and the height of the walls would be from one to two feet above the top of the bank.

Unionhouse Creek - Floodwalls, sheetpile walls, or levee raising and widening would be constructed at the same locations and using the same methods as described in Alternative 2. In the leveed portion of Unionhouse Creek the height of the walls would be about one foot above the top of the levee. The sheetpile walls in the incised portion of Unionhouse Creek (Franklin Boulevard to Center Parkway) would be 2.0 to 2.5 feet above the top of the channel bank.

Index Area 4 - Between Highway 99 and Stockton Boulevard

Morrison Creek - Improvement to the incised portion of Morrison Creek would include floodwalls or sheetpile wall as described in Alternative 2. The top of the walls would be built to a maximum height of 3 feet above the top of the existing channel bank.

*Florin Creek*² - Improvements in this incised channel would include floodwalls or sheetpile walls as described in Alternative 2. The top of the wall would be built to a maximum height of 6.0 feet above the top of the existing channel bank.

ECOSYSTEM RESTORATION COMPONENT

SAFCA has expressed interest in including an environmental restoration component in the proposed project alternatives. Since the upper basin of the study area is completely urbanized and has few restoration opportunities, restoration was considered for the lower basin only. Since future urban development is planned for the area north of the North Beach Lake levee, opportunities for restoration were only considered around the levee surrounding the treatment plant.

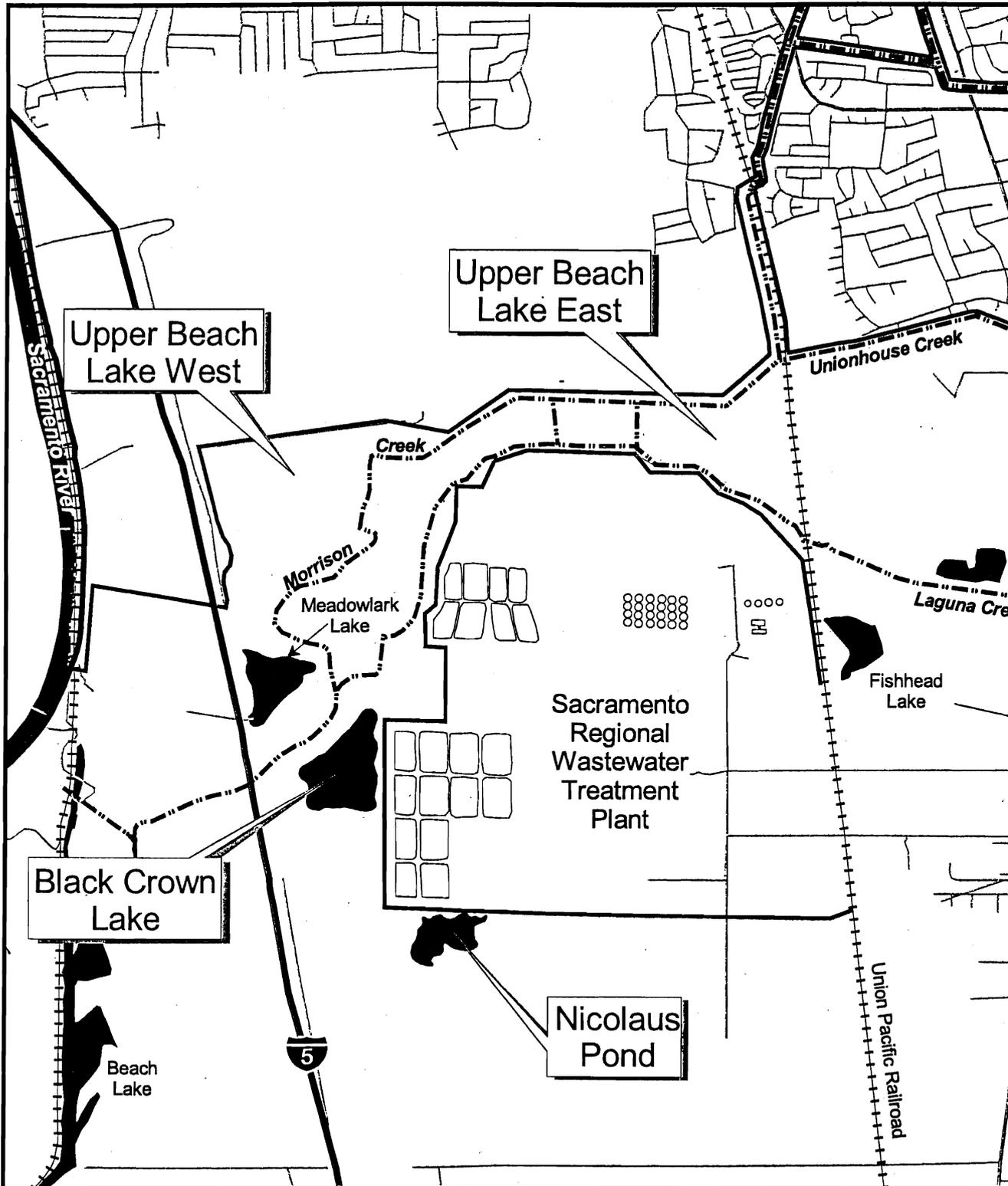
The treatment plant is surrounded by 3,650 acres of lands which are owned by Sacramento County. These lands act as a “buffer” to surrounding residences and businesses from the activities of the treatment plant. The buffer lands are actively managed for open space, floodplain, agriculture, and wildlife habitat. They mostly consist of agricultural lands, wetlands, and annual grassland habitats (Corps of Engineers 1998a). There are six small permanent lakes, 235 acres of seasonal wetlands, two perennial creeks, and over 13,000 linear feet of water conveyance ditches on these lands. The buffer lands are also contiguous to the northern-most part of the Stone Lakes National Wildlife Refuge (NWR).

An initial list of restoration opportunities was developed by treatment plant staff. Based on these opportunities, an ecosystem restoration plan was developed by the Corps, Corps consultants, and treatment plant staff. More specific details on how alternatives were developed and screened is contained in Appendix D. Figure 5 shows the locations of the restoration sites.

Since a variety of restoration designs are possible, there is no single best alternative. The final alternative selected by the non-Federal sponsor was based on the plan’s benefits and cost-sharing consideration. SAFCA has expressed interest in the plan which includes the following components:

- Black Crown Lake - There would be excavation along the north and northwest shore of the lake to expand an area suitable for supporting emergent wetlands, riparian woodland, valley oak woodland, savannah, and perennial grassland. A weir would be installed at the existing outflow to allow lake water levels to be controlled to provide appropriate hydrological conditions necessary to support the restored habitats.
- Upper Beach Lake East - Valley oak savanna and emergent wetland habitats would be restored by excavating a channel from the existing seasonal pond, creating an additional pond by providing water to a downstream depression. There would be two water control structures along Laguna Creek to extend the period of seasonal flooding to existing

² See Discussion Section of this report for project changes in this reach. Final design will be determined during the pre-construction engineering and design (PED) phase of the project.



South Sacramento County
Streams Investigation
Figure 5
Restoration Sites

March 1998



1000 0 1000 2000 3000 Feet



seasonal ponds along the creek. In addition, the north bank of Laguna Creek downstream of the new water control structures would be excavated to create benches at elevations suitable for restoring riparian vegetation.

- Upper Beach Lake West - Riparian woodland and perennial grassland habitats would be restored by planting trees and perennial grasses along the west bank of Morrison Creek to expand and enhance the areas of existing vegetation.
- Nicolaus Pond/Parker Slough - The existing pond outlet pipe would be replaced with a water control structure which would allow the restoration of emergent wetland and seasonal wetland/perennial grassland habitats.

MITIGATION POLICY AND RESOURCE CATEGORY DETERMINATION

The recommendations provided herein for the protection of fish and wildlife resources are in accordance with the Service's Mitigation Policy as published in the Federal Register (46:15; January 23, 1981).

The Mitigation Policy provides Service personnel with guidance in making recommendations to protect or conserve fish and wildlife resources. The policy helps ensure consistent and effective Service recommendations, while allowing agencies and developers to anticipate Service recommendations and plan early for mitigation needs. The intent of the policy is to ensure protection and conservation of the most important and valuable fish and wildlife resources, while allowing reasonable and balanced use of the Nation's natural resources.

Under the Mitigation Policy, resources are assigned to one of four distinct Resource Categories, each having a mitigation planning goal which is consistent with the fish and wildlife values involved. The Resource Categories cover a range of habitat values from those considered to be unique and irreplaceable to those believed to be much more common and of relatively lesser value to fish and wildlife. The Mitigation Policy does not apply to threatened and endangered species, Service recommendations for completed Federal projects or projects permitted or licensed prior to enactment of Service authorities, or Service recommendations related to the enhancement of fish and wildlife resources, however. In applying the Mitigation Policy during an impact assessment, the Service first identifies each specific habitat or cover-type that may be impacted by the project. Evaluation species which utilize each habitat or cover-type are then selected for Resource Category analysis. Selection of evaluation species can be based on several rationale, as follows: (1) species known to be sensitive to specific land- and water-use actions; (2) species that play a key role in nutrient cycling or energy flow; (3) species that utilize a common environmental resource; or (4) species that are associated with Important Resource Problems, such as anadromous fish and migratory birds, as designated by the Director or Regional Directors of the Fish and Wildlife Service. (Note: Evaluation species used for Resource Category determinations may or may not be the same evaluation species used in a Habitat Evaluation Procedures application, if one is conducted). Based on the relative importance of each specific habitat to its selected evaluation species, and the habitat's relative

abundance, the appropriate Resource Category and associated mitigation planning goal are determined.

Mitigation planning goals range from “no loss of existing habitat value” (i.e., Resource Category 1) to “minimize loss of habitat value” (i.e., Resource Category 4). The planning goal of Resource Category 2 is “no net loss of in-kind habitat value;” to achieve this goal, any unavoidable losses would need to be replaced in-kind. “In-kind replacement” means providing or managing substitute resources to replace the habitat value of the resources lost, where such substitute resources are physically and biologically the same or closely approximate those lost.

In addition to mitigation planning goals based on habitat values, Region 1 of the Service, which includes California, has a mitigation planning goal of no net loss of acreage for wetland habitat. This goal is applied in all impact analyses.

Seven fish and/or wildlife habitats were identified in the South Sacramento County Streams Investigation project area which had potential for impacts from the project. These are riparian scrub-shrub, seasonal wetland, vernal pools, emergent marsh, farmed wetland, annual grassland, and agriculture. The resource categories, evaluation species, and mitigation planning goal for the habitats possibly impacted by the project are summarized in Table 1.

The evaluation species selected for the riparian scrub-shrub habitat in the project area were passerine and raptorial birds, and small mammals. The birds were selected because of (a) their dependence on riparian habitats for feeding, nesting, and migration, (b) their ability to represent other riparian oriented birds, (c) their importance for nonconsumptive human uses (i.e., bird watching), and (d) the Service's responsibilities for their management, under the Migratory Bird Treaty Act. Small mammals were selected because they are ground dwellers, and they have an important role as prey in the food chain for birds, reptiles, and other larger mammals.

Riparian scrub-shrub habitat is defined for this project as woody vegetation composed predominately of trees and shrubs. A few small stands of this habitat occur in the project area along existing levees stream channels, and agricultural drainage ditches. Consequently, the stands are generally narrow linear bands with a canopy areas ranging up to only to a few yards wide. Riparian habitat has been severely degraded in the project area and ecoregion in general due to overall habitat loss, fragmentation, and disturbance of existing habitat. Remaining stands of this habitat are extremely valuable to the evaluation species and wildlife species in general. Riparian habitat supports a wide variety of plant and wildlife species whose numbers are disproportionately large relative to the area of available habitat. The diversity of species supported by riparian habitat rests on a combination of enhanced surface and groundwater availability, soil fertility, nutrient availability, vegetative layering to form a variety of microclimates, and the role in providing migration routes. Because of its high value to the evaluation species, and its relative scarcity, the Service designates the riparian habitat in the project area potentially impacted by the project as Resource Category 2. Our associated mitigation planning goal is for “no net loss of in-kind habitat value or acreage.”

Table 1. Evaluation species, resource categories, and mitigation planning goals for the habitats within the study area of the South Sacramento County Streams Investigation, California.

HABITAT	EVALUATION SPECIES	RESOURCE CATEGORY	MITIGATION GOAL
Riparian Scrub-shrub	Passerine birds Raptorial birds Small mammals	2	No net loss of in-kind habitat value or acreage.
Seasonal Wetland	Mallard duck Egrets	2	No net loss of in-kind habitat value or acreage.
Vernal Pool	Mallard duck Egrets	2	No net loss of in-kind habitat value or acreage. (refer to current mitigation guidelines for this habitat)
Emergent Marsh	Mallard duck Egrets	2	No net loss of in-kind habitat value or acreage.
Farmed Wetland	Waterfowl Shorebirds	2	No net loss of in-kind habitat value or acreage. (refer to current mitigation guidelines for vernal pool habitat)
Annual Grassland	Ring-necked pheasant	4	Minimize loss of habitat value.
Agriculture	Small mammals	4	Minimize loss of habitat value.

