US Army Corps
of Engineers ®
San Francisco District

PAJARO RIVER FLOOD RISK MANAGEMENT PROJECT
SANTA CRUZ AND MONTEREY COUNTIES
CALIFORNIA

ENVIRONMENTAL
APPENDIX E OCTOBER 2018

Appendix E

Environmental

E-1 Endangered Species Act
- Biological Assessment

E-2 Fish and Wildlife Coordination Act
- FWCA Letter Report

E-3 National Historic Preservation Act
[Note: This appendix is now Appendix J.]

E-4 Farmland Protection Policy Act
- Farmland Conversion Impact Rating for Monterey County
- Farmland Conversion Impact Rating for Santa Cruz County

E-5 Clean Water Act
- Section 404(b)(1) Evaluation

E-6 Phase 1 Site Assessment
[Note: This appendix was removed to the Project File.]

Appendix E-1

Endangered Species Act Biological Assessment

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, US ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO CALIFORNIA 94103-1398

REPLY TO
ATTENTION OF

November 2, 2017

Environmental Section B

Ms. Amanda Morrison
North Central Coast Office
National Marine Fisheries Service
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

Dear Ms. Morrison:

This letter is to request concurrence with our determination that the Pajaro River Flood Risk Management Study Tentatively Selected Plan (project), which is the proposed action, may affect, but is not likely to adversely affect the South Central California Coast Steelhead Evolutionarily significant unit (ESU) (*Oncorhynchus mykiss*), or its designated critical habitat. Our biological assessment is enclosed.

The purpose of the project is to reduce flood risk to the City of Watsonville, town of Pajaro, and surrounding agricultural lands. This will be accomplished by improving existing levees, constructing new levees (including setback levees), removing existing levees where setback levees will be constructed, constructing new floodwalls, and placing erosion protection (riprap) along the waterside slope of existing levees along the Pajaro River. The project also incorporates mitigation and conservation measures, which are detailed in Section 3.5 of the enclosed document. If the project is approved and funded, then detailed engineering analysis and design development would be completed prior to construction.

A draft integrated General Reevaluation Report and Environmental Assessment (GRR/EA) is also available for public review and comment through November 30, 2017. The GRR/EA provides additional information about the proposed action, alternatives to the action, and the effects of the project on a wide range of environmental and socioeconomic resources. The GRR/EA was received by your office on October 30, 2017 and can also be accessed at: http://www.spn.usace.army.mil/Missions/Projects-and-Programs/Projects-by-Category/Projects-for-Flood-Risk-Management/Pajaro-River-Watsonville/.

If you have any questions, please contact Mr. Chris Eng, Environmental Manager, at (415) 503-6868 or email: Christopher.K.Eng@usace.army.mil. Thank you for your attention to this matter.

Sincerely,

Jessica Burton Evans
Chief, Environmental Section B

Enclosure

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, US ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO CALIFORNIA 94103-1398

REPLY TO
ATTENTION OF

November 2, 2017

Environmental Section B

Mr. Steve Henry, Field Supervisor
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, California 93003

Dear Mr. Henry:

This letter is to request concurrence with our determination that the Pajaro River Flood Risk Management Study Tentatively Selected Plan (project), which is the proposed action, may affect, but is not likely to adversely affect the California red-legged frog (*Rana aurora draytonii*). We have also determined that the proposed action would have no effect on the tidewater goby (*Eucyclogobius newberryi*) or the Santa Cruz tarplant (*Holocarpha macradenia*). Our biological assessment is enclosed.

The purpose of the project is to reduce flood risk to the City of Watsonville, town of Pajaro, and surrounding agricultural lands. This will be accomplished by improving existing levees, constructing new levees (including setback levees), removing existing levees where setback levees will be constructed, constructing new floodwalls, and placing erosion protection (riprap) along the waterside slope of existing levees along the Pajaro River. The project also incorporates mitigation and conservation measures, which are detailed in Section 3.5 of the enclosed document. If the project is approved and funded, then detailed engineering analysis and design development would be completed prior to construction.

A draft integrated General Reevaluation Report and Environmental Assessment (GRR/EA) is also available for public review and comment through November 30, 2017. The GRR/EA provides additional information about the proposed action, alternatives to the action, and the effects of the project on a wide range of environmental and socioeconomic resources. The GRR/EA was received by your office on October 30, 2017 and can also be accessed at: http://www.spn.usace.army.mil/Missions/Projects-and-Programs/Projects-by-Category/Projects-for-Flood-Risk-Management/Pajaro-River-Watsonville/.

If you have any questions, please contact Mr. Chris Eng, Environmental Manager, at (415) 503-6868 or email: Christopher.K.Eng@usace.army.mil. Thank you for your attention to this matter.

Sincerely,

Jessica Burton Evans
Chief, Environmental Section B

Enclosure

PAJARO RIVER FLOOD RISK MANAGEMENT PROJECT

BIOLOGICAL ASSESSMENT

October 2017

U.S. Army Corps of Engineers
San Francisco District

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LIST OF ABBREVIATIONS AND ACRONYMS

AAHU	Annual Habitat Unit
AFB	Alternative Formulation Briefing
BA	Biological Assessment
BMPs	Best Management Practices
BO	Biological Opinion
CAR	Fish and Wildlife Coordination Act Report
CCT	California Coastal Trail
CDFG	California Department of Fish and Game (now Department of Fish and Wildlife)
CDPR	California Department of Parks and Recreation
cfs	cubic feet per second
CDFW	California Department of Fish and Wildlife
Corps	U.S. Army Corps of Engineers, San Francisco District
CNDDB	California Natural Diversity Database
Counties	Santa Cruz and Monterey Counties
CRLF	California Red-legged Frog
DPS	Distinct Population Segment
E	Endangered
EIR	Environmental Impact Report
ESA	Federal Endangered Species Act
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
ft	feet, foot
FWCA	Fish and Wildlife Coordination Act
GANDA	Garcia and Associates
HEC-FDA	Hydrologic Engineering Center-Flood Damage Analysis
HEP	Habitat Evaluation Procedures
HSI	Habitat Suitability Index
HU	Habitat Unit
LAA	likely to adversely affect
MCWRA	Monterey County Water Resources Agency
MSL	mean sea level
n-value	Manning's roughness coefficient
NAP	normal annual precipitation
NE	no effect
NED Plan	National Economic Development Plan
NLAA	not likely to adversely affect
NOAA Fisheries	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
O&M	Operation and Maintenance
OMRR&R	Operation, maintenance, repair, replacement and rehabilitation
PRBO	Point Reyes Bird Observatory
RWQCB	Regional Water Quality Control Board
SCCDPW	Santa Cruz County Department of Public Works

SCCRCD	Santa Cruz County Resources Conservation District
T	Threatened
TMDL	total maximum daily load
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

The purpose of this Biological Assessment (BA) is to analyze the potential effect of the proposed Pajaro River Flood Risk Management Project (project) on species listed or proposed for listing as Endangered (E) or Threatened (T) under the Endangered Species Act (ESA), and on designated and proposed critical habitat, within the project's area of effect (action area). The United States (U.S.) Army Corps of Engineers (USACE), San Francisco District, proposes to construct the project in Santa Cruz and Monterey counties, California (**Figure 1**). The purpose of the project is to reduce flood risk (and associated risks to life safety, property, and socioeconomics), to the City of Watsonville, the town of Pajaro, and surrounding agricultural lands. This area has a long history of flooding from the lower Pajaro River, Salsipuedes Creek, and Corralitos Creek which has resulted in substantial damages in the City of Watsonville, town of Pajaro, and surrounding agricultural areas. Santa Cruz and Monterey counties (Counties) are the local sponsors of the project.

Figure 1. General Location of the Proposed Action.

1.1 Background

1.1.1 Current General Reevaluation Study

USACE and its non-Federal sponsors, Monterey and Santa Cruz counties, are conducting the Pajaro River General Reevaluation Study. The purpose of the study is to investigate and determine the extent of Federal interest in a plan reduce the risk of flooding in the City of Watsonville, town of Pajaro, and surrounding agricultural lands. The study partners have identified a Tentatively Selected Plan (TSP), which is the proposed action addressed in this BA.

1.1.2 Original 1949 Flood Risk Management Project

In 1949, to reduce potential flood damage to adjacent agricultural and urban lands, USACE constructed the existing earthen levees bordering the Pajaro River. The project consisted of levees along the Pajaro River from its mouth to mile 11.1 on the right (north) bank and to mile 9.9 on the left (south) bank[1]. The project also included levees on Salsipuedes Creek from its confluence with the Pajaro River to the high ground at mile 2.6 on the right (west) bank and at mile 1.7 on the left (east) bank. The 1949 project did not include any structural flood risk management measures on Corralitos Creek.