The mallard duck and egrets were selected as the evaluation species for the seasonal wetland, emergent marsh, and vernal pool habitats. These species were selected because of (a) their dependence on wetlands for feeding and nesting, (b) their ability to represent other waterfowl and water-related birds using these habitats, (c) their importance for consumptive and nonconsumptive human uses (i.e., hunting and bird watching), and (d) the Service's responsibility for their management, under the Migratory Bird Treaty Act. These wetland habitats occur in the project area typically occur in association ponding during the rainy season (seasonal wetlands and vernal pools) or along the creeks, and irrigation ditches (emergent marsh) in the project area. These wetlands provide valuable habitat for many water-birds including waterfowl, shorebirds, and wading birds. These habitats are severely reduced in the project area and ecoregion. Therefore, the Service designates these habitats in the project area potentially impacted by the project as Resource Category 2. Our associated mitigation planning goal is for "no net loss of in-kind habitat value or acreage."

Waterfowl and shorebirds were selected as the evaluation species for the farmed wetland habitat in the project area. These species were selected because (a) they utilize this habitat for feeding and loafing, (b) their importance for consumptive and nonconsumptive human uses (i.e., waterfowl hunting and bird watching), and (d) the Service's responsibility for their management, under the Migratory Bird Treaty Act. Wetland habitats are severely reduced in the

project area and ecoregion and are valuable for a variety of wildlife species. Therefore, the Service designates this habitat in the project area potentially impacted by the project as Resource Category 2. Our associated mitigation planning goal is for “no net loss of in-kind habitat value or acreage.”

The ring-necked pheasant was selected as the evaluation species for the annual grassland habitat in the project area. This species was selected because it (a) feeds and nests in this habitat, and (b) has high consumptive and, to a lesser degree, nonconsumptive human uses (i.e., hunting and bird watching). This habitat is generally a contiguous area of primarily herbaceous plants such as grasses (i.e., wild oats, rip-gut brome, Bermuda grass, annual and perennial rye), sedges, forbs (i.e., clover spp., vetch, star thistle, dove weed) and various weeds. Generally this habitat has low-to-moderate habitat values and is fairly common regionally and statewide. Therefore, the Service designates the annual grassland habitat in the project area potentially impacted by the project as Resource Category 4. Our associated mitigation planning goal is to “minimize any loss of habitat value.”

Small mammals were selected as the evaluation species for the agricultural lands in the project area. Small mammals were selected because of their important role in the food chain as prey species for raptors and larger mammals which forage on these lands. Typically, agricultural lands in the project area are characterized by intensive farming. The type of crop grown and post harvest land management practices affect the value of the of these lands for wildlife (crop type is usually a key factor in assigning value); therefore, the Service designates the agricultural habitat in the project area potentially impacted by the project as Resource Category 4. Our associated mitigation planning goal is “minimize any loss of habitat value.”

BIOLOGICAL RESOURCES

EXISTING CONDITIONS

Generally, all of the sections of streams chosen for study in the project have been channelized into little more than drainage canals for the surrounding urban areas. The trend for the upper basin of Morrison Creek and its tributaries is for continued urbanization of adjacent lands and degradation of habitat values. In the lower basin of Morrison Creek, lands are now being managed to provide natural habitat conditions for fish and wildlife resources which should continue to improve over time.

The vegetation and fish and wildlife resources of the lower basin of Morrison Creek (North Beach Lake Levee area) are described in the July 1991 *Upper Beach Lake Wildlife Area Specific Plan* prepared by Jones and Stokes Associates, Sacramento, California. Additional information can be found in the *Final Environmental Impact Statement for the Stone Lakes National Wildlife Refuge*, May 1992, prepared by Jones and Stokes Associates, and the February 1996 *Draft Environmental Impact Report for the North Beach Lake/SRWTP Levee Improvement Project* prepared by Environmental Science Associates, Sacramento, California. These documents provide considerable description of vegetation and wildlife resource, but are characterized by a

paucity of fishery information. Information presented below is summarized from the above reports supplemented by a few other sources.

Vegetation

North Beach Lake Levee - Morrison Creek, in the lower basin, is a channelized steep-sided canal downstream from the confluence with Unionhouse Creek paralleling the North Beach Lake Levee to Beach Lake. Virtually all middle and upper story riparian vegetation has been removed for flood control purposes leaving only grasses and low growing forbs widely interspersed with single trees. A large beaver population has also served to prevent natural growth of trees and shrubs.

The Morrison Creek channel in the Beach Lake vicinity has been relocated several times. In 1993 the channel was routed away from the center of Beach Lake to its periphery where it more closely approximates the historical location. This modification expanded open water stream habitat and served to route contaminated storm drain runoff water around the lake. The creek downstream to the confluence with Laguna Creek constitutes a low gradient open water channel with typical wetland vegetation. The area adjacent to the creeks includes permanent marsh, seasonal wetland, and annual grasslands. The creek downstream of Beach Lake supports a mature riparian forest of cottonwood, Goodings willow, sandbar willow, valley oak, and box elder.

Much of the Upper Beach Lake Wildlife Area restoration plan has been implemented (Jones 1996). The major components of the plan consist of a water control system, plantings of native trees and shrubs, and control of the beaver population. A system of control weirs, berms and canals has been constructed to allow for limited control of water flows and elevations. This feature has facilitated an expansion of permanent wetland area. Control of water elevation allows for creation of seasonal mudflat habitat. Most of the planting effort has occurred on the Beach Lake lands south and away from the North Beach Lake levee. About 15,000 trees have been planted over the last five years. Plantings included elderberry, sycamore, valley oak, cottonwood, willow, box elder, and black walnut.

A beaver control program was initiated in 1992 to improve conditions for growth of riparian vegetation. As of April 1996, about 70 animals had been removed. In addition many trees have been wrapped with wire and areas have been fenced. The effective control of beavers has allowed both new plantings and natural riparian plants to proliferate. As a result there has been an increase in low to medium height oak and cottonwood trees in the area above Beach Lake between Morrison and Laguna Creeks. Sacramento Regional Wastewater Treatment Plant staff may plant additional trees in this area.

The North Beach Lake levee has annual grasses and forbs growing on both slopes nearly its entire length.

Morrison Creek - In the upper basin of Morrison Creek, upstream of the confluence with Unionhouse Creek, a 4.4-mile-long reach is being studied by the Corps. The reach extends from

Unionhouse Creek upstream to Stockton Boulevard. Most of this reach consists of sections of lowflow concrete and earth-lined channel with steep grass covered banks. There are small scattered clumps of riparian and emergent wetland vegetation. Most of the creek flows through heavily urbanized areas, but there are a few open areas, mostly in the lower reach.

Vegetation within the channel corridor is limited primarily to introduced grass species such as soft chess, ripgut grass, wild oat, yellow star thistle, tarweed, filaree, red clover, Italian ryegrass, and Mediterranean barley. Occasional clumps of emergent vegetation occur. Species include rushes, sedges, arrowhead, knotweed, and Johnson grass. No mid-level or upper-level plants were observed within the canal right-of-way. However, ornamental trees abutting the right-of-way occur frequently.

Unionhouse Creek - Unionhouse Creek is a narrow channelized tributary to Morrison Creek. The 2.6-mile-long section selected for study by the Corps extends from Morrison Creek upstream to Center Parkway. It is mostly concrete-lined for low flows. The levee slopes above the concrete are vegetated with grasses and low-growing forbs (USFWS 1994). Extensive suburban development interspersed with occasional open fields lie adjacent the creek. Flows are intermittent.

Elder Creek - Elder Creek is a heavily channelized tributary to Morrison Creek. Its channel is narrow, mostly having a concrete low-flow lining, and covered with grasses and low growing forbs upstream of the Southern Pacific Railroad tracks. Lands adjacent to the creek are heavily urbanized, but there is some undeveloped open field habitat remaining. Some small areas have scattered clumps and narrow strips of emergent vegetation.

Florin Creek - Florin Creek is a narrow channelized tributary to Elder Creek containing both concrete-lined and earth-lined sections. The banks are lined with grasses and low-growing forbs. The 4.0-mile-long section from the confluence with Elder Creek upstream to the Stockton Boulevard has been selected for study. Adjacent lands are urbanized with occasional undeveloped fields. There are a few intermittent clumps of emergent vegetation in the area.

Sacramento Regional Wastewater Treatment Plant Levee - Emergent marsh, seasonal wetland, farmed wetland, annual grasses, and agricultural lands are located adjacent the existing levee surrounding the treatment plant. The wetland habitats support cattails, tules, nutsedge, dallis grass, popcornflower, common spellweed, and willow weed (ESA 1995).

Annual grassland habitat supports soft chess, Italian ryegrass, wild oat, tarweed, and other typical annual grassland species.

Wildlife

North Beach Lake Levee - The wildlife value in the lower basin of Lower Morrison Creek from the Unionhouse Creek confluence to the upper edge of Beach Lake is greatly limited because of the lack of riparian vegetation adjacent to the channel. However, the open water channel does provide low-to-moderate quality foraging habitat for wading birds and dabbling ducks. The

scattered trees near the banks provide some nesting and roosting habitat for birds. Use of this section of the creek by amphibians, reptiles and mammals is also limited.

Wildlife use of the creek in the Beach Lake area is much greater than upstream because of its proximity to permanent and seasonal wetlands. Productivity will increase as the tree plantings mature and the effects of the beaver control program materialize. A winter bird survey by Sacramento Regional Wastewater Treatment Plant staff in 1996 revealed the presence of 95 species (Jones 1996). Species observed in field surveys by Jones and Stokes Associates biologists in 1989, 1990 and 1991 included: red-shouldered hawk, red-tailed hawk, Swainson's hawk, western sandpiper, dunlin, least sandpiper, ring-billed gull, Forster's tern, great horned owl, Nuttall's woodpecker downy woodpecker, northern flicker, black phoebe, tree swallow, song sparrow, house finch, yellow-rumped warbler, and ruby-crowned kinglet.

Other wildlife species typically using the Beach Lake area include: beaver, coyote, California ground squirrel, racoon, striped skunk, pocket gopher, California vole, muskrat, black-tailed jackrabbit. Also present are bullfrog, western toad, Pacific treefrog, garter snake, gopher snake, and western pond turtle. An interesting phenomenon has been the proliferation of the red-eared slider turtle. This exotic species was likely released into the area as unwanted pets (Jones 1996).

Morrison Creek - The canal-like channel bordered by grassland has limited wildlife value, mainly for small mammals and a few species of birds. Common mammal inhabitants are expected to include the house mouse, deer mouse, California vole, pocket gopher, black-tailed jack rabbit, cottontail rabbit, and striped skunk. Coyotes, racoons, Norway rats, and feral cats forage along the stream channel and use it as a travel corridor.

Mallard ducks regularly feed and rest in the creek. Several pairs were observed during site visits in 1996 and 1997. Other birds using this habitat include foraging raptors such as red-tailed hawk, Swainson's hawk, northern harrier, and American kestrel. Other species that may be observed include the mourning dove, song sparrow, sandpiper, and western meadowlark. Fifty-six bird species were recorded in surveys of habitats upstream of the study area (Sacramento County 1995).

The creek and grassland in the study area also provide low quality habitat for a variety of amphibians and reptiles. Tadpoles were observed near the Franklin Boulevard Bridge during an April 1996 site visit. Potential species inhabiting the channel include bullfrog, Pacific treefrog, western toad, and the common garter snake. Some aquatic and terrestrial invertebrate species also thrive in and along the creek.

Unionhouse Creek - This channelized stream provides minimal wildlife habitat value. Wildlife use would be similar to, but less than, that described for Morrison Creek. The grassland habitat would support some small mammals and bird species and provide a travel corridor. There is also marginal habitat for amphibians and reptiles such as bullfrog, Pacific treefrog, western toad, and the common garter snake.

Elder Creek - Wildlife habitat values are low and species are similar to those described for Morrison Creek. The channel supports a few species of small mammals, birds, amphibians, and reptiles and functions as a travel corridor.

Florin Creek - Wildlife habitat values are low and species are similar to that described for Morrison and Elder Creeks. The corridor supports some species of small mammals, birds, amphibians, and reptiles and serves as a migration pathway. Tadpoles, probably bullfrogs, were observed at the Central Parkway Bridge during an April 1996 visit.

Sacramento Regional Wastewater Treatment Plant Levee - Mallard ducks feed and rest in the wetland habitats adjacent to the existing levee. Other birds using this habitat include foraging raptors such as red-tailed hawk, Swainson's hawk, northern harrier, and American kestrel. Other species that may be observed include the mourning dove, song sparrow, sandpiper and western meadowlark.

Common mammal inhabitants in the upland and seasonal wetland areas are expected to include the house mouse, deer mouse, California vole, pocket gopher black-tailed jack rabbit, cottontail rabbit, and striped skunk. Coyotes, racoons, Norway rats, and feral cats forage along the stream channel and use it as a travel corridor.

Fish

North Beach Lake Levee - Lower Morrison Creek from Unionhouse Creek downstream to the confluence with Laguna Creek is not high quality fish habitat (Bufferlands Management Staff 1994). This stream reach is highly channelized, has little cover, experiences seasonal low flows and warm water temperatures and is exposed to water pollution from agricultural and urban runoff. Below the confluence with Laguna Creek there is much better habitat and greater fish productivity. It is probable that most of the fish found in the Lower Morrison Creek study reach are upstream or downstream migrants.

Species observed in Lower Morrison Creek include: black crappie, largemouth bass, bluegill, warmouth, brown bullhead, black bullhead, white catfish, Sacramento blackfish, common carp, goldfish, hardhead minnow, California roach, mosquitofish, inland silversides, white crappie, and bigscale logperch, (Jones and Stokes Associates 1992; Bufferlands Management Staff 1994).

Morrison Creek - No fish survey data for the study section was found. Habitat above the study area has been characterized as an intermittent stream that has historically supported a warmwater fishery (Sacramento County 1995). Viable fish populations of warmwater species have been documented in the lower basin of Morrison Creek (CDFG et. al.). Because of the barren intermittent flow conditions in the concrete-lined study area, any fish observed would likely be either downstream or upstream migrants. Potential species include carp, goldfish, brown bullhead, golden shiner, green sunfish, largemouth bass and mosquitofish (USFWS 1994).

Unionhouse Creek - This channelized stream provides minimal fish habitat value. Some fish may move into the channel during high flows and are occasionally observed. Mosquitofish is the most likely species to occur in the creek.

Elder Creek - This channelized stream provides minimal fish habitat value. Some fish species may move into the creek channel during high flows and may occasionally be observed.

Florin Creek - This channelized stream provides minimal fish habitat value. Some fish may move into the channel during high flows and are occasionally observed. Mosquitofish is the most likely species to occur in the creek.

Sacramento Regional Wastewater Treatment Plant Levee - Morrison and Laguna Creeks are the closest aquatic habitat likely to support fish. The Morrison Creek fishery is discussed above.

Endangered Species

The Service (1996) identified 12 federally listed, or proposed for listing, species and critical habitat which may occur in the project area (see Appendix A). Two additional plant species have been proposed for listing since that initial information was provided. Table 2 summarizes the Federal and State-listed endangered and threatened species potentially occurring in the project area. This information should be confirmed with the Service and the California Department of Fish and Game prior to preparation of a Biological Assessment, if one is prepared.

The Service also identified candidate species which may occur in the project area. Candidate species are those which are currently being reviewed by the Service and are under consideration for possible listing as endangered or threatened. Candidate species have no protection under the Endangered Species Act, but are included for consideration as it is possible that one or more of these species could be proposed for listing before any or all of the construction activities proposed for this project is completed. See Appendix A for the list of candidate species potentially occurring in the project area.

A biological opinion on the project was completed on April 15, 2002. This opinion can be found in Appendix A. Conservation measures proposed by the Corps and reasonable and prudent measures and terms and conditions proposed by the Service can be found in the opinion in Appendix A.

Table 2. Summary of Federal and State-listed endangered and threatened species potentially occurring in the South Sacramento County Streams Investigation.

SPECIES		STATUS	
COMMON NAME	SCIENTIFIC NAME	FEDERAL	STATE
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	T	-
vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	E	-
valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	T	-
California red-legged frog	<i>Rana aurora draytonii</i>	PE	-
giant garter snake	<i>Thamnophis gigas</i>	T	T
mountain plover	<i>Charadrius montanus</i>	PT	-
Swainson's hawk	<i>Buteo swainsoni</i>	-	T
American peregrine falcon	<i>Falco peregrinus anatum</i>	-	E
western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	-	E
bald eagle	<i>Haliaeetus leucocephalus</i>	E	E
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	T	-
winter-run chinook salmon	<i>Oncorhynchus tshawytscha</i>	E	E
Central Valley spring-run chinook salmon	<i>Oncorhynchus tshawytscha</i>	T	T
delta smelt and critical habitat	<i>Hypomesus transpacificus</i>	T	T
Sacramento splittail	<i>Pogonichthys macrolepidotus</i>	T	T
Antioch Dunes evening-primrose	<i>Oenothera deltooides ssp. howellii</i>	E	E
slender orcutt grass	<i>Orcuttia tenuis</i>	T	E
Sacramento orcutt grass	<i>Orcuttia viscida</i>	E	E
Boggs Lake hedge-hyssop	<i>Gratiola heterosepala</i>	-	E
soft bird's-beak	<i>Cordylanthus mollis ssp. mollis</i>	E	-
T = Threatened PT = Proposed Threatened E = Endangered PE = Proposed Endangered			

FUTURE WITHOUT THE PROJECT

Urbanization in the study area is expected to continue. As stated previously, the City and County of Sacramento plan to construct or require construction of flood control basins to mitigate the increase in future runoff. Sacramento County is preparing drainage master plans for eight sub-basins. Some of the drainage master plans have already been adopted. These detention basins would be constructed as urbanization takes place. The County also plans to deepen some stream channels in the upper watershed to facilitate drainage.

Vegetation

It is assumed that any adverse impacts to vegetation from any flood control project built by the County in the future would be fully mitigated. Additional vegetation plantings are expected in the vicinity of the Sacramento Regional Wastewater Treatment Plant.

Wildlife

Habitat values in the vicinity of Morrison Creek near the Sacramento Regional Wastewater Treatment Plant should continue to improve over time as the vegetation planted in recent years matures. Wildlife use of the area should increase as the vegetation matures.

Fish

No major change in the fisheries in the study area is expected in the future without the project. Proposed tree plantings along lower Morrison Creek could improve habitat conditions for fish by providing shade and overhead cover to the stream as the trees mature.

FUTURE WITH THE PROJECT

The project would affect a total of 376.61 acres and impact fish and wildlife resources through (1) construction activity, and (2) conversion of lands from one habitat type to another. There would be both permanent and temporary effects; 16.98 acres of habitat would be permanently affected. The impacted areas are summarized by location and alternative in Table 3, and discussed by general location below.

Vegetation

Riparian scrub-shrub, seasonal wetland, annual grassland and agricultural habitats would be impacted on Morrison, Elder, Florin, and Unionhouse Creeks. These impacts (both temporary and permanent) would result in a net loss of habitat value as determined using Habitat Evaluation Procedures (HEP) (Appendix C). The loss of habitat value in terms of Average Annual Habitat Units (AAHUs) shown in Table 4. Compensatory mitigation needs were developed using HEP and these are also contained in Table 4.

The levee work proposed for the North Beach Lake levee would result in the permanent loss of 0.11 acres of riparian scrub-shrub habitat, 0.75 acres of farmed wetland habitat, and 1.80 acres of agricultural habitat. These habitats would be converted to annual grassland habitat as part of the raised or new levee work. The net loss of habitat value and compensatory mitigation need for the riparian scrub-shrub habitat is summarized in Table 4. Habitat values for the annual grassland and agricultural area were assumed to be equivalent and were not analyzed in the HEP. The farmed wetland habitat was not included in the HEP as it was assumed to provide suitable habitat for vernal pool fairy shrimp and the vernal pool tadpole shrimp. Mitigation has been proposed at a 3:1 ratio to compensate for this loss (see Table 4).

The levee work proposed for the Sacramento Regional Waste Water Treatment Plant would result in the permanent loss of 0.16 acres of emergent marsh, 1.28 acres of farmed wetland, 0.01 acre of vernal pool, and 0.07 acres of non-jurisdictional wetland habitats. These impacts would result in a net loss of habitat values as determined using HEP (Appendix B). The loss in terms of AAHUs is shown in Table 4, as well as the compensation needs developed using HEP. Vernal pool habitat mitigation needs were not determined using HEP, instead mitigation at a ratio of 3:1 has been proposed to compensate for this loss (see Table 4) using the Service's current guidelines.

Table 3. Summary of impacted areas by location for each alternative of the South Sacramento County Streams Investigation.

Location/ Habitat Affected	Alternative 1 No Action	Alternative 2 Max. Net Benefits		Alternative 3 Consistent Protection		Alternative 4 Cons. High Protection	
		Temp. (acres)	Perm. (acres)	Temp. (acres)	Perm. (acres)	Temp. (acres)	Perm. (acres)
Morrison Creek							
Riparian Scrub-shrub	no change	0.62	0.00	0.62	0.00	0.62	0.00
Seasonal Wetland	no change	39.96	0.00	39.96	0.00	39.96	0.00
Annual Grassland	no change	54.78	0.00	64.78	0.00	64.78	0.00
Agriculture	some future loss	2.26	1.80	2.26	1.80	2.26	1.80
Elder Creek							
Seasonal Wetland	no change	9.69	0.00	9.69	0.00	9.69	0.00
Annual Grassland	no change	13.93	0.00	13.93	0.00	13.93	0.00
Florin Creek							
Seasonal Wetland	no change	5.76	0.00	5.76	0.00	5.76	0.00
Annual Grassland	no change	13.43	0.00	13.43	0.00	13.43	0.00
Unionhouse Creek							
Seasonal Wetland	no change	8.04	0.00	8.04	0.00	8.04	0.00
Annual Grassland	no change	24.52	0.00	24.52	0.00	24.52	0.00
North Beach Lake Levee							
Riparian Scrub-shrub	some future loss	0.12	0.11	0.12	0.11	0.12	0.11
Agriculture	some future loss	10.10	8.60	10.10	8.60	10.10	8.60
Farmed Wetland	some future loss	0.00	0.75	0.00	0.75	0.00	0.75
Sacramento Regional Wastewater Treatment Plant							
Emergent Marsh	no change	0.00	0.16	0.00	0.16	0.00	0.16
Farmed Wetland	no change	0.00	1.03	0.00	1.03	0.00	1.03
Non-Jurisdictional Wet	no change	0.00	0.07	0.00	0.07	0.00	0.07
Annual Grass/Agric.	no change	106.40	4.20	106.40	4.20	106.40	4.20
Giant garter snake upland		0.00	1.60	0.00	1.60	0.00	1.60
Borrow Sites							
Agriculture	some future loss	87.00	0.00	87.00	0.00	87.00	0.00
TOTALS		396.01	18.32	396.01	18.32	396.01	18.32

Wildlife

The proposed construction activities would have permanent and temporary effects on both wildlife diversity and abundance. The loss of riparian scrub-shrub habitat acreage and values would reduce capability of the study areas to provide conditions required to maintain wildlife productivity. Some species may experience reductions in numbers in response to decreased habitat. In areas where there is only a temporary loss of habitat value, adaptive species should resume inhabiting the area as soon as construction is completed, and any recommended avoidance and minimization mitigation measures are implemented.

Table 4. Summary of net change in Average Annual Habitat Units and compensation need for each habitat impacted in the South Sacramento County Streams Investigation.

LOCATION	HABITAT	AAHUs W/O PROJECT	AAHUs W/ PROJECT	NET CHANGE IN AAHUs	COMPENSATION NEED (acres)
North Beach Lake Levee	Rip. scrub-shrub	0.24	0.11	-0.13	0.13
	Annual grassland	---	---	---	re-seed
	Farmed wetland	n/a ¹	n/a	n/a	2.25 ²
Florin Creek	Seasonal wetland	4.44	4.38	-0.05	0.05
	Annual grassland	---	---	---	re-seed
Morrison Creek	Rip. scrub-shrub	0.66	0.61	-0.05	0.05
	Seasonal wetland	47.08	46.43	-0.64	0.64
	Annual grassland	---	---	---	re-seed
Elder Creek	Seasonal wetland	1.16	1.16	0.00	0.00
	Annual grassland	---	---	---	re-seed
Unionhouse Creek	Seasonal wetland	2.65	2.62	-0.03	0.03
	Annual grassland	---	---	---	re-seed
Borrow Sites	Agriculture	---	---	---	re-seed
	Agriculture	---	---	---	re-seed
Treatment Plant	Emergent marsh	0.13	0.01	-0.12	0.16
	Farmed wetland	n/a ¹	n/a	n/a	6.18 ²
	Non-jurisdictional wetland	0.01	0.01	0.00	0.07
	Ann. grassland/ Agriculture	---	---	---	re-seed
	Agriculture	---	---	---	re-seed
	Giant garter snake upland	n/a ¹	n/a	n/a	3.2 ³
	Giant garter snake aquatic	n/a ¹	n/a	n/a	1.6 ³
TOTAL:					
	Riparian scrub-shrub				0.18
	Seasonal wetland				0.72
	Farmed wetland ²				9.18
	Emergent marsh				0.16
	Non-Jurisd. wetland				0.07
	Annual grassland				re-seed
	Agriculture				re-seed
	Giant garter snake upland				3.20
	Giant garter snake aquatic				1.60

1. This habitat was not evaluated using HEP as it is assumed to provide suitable habitat for federally listed threatened and endangered species.
2. Compensation is a 6:1 ratio to compensate for the loss of vernal pool habitat at the treatment plant and 4:1 for loss of vernal pool habitat at the North Beach Lake Levee.
3. Compensation is a 3:1 ratio to compensate for the loss of upland giant garter snake habitat.

Fish

The proposed construction activities would have a temporary effect on fishery values in the affected stream channels in the upper basin reaches as each segment is constructed. Existing

fishery values are low and postproject conditions will quickly return to existing conditions once construction is completed. There should be no impact in the lower basin of Morrison Creek as the work will occur from the top of the levee and on the landside levee slope and toe.

Endangered Species

Sacramento Regional Wastewater Treatment Plant - Construction activities commenced without the benefit of a biological opinion or a Corps permit and the height of the levee was raised in the immediate vicinity of Laguna Creek. The Service was notified October 18, 1996, that the project had been completed. On November 8, 1996, Service staff visited the project site to evaluate the impacts due to construction continuing beyond October 1 and into the dormant period for the giant garter snake when the snake would be in hibernacula. The snake is a State and Federally listed threatened species. When Service staff arrived the construction was ongoing. A site inspection revealed that no fencing had been installed to avoid sensitive marsh areas and, in the area where a floodwall was being installed, Service staff observed an area of Laguna Creek where heavy equipment operating in proximity to the marsh had crushed the vegetation. In addition, riprap had been placed over potential hibernacula areas during a period when snakes would likely be occupying the waterside of the levee near Laguna Creek.