Although the 1949 flood control project was designed to reduce flood risk in the Pajaro Basin from a two percent annual exceedance probability event (50-year event), hydrologic analysis conducted following the flood flows of 1955 and 1958 indicated that the design capacity was more equivalent to a four percent annual exceedance probability event (25-year event). Additionally, the analysis indicated that Corralitos Creek has a twelve percent annual exceedance probability event (8-year event) capacity and flooding from Corralitos Creek circumvents the higher level of protection afforded by the levees on Salsipuedes Creek. Therefore, an expected annual exceedance probability of twelve percent (8-year event) more accurately describes the existing level of flood protection for both Salsipuedes and Corralitos creeks.

Since the 1949 levee construction, flooding events have damaged the levees along Pajaro River and Salsipuedes Creek six times, and additional flooding events have occurred along Corralitos Creek upstream of the existing levees. The first major flooding event to breach the levee system occurred in 1955. In 1986, flooding events damaged the levees along Salsipuedes Creek and in the 1989 Loma Prieta earthquake, the Pajaro River levee system was severely damaged. In 1995, major flooding occurred along the Pajaro River, breaching the levees along both sides of the river. This flood event resulted in significant damage to the agricultural and urban lands surrounding the Pajaro River. Following the 1995 flooding, the Governor of California ordered that riparian vegetation be removed from both banks of the river to provide better flow control as part of emergency flood control measures. In 2006, major flooding again occurred along the Pajaro River and Salsipuedes Creek. In 2017, a series of winter storms in January damaged dozens of sites long the existing project on the Pajaro River and Salsipuedes Creek. The levee on the Santa Cruz County side of the river was again breached in 1998 by high winter flows. In 1982, 1997, and 2016 flooding occurred along Corralitos Creek.

1.2 Authority

The original Pajaro River flood risk management project was authorized by the Flood Control Act of 1944 (Public Law No. 534, 78th Congress, Ch. 665, 2nd Session). The existing Pajaro River flood risk management project was authorized by the Flood Control Act of 1966 (section 203, Public Law 89-789, 80 Stat. 1421). Section 1001 of the Water Resources

[1] The right bank referred to in this report is always to the right of a person looking downstream, and the left bank is to the left of a person looking downstream.

Development Act (WRDA) of 1986 states that every two years, the Secretary of the Army will submit a list of projects to Congress for de-authorization. The list would include authorized projects that have not been constructed and have received no funding for the previous 10 fiscal years. In order to avoid de-authorization, the Pajaro River flood risk management feasibility study was re-authorized by the WRDA 1990, Section 107 Continuation of Authorization of Certain Projects (Public Law 101-640, November 28, 1990),

Section 107 of WRDA 1990 provided that the Pajaro River flood risk management project as authorized by the Flood Control Act of 1966 remain authorized. If the project is approved through a Director's Report the project would be considered authorized and would be eligible for construction funding as part of the budgetary process. If the project is approved through a Chief's Report the project would need to be authorized through a Water Resources, Reform and Development Act (WRRDA) or other Congressional authorization. If authorized the project would be eligible for construction funding as part of the budgetary process.

1.3 Species and Critical Habitat Addressed in this BA

An official list of species with the potential to occur in the vicinity of the project areas and federally listed or proposed for listing as threatened, endangered, and designated critical habitat or habitat proposed for designation was obtained from the U.S. Fish and Wildlife Service's (USFWS) Information Planning and Conservation System (IPaC). The list is provided in **Appendix A**. The following federally endangered and threatened species were included on the USFWS species list and were considered for inclusion in this BA.

<u>Invertebrates</u>

- Vernal Pool Fairy Shrimp (*Branchinecta lynchi)*
- Bay Checkerspot Butterfly (*Euphydryas editha bayensis)*
- Ohlone Tiger Beetle (*Cicindela ohlone)*
- San Bruno Elfin Butterfly (*Callophrys mossii bayensis)*
- Zayante Band-winged Grasshopper (*Trimerotropis infantilis*)

<u>Fish</u>

- Tidewater Goby (*Eucyclogobius newberryi)*
- Delta Smelt (*Hypomesus transpacificus)*
- Steelhead (*Oncorhynchus (=Salmo) mykiss) (S-CCC)*

<u>Amphibians</u>

- California Tiger Salamander (*Ambystoma californiense)*
- California Red-legged Frog (*Rana draytonii*)
- Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*)

<u>Reptiles</u>

- San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia)*

<u>Birds</u>

- Southwestern Willow Flycatcher (*Empidonax traillii extimus)*
- Western snowy plover (*Charadrius alexandrinus nivosus)*
- California least tern (*Sternula antillarum brownii)*
- Marbled Murrelet (*Brachyramphus marmoratus*)

- California condor (*Gymnogyps californianus*)
- Least Bell's vireo (*Vireo bellii pusillus)*

Mammals

- San Joaquin Kit Fox (*Vulpes macrotis mutica)*
- Southern Sea Otter (*Enhydra lutris nereis)*

Plants

- Santa Cruz Tarplant (*Holocarpha macradenia)*
- Marsh Sandwort (*Arenaria paludicola)*
- Monterey Spineflower (*Chorizanthe pungens var. pungens)*
- Ben Lomond Spineflower (*Chorizanthe pungens var. hartwegiana)*
- Ben Lomond Wallflower (*Erysimum teretifolium)*
- San Mateo Woolly Sunflower (*Eriophyllum latilobum)*
- Scotts Valley Spineflower (*Erysimum teretifolium)*
- Scotts Valley Polygonum (*Polygonum hickmanii)*
- Monterey Gilia (*Ambystoma californiense)*

Critical Habitat

- Steelhead (*Oncorhynchus (=Salmo) mykiss)*
  Northern California DS, South-Central California Coast DPS, Central California Coast DPS, California Central Valley DPS, Southern California DPS

Of the twenty-nine federally listed species considered for inclusion in this BA, only the four species listed in **Table 1** have the potential to occur in the Action Area and may be affected by the proposed project; therefore, these species are the subject of this BA. The analysis is based on documented distribution and habitat requirements for each species. Suitable habitat is not present within the action area for the other twenty-five species. Therefore, USACE has determined that the proposed action would have no effect on any of these species, and no further evaluation or consultation on these species is needed (50 Cod of Federal Regulations [CFR] 402.12).

Table 1. Species Considered in this Biological Assessment

Common Name	Scientific Name	Status[1]	Critical Habitat in Action Area?
Plants			
Santa Cruz tarplant	*Holocarpha macradenia*	T	N
Animals			
South Central California Coast steelhead	*Oncorhynchus mykiss*	T	Y
Tidewater goby	*Eucyclogobius newberryi*	E	N
California red-legged frog	*Rana aurora draytonii*	T	N

[1] Listing status under the federal Endangered Species Act: E = Endangered, T = Threatened.

1.4 Consultation to Date

This section summarizes project consultation and correspondence between USACE, USFWS, and NOAA Fisheries/National Marine Fisheries Service (NMFS). USACE has been informally consulting with USFWS and NMFS since the General Reevaluation study was initiated in 2001.

1.4.1 U.S. Fish and Wildlife Service

2001 - USACE initiated informal consultation with the USFWS on the project in 2001 in combination with community planning and stakeholder meetings in a process to develop and evaluate possible project alternatives.

May 29, 2002 - USACE spoke with Ivana Noell of the USFWS Ventura Field and Wildlife. Issues discussed included California red-legged frog (CRLF), the Fish and Wildlife Coordination Act (FWCA), and stakeholder meeting concerns.

September 11, 2002 - USACE spoke with Ivana Noell of the USFWS Ventura Field and Wildlife Office. Continued discussions of CRLF, FWCA, and stakeholder meeting concerns.

January 16, 2003 - USACE spoke with Ivana Noell of the USFWS Ventura Field and Wildlife Office. Continued discussions of CRLF, FWCA, and stakeholder meeting concerns.

April 14, 2003 - USACE spoke with Amelia Orton-Palmer of the USFWS Ventura Fish and Wildlife Office regarding initiation of Habitat Evaluation Procedures (HEP) and a Fish and Wildlife Coordination Act Report (CAR) in accordance with the FWCA.

April 21, 2003 - USACE continued discussion with Amelia Orton-Palmer of the USFWS Ventura Fish and Wildlife Office regarding initiation of Habitat Evaluation Procedures (HEP) and a Fish and Wildlife Coordination Act Report (CAR) in accordance with the FWCA.

September 16, 2003 - USACE spoke with Richard DeHaven and Douglas Weinrich of the USFWS Sacramento Fish and Wildlife Office regarding HEP/CAR.

February 2004 - USACE met with David Pereksta of the Ventura Fish and Wildlife Office and had additional conversations with him regarding HEP/CAR.