These activities, originally proposed as temporary disturbance of upland refugia and basking habitat for the snake during its active season, likely caused take. The Corps and the Service worked together and created conservation measures for the giant garter snake. The Corps will create 1.6 acres of giant garter snake aquatic habitat and preserve 3.2 acres of upland snake habitat as compensation for past direct effects to the snake.

Construction to increase the footprint of the existing levee to accommodate the additional height resulted in the permanent loss of 1.04 acres of potential vernal pool fairy shrimp and vernal pool tadpole shrimp habitat. The Corps proposed to compensate for the loss of listed vernal pool crustacean habitat by preserving 4.1 acres of vernal pool habitat under a conservation easement at the Sims Field Vernal Pool Complex and purchasing 2.08 acres of vernal pool creation credits at a Service approved conservation bank.

North Beach Lake Levee - Construction activities for raising the North Beach Lake levee would result in the fill of 0.75 acre of vernal pool habitat. The Corps has proposed to compensate for this loss by preserving 2.25 acres of vernal pool habitat under a conservation easement at the Sims Field Vernal Pool Complex and purchasing 0.75 acre of vernal pool creation credits at a Service approved conservation bank. The Corps would effect elderberry shrubs during construction of the levee, while taking material from the borrow site, and traveling along the haul route. Fencing would be used around shrubs on the borrow site. The haul route and borrow site would be watered one to three times per day and speeds would be limited to 15 miles per hour. No hauling activities would occur between April 15 and June 15. Concrete "K" rails, 3 to 4 feet high, would be installed adjacent to shrubs on the haul route. For shrubs within 0 to 5 feet of construction the Corps would implement the Service's July 9, 1999, *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Guidelines). For shrubs 5 to 25 feet from disturbance the Service's Guidelines would be implemented without transplantation for shrubs along the haul

route. For shrubs 25 to 100 feet from the haul route the Corps would implement the Service's Guidelines at ½ the ratios without transplanting the affected shrubs follow the Service Guidelines without transplantation of the affected plants. For shrubs along the North Beach Lake Levee shrubs from 5 to 100 feet would follow the Service's Guidelines without transplantation. Standard avoidance and minimization measures for the giant garter snake would be followed during work in the upper basin.

Morrison, Elder, Florin, Unionhouse Creeks - Avoidance and minimization guidelines for giant garter snake and valley elderberry longhorn beetle will be followed during construction activities along the four creeks.

DISCUSSION

The South Sacramento County Streams Investigation would improve flood control in the Morrison Creek Stream Group by construction of combinations of new and raised levees, and placement of floodwalls and/or sheetpile walls.

The project has three structural alternatives, each providing a different level of flood protection. The primary difference between these structural alternatives is the height of the flood wall or sheetpile wall features. In all three alternatives, the construction footprint is the same, so the impacts are similar.

About 376.61 acres of land would be affected by the project resulting in temporary and permanent impacts to fish and wildlife resources. Two separate HEPs were conducted to quantify these impacts which resulted in identification of a compensatory mitigation need of 2.96 acres (not including any endangered species mitigation needs). This mitigation is proposed to take place at a mitigation bank to be developed by SAFCA in south Sacramento County, near Morrison Creek and the North Beach Lake levee.

The Service fully supports the use of mitigation banks provided they are developed and managed in accordance with the Federal Mitigation Banking Guidelines dated December 1, 1995 (Federal Register, November 28, 1995, Volume 60, Number 228).

Due to comments from the public review process of the Draft Environmental Impact Statement/Environmental Impact Report the Corps may modify work proposed for Florin Creek near Sheldon Park, east of Highway 99. The Service will evaluate any proposed modification to the project when specific information has been developed. A supplemental FWCA report would be prepared if a change to the project occurs.

The Service fully supports the ecosystem restoration component of the proposed project. The benefits, in terms of acres of habitat restored by the selected plan, are summarized in Table 5.

The Service concurs with the Corps' determination that the proposed restoration would make a significant contribution towards accomplishing the goals of the North American Waterfowl

Management Plan, the CALFED Bay-Delta program, the California Waterfowl Association, the Riparian Habitat Joint Venture, and the Western Hemisphere Shorebird Reserve Network.

Table 5. Acres, location, and type of habitat to be restored for the South Sacramento County Streams Investigation, California.

Site	Aquatic Cover (acres)	Emergent Marsh (acres)	Seasonal Marsh (acres)	Riparian Forest and Woodland (acres)	Valley Oak Savannah and Perennial Grassland (acres)
Black Crown Lake	24.0	0.5	---	24.9	29.0
Upper Beach Lake (West)	---	---	---	6.9	63.0
Upper Beach Lake (East)	---	---	---	20.0	37.5
Nicolaus Pond	16.2	0.6	9.5	7.4	9.0
TOTAL	40.2	1.1	9.5	59.2	138.5

The plan is also consistent with the goals of the Service’s nearby Stone Lakes NWR, as well as the master plan for the Sacramento County-owned lands surrounding the Sacramento Regional Wastewater Treatment Plant.

RECOMMENDATIONS

The Service has the following recommendations regarding the development of the flood control measures proposed for the South Sacramento County Streams Investigation.

FLOOD CONTROL COMPONENT

1. Avoid impacts to woody vegetation, including ornamental shrubbery and any trees overhanging the stream channels where floodwalls and/or sheetpile wall or levee contouring will occur. Temporarily mark these areas with orange construction fencing **prior** to initiation of work.
2. Minimize impacts to aquatic resources by placing and removing tarps and gravel placed in the channel to protect the concrete low flow channels from damage in as short a time period possible, but not to exceed 30 days.
3. Minimize impacts to agricultural and annual grasslands by re-seeding all disturbed areas at the completion of construction with annual grasses and forbs (if crops are not replanted on agricultural lands).
4. Implement the Terms and Conditions and Conservation Measures, as provided pursuant to section 7 of the Endangered Species Act, to minimize take of the vernal pool tadpole

shrimp, vernal pool fairy shrimp, valley elderberry longhorn beetle, and giant garter snake. A copy of the biological opinion can be found in Appendix A.

5. The following recommendations are made to assist the Corps in complying with the California Environmental Quality Act and the California Endangered Species Act:
 - a. Avoid carrying out construction activities within one-half mile of active Swainson's hawk nesting sites between March 1 and September 15, or until a determination is made by a California Department of Fish and Game (CDFG) biologist that the young birds have either fledged or the reproductive attempt has failed. This precaution would minimize risks of nest abandonment or forced fledging (CDFG 1994). Surveys may be needed to verify presence of active nests.
 - b. Conduct wintering (December 1-January 31) and nesting (April 15 - July 15) surveys for burrowing owls within 500 feet of the centerline along all feature alignments in accordance with CDFG guidelines (CDFG 1995). If owls are detected within the project area then impact avoidance may be the preferred action after consultation with CDFG. To avoid potential impacts to occupied burrows during the September 1 -January 31 non-breeding season, construction should not occur within 160 feet of the burrow. During the February 1 - August 31 breeding season the buffer distance should be increased to 250 feet. Should disturbance of occupied burrows be unavoidable, the CDFG should be consulted to develop appropriate mitigation measures.
6. Compensate for unavoidable impacts as follows:

North Beach Lake Levee

- a. Avoid impacts to the riparian scrub-shrub habitat occurring within the construction right-of-way near the landside toe of the west levee of Morrison Creek between the Union Pacific Railroad bridge and Unionhouse Creek.
- b. Provide 0.13 acres of riparian scrub-shrub habitat to offset impacts to this habitat in this reach.
- c. Preserve 2.25 acres of seasonal wetland habitat and create 0.75 acre of seasonal wetland habitat, both suitable for the vernal pool fairy shrimp and vernal pool tadpole shrimp to offset impacts to farmed wetlands in this reach (see the BO in Appendix A).

Florin Creek

- a. Provide 0.05 acres of seasonal wetland habitat to offset impacts to this habitat in this reach.

Morrison Creek

- a. Provide 0.05 acres of riparian scrub-shrub habitat to offset impacts to this habitat in this reach.
- b. Provide 0.64 acres of seasonal wetland habitat to offset impacts to this habitat in this reach.

Elder Creek

No compensatory mitigation needed.

Unionhouse Creek

- a. Provide 0.03 acres of seasonal wetland habitat to offset impacts to this habitat in this reach.

Sacramento Regional Wastewater Treatment Plant Levee

- a. Provide 0.16 acres of emergent marsh habitat to offset impacts to this habitat in this reach.
- b. Preserve 4.1 acres of vernal pool habitat and purchase 2.08 acres of vernal pool creation credits as the settlement for the past direct effect to vernal pool crustaceans (see the BO in Appendix A).
- c. Provide 0.07 acres of seasonal wetland to offset impacts to non-jurisdictional wetland habitat in this reach.

7. The following recommendations are specific to the modification of work proposed on Florin Creek, between Highway 99 and Stockton Boulevard, as part of the South Sacramento County Streams Investigation during the PED phase of the project.
 - a. Avoid impacts to existing woody riparian vegetation along Florin Creek by designing the project to leave existing banks intact and by confining excavation areas adjacent to the creek. This habitat should be marked with orange construction fencing and the contractors notified to not disturb these areas.
 - b. Minimize impacts to seasonal wetland and woodland habitat by providing embayments along the creek where emergent vegetation can establish and by planting native woody vegetation, such as valley oaks, along the outer margins of the channel. The specific number of acres needed should be determined once a specific construction plan is developed and analyzed.
 - c. Minimize the impacts of the project on annual grassland, irrigated pasture, and agricultural habitat by reseeding all disturbed areas with a mixture of native grasses as construction is completed. A mixture of purple needlegrass, nodding needlegrass, blue wildrye, California barley, Yolo slender wheatgrass, and meadow barley is recommended.

- d. Minimize impacts of disposal of excavated material by placing this material in a certified landfill or use the material in the project design (such as the detention basin).
- e. Minimize impacts of constructing a detention basin upstream of Stockton Boulevard by locating it in an upland area.
- f. The Corps should provide the Service with detailed plans of the modification as soon as they are developed so that supplemental coordination under the FWCA can be conducted early in the planning process.

ECOSYSTEM RESTORATION COMPONENT

- 8. Implement the recommended plan for ecosystem restoration concurrent with construction of the proposed flood control features of the project.

LITERATURE CITED

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Zentner and Zentner. 1993. Lower Laguna Creek Drainage Master Plan: Wetland Mitigation Plan. Prepared for Sacramento County Department of Public Works, Sacramento, California (Project 250 GWR) March 12, 1993.

Personal Communications

Hill, Kathy. Fishery Biologist. California Department of Fish and Game, Rancho Cordova, California. Personal Communication. April 4, 1996.

Jones, Roger. 1996. National Resource Specialist. Sacramento Regional Wastewater Treatment Plant. Elk Grove, California. Personal Communication. April 23, 1996.

APPENDIX H

CULTURAL RESOURCES COORDINATION

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov



January 27, 2011

In Reply Refer To: COE110106B

Alicia E. Kirchner
Chief, Planning Division
Department of the Army
U.S. Army Engineer District
Sacramento Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Re: Union Pacific Railroad (UPRR) Floodwall and the North Beach Lake Levee Components (NBLL) of the South Sacramento County Streams Project, Sacramento County, California.

Dear Ms. Kirchner:

Thank you for submitting to my office, your letter and supporting documentation regarding the undertaking noted above. The U.S. Army Engineer District, Sacramento Corps of Engineers, is seeking my comments on the effects that the subject undertaking will have on historic properties, pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA). The proposed project, the Union Pacific Railroad (UPRR) Floodwall and the North Beach Lake Levee (NBLL) components of the South Sacramento County Streams Project, has been identified by the COE as an undertaking subject to review under Section 106 of the NHPA.

The UPRR component is located at the eastern end of the project along the east bank of Morrison Creek. Currently, the railroad levee is the sole flood protection measure for homes located east of Morrison Creek. The NBLL component extends from the UPRR levee to the Sacramento River near Freeport. There are seven alternatives for this undertaking, ranging from no project or simple vegetation removal to the construction of either a new setback levee or a setback floodwall. The Area of Potential Effects (APE) encompasses the locations that would be impacted by all of the proposed alternatives, an area of approximately 120 acres. In addition to your letter of December 29, 2010 (received at our office on January 06, 2011), you have submitted the following document in support of your efforts to identify historic properties in the APE:

- *Memorandum for Record: Archaeological Survey and Historic Properties Evaluation of Approximately 120 acres for the South Sacramento County Streams Project* (S. Joe Griffin, U.S. Army Engineer District, Sacramento: December 10, 2010).

Identification efforts by the COE concluded that the only historic property in the project APE was the original portion of the North Beach Lake Levee (P-34-1363), which was constructed in 1961. The COE has applied the four criteria of eligibility for the National Register of Historic Places to the North Beach Lake Levee and has determined that it is not eligible under any criteria. After reviewing your letter and supporting documentation, I have the following comments:

1) I concur that the APE has been appropriately determined in accordance with 36 CFR Parts 800.4(a)(1) and 800.16(d) and that the COE's efforts to identify and evaluate historic properties represent a reasonable and good faith effort pursuant to 36 CFR Part 800.4(b)(1).

2) I further concur that the North Beach Lake Levee (P-34-1363) is *not* eligible for the National Register of Historic Places (NRHP) under any criteria.

3) I further concur that your finding of No Historic Properties Affected is appropriate pursuant to 36 CFR Part 800.4(d)(1).

Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the COE may have additional future responsibilities for this undertaking under 36 CFR Part 800. Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact William Soule, Associate State Archeologist, at phone 916-445-7022 or email wsoule@parks.ca.gov.