September 13, 2017 - USACE submitted request to the USFWS Ventura Fish and Wildlife Office for a species list for the proposed project area via IPaC. The USFWS provided a species list in a letter to USACE dated September 13, 2017 (Consultation Code: 08EVEN00-2017-SLI-0644). The species list covered two U.S. Geological Survey (USGS) 7.5-minute quadrangles: Watsonville West and Watsonville East.

1.4.2 National Marine Fisheries Service

2001 - USACE initiated informal consultation with NOAA Fisheries on the project in combination with the community planning process.

February 26, 2001 - Letter from NOAA Fisheries Southwest Region Office requesting that USACE consider the use of setback levees as the preferred project alternative rather than other structural alternatives such as floodwalls. Setback levees were subsequently investigated by USACE and incorporated as a prominent feature of the preferred project design.

May 30, 2002 through September 9, 2003 - Numerous technical meetings were held among USACE, NOAA Fisheries, the California Coastal Commission, the CDFW, and the Regional Water Quality Control Board to develop project alternatives that would satisfy the ESA, Clean Water Act, and regulatory requirements of the State of California.

April 11, 2003 - USACE presented a preliminary mitigation and monitoring plan for the project and requested recommendations from the resource agencies. At the request of the agencies, USACE and Counties agreed to investigate the potential for creating additional river meanders and excavating the channel benches to allow more frequent overbank flooding within the project footprint. At the conclusion of these technical meetings, USACE and resource agencies recommended criteria for the preliminary design based on analysis of the project alternatives.

January 27, 2004 – Joint letter from NOAA Fisheries and California Department of Fish and Wildlife (CDFW 2004) which stated that these agencies would provide specific comments on ways to reduce impacts and improve maintenance efficiency for the proposed project.

April 21, 2004 – Letter from Mr. Patrick Rutten of NOAA Fisheries that provided information on general performance standards including a paper entitled *Steelhead Requirements and Habitat Performance Standards for the Pajaro River Flood Control Project* (Rutten 2004).

February 8, 2005 - Jonathan Ambrose of NOAA Fisheries spoke with GANDA regarding the proposed project. Items discussed included long-term maintenance of the flood control project, geomorphologic conditions in the Pajaro River channel near Murphy's Crossing, establishing performance criteria for steelhead, and extending the analysis area of the BA to include upstream spawning and rearing areas for steelhead.

February 10, 2005 – USACE letter to Dick Butler of NOAA Fisheries summarizing its previous consultation with the agency on the project and requesting site-specific recommendations regarding performance standards for the project.

March 2, 2006 - GANDA wildlife and fisheries biologists attended a meeting with USACE and Jonathan Ambrose. Items discussed included the long-term project Operation and Maintenance (O&M), Best Management Practices (BMPs), bridge modifications, and the need to measure flow velocities.

2.0 ACTION AREA

The action area refers to the area directly or indirectly affected by the Federal action (50 CFR§402.02 and 402.14[b][2]). This includes the project footprint and surrounding areas where covered species could be affected by project-related impacts such as ground disturbance, noise, changes in water quality and quantity, changes in air quality, and lighting effects.

The action area for this BA is centered on the project area reaches on the Pajaro River from upstream of California Highway 1 to the Murphy Road crossing (Murphy's Crossing); on Salsipuedes Creek from the Pajaro River confluence upstream to College Lake; and on Corralitos Creek from the Salsipuedes Creek confluence upstream to just beyond the Airport Boulevard crossing. These stream reaches are shown in **Figure 2**. The action area extends laterally outward from these existing stream channels to the outer edge of the proposed new levees and floodwalls (the project footprint). No project-related effects on listed species are expected beyond this footprint because construction equipment and earth-moving activities would be confined to the area between the existing levees and the new levees. All of the areas adjacent to the levees consist entirely of cultivated agricultural and urban lands. At the upstream ends of the project along the Pajaro River and Corralitos Creek, the action area extends 100 feet beyond the levee footprint to account for potential temporary disturbance effects.

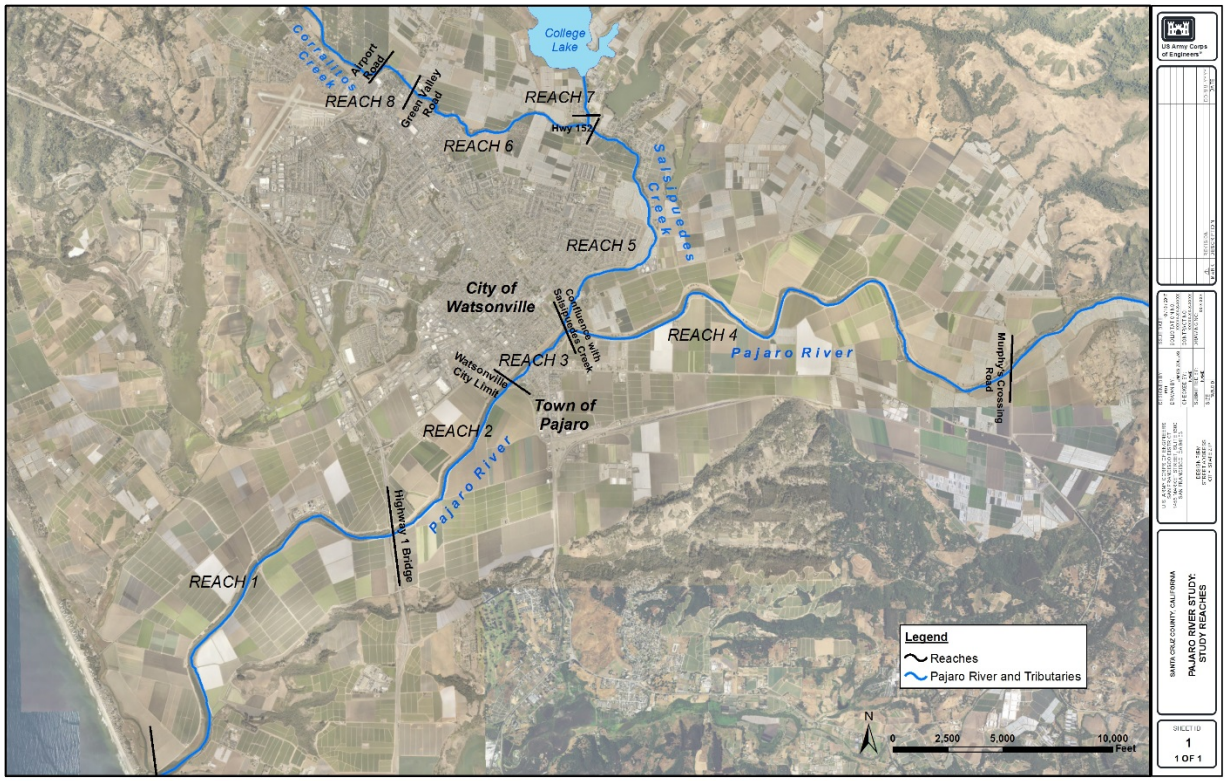


Figure 2. Action Area and Project Reaches

Although the action area is defined relatively narrowly based on anticipated direct and indirect effects of the project, the *analysis area* for this BA extends farther upstream to document habitats for the species analyzed. This is the specifically the case with steelhead within the Pajaro River watershed. The analysis area is more extensive than the action area in order to provide a regional context to discuss existing conditions for steelhead and other covered species. All steelhead that breed within the Pajaro River watershed must migrate through the project area to access their upstream spawning and rearing habitats. While individual steelhead could be affected within project area reaches *en route* to and from upstream habitats, the proposed action would not affect these habitats. Therefore, these upstream areas are not included in the action area.

3.0 PROPOSED ACTION

3.1 Overview

This BA analyzes the TSP, also referred to as the project or the proposed action, which consists of structural flood risk management measures on the lower Pajaro River and on Salsipuedes and Corralitos Creeks (**Figure 3**). It consists of the following broad elements:

- Constructing new levees, including setback levees, "completion levees."
- Removing existing levees in reaches where setback levees are proposed.
- Improving existing levees in place and placement of floodwalls on top of some existing levees.
- Constructing new floodwalls in some areas.
- Placing erosion protection (i.e., riprap) on the waterside slope of existing levees on the lower Pajaro River.
- Levee and floodwall maintenance and repair.

3.2 Project Location

The project area is located in the Pajaro Valley in Santa Cruz and Monterey counties (Figure 1). The Pajaro River generally forms the boundary between these two counties. Salsipuedes Creek and Corralitos Creek are located north of the Pajaro River within Santa Cruz County. The project area includes the City of Watsonville and the Town of Pajaro. Approximately 8,250 acres of agricultural land are also located within the floodplain of the lower Pajaro River Basin. The total project length is approximately 12.4 miles.

Waterways included in the project area are the Pajaro River from California 1 to approximately 7.4 miles upstream at Murphy's Crossing; Salsipuedes Creek from its confluence with the Pajaro River to the outlet at College Lake approximately 2.9 miles upstream; and Corralitos Creek from its confluence with Salsipuedes Creek to Airport Boulevard approximately 2.1 miles upstream. These river segments and tributaries are divided into reaches as described below.

3.2.1 Pajaro River

The project area includes reaches 2 through 4 of the Pajaro River (figures 2 and 3). Reach 2 begins at Highway 1 and continues upstream 1.5 miles to the Watsonville city limits. Reach 3 extends 0.9 mile through the urban area of Watsonville and the Town of Pajaro to the confluence with Salsipuedes Creek. Reach 4 continues for five miles upstream along the main stem from the creek confluence to Murphy's Crossing.

3.2.2 Tributaries

The project area includes reaches 5 and 7 along Salsipuedes Creek and reaches 6 and 8 along Corralitos Creek (figures 4 and 5). Reach 5 extends 2.6 miles up Salsipuedes Creek from the Pajaro River confluence to Highway 152. Reach 7 extends approximately 0.3 mile from

Highway 152 to the outlet at College Lake. Along Corralitos Creek, Reach 6 extends from the confluence with Salsipuedes Creek at Highway 152 to Green Valley Road approximately 1.8 miles upstream. Reach 8 extends another 0.3 mile from Green Valley Road to just upstream of Airport Boulevard.

3.3 Description of Proposed Action

For the purposes of this analysis, the project area is divided into eight stream reaches numbered from the river mouth upstream. Reaches 2 through 4 are located along the main stem of the Pajaro River; while Reaches 5 and 7 are along Salsipuedes Creek and Reaches 6 and 8 are along Corralitos Creek (**Figure 2**). In addition to the narrative description below, structural measures are identified by provided by reach in **Table 2** with addition information on specific features provided in **Table 3**.

Main Stem Pajaro River Measures

This alternative includes improvements on both banks of Reaches 2, 3, and the left bank of Reach 4. Improvement on both banks of Reach 2 include demolition of the existing levee and construction of a new 100-foot setback levee. In Reach 3 on both banks the existing levee would be improved in place with a floodwall. In Reach 4 on the left bank the existing levee would be degraded and a new 100 foot setback levee would constructed with a completion levee that ties into high ground constructed on the east end. Also in Reach 4 left bank, a sliding floodgate would be installed in the gap between levee segments created where railroad tracks cross the river. The floodgate would close during high flows. These levees would be constructed to provide flood risk management up to the 1% (1/100) Annual Chance Exceedance (ACE) event. There would be no improvements to the right bank of Reach 4 since this reach was not economically justified.

The levees would range from 7-9.5 feet in height. The floodwall will be approximately 8 feet in height depending on construction method. Approximately 9200 lineal feet of bank protection rip rap will be placed on the left bank and 4300 lineal feet of bank protection rip rap will be placed on the right bank.

Tributaries – Salsipuedes and Corralitos Creeks - Measures

The levee design for the right bank reaches of Salsipuedes and Corralitos Creek provides FRM up to the 1% (1/100) ACE flood for the areas on the right bank of the streams. Incremental economic analysis indicated that improvements to levees on the left bank of the tributaries was not economically justified if designed to provide flood risk management for the 1% (1/100) ACE. Further analysis of the features on the left bank determined that features providing flood risk management to the urbanized areas along the left bank, the upper portion of reach 5 above Lakeview Road and Reach 6, were economically justified to provide flood risk management for the 4% (1/25) ACE event, consistent with the existing levee located further downstream in Reach 5.

In Reach 5 right bank, above the confluence with the Pajaro River, approximately 5,300 lineal feet of floodwalls or a combination levee with a floodwall on top would be constructed

where urban development prevents raising existing levees. A 4,500 foot levee setback between 100 to 225 feet would be constructed upstream of the floodwall section. Then an approximately 500 foot long section of the existing levee would be rebuilt in place. For Reach 5 left bank, beginning 8,800 feet upstream from the confluence with the Pajaro River, a floodwall or a combination levee with a floodwall on top will be constructed on the left–bank between Lakeview Road and College Road—a distance of approximately 5,000 feet.

Reach 6, both right and left bank, includes construction of a new levee, approximately 5900 feet in length, constructed 50 to 75 feet from the edge of the Corralitos Creek channel.

In addition, in Reach 5 the bridge over Highway 129 would be raised, and in Reach 6, the bridge over Highway 152 would be raised.

Table 2. TSP Structural Measures by Reach

Reach	Left Bank (L)/ Right Bank (R)	Measures
Reach 2	L	100 ft. setback levee. Demolish existing levees
	R	100 ft. setback levee. Demolish existing levees
Reach 3	L	Floodwall on levee
	R	Floodwall on levee
Reach 4	L	Completion levee Demolish existing levee
Salsipuedes	L	New floodwall
	R	Rebuild levee in place New levee with setback New floodwall on existing levee
Corralitos	L	New levee with setback
	R	New levee with setback

Table 3. TSP Specific Features

Structural Measure	Length/ Amount
Floodwall (mi)	1.0
Floodwall on levee (mi)	1.9
New Levee (mi)	12.3
Levee Setback (mi)	8.2
Existing levee removed (mi)	6.9
Completion levee	yes
Ring Levee (mi)	1
Erosion Protection, Left Bank (mi)	1.7
Erosion Protection, Right Bank (mi)	0.8
Sliding Floodgate at railroad crossing	Yes
Setback Floodplain (acres)	89.6
Bridge Raise (#)	2

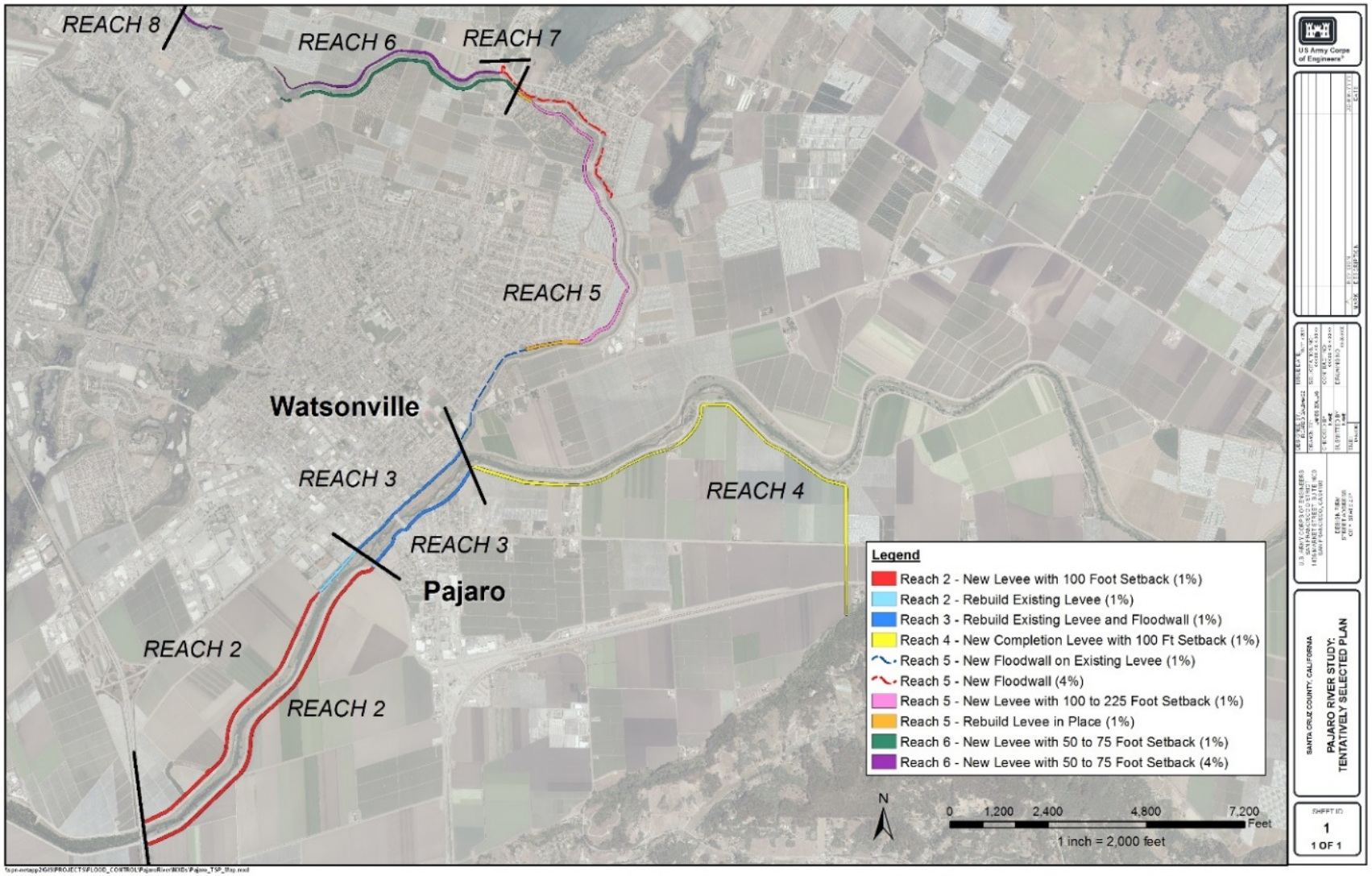


Figure 3. Tentatively Selected Plan (Proposed Action)