Sincerely,



Milford Wayne Donaldson, FAIA
State Historic Preservation Officer



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

DEC 29 2010

Environmental Resources Branch

Ms. Rhonda Morningstar Pope, Chairperson
Buena Vista Rancheria
P.O. Box 162283
Sacramento, California 95816

Dear Ms. Pope:

In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, pursuant to 36 CFR 800.2 (c)(2)(ii) and 36 CFR 800.4(a)(4), we are writing to inform you of the proposed Union Pacific Railroad (UPRR) floodwall and the North Beach Lake Levee (NBL) components of the South Sacramento County Streams Project in Sacramento County, California and are requesting identification of any properties of religious or cultural significance located in the project area.

The area of potential effects (APE) is located just south of Sacramento, immediately east of Freeport Boulevard in Sacramento County in Township 7 North/Range 4 and 5 East, on the Florin, California (1980) 7.5 minute U.S.G.S. topographic quadrangle. The APE for the UPRR project includes the areas on either side of the UPRR tracks, towards Morrison Creek to the west and a housing development to the east. The NBL APE includes the levee itself, a fifteen foot buffer along both toes, and the area between the levee and interstate 5 where the proposed set-back levee or floodwall would be located (enclosure). On May 27, 2010, a records and literature search was conducted by U.S. Army Corps of Engineers archaeologist, S. Joe Griffin at the North Central Information Center at California State University, Sacramento. The records search indicated that portions of the APE had been surveyed in the past, but that additional survey would be required.

On the 13th of August, 2010, Mr. Griffin performed an intensive pedestrian survey of the UPRR floodwall APE; on November 12th, 2010, Mr. Griffin surveyed the landside and waterside toes of the NBL and the area along Interstate 5 where the proposed set-back levee would be constructed. The only cultural resource encountered in the APE was the original portion of the North Beach Lake Levee (P-34-1363) constructed in 1961. Aside from the levee, no cultural resources were discovered within the APE.

We are sensitive to the protection of traditional cultural properties and sacred sites, and make every effort to avoid them. Please let us know if you have knowledge of locations of archeological sites, or areas of traditional cultural value or concern in or near the proposed South Sacramento County Streams Project area. Correspondence may be sent to Mr. S. Joe Griffin, U.S. Army Corps of Engineers, Sacramento District, 1325 J Street, Sacramento, California 95814-2922. If you have any questions or would like additional information, please contact Mr. Griffin at (916) 557-7897 or by email at: s.joe.griffin@usace.army.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "Alicia E. Kirchner".

Alicia E. Kirchner
Chief, Planning Division

Enclosure

Maps and Photographs

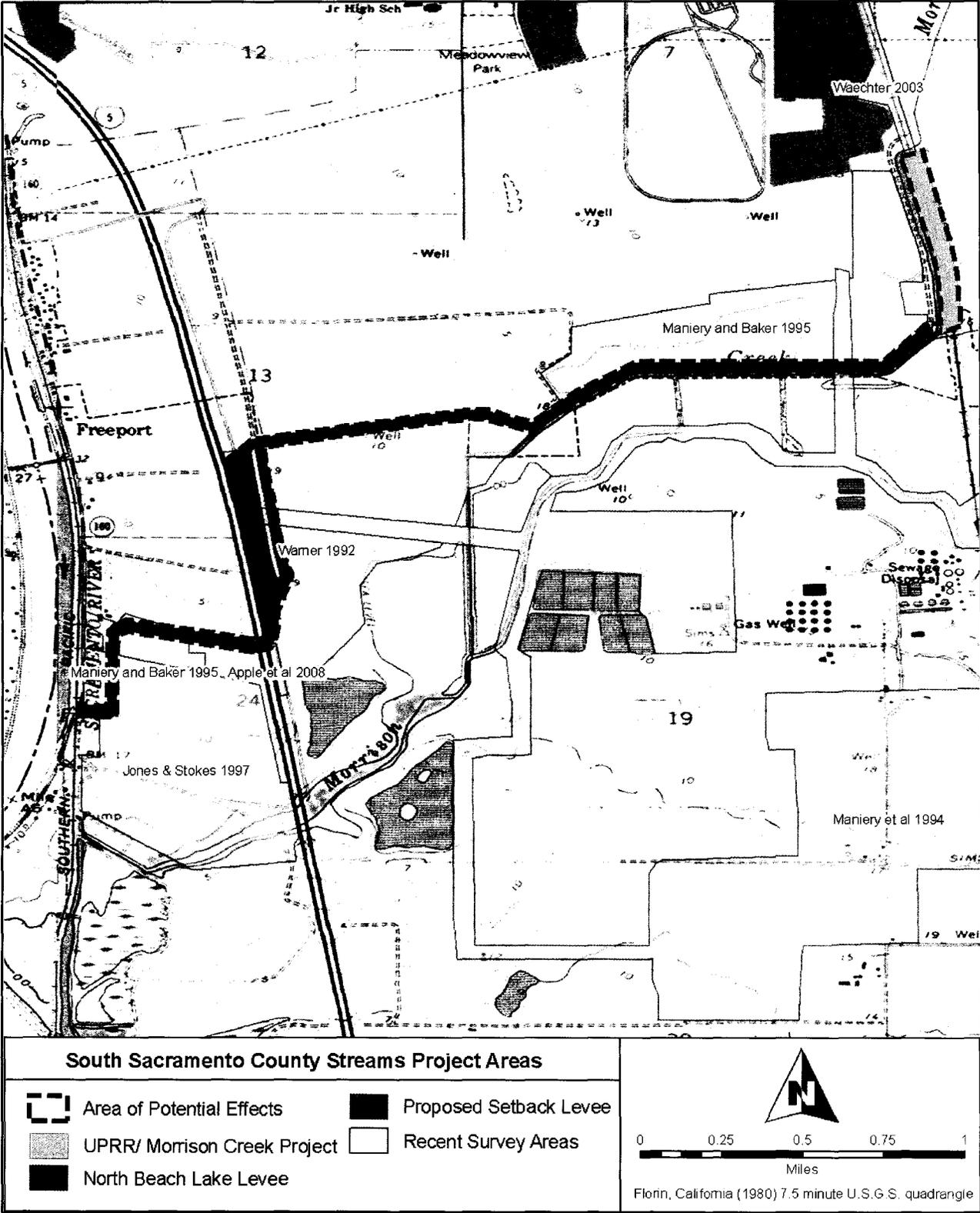


Figure 1. Area of Potential Effects and Previous Cultural Resources Surveys.



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

Environmental Resources Branch

DEC 29 2010

Ms. Mary Daniels-Tarango, Chairperson
Wilton Rancheria
7916 Farnell Way
Sacramento, California 95823

Dear Ms. Daniels-Tarango:

In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, pursuant to 36 CFR 800.2 (c)(2)(ii) and 36 CFR 800.4(a)(4), we are writing to inform you of the proposed Union Pacific Railroad (UPRR) floodwall and the North Beach Lake Levee (NBLL) components of the South Sacramento County Streams Project in Sacramento County, California and are requesting identification of any properties of religious or cultural significance located in the project area.

The area of potential effects (APE) is located just south of Sacramento, immediately east of Freeport Boulevard in Sacramento County in Township 7 North/Range 4 and 5 East, on the Florin, California (1980) 7.5 minute U.S.G.S. topographic quadrangle. The APE for the UPRR project includes the areas on either side of the UPRR tracks, towards Morrison Creek to the west and a housing development to the east. The NBLL APE includes the levee itself, a fifteen foot buffer along both toes, and the area between the levee and interstate 5 where the proposed set-back levee or floodwall would be located (enclosure). On May 27, 2010, a records and literature search was conducted by U.S. Army Corps of Engineers archaeologist, S. Joe Griffin at the North Central Information Center at California State University, Sacramento. The records search indicated that portions of the APE had been surveyed in the past, but that additional survey would be required.

On the 13th of August, 2010, Mr. Griffin performed an intensive pedestrian survey of the UPRR floodwall APE; on November 12th, 2010, Mr. Griffin surveyed the landside and waterside toes of the NBLL and the area along Interstate 5 where the proposed set-back levee would be constructed. The only cultural resource encountered in the APE was the original portion of the North Beach Lake Levee (P-34-1363) constructed in 1961. Aside from the levee, no cultural resources were discovered within the APE.

We are sensitive to the protection of traditional cultural properties and sacred sites, and make every effort to avoid them. Please let us know if you have knowledge of locations of archeological sites, or areas of traditional cultural value or concern in or near the proposed South Sacramento County Streams Project area. Correspondence may be sent to Mr. S. Joe Griffin, U.S. Army Corps of Engineers, Sacramento District, 1325 J Street, Sacramento, California 95814-2922. If you have any questions or would like additional information, please contact Mr. Griffin at (916) 557-7897 or by email at: s.joe.griffin@usace.army.mil.

Sincerely,

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Alicia E. Kirchner
Chief, Planning Division

Enclosure

Maps and Photographs

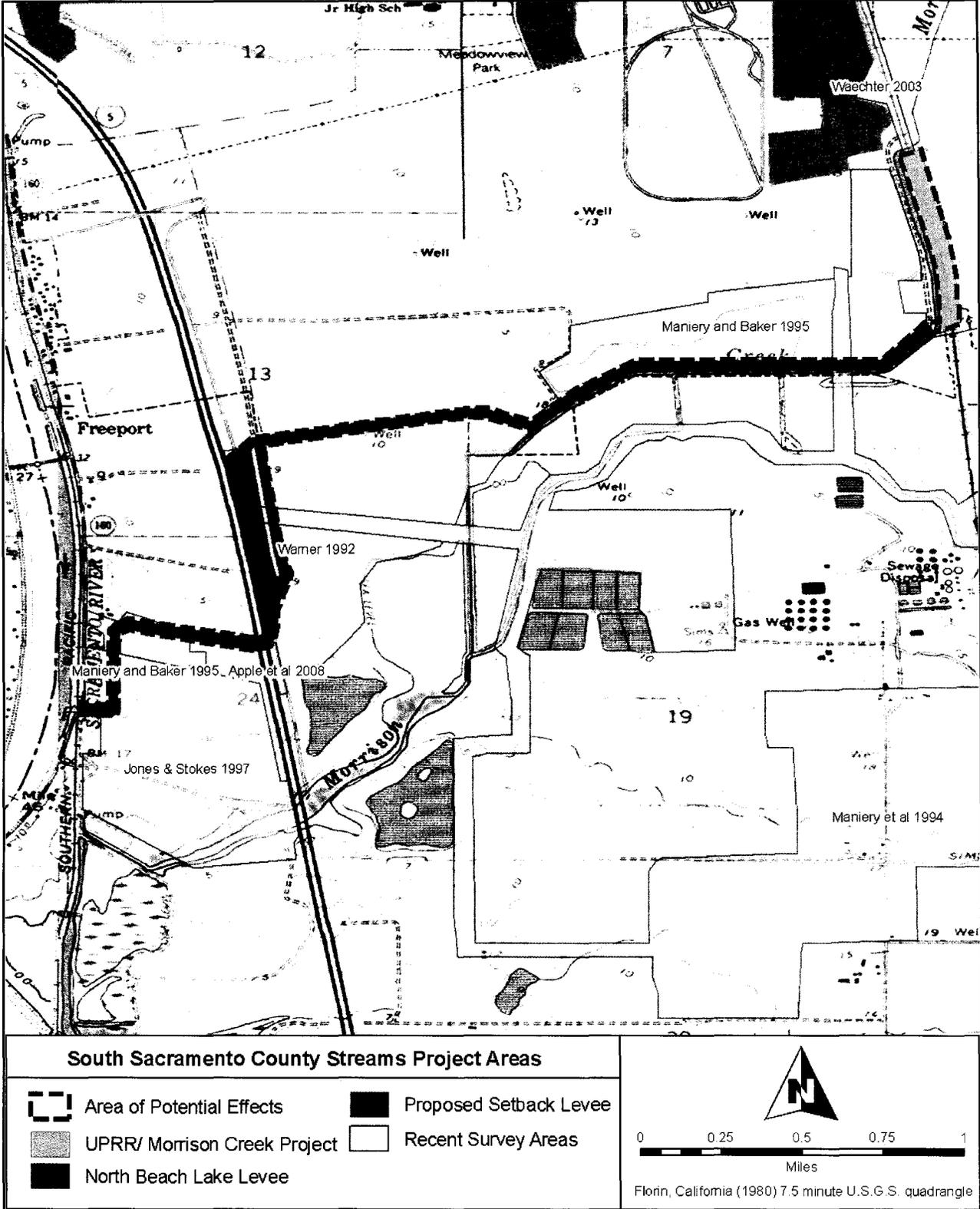


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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

Environmental Resources Branch

DEC 29 2010

Ms. Billie Blue, Chairperson
Ione Band of Miwok Indians, Cultural Committee
604 Pringle Ave # 42
Galt, California 95632

Dear Ms. Blue:

In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, pursuant to 36 CFR 800.2 (c)(2)(ii) and 36 CFR 800.4(a)(4), we are writing to inform you of the proposed Union Pacific Railroad (UPRR) floodwall and the North Beach Lake Levee (NBLL) components of the South Sacramento County Streams Project in Sacramento County, California and are requesting identification of any properties of religious or cultural significance located in the project area.