3.4 Construction

Construction would occur outside of the flood season which is from 1 November to 15 April and would be consistent with all regulatory requirements. **Table 4** shows the construction duration in total number of years and construction seasons. Construction staging and access for equipment would be on the landside of the existing levees. **Table 4** shows the estimated borrow material required to construct the project. Sufficient quantities of appropriate borrow materials are available within 25 miles of the project from licensed permitted facility that meets all Federal and State standards and requirements. In reaches where a setback levee is proposed, much of the required material would come from existing levees demolished and replaced with setback levees. Up to 75% of the existing levee material would be reused to construct the new setback levee. The remaining removed material would be hauled offsite and disposed of at an approved site in the vicinity of the project. For exiting levees that would be fixed in place, suitable materials removed from the levees would temporarily be stockpiled adjacent to the levee landside and returned to the levee as the remediation is completed. Alternatively, materials would be moved to another levee segment for use in constructing that segment. Materials unsuitable for reuse would be removed to commercial and local disposal sites.

Table 4. Construction Duration and Borrow Material Required for Construction.

Construction Duration (months)	19
Construction Seasons (years)	7[1]
Amount of borrow material needed (cy)	447,172

[1] Based upon simultaneous construction on both the Pajaro River and the tributaries (Salsipuedes and Corralitos Creeks)

3.5 Mitigation and Conservation Measures

Mitigation measures are included in the proposed action to avoid and minimize adverse effects on native plants and animals, including federally listed species and designated critical habitat. These measures will also function to conserve the species addressed in this BA.

3.5.1 Construction Best Management Practices

Best Management Practices (BMPs) will be included as part of the project design that will minimize or avoid project-related impacts from the following items:

- Pile driving;
- Vegetation removal;
- Erosion control;
- Equipment to be used for each construction activity; and,
- Fueling procedures.

Biological monitors may need to be present during portions of the project work. Also, is there an established ACOE procedure to follow in the event that sensitive species colonize the project footprint.

3.5.2 Steelhead

There are two distinct time frames of concern for steelhead: the upstream migration period of adults through the project zone and into the spawning areas higher in the drainage; and the downstream migration period for the juveniles preparing to go out to sea. The adults move in quickly and into the spawning beds. After spawning, most return downstream and back to sea. The normal in-run is from December to March during the high river flow periods. The downstream migration of juveniles can occur at any time there is sufficient flow in the natal streams and downstream into the lagoon, but they generally migrate out between January and June. They can hold in the lagoon for a year or more and have some flexibility regarding their movement into the ocean. Normally, juveniles take up to two years in the streams and lagoon before leaving the river environment.

Instream construction activities, particularly during the bridge reconstruction, will not be carried out in the October 15 to June 15 time frame to allow for the migration of the adult steelhead. Construction along the banks of the river and the levees may be conducted during any time of the year because they are not expected to impact stream flow or quality and should not affect steelhead migration patterns.

3.5.3 California Red-legged Frog

The California red-legged frog (*Rana aurora draytonii*) is listed as threatened under the federal ESA. California red-legged frogs are present in the Pajaro River in the project area. CRLF have been observed at 18 distinct locations in the Pajaro River downstream of Murphy's Crossing since 2009 (Kittleson, personal observations). They are also known from Soda Lake and Chittenden Pass upstream of the project site, the Watsonville Slough system to the north and the Elkhorn Slough system to the south. Six known breeding locations are within 1 mile of the project area (Kittleson 2012).

California red-legged frogs were not observed in College Lake, or the Corralitos Creek/Salsipuedes Creek corridor, nor have they been observed in previous annual daytime surveys conducted in those areas by KEC for flood control maintenance from 2001 to 2011.

As a precaution, the following measure adapted from the 1602 agreement with the Counties for vegetation removal activities along the Pajaro River and Salsipuedes Creek (CDFG 2004) should apply to work conducted within the action area during the breeding season of February 25 to April 30:

No more than 72 hours prior to beginning work, a qualified biologist will survey the work area for the possible presence of California red-legged frogs. If California red-legged frogs are found, work will not begin until consultation with the CDFW and USFWS has been undertaken and permission to proceed has been issued. If red-legged frogs are found after

work begins, operations will cease until consultation has occurred and permission to proceed has been issued.

3.5.4 Mitigation Measures for Wildlife

Mitigation Measure WILD-1: Implement General Construction and O&M Best Management Practices.

- The construction contractor and O&M personnel would be required to place food-related wastes in self-closing trash containers, in an effort to keep wildlife away from construction areas where they might be harmed.
- To minimize dust impacts to vegetation, wetlands, and wildlife, dust control measures consistent with the appropriate air quality control board measures would be implemented by the construction contractor and personnel conducting O&M
- Minimize impacts to fish and wildlife resources and their habitat by confining travel to established roads/paths in the project area and confining parking to established areas (parking lots and staging areas).
- Minimize project impacts by reseeding all disturbed areas at the completion of construction with forbs and grasses.
- Avoid future impacts to the site by ensuring all fill material is free of contaminants.
- For each phase of the project, USACE would prepare final construction plans that would include drawings identifying habitat areas, including wetlands, that must be protected and specifying the methods of protection (e.g. installation of fencing or similar physical barriers, posting of signs, etc.). These plans would also illustrate and/or describe those areas/lands near the project features that are outside the limits of construction (and thus are protected from direct construction impacts). The final construction plans would be accompanied by written project specifications further detailing the habitat protection requirements, as well as general requirements concerning the protection of vegetation and wildlife.
- To help prevent importation of invasive plants and animals, the construction contractor would be required to thoroughly clean vehicles and equipment before first entering the project site.

Mitigation Measure WILD-2: Implement Worker Awareness Training for Construction Personnel.

- USACE would ensure that all construction and O&M personnel undergo environmental protection training to be aware of all required environmental protections (birds, wildlife, and vegetation/habitat protection) per the final construction plans and specifications and approved O&M Manual, as well as those required by applicable federal and state laws.

Conservation Mitigation Measure WILD-3: Implement Migratory Bird Surveys and Best Management Practices. Where work would occur in or adjacent to migratory bird habitat:

- Schedule work outside of nesting season to the extent feasible.
- Conduct pre-construction surveys for active nests in the areas scheduled for construction that year.

- Avoid work activity around active nests until the young have fledged. If this is not feasible, coordinate with USFWS, to develop an acceptable solution.

Mitigation Measure WILD-4: Implement Swainson's Hawk Conservation Measures.

- The following protocol from the CDFW for Swainson's hawk would suffice for the pre-construction survey for raptors: A focused survey for Swainson 's hawk nests will be conducted by a qualified biologist during the nesting season (February 1 to August 31) to identify active nests within 0.25 mile of the project area. The survey will be conducted no less than 14 days and no more than 30 days prior to the beginning of construction. If nesting Swainson 's hawks are found within 0.25 mile of the project area, no construction will occur during the active nesting season of February 1 to August 31, or until the young have fledged (as determined by a qualified biologist), unless otherwise negotiated with the California Department of Fish and Wildlife (CDFW). If work is begun and completed between September 1 and February 28, a survey is not required.

Mitigation Measures WILD-5: Complete Pre-Construction Survey and Delineate Wetlands and Other Waters of the U.S.

- Prior to initiating construction of a given project phase, USACE staff would conduct an assessment of drainage depressions, channels, and ditches present at the project site to determine whether any such features provide water to wetlands. USACE staff would also delineate the approximate limits of jurisdictional wetlands located within or immediately adjacent to the project's limits of construction. The construction contractor would be required to maintain flows in those drainage features that are found to provide water to wetlands. Direct construction impacts to wetlands would be prohibited.

Mitigation Measure WILD-6: Avoid Affecting Native Plants Outside the Designated Construction and O&M Footprints.