The area of potential effects (APE) is located just south of Sacramento, immediately east of Freeport Boulevard in Sacramento County in Township 7 North/Range 4 and 5 East, on the Florin, California (1980) 7.5 minute U.S.G.S. topographic quadrangle. The APE for the UPRR project includes the areas on either side of the UPRR tracks, towards Morrison Creek to the west and a housing development to the east. The NBLL APE includes the levee itself, a fifteen foot buffer along both toes, and the area between the levee and interstate 5 where the proposed set-back levee or floodwall would be located (enclosure). On May 27, 2010, a records and literature search was conducted by U.S. Army Corps of Engineers archaeologist, S. Joe Griffin at the North Central Information Center at California State University, Sacramento. The records search indicated that portions of the APE had been surveyed in the past, but that additional survey would be required.

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We are sensitive to the protection of traditional cultural properties and sacred sites, and make every effort to avoid them. Please let us know if you have knowledge of locations of archeological sites, or areas of traditional cultural value or concern in or near the proposed South Sacramento County Streams Project area. Correspondence may be sent to Mr. S. Joe Griffin, U.S. Army Corps of Engineers, Sacramento District, 1325 J Street, Sacramento, California 95814-2922. If you have any questions or would like additional information, please contact Mr. Griffin at (916) 557-7897 or by email at: s.joe.griffin@usace.army.mil.

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Alicia E. Kirchner
Chief, Planning Division

Enclosure

Maps and Photographs

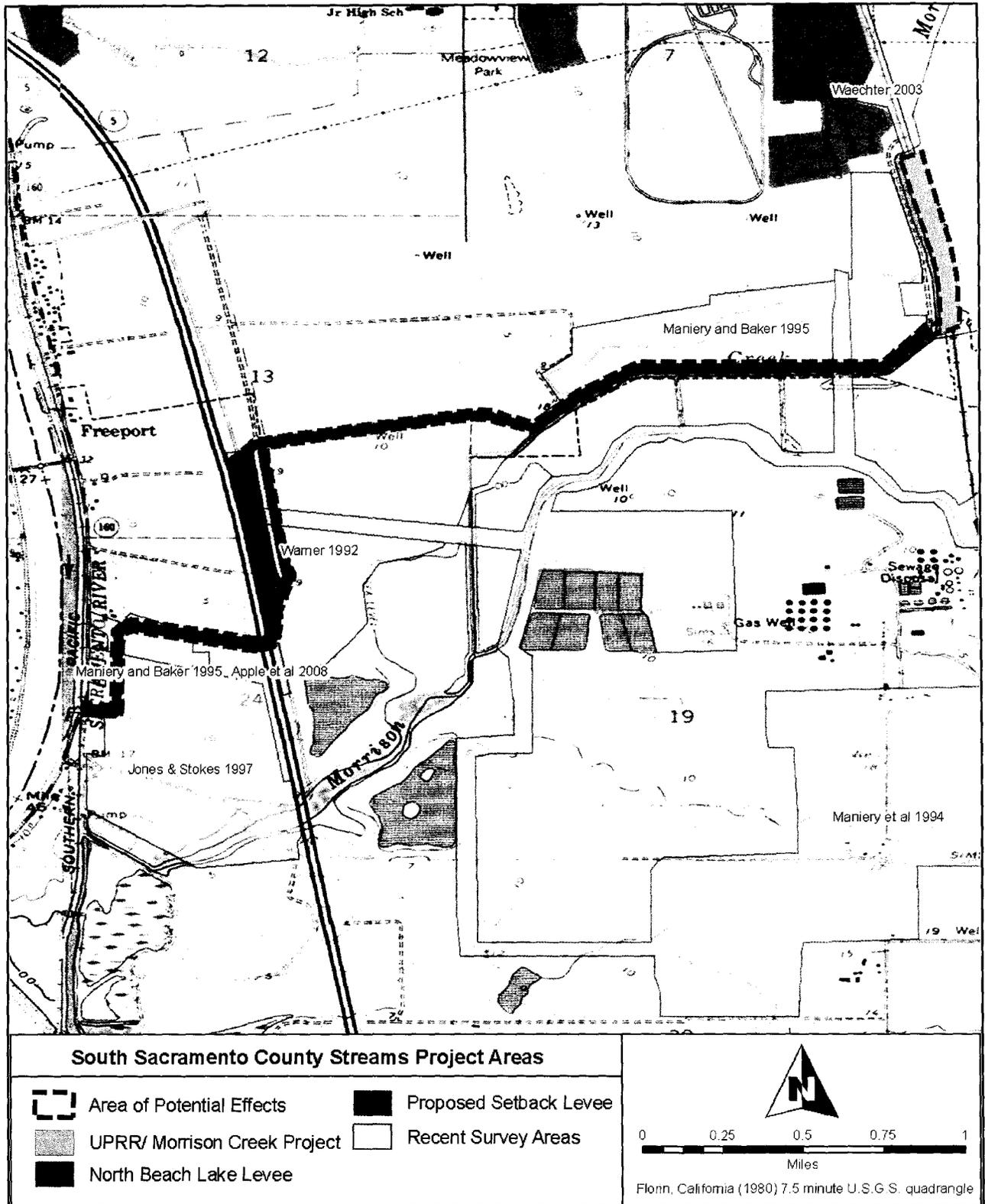


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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

Environmental Resources Branch

DEC 29 2010

Mr. Leland Daniels, Cultural Resources Representative
Wilton Rancheria
7531 Maple Leaf Lane
Sacramento, California 95828

Dear Mr. Daniels:

In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, pursuant to 36 CFR 800.2 (c)(2)(ii) and 36 CFR 800.4(a)(4), we are writing to inform you of the proposed Union Pacific Railroad (UPRR) floodwall and the North Beach Lake Levee (NBL) components of the South Sacramento County Streams Project in Sacramento County, California and are requesting identification of any properties of religious or cultural significance located in the project area.

The area of potential effects (APE) is located just south of Sacramento, immediately east of Freeport Boulevard in Sacramento County in Township 7 North/Range 4 and 5 East, on the Florin, California (1980) 7.5 minute U.S.G.S. topographic quadrangle. The APE for the UPRR project includes the areas on either side of the UPRR tracks, towards Morrison Creek to the west and a housing development to the east. The NBL APE includes the levee itself, a fifteen foot buffer along both toes, and the area between the levee and interstate 5 where the proposed set-back levee or floodwall would be located (enclosure). On May 27, 2010, a records and literature search was conducted by U.S. Army Corps of Engineers archaeologist, S. Joe Griffin at the North Central Information Center at California State University, Sacramento. The records search indicated that portions of the APE had been surveyed in the past, but that additional survey would be required.

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Sincerely,

A handwritten signature in cursive script, reading "Alicia E. Kirchner".

Alicia E. Kirchner
Chief, Planning Division

Enclosure

Maps and Photographs

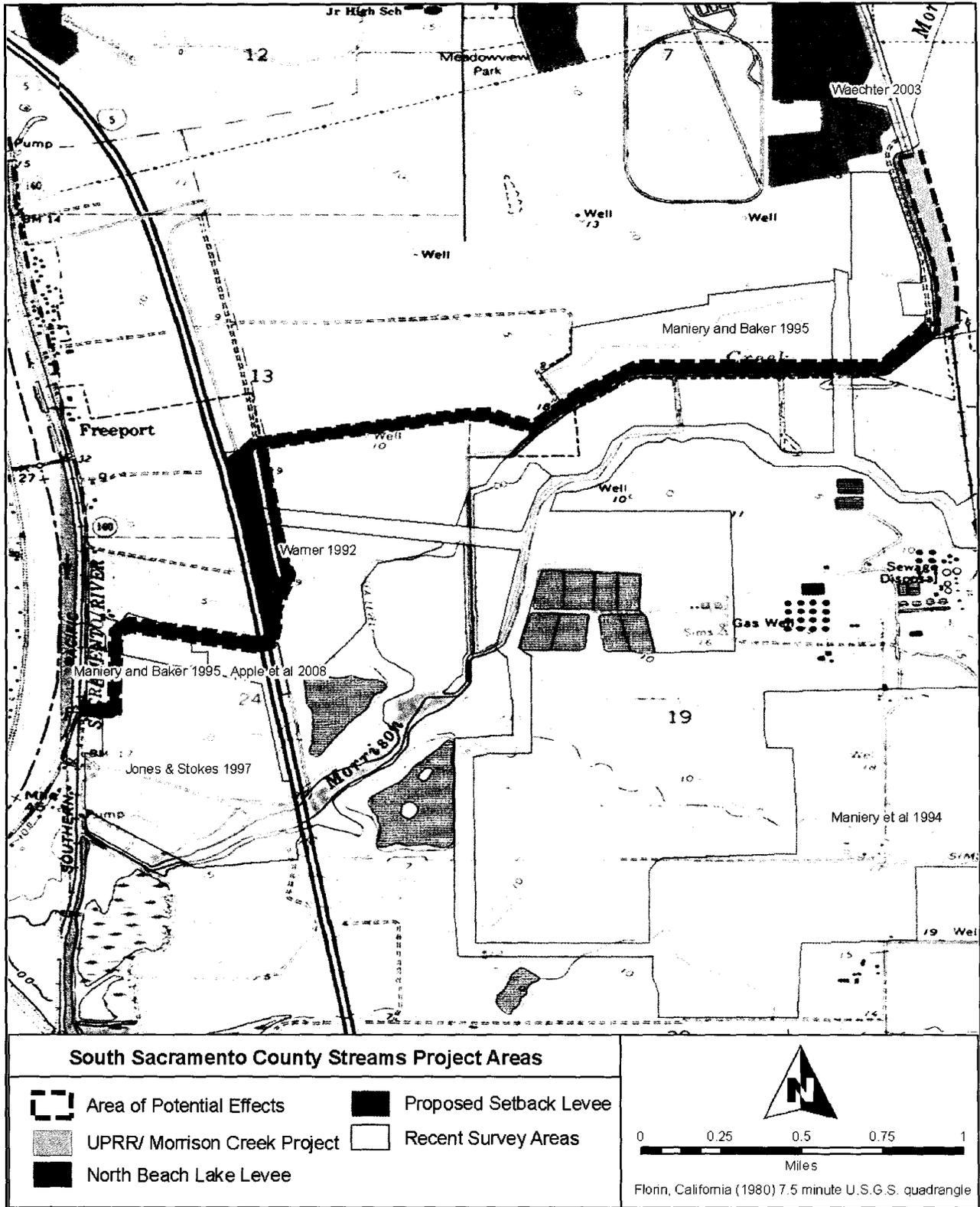


Figure 1. Area of Potential Effects and Previous Cultural Resources Surveys.

APPENDIX I

PUBLIC COMMENTS, RESPONSES, AND SUMMARY OF TEXT CHANGES

Appendix I

South Sacramento County Streams Group Morrison Creek-Union Pacific Railroad Project Supplemental Environmental Assessment/Initial Study Response to Comments and Summary of Text Changes

Comments Received

The United States Army Corps of Engineers (Corps) and Sacramento Area Flood Control Agency (SAFCA) circulated the draft Environmental Assessment/Initial Study (EA/IS) for the Morrison Creek-Union Pacific Railroad Project (Morrison Creek-UPRR project) for a 30-day public review period from July 7, 2011 to August 5, 2011. At the close of the public review period five comment letters were received:

- California Department of Conservation
- California Regional Water Quality Control Board Central Valley Region
- Sacramento Metropolitan Air Quality Management District
- County of Sacramento Department of Transportation
- City of Sacramento Department of Utilities

These letters are included as Appendix I of the final Supplemental EA/IS.

The following summarizes responses to the comments provided in these letters.

California Department of Conservation - The Department of Conservation will be contacted "if any abandoned or unrecorded wells are uncovered or damaged during excavation or grading".

Central Valley Regional Water Quality Control Board- The appropriate permits will be obtained prior to construction.

Sacramento Metropolitan Air Quality Management District -

1. Comment noted-Added control measures for reducing NO_x and controlling visible emissions.
2. Construction phases will not overlap.
3. Tons per year CO₂ will be revised to pounds per day.
4. If the need arises, a plan will be developed and coordinated with SMAQMD.
5. Comment noted.

County of Sacramento Department of Transportation – comment noted

City of Sacramento Department of Utilities – The Corps will incorporate a monitoring system into the project.

Summary of Text Changes to the Draft IS/EA

This errata presents changes to the draft EA/IS resulting from comments received and/or staff initiated text changes. New text is shown in a double underline and text to be deleted is shown in ~~strike out~~. The changes identified below are clarifications or amplification of the information and analysis contained in the draft EA/IS and does not change the results or conclusions.

Page 6:

This route would be the ~~main~~ ingress ~~and egress~~ for all haul trucks accessing the project site. The egress for all haul trucks leaving the project site would be to leave the SMUD lot at the end of Deertree Court, turn left on Deer Water Drive, turn right on Deer Lake Drive and left on Armadale Way (see revised Plate 3).

Page 21:

Construction equipment, haul trucks, and worker vehicles shall be turned off when not in use for more than ~~30~~ five minutes.

Page 33:

Reducing NOx Emissions from Off-Road Diesel Powered Equipment

The project would provide a plan for approval by SMAQMD demonstrating that the heavy-duty (greater than 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, would achieve a project wide fleet-average 20 percent NOx reduction and 45 percent particulate reduction as compared to the most recent CARB fleet average at time of construction.

The project representative would submit to SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that would be used an aggregate of 40 or more hours during any portion of the construction project. The inventory would include the horsepower rating, engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory would be updated and submitted monthly throughout the duration of the project, except that an inventory would not be required for any 30-day period in which there is no construction activity. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative would provide SMAQMD with the anticipated construction timeline, including start date, and name and phone number of the project manager and onsite foreman.