- Avoid impacts to any oak woodlands and riparian areas outside, but in close proximity to, the construction easement and staging areas by fencing their boundaries with orange construction fencing or cyclone fencing just outside of the dripline of the woody vegetation.
- Avoid impacts to native trees, shrubs, and aquatic vegetation. Any native trees or shrubs removed with a diameter at breast height of 2 inches or greater should be replaced onsite, in-kind with container plantings so that the combined diameter of the container plantings is equal to the combined diameter of the trees removed. These replacement plantings should be monitored for 5 years or until they are determined to be established and self-sustaining. The planting site(s) should be protected in perpetuity.
- Minimize the impact of removal and trimming of all trees and shrubs by having these activities supervised and/or completed by a certified arborist.

3.5.5 Mitigation Measures for Water Quality

Mitigation Measure WQ-1: Implement Best Management Practices for Construction.

- The contractor would prepare a spill control plan and a SWPPP prior to initiating construction in accordance with guidance from the Central Coast RWQCB. These plans would be reviewed and approved by USACE before construction begins.
- Implement appropriate measures to prevent debris, soil, rock or other material from entering the water. Use a water truck or other appropriate measures to control dust on haul roads, construction areas and stockpiles.
- Properly dispose of oil or other liquids.
- Fuel and maintain vehicles in a specified area that is designed to capture spills. This area cannot be near any ditch, stream or other body of water or feature that may convey water.
- Fuels and hazardous materials would not be stored on site.
- Inspect and maintain vehicles and equipment to prevent dripping oil and other fluids.
- Schedule construction to avoid the rainy season as much as possible. If rains are forecasted during construction, erosion control measures would be implemented as described in the RWQCB Erosion and Sediment Control Field Manual.
- Maintain sediment and erosion control measures during construction. Inspect the control measures before, during and after a rain event.
- Train construction workers in SWPPP and how to respond to, control, contain and clean up spills.
- Re-vegetate disturbed areas in a timely manner to control erosion.
- Cover and protect materials from wind, rain and runoff to avoid unwarranted dispersal.

Mitigation Measure WQ-2: Prepare and implement an approved Construction Dewatering Plan. The construction specifications for the implementation of the project would include the requirement that the contractor prepare and implement a Construction Dewatering Plan that is approved by the Central Coast RWQCB. The plan would be submitted to the RWQCB for review and approval. No dewatering can occur until such actions are permitted by the RWQCB. Documentation of the permit would be maintained at the construction site at all times during operation. The plan would include, but not be restricted to the following information:

- Identification of the site(s) of dewatering and effluent discharge.
- Characterization of the expected quality of effluent based on analytical testing (including sediment, metals, and any other constituents of concern identified by the RWQCB).
- Estimated rates, timing and duration of effluent discharges.
- Detailed information of the BMPs for removal of sediment or other pollutants prior to discharge (e.g., sediment trapping, filtering, etc.).
- Specific information on the disposal of the effluent (e.g., retained on site, discharge to land off-site under agreement with owner, discharge to sanitary sewer, off-site transport to disposal site).

Mitigation Measure WQ-3: Minimize the potential for soil erosion during and after construction. The contract specifications for the Project would include the requirement that the contractor file for a Notice of Intent to comply with the SWRCB's General Permit for Discharges of Storm Water Associated with Construction Activities (General Permit). Prior to the initiation of construction, the contractor will prepare a site-specific SWPPP for submittal to Santa Cruz and Monterey counties for review and approval.

Mitigation Measure WQ-4: Implement Best Management Practices for O&M. Apply herbicides and pesticides consistent with the application methods described in the Pajaro River and Salsipuedes and Corralitos creeks Management and Restoration Plan. These methods include:

- Use of herbicides at or below concentrations recommended by the manufacturer.
- Use of proper precautions to avoid spills.
- Worker training to ensure that herbicide is sprayed only on target vegetation.
- Use of Roundup herbicide for on-land application only.
- Minimal in-channel use of Rodeo herbicide.

3.5.6 Mitigation Measures for Environmental Hazards

Mitigation Measure HAZ-1: Implement Best Management Practices. Some standard BMPs for construction projects include:

- Use a covered, paved area dedicated to vehicle maintenance and washing;
- Ensure that the areas are properly connected to a storm drain system;
- Develop a spill prevention and cleanup plan;
- Prevent hazardous chemical leaks by properly maintaining vehicles and equipment;
- Properly cover and provide secondary containment for fuel drums and toxic materials;
- Properly handle and dispose of vehicle wastes and wash water.
- Develop a Storm Water Pollution Prevention Plan (SWPPP). The transport of non-visible pollutants by surface runoff from the construction site would be regulated by a site-specific SWPPP. The SWPPP would identify any location where fuels or other hydrocarbons would be stored on-site, as well as any other construction materials that could result in non-visible surface water pollution, such as cement, tackifier, or other materials. The SWPPP would also identify BMPs such that any spills or leakage would be adequately contained.
- Standard construction procedures and Best Management Practices (BMPs) will be implemented to reduce the emissions of dust and pollutants during construction. See Section 4.5.3, Air Quality.

Mitigation Measure HAZ-2: Immediately contain spills, excavate spill-contaminated soil and dispose of contaminated soils at an approved facility. In the event of a spill of hazardous materials over soil the contractor would immediately control the source of the leak and contain the spill. Contaminated soils would be excavated, tested and disposed of off-site at a facility approved to accept such soils. The likelihood of spills from

vehicles would be lessened by use of designated parking areas, maintenance of construction equipment, and other preventive measures outlined in the project SWPPP.

Mitigation Measure HAZ-3: Environmental specialist retained to characterize excavations. Personnel responsible for construction oversight would be adequately trained to recognize and evaluate the potential presence of soil and groundwater contamination. During excavation down-gradient of existing commercial properties, field screening would take place as necessary to evaluate excavated soils for the presence of pollutants and would include systematic random sampling of agricultural soils and testing for agricultural chemicals (including but not limited to Dichlorodiphenyldichloroethane (DDD), Dichlorodiphenyltrichloroethane (DDT), and toxaphane). If evidence of a past spill is identified, all work within 100 feet of the evidence would be halted until a Professional Geologist, Professional Engineer, or Registered Environmental Assessor evaluates the area. If hazardous materials are identified, the Construction Contractor would notify the USACE within two days and ensure that all other required release reporting is performed. Alternatively, a pre-construction soil investigation involving trenching or soil borings with analysis for constituents of concern would be conducted to determine whether shallow soils near existing or historical commercial properties are impacted by hazardous materials. Any further action would be dependent upon the result of the investigation

Mitigation Measure SSS-3: Limit work in or near channel until after May. During cool, wet years when steelhead may be present in the Project area due to a shift in the run timing of adult fish (Shapovalov and Taft 1954), avoid any work in or immediately adjacent to the channel until after May. Construction work before June will be limited to areas away from the channel to ensure no impacts occur to steelhead adults.

Mitigation Measure SSS-4 (Alternatives 5, 6, 7, 8): Preconstruction Surveys prior to in-water Construction. Perform preconstruction surveys in areas where in-water construction would be required. Preconstruction surveys will be performed by a qualified biologist to determine if steelhead, CRLF, or FYLF are present in the construction area. Protocol surveys would be performed for CRLF and FYLF. Steelhead surveys would consist of visual and seine surveys. If either species is present, these organisms would be captured and relocated to areas of suitable habitat that would not be affected by the construction activity.

Mitigation Measure SSS-5 (Alternatives 5, 6, 7, 8): Biological Monitor for Dewatering Activities. During the isolation of the work area after preconstruction surveys have been conducted, an on-site biological monitor would present during all working hours from prior to the time activities to isolate the site begin, until the site is dewatered and completely isolated. The monitor will inspect the work area to determine if any steelhead or CRLF are present during the dewatering. If either species is detected, all construction activity will cease, except as directed by the monitor, until these species can be captured and relocated.

Mitigation Measure SSS-6: Delay application of herbicide during cool, wet years. During cool, wet years when steelhead may be present in the Project area due to a

shift in the run timing of adult fish (Shapovalov and Taft 1954), delay application of herbicide until after May to ensure no adult migrants are present in Project area.

Mitigation Measure SSS-7: Manage Herbicide Use During O&M. Runoff of herbicides and sediment during maintenance activities could impact sensitive aquatic species. Some herbicides could be applied directly within or immediately adjacent to the active channel. These activities would be conducted during the season when steelhead are unlikely to be present (April 15 to October 15) and when little precipitation occurs in the Project area; therefore, runoff would be negligible. The herbicides that would be applied near the water are approved for use in aquatic environments and, therefore, should not impact aquatic organisms. Water approved herbicides could negatively affect adult steelhead that are present later in the season due to cool wet years. This impact could be significant.

3.6 Operation and Maintenance

Once project construction is complete, it would be turned over to the non-Federal project partners with an O&M manual in accordance with the executed Project Partnership Agreement (PPA) for construction. The PPA is signed before construction begins. Following construction, the non-Federal partners would be responsible for continued O&M of the project consistent with the new and/or amended O&M manuals, also referred to as Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) Manuals, which specify requirements for operating and maintaining the project.