Controlling Visible Emissions from Off-Road Diesel Powered Equipment

The project would ensure that emissions from all off-road diesel powered equipment used on the project site do not exceed 40 percent opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) would be repaired immediately, and SMAQMD would be notified within 48 hours of identification of non-compliant equipment. A visual survey of all in-operation equipment would be made at least weekly, and a monthly summary of the visual survey results would be submitted throughout the duration of the project, except that the monthly summary would not be required for any 30-day period in which no construction activity occurs. The monthly summary would include the quantity and type of vehicles surveyed, as well as the dates of each survey. The SMAQMD

and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section would supercede other SMAQMD or State rules or regulations.

Improve fuel efficiency from construction equipment by minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than ~~three~~ five minutes.

Page 36:

As shown in Table 3.4-5 in Section 3.4-3 above, it is estimated that construction of the project would generate approximately 10,100 ~~tons per year~~ pounds per day of CO₂.

Improve fuel efficiency from construction equipment by minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than ~~three~~ five minutes.

Page 41:

To exit the project area, haul trucks would return to Franklin Boulevard or Mack Road ~~via the ingress route~~ by leaving the SMUD lot at the end of Deertree Court, turning left on Deer Water Drive, turning right on Deer Lake Drive and left on Armadale Way (See Plate 3).

Page 47:

If it is determined that the remains are of Native American origin, the descendants of the deceased native Americans have made a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code 5097.98; or

Page 64:

If construction is scheduled to occur during the typical nesting season for these birds, March 1 through September 1, a preconstruction survey would need to be conducted within two weeks prior to construction for nesting birds under the ~~project~~ Franklin Boulevard and UPRR bridges and in other suitable habitats. If no nests are detected, no further mitigation would be necessary. If active nests are detected, CDFG would need to be contacted to determine appropriate mitigation measures to prevent impacts to nesting birds.

Page 76:

National Environmental Policy Act of 1969: ~~Partial Compliance~~ Full Compliance.

Page 77:

California Environmental Quality Act: ~~Partial Compliance~~ Full Compliance.



DEPARTMENT OF CONSERVATION

Managing California's Working Lands

DIVISION OF OIL, GAS, & GEOTHERMAL RESOURCES

801 K STREET • MS 20-22 • SACRAMENTO, CALIFORNIA 95814

PHONE 916 / 322-1110 • FAX 916 / 322-01201 • TDD 916 / 324-2555 • WEB SITE www.conservation.ca.gov

August 5, 2011

Ms. Lizette Longacre
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Re: **Morrison Creek – Union Pacific Railroad Project**

Dear Ms. Longacre:

The Division of Oil, Gas and Geothermal Resources (Division) is mandated by Section 3106 of the Public Resources Code (PRC) to supervise the drilling, operation, maintenance, and plugging and abandonment of oil and gas wells.

There do not appear to be any active or abandoned oil or gas wells within the boundaries of this project. However, if any abandoned or unrecorded wells are uncovered or damaged during excavation or grading, remedial plugging operations may be required. This office must be contacted to obtain information on the requirements for and approval to perform remedial operations.

If you have any questions, please contact the undersigned at (916) 322-1110 or at mwoods@consvr.ca.gov.

Sincerely,

Michael L. Woods
District Deputy



Linda S. Adams
Acting Secretary for
Environmental Protection

California Regional Water Quality Control Board Central Valley Region

Katherine Hart, Chair

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
(916) 464-3291 • FAX (916) 464-4645
<http://www.waterboards.ca.gov/centralvalley>



Edmund G. Brown Jr.
Governor

25 July 2011

Lizette Longacre
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

CERTIFIED MAIL
7010 3090 0001 4843 2534

COMMENTS TO DRAFT MITIGATED NEGATIVE DECLARATION, SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT, SCH NO. 1997102056, SACRAMENTO COUNTY

Pursuant to the State Clearinghouse's 7 July 2011 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Draft Mitigated Negative Declaration* for the South Sacramento County Streams Morrison Creek –Union Pacific Railroad Project, located in Sacramento County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits¹

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the

¹ Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

California Environmental Protection Agency

maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed for the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916)557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACOE permit, or any other federal permit, is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. Water Quality Certification must be obtained prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

Waste Discharge Requirements

If USACOE determines that only non-jurisdictional waters of the State (i.e., “non-federal” waters of the State) are present in the proposed project area, the proposed project will require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

If you have questions regarding these comments, please contact me at (916) 464-4745 or gsparks@waterboards.ca.gov.



Genevieve (Gen) Sparks
Environmental Scientist
401 Water Quality Certification Program

cc: State Clearinghouse Unit, Governor's Office of Planning and Research, Sacramento

July 20, 2011

SENT VIA E-MAIL ONLY

Ms. Sarah Ross
U.S. Army Corps of Engineers, Sacramento District
Environmental Resources Branch
1325 J Street
Sacramento, CA 95814

**South Sacramento Streams – Morrison Creek-Union Pacific Railroad Project
Draft Environmental Assessment and Initial Study, Finding of No Significant Impact
and Mitigated Negative Declaration (SAC200400273b)**

Dear Ms. Ross:

Thank you for providing the draft Morrison Creek-Union Pacific Railroad Project Draft Environmental Assessment and Initial Study, Finding of No Significant Impact and Mitigated Negative Declaration document to the Sacramento Metropolitan Air Quality Management District (SMAQMD) for review. Staff comments follow.

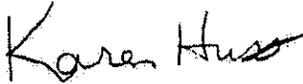
1. The document states it is a supplement to previous environmental documents for the South Sacramento Streams project – the 1998 Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and the 2004 Environmental Assessment (EA) for Design Refinements. The 2004 EA included (on page 39) control measures for NO_x emissions and visible emissions from off-road diesel powered equipment that should carry over to this project. These control measures are identical to the SMAQMD's current Enhanced Exhaust Control Practices (attached).
2. Emissions are estimated using the Road Construction Emissions Model, which is appropriate for this linear project. If any of the construction phases of the project overlap, the emissions estimates from each phase need to be added together to determine the worst-case day emissions. Currently the document states 76 pounds/day of NO_x as the "total emissions." (page 32) Please confirm the potential for overlapping phases, which would further justify the need to include the NO_x control measures noted in comment 1.
3. Page 36 of the document references "10,100 tons per year of CO₂" from the project when the reference should be "pounds/day" as noted in Table 3.4-5 on page 32.
4. If the Army Corps plans to coordinate the construction schedules of this and other projects in the area to reduce cumulative emissions impacts, the document should provide a plan on how this will be implemented. (pages 69-70)

Ms. Sarah Ross
July 20, 2011
Page 2

5. All projects are subject to SMAQMD rules and regulations in effect at the time of construction. A list of specific rules that may relate to construction activities or building design is attached for your reference, but a complete listing of current rules is available at www.airquality.org or by calling 916.874.4800.

Please contact me at 916-874-4881 or khuss@airquality.org if you have any questions regarding these comments.

Sincerely,



Karen Huss
Associate Air Quality Planner/Analyst
Land Use and Mobile Sources Division

Attachments: Enhanced Exhaust Control Practices
 Rules List

Cc: Larry Robinson, SMAQMD



Municipal Services Agency

Department of Transportation

Michael J. Penrose, Director

Steven Szalay, Interim County Executive

Robert B. Leonard, Agency
Administrator

County of Sacramento

August 4, 2011

Ms. Sarah Ross
U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, CA 95814

SUBJECT: COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT/INITIAL STUDY (EA/IS), DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI) AND DRAFT MITIGATED NEGATIVE DECLARATION (MND) FOR THE SOUTH SACRAMENTO STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD (MORRISON CREEK-UPRR) PROJECT.

Dear Ms. Ross:

The Sacramento County Department of Transportation has reviewed the EA/IS, FONSI, and MND for the Morrison Creek – UPRR project. We appreciate the opportunity to review this document and have no comments to offer at this time.

Should you have any questions, please feel free to contact me at (916) 875-2844 or atwalk@saccounty.net.

Sincerely,

Kamal Atwal, P.E., T.E.
Associate Transportation Engineer
Department of Transportation

KA:ka

c: Matt Darrow, DOT
Rizaldy Mananquil, DOT

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ENGINEERING SERVICES

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FAX: 916-808-1497

July 28, 2011
110272

Sarah R. Ross
Biological Sciences
Environmental Manager U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

SUBJECT: So. Sac Streams, Morrison Creek - UPRR Project, Draft EA/IS

Dear Ms. Ross:

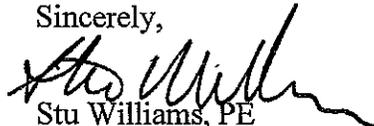
The draft EA/IS, on page 44, in the 2nd half of the 1st paragraph under **“Proposed Action - Construct Landside Floodwall”** states: *“A drainage system along the east side of the proposed floodwall will connect to the City’s storm drain system and drain the area between the proposed floodwall and the backyard fences. If necessary, during high water events, installation of a portable pump will be required at the proposed floodwall to pump excess drainage water directly into Morrison Creek. Portable pump operation will need to be coordinated with water levels in the storm drain system. The Sacramento City Utilities Department, in conjunction with the Corps, are developing plans to install a monitoring system in Morrison Creek upstream of the project area to detect flood water stages.”*

Sacramento City Utilities Department staff expects installation of this monitoring system, described in more detail below, to be included as part of the project construction. The proposed floodwall impacts the neighborhood drainage system by altering existing drainage patterns and increasing the rate and/or amount of surface runoff that flows into it (Project creates a piped system w/ curb and gutter that will collect patrol road runoff and direct that flow into the neighborhood during major storms).

DOU has provided details to the Corps for installation of a self-contained mesh radio based monitoring system. The monitoring system will report storm water levels in two adjacent neighborhood drainage manholes to a web-based network system. The network, based on preset alarm level settings, will notify maintenance staff when to install/operate the portable pump at the floodwall. Operating the pump is intended to prevent localized flooding in the adjacent neighborhood and over the new project patrol road. Installation of the monitoring system will facilitate effective pump operations and offsetting some neighborhood drainage system impacts associated with the floodwall project.

Please assure that this monitoring system is installed as part of the project, and that noise from the operation of an engine driven portable pump has been considered in the environmental impacts. Thank you for the opportunity to comment.

Sincerely,


Stu Williams, PE

Cc: Holly Gilchrist/SAFCA Council, & file

SAFCA '11 AUG 1 AM 11:28

SOUTH SACRAMENTO MORRISON CREEK- UNION PACIFIC RAILROAD PROJECT

Mitigation Monitoring and Reporting Program

Public Resources Code Section 21081.6, subdivision (a)(1) requires lead agencies to, “adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation”. This Mitigation Monitoring and Reporting Program (MMRP) identifies: mitigation measures adopted by the Sacramento Area Flood Control Agency (SAFCA) for the South Sacramento Streams Morrison Creek-Union Pacific Railroad Project; timing of the action; responsibility for implementation of the mitigation measures; and responsibility for monitoring implementation of mitigation measures. Mitigation measures were included in the Supplemental Environmental Assessment/Initial Study (EA/IS) (State Clearinghouse No. 1997102056).

The MMRP table includes the following:

- **Mitigation Measures** – lists the adopted mitigation measures from the EA/IS.
- **Timing** – identifies the timing of implementation of the actions described in the mitigation measures.
- **Responsibility for Implementation** – identifies the agency/party responsible for implementing the actions described in the mitigation measures.
- **Responsibility for Monitoring** – identifies the agency/party responsible for monitoring implementation of the actions described in the mitigation measures.

Abbreviations used in the MMRP include:

- Corps – US Army Corps of Engineers
- CVFPB – Central Valley Flood Protection Board
- SAFCA – Sacramento Area Flood Control Agency
- SMAQMD – Sacramento Metropolitan Air Quality Management District

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
Noise					
Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools.	During Construction	Corps	SAFCA		
Construction equipment, haul trucks, and worker vehicles shall be turned off when not in use for more than 5 minutes.	During Construction	Corps	CVFPB		
Residences adjacent to the project area and along the haul routes identified in Section 3.2.2 shall be notified by the Corps and or its partners about the type and schedule of construction.	Prior to Construction	Corps	CVFPB/SAFCA		
Air Quality					
Implement the following measures to reduce NO _x emissions from off-road diesel powered equipment:	During Construction	Corps	CVFPB/SMAQMD		
<ul style="list-style-type: none"> The project would provide a plan for approval by SMAQMD demonstrating that the heavy-duty (greater than 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, would achieve a projectwide fleet-average 20 percent NO_x reduction and 45 percent particulate reduction as compared to the most recent CARB fleet average at time of construction. The project representative would submit to SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that would be used an aggregate of 40 or more hours during any portion of the construction project. The inventory would include the horsepower rating, engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory would be updated and submitted monthly throughout the duration of the project, except that an inventory would not be required for any 30-day period in which there is no construction activity. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative would provide SMAQMD with the anticipated construction timeline, including start date, and name and phone number of the project manager and onsite foreman. 					