3.6.1 Local Maintaining Agencies

The Pajaro Storm Drain Maintenance District (PSDMD) was formed in 1951, pursuant to the procedure enacted by the Storm Drain Maintenance District Act of 1939. PSDMD maintains channels within its District boundary for flood flow conveyance and also provides for emergency response activities that respond to flow conveyance during inclement weather. The Santa Cruz County Flood Control and Water Conservation District Zone 7 was formed in 1991 to engineer, construct, finance, and maintain a storm drainage system or water conservation projects within the District boundary, as well as to provide funding for the local match share of the Pajaro River Flood Risk Reduction Project. The District boundary is similar to, but not exactly the same as, the PSDMD boundary.

The Monterey County Water Resources Agency (MCWRA) is the agency that performs maintenance activities in what Monterey County calls Flood Control Zones 1 and 1A. Maintenance occurs along approximately 11.5 miles of levee on the Monterey County side of the Pajaro River.

3.6.2 Levees

Levees will be maintained to the as-built condition in perpetuity or as long as the PPA is in effect. This means that the levee should maintain a consistent shape, side slopes, height and composition to when the levee is constructed. If the levee settles to a lower height or the slopes of the levee cause a loss or material and steepened slopes, the local maintainer is expected to return the levee to the as-built lines and grade. If the levee erodes due to water

moving across the face or wind and wave run-up, the levee should be restored to the as-built condition and the slope protected against future erosion with stone riprap or other means. Holes or burrows into the levee caused by animals will be properly backfilled and measures taken to deter, remove, and/or exterminate burrowing animals. The grasses on the slopes and easement area will be maintained to 12" in height or less.

Access roads to and along the levee as well as the levee crown will be maintained to the as-built condition ensuring that the crown is sloped to drain and the access roads are sloped to prevent ponding, allowing all-weather access. The local maintainer will be responsible for making sure encroachments do not occur within the right of way of the project that might endanger efficient functioning of the levee. Lastly, jet grouting would be installed within the levee section and sometimes deep into the levee foundation. These features would not be visible from the ground surface following construction. O&M of these features are to ensure that they remain in place and are not penetrated by encroachments or other ground disturbing activities.

3.6.3 ETL 1110-2-583 Compliant Levees and Floodwalls

The USACE "Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams and Appurtenant Structures," (ETL 1110-2-583) dated 30 April 2014, provides the standards for vegetation on and adjacent to USACE facilities. To be compliant, levees, floodwalls and 15 feet landward and waterward of the levee toes or floodwall face, must be maintained free of woody vegetation unless a variance is granted by USACE.

3.6.4 Floodwalls

Floodwall maintenance is very similar to the concept of levee maintenance: keep the floodwall in the as-built condition in perpetuity or as long as the project partnership agreement is in effect. The local maintainer will ensure that the floodwall does not settle or shift from its constructed position, which could impact the effective height of the wall or the wall's water tight seals. If the concrete cracks, spalls or has exposed rebar, the wall would be patched or repaired. The vegetation along the wall will be maintained within the project easements to ensure visibility and accessibility to the wall. Erosion near the floodwall and floodwall foundation could threaten the stability and would be repaired. The eroded area would be restored to the as-built condition and the area protected against future erosion. Lastly, drainage features for the wall should be inspected and properly maintained, including any pipes through the levee and drainage features for the wall itself.

3.6.5 Setback Floodplain

Specific requirements for maintenance of this area will be developed prior to completing project construction and included in the OMRRR Manual. Generally, the area would be maintained free of human habitation and dumping. Vegetation that creates a fuels and fire risk would be appropriately managed.

4.0 ENVIRONMENTAL BASELINE

This section identifies and describes known human-induced sources of impact to the listed species in the Action Area, except those caused by the proposed action. Effects of the proposed action are discussed in Section 6.0.

4.1 Regional and Local Setting

The action area is located in the Pajaro Valley in Santa Cruz and Monterey counties. The Pajaro Valley is a flat to gently-sloping alluvial plain that is bounded by Monterey Bay to the west, the Santa Cruz Mountains to the northeast and coastal foothills to the south. Elevations range from sea level at the Pajaro River mouth to approximately 100 feet above sea level at the northern end of the project area adjacent to Corralitos Creek. The surrounding peaks of the Santa Cruz Mountains rise to more than 1,700 feet above sea level adjacent to the Pajaro Valley, and to more than 3,000 feet in more remote areas of the Pajaro River Basin.

The region has a Mediterranean climate characterized by warm, dry summers and mild, wet winters. About 90 percent of the rainfall occurs between the months of November and April. Coastal fog is common in summer months. Snowfall is rare and has no measurable influence on flood runoff.

Land uses in and adjacent to the action area are predominantly agricultural and urban. The Pajaro Valley encompasses approximately 8,250 acres of prime agriculture land: 4,750 acres in Santa Cruz County and 3,500 acres in Monterey County. This valley produces most of the strawberry crop in central California and supports a variety of other crops including lettuce, bush berries, specialty leaf crops, and flowers.

Urban environments in the action area include the city of Watsonville, located in Santa Cruz County adjacent to the Pajaro River and Salsipuedes and Corralitos creeks, and the unincorporated town of Pajaro, located in Monterey County across the Pajaro River from Watsonville. The population of the Pajaro Valley is concentrated in these urban areas. In 2010, the US Census estimated population was approximately 51,199 in the city of Watsonville and 3,070 in the town of Pajaro.

Major roads in the action area include highways 1, 129 and 152. Highway 1 crosses the Pajaro River at the western boundary of the project area. Highway 129 (Riverside Drive) crosses Salsipuedes Creek at the south end of Watsonville and Highway 152 (East Lake Avenue) crosses Corralitos and Salsipuedes creeks near their confluence. Other road crossings in the project area are Thurwachter Road, Main Street, and Murphy Road which cross the Pajaro River; College Road which crosses Salsipuedes Creek; and Green Valley Road and Airport Boulevard which cross Corralitos Creek. The Union Pacific Railroad crosses the Pajaro River at the Walker Street Bridge. Most of the existing crossing structures are bridges except for the Highway 152 and College Road crossings of Salsipuedes Creek, which have culverts.

Five small lakes are located north and east of the city of Watsonville. College Lake is a shallow, seasonal lake that is farmed on its dry lake bed during the summer. Pinto, Kelly, and Tynan lakes are year-round reservoirs used for recreation, and Drew Lake is a seasonal lake that fills after periods of rainfall.

At the western extent of the action area, Watsonville Slough flows into the Pajaro River Estuary/Lagoon just upstream of the river mouth at the Pacific Ocean. Sunset State Beach and Zmudowski State Beach border the river mouth to the north and south, respectively. The Pajaro Dunes residential development is also located to the north of the river mouth between Sunset State Beach and Watsonville Slough.

4.1.1 Hydrology

Pajaro River Watershed

The Pajaro River Basin encompasses a drainage area of approximately 1,300 square miles in the coast ranges of Central California. The basin is approximately 88 miles long and 30 miles wide, and empties into the Pacific Ocean at Monterey Bay west of Watsonville. The normal annual precipitation (NAP) averages about 19 inches for the entire basin but varies with location due to the influence of the coastal mountains. The NAP ranges from 13 inches at Hollister to 44 inches near the headwaters of Corralitos Creek in the Santa Cruz Mountains. About 45 percent of the basin is rangeland, 25 percent is cultivated, 25 percent is brush and forest cover, and the remaining 5 percent is urbanized.

The Pajaro River Basin is divided into five sub-basins. These sub-basins are the Upper San Benito, Hollister-Tres Pinos, Upper Pajaro, Llagas-Uvas, and Pajaro Valley. The largest tributary to the Pajaro River is the San Benito River, which has a drainage area of approximately 660 square miles (1,710 km^2). The San Benito River drains the east side of the Gabilan Range and the surrounding slopes of the interior coastal range. Llagas and Uvas creeks drain the northeastern slopes of the Santa Cruz Mountains and join the Pajaro River in the southern Santa Clara Valley. Pescadero Creek and several other tributary streams drain the southern slopes of the Santa Cruz Mountains.

The action area is located within the Pajaro Valley sub-basin. This sub-basin is drained from the north principally by Corralitos and Salsipuedes creeks and Watsonville Slough. Salsipuedes and Corralitos creeks drain the southwestern slopes of the Santa Cruz Mountains and join north of Watsonville, approximately 2.5 miles north of the confluence with the Pajaro River. The combined drainage area of these creeks is approximately 57 square miles. Casserly Creek drains much of the upper watershed of Salsipuedes Creek. Browns Creek drains the adjacent upper watershed between Salsipuedes and Corralitos creeks and is the principal tributary to Corralitos Creek.