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
<p>Implement the following measure to control visible emissions from off-road diesel powered equipment:</p> <ul style="list-style-type: none"> The project would ensure that emissions from all off-road diesel powered equipment used on the project site do not exceed 40 percent opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) would be repaired immediately, and SMAQMD would be notified within 48 hours of identification of non-compliant equipment. A visual survey of all in-operation equipment would be made at least weekly, and a monthly summary of the visual survey results would be submitted throughout the duration of the project, except that the monthly summary would not be required for any 30-day period in which no construction activity occurs. The monthly summary would include the quantity and type of vehicles surveyed, as well as the dates of each survey. The SMAQMD and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section would supercede other SMAQMD or State rules or regulations. 	During Construction	Corps	SMAQMD		
<p>Implement the following Basic Construction Emission Control Practices (BCECP) and Best Management Practices (BMPs):</p> <ul style="list-style-type: none"> Equipment operation, activities, or processes performed by the contractor would be in accordance with all Federal and State air emission and performance laws and standards. Dust particles, aerosols, and gaseous by-products from construction activities, and processing and preparation of materials would be controlled at all times, including weekends, holidays, and hours when work is not in progress. The contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control would be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The contractor would comply with all State and local visibility regulations. All on-street trucks hauling soil, sand, and other loose materials would be covered or would maintain at least two feet of freeboard. Any haul trucks that would be traveling along freeways or major roadways should be covered. Exposed surfaces, graded areas, and storage piles would be watered at least twice daily to reduce generation of dust. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads. Vehicle speeds on unpaved roads would be limited to 15 miles per hour (mph). Minimize idling time either by shutting equipment off when not in 	During Construction	Corps	CVFPB		

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
use or reducing the time of idling to 5 minutes [required by California Code of Regulations, Title 13, sections 2449(d)(3) and 2485]. Provide clear signage that posts this requirement for workers at the entrances to the site.					
<p>Prepare and implement a dust and particulate suppression plan and submit it to the Sacramento Metropolitan Air Quality Management District (SMAQMD) for review before initiating construction activities. The plan would include as many of the following mitigation measures, as applicable, depending on the maximum actively disturbed area during construction (Appendix B of the <i>Sacramento Metropolitan Air Quality Management District Plan's Guide to Air Quality Assessment for Sacramento County</i>):</p> <ul style="list-style-type: none"> • Water exposed soil at least three times daily (55 percent mitigation factor) and additionally as required to prevent fugitive dust. • Maintain at least two feet of freeboard for on-street trucks hauling soil, sand, or other loose materials or cover loads (1 percent mitigation factor). • Water soil piles three times daily (55 percent mitigation factor) and additionally, as required, to prevent fugitive dust. • Keep soil moist at all times (75 percent mitigation factor) and additionally as required to prevent fugitive dust. • Use emulsified diesel or diesel catalysts on applicable heavy duty diesel construction equipment. • Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, and/or other options as they become available. • Improve fuel efficiency from construction equipment by minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 5 minutes. • Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated. • Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power. • Use a California Air Resources Board (CARB)-approved low carbon fuel for construction equipment. • Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes. 	<p>Prior to Construction - develop and get approval of dust and particulate suppression plan</p> <p>During Construction - implement dust suppression measures</p>	Corps	CVFPB		

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
Climate Change					
Implement the following BMPs, which are also included in the Air Quality section, to further reduce greenhouse gas (GHG) emissions associated with the project: <ul style="list-style-type: none"> • Improve fuel efficiency from construction equipment by minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 5 minutes. • Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated. • Train equipment operators in proper use of equipment. • Use the proper size of equipment for the job. • Use equipment with new technologies. 	During Construction	Corps	CVFPB		
Traffic and Circulation					
The contractor would be required to develop a Traffic Control Plan prior to construction, and coordinate all use of public roads with the City of Sacramento, or other responsible agencies. This plan would include the following measures: <ul style="list-style-type: none"> • Construction vehicles would not be permitted to block any roadways or driveways. • Access will be provided for emergency vehicles at all times. • Signs and flagmen would be used, as needed, to alert motorists, bicyclists, and pedestrians to the presence of haul trucks and construction vehicles at all access points. • Vehicles would be required to obey all speed limits, traffic laws, and transportation regulations during construction. Vehicles would not exceed 15 miles per hour on unpaved levee roads. • Construction workers would be encouraged to carpool and park in designated staging areas. • Closure of levee roads, staging areas, and construction sites would be clearly fenced and delineated with appropriate closure signage. • The contractor would be required to repair any roads damaged by construction. 	Prior to Construction – develop Traffic Control Plan During Construction – Implement traffic control measures At Conclusion of Construction – repair road damage	Corps	CVFPB		

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
Hydrology and Water Quality					
The contractor would be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Central Valley Regional Water Quality Control Board (CVRWQCB).	Prior to Construction	Corps	CVFPB		
<ul style="list-style-type: none"> Prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to initiation of construction activities. The SWPPP would be developed in accordance with guidance from the CVRWQCB. These plans would also be reviewed and approved by the Corps. Implement appropriate measures to prevent any debris, soil, rock, or other construction activities from getting into the water. The contractor will use appropriate measures to control dust on the project site and stockpiles. Properly dispose of oil or liquid wastes. Fuel and maintain vehicles in specified areas that are designed to capture spills. Inspect and maintain vehicles and equipment to prevent dripping of oil and other fluids. Schedule construction to avoid as much of the wet season as possible. If rains are forecast during the construction period, erosion control measures would be implemented as described in the SWPPP. Train construction personnel in stormwater pollution prevention practices. Revegetate and restore areas cleared by construction with native grasses in a timely manner to control erosion. 	Prior to Construction – prepare SWPPP During Construction – implement measures in SWPPP	Corps	CVFPB		
Cultural and Paleontological Resources					
All initial excavations into intact sediments would be observed by a qualified archaeological monitor.	During Construction	Corps	CVFPB		
If tree removal occurs, and root excavations bear the potential to impact buried cultural resources, those excavations would also be observed by an archaeological monitor.	During Construction	Corps	CVFPB		
If buried cultural resources such as chipped or ground stone, midden deposits, historic debris, building foundations, human bone, or paleontological resources are inadvertently discovered during ground-disturbing activities, work would be stopped pursuant to 36 CFR 800.13(b), Discoveries Without Prior Planning, to determine the significance of the find and, if necessary, complete appropriate discovery procedures.	During Construction	Corps	CVFPB		

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
<p>If remains of Native American origin are discovered during project construction, it will be necessary to comply with state laws concerning the disposition of Native American burials, which fall within the jurisdiction of the California Native American Heritage Commission (NAHC). If any human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:</p> <ul style="list-style-type: none"> • The Sacramento County coroner has been informed and has determined that no investigation of the cause of death is required; and • If it is determined that the remains are of Native American origin, the descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code 5097.98; or • The NAHC has been unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission. 	During Construction	Corps	CVFPB		
Vegetation and Wildlife					
Any previously identified disturbed habitat temporarily impacted by construction would be restored by reseeding the affected area with native grasses and forbs after construction.	At Conclusion of Construction	Corps	CVFPB		
Loss of wetland habitats will be compensated to the degree needed to replace the functional values supported by this habitat.	At Conclusion of Construction	Corps	CVFPB/SAFCA		
If determined appropriate, possible mitigation strategies would be identified. These could include, purchasing additional mitigation in a suitable offsite mitigation bank to compensate for any additional potential impacts to waters of the U.S. as a result of the project.	At Conclusion of Construction or at USFWS direction	Corps	CVFPB/SAFCA		

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
Special-Status Species					
<p>Mitigation measures for impacts to for vernal pool fairy shrimp, vernal pool tadpole shrimp, and midvalley fairy shrimp (vernal pool branchiopods) may include, but are not limited to:</p> <ul style="list-style-type: none"> Implementing BMPs and adherence to all project permit requirements to prevent water quality impacts to the seasonal wetland; preservation of seasonal wetland habitat for habitat affected at a ratio of 2:1 at a USFWS approved location; and other appropriate mitigation as determined by United States Fish and Wildlife Service (USFWS). 	<p>Prior to Project Completion – preserve wetland habitat or at USFWS direction</p> <p>During Construction – implement wetland protection BMPs</p>	Corps	CVFPB/SAFCA		
<p>Prior to construction, the habitat suitability of the project area and adjacent wetlands would be determined in consultation with USFWS. If suitable habitat for California tiger salamander is determined to be present, the Corps would consult with USFWS to determine if additional mitigation measures are needed above those included in this document for vernal pool branchiopods. Additional measures may include, but are not limited to:</p> <ul style="list-style-type: none"> Biological monitoring during initial construction activities in suitable habitat for this species; worker awareness training to inform construction personnel of the potential occurrence of California tiger salamander; and proper procedures for protecting the species if it is observed during construction. 	<p>Prior to Construction – determine habitat suitability</p> <p>During Construction – implement protection measures</p>	Corps	CVFPB/SAFCA		
<p>The following mitigation measures would be implemented for impacts to giant garter snake (GGS):</p> <ul style="list-style-type: none"> The Corps and the non-federal sponsor will ensure implementation of the respective terms and conditions and reasonable and prudent measures identified in the resulting Biological Opinion once it is received. Construction in aquatic habitat or upland habitat within 200 feet of Morrison or Unionhouse Creeks will conform to the USFWS's <i>Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat</i>, including the requirement that construction be limited to the period between May 1 and October 1, the active period for the snake. Additional measures, such as worker awareness training and biological monitoring for GGS during construction and habitat protection, would be implemented as determined appropriate by USFWS. 	During Construction	Corps	CVFPB/SAFCA		

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
Conduct pre-construction bat surveys to inspect the undersides of the Franklin Boulevard and the UPRR bridges for roosting bats. If no roosting bats are found, no further mitigation would be necessary. If bats are detected within the roost at the time of construction, excluding any bats from roosts would be accomplished by a bat specialist prior to the onset of any construction activities. Exclusionary devices, such as plastic sheeting, plastic, and/ or wire mesh, can be used to allow for bats to exit but not re-enter any occupied roosts. Expanding foam and plywood sheets can be used to prevent bats from entering unoccupied roosts.	Prior to Construction – conduct pre-construction survey During Construction – implement exclusion measures	Corps	CVFPB/SAFCA		
If construction is scheduled to occur between March 15 and September 15, preconstruction surveys would be conducted in suitable nesting habitat within 0.5 miles of the project area for Swainson’s hawk, within 1,000 feet of the project area for tree nesting raptors including Cooper’s hawk and whitetailed kite, and within 500 feet of the project site for burrowing owls. Surveys shall conform to the Swainson’s Hawk Technical Advisory Committee Guidelines and California Department of Fish and Game (CDFG) burrowing owl recommendations, where feasible. Burrowing owl surveys shall be conducted in both the breeding (April 15 to July 17) and non-breeding (December 1 to January 31) seasons. If nesting raptors are recorded within their respective buffers, CDFG would be consulted regarding suitable measures to avoid impacting breeding effort. Mitigation measures would include but are not limited to the following: <ul style="list-style-type: none"> An appropriately sized buffer would be maintained around each active raptor nest. The buffer size would be determined in consultation with CDFG. No construction activities would be allowed within this buffer, except as allowed through consultation with CDFG. Depending on conditions specific to each nest, and the relative location and rate of construction activities, it may be feasible for construction to occur as planned within the buffer without impacting breeding effort. In this case, as determined by consultation with CDFG, the nest(s) shall be monitored by a qualified biologist during construction within the buffer. If the monitoring biologist determines that construction will impact the nest, the biologist shall immediately inform the construction manager and CDFG. Construction activities within the buffer will be stopped until either the nest is no longer active or the project receives approval to continue by CDFG. 	Prior to Construction – conduct pre-construction survey During Construction – implement protection measures	Corps	SAFCA CVFPB/SAFCA		

**SOUTH SACRAMENTO COUNTY STREAMS MORRISON CREEK-UNION PACIFIC RAILROAD PROJECT
MITIGATION MONITORING AND REPORTING PROGRAM**

Mitigation Measure	Timing	Responsible for Mitigation	Responsible for Monitoring	Verification and Implementation	
				Date Completed	Status/Comments
<p>If construction is scheduled to occur during the typical nesting season for swallows, black phoebe, and other migratory birds, March 1 through September 1, a preconstruction survey would need to be conducted within two weeks prior to construction for nesting birds under the Franklin Boulevard and UPRR bridges and in other suitable habitats. If no nests are detected, no further mitigation would be necessary. If active nests are detected, CDFG would need to be contacted to determine appropriate mitigation measures to prevent impacts to nesting birds.</p> <p>Alternatively, in order to prevent swallows and black phoebes from nesting under the bridge, a nest survey should be conducted prior to the nesting season in the year that construction is scheduled to commence. In consultation with CDFG, the existing unoccupied nests under the bridge should be removed prior to the nesting season by pressure washer or mechanical means. Nests can only be removed in consultation with CDFG and prior to eggs being laid in the nests. Nest exclusion should be conducted throughout the nesting season consisting of either removing partially built nests weekly through the nesting season or installing exclusionary netting for as long as necessary to prevent swallows from attempting to rebuild the nests.</p>	<p>Prior to Construction – conduct pre-construction survey</p> <p>During Construction – implement protection measures</p>	Corps	CVFPB/SAFCA		
<p>Pre-construction surveys would be conducted in the study area prior to construction. If Sanford's arrowhead is not found, then no further mitigation would be necessary. If Sanford's arrowhead is found in the study area, appropriate mitigation would be determined in consultation with CDFG to avoid impacts to this species. Mitigation could include transplanting any Sanford's arrowhead plants found in the study area to suitable habitats up or downstream.</p>	<p>Prior to Construction – conduct pre-construction survey</p> <p>During Construction – implement protection measure</p>	Corps	CVFPB/SAFCA		