Lower Pajaro River

The lower Pajaro River has been highly modified from its natural state by the existing levee project, which has confined and, in some places, realigned the natural river channel. Channel

maintenance practices, surrounding agricultural and urban land uses, and upstream land uses all substantially affect the hydrology of the lower Pajaro River.

The USGS gages stream flow in the Pajaro River at Chittenden, approximately seven river miles upstream of Murphy's Crossing. Median daily stream flows in the Pajaro River are typically highest from early February to early April, exceeding 40 cubic feet per second (cfs) during this period (495 acre-feet per day). Median flows decline to less than 20 cfs (247 ac/ft/day) by mid-May and less than 10 cfs (125 ac/ft/day) after mid-June. Flows then begin to increase in November with the onset of winter rains. Annual stream flows in the Pajaro River are highly variable. A minimum of 766 acre-feet per year was recorded in 1977 and a maximum of over 653,900 acre-feet per year was recorded in 1983 (ESA 2001).

During flood stages, stream flows in the Pajaro River can increase to several hundred times above the median flows. Estimated peak discharges for the Pajaro River below Salsipuedes Creek, assuming future (with project) hydrologic conditions, are 30,000 cfs for the 25-year flood level (4 percent probability) and 49,000 cfs for the 100-year flood level (1 percent probability) (USACE 1997). The current levee system was designed to contain a maximum peak discharge of 19,000 cfs between Murphy's Crossing and Salsipuedes Creek. This capacity has been exceeded four times: in December 1955, April 1958, March 1995, and February 1998.

Infiltration rates have a large influence on the amount of runoff and peak discharges in the Pajaro River. For example, the storm of 1-4 April 1958, which had a three-day rainfall of 2.98 inches, produced nearly the same peak discharge (23,500 cfs) as the 21-24 December 1955 storm (24,000 cfs), which had a three-day rainfall of 6.24 inches at Watsonville (USACE 2004).

Salsipuedes and Corralitos Creeks

Salsipuedes Creek receives inflow from both College Lake and Corralitos Creek, which joins Salsipuedes Creek immediately downstream from the Highway 152 crossing. Salsipuedes Creek has been modified by the existing levee project and by adjacent urban and agricultural land uses. The existing levee along the right bank of Salsipuedes Creek extends approximately 2.6 miles from the Pajaro River confluence upstream to just below the confluence with Corralitos Creek. On the left bank, the levee ends approximately 1.8 miles upstream of the Pajaro River confluence where higher ground borders the river on that side.

The Salsipuedes Creek levees were designed to convey a peak discharge of 3,400 cfs. Flooding occurs fairly frequently near the upstream end of Reach 5, where the right bank levee is higher than the unleveed bench on the left side. In this area, flood stages can overtop the left bank and flooding can also result from overflow from College Lake and Kelly Lake. Upstream of the Corralitos Creek confluence, two large-diameter (approximately six-foot) pipe culverts carry flow from Salsipuedes Creek under Highway 152 and College Road.

Corralitos Creek has a more natural channel configuration than either the Lower Pajaro River or Salsipuedes Creek and has no levees. The channel of Corralitos Creek is incised with

steep banks that rise approximately 15-20 vertical feet from the stream bed to the top of bank. Stream flow data have been recorded in Corralitos Creek at the Green Valley Road Bridge in Freedom since 1955. Hydrologic models estimate the existing capacity of this creek to be 2,900 cfs, in its current form. Since the stream gage records began, this capacity has been exceeded five times: in December 1955, January 1982, February 1986, December 1996, and February 2000. When flows in Corralitos Creek exceed 2,900 cfs, flooding occurs in Watsonville and unincorporated areas near College Lake (including the Orchard Park subdivision). This flooding includes the overflow from College Lake, and occurs when high flood stages overtop the channel banks (USACE 2004).

4.1.2 Geology and Geomorphology

Regional and Project Area Geology

The Pajaro Valley is located at the western edge of the California Coast Ranges province. This region is characterized by fault-folded ridges and valleys generally oriented along a northwest-to-southeast axis. The San Andreas Fault Zone traverses the northeastern edge of the Pajaro Valley, approximately two miles north of the eastern extent of the project area.

The soils of the project area are alluvial and are underlain by two Holocene alluvial deposits identified as Quaternary Younger flood-plain deposits (Qyf) and Quaternary Older floodplain deposits (Qof). The Qyf unit consists of heterogeneous layers of sand and silt with thin, discontinuous layers of clay. This layer is generally less than 20 feet thick. The Qof unit consists of unconsolidated sand, silt and gravel with layers of silty clay. This unit has been found to extend to approximately 200 feet beneath parts of the Pajaro Valley. Lower parts of these thick deposits include large amounts of gravel and support a major groundwater aquifer (USACE 2004).

Geomorphology

The lower Pajaro River within the project area has a relatively flat hydraulic gradient and is predominantly a sediment depositional zone. The normal low-flow channel tends to form shallow point bars and becomes a meandering stream bed at the bottom of the incised channel.

4.1.3 Vegetation and Wildlife

Vegetation

Vegetation and habitat types within the action area include open water habitat, riparian forest, riparian shrub-scrub, freshwater marsh, coastal salt marsh, coastal dune, annual grassland, cultivated cropland, ruderal (which includes vegetation on the existing levees and other disturbed areas), and developed areas. The following is a description of the dominant vegetation occurring along the lower reaches of the Pajaro River and along Salsipuedes and Corralitos creeks.

Pajaro River

Freshwater marsh vegetation occurs in some areas along the main stem, primarily in Reaches 2 through 4 which are upstream of the tidally-influenced portion of the river. Characteristic species of this plant community include cattails, rushes (*Juncus* spp.), spikerush (*Eleocharis macrostachya*), and bulrushes. In some areas, matted water primrose (*Ludwigia peploides*), an invasive, aquatic herb that forms dense mats, has become established in the river channel.

In Reaches 2, 3, and 4, most of the existing mature trees and other riparian vegetation were removed by the SCCDPW and MCWRA following the major flood event of 1995. Vegetation was cleared from the streambed, channel slopes, and benches, and continues to be removed as part of the ongoing channel maintenance activities. The remaining riparian vegetation in Reaches 2 through 4 is composed primarily of arroyo willow (*Salix lasiolepis*) and shining willow (*Salix lucida*) interspersed with black cottonwood (*Populus trichocarpa*) (Kittleson 2004). Common species in the shrub layer include California blackberry (*Rubus ursinus*), coyote brush (*Baccharis pilularis*), mugwort (*Artemisia vulgaris*), and non-native tree tobacco (*Nicotiana glauca*) (Kittleson 2004).

Reach 4 supports a somewhat greater diversity of vegetation than Reaches 2 and 3. Sand bars and gravel bars in this reach are well vegetated with thickets of sandbar willow (*Salix exigua*) and mule fat (*Baccharis salicifolia*) (Kittleson 2004). This reach also contains scattered California sycamore (*Platanus racemosa*) and box elder (*Acer negundo* var. *californicum*) trees along with willows and black cottonwood. Invasive, non-native plants occurring along this reach include poison hemlock (*Conium maculatum*), kikuyu grass (*Pennisetum clandestinum*), and giant reed (*Arundo donax*) (Kittleson 2004).

The existing levees, the benches in Reaches 2, 3 and 4, and the outer portion of the benches of Reach 1 support mostly non-native annual grasses and ruderal vegetation. These areas are periodically mowed or sprayed with herbicides to control woody vegetation. Reaches 1, 2, and 4 are bounded on both banks by cultivated fields that extend to the landside toe of the levees. The levees along Reach 3 are bordered by the urbanized areas of Watsonville and the town of Pajaro.

Salsipuedes Creek (Reaches 5 and 7)

The lower portion of Reach 5 along Salsipuedes Creek supports a mature, mixed riparian forest. This stretch of riparian habitat extends from just upstream from the confluence with the Pajaro River to the Highway 129 crossing. Dominant tree species in this area include arroyo willow, box elder, black cottonwood, and non-native black locust (*Robinia pseudoacacia*) (Kittleson 2004). Invasive, non-native plants are prevalent in the understory and include Cape ivy, English ivy, and periwinkle (*Vinca major*). Upstream of Highway 129, the channel banks and benches have been largely cleared of riparian vegetation and support mostly non-native annual grasses and ruderal vegetation. A narrow band of riparian vegetation also remains along the unleveed portion of the left bank of Reach 5, downstream

of the confluence with Corralitos Creek. A band of riparian habitat is also present in the upper portion of Reach 7, below College Lake and upstream of the Highway 152 culvert.

Corralitos Creek (Reaches 6 and 8)

Corralitos Creek supports a dense riparian forest and understory and is well shaded, especially by a diverse mixture of mid-size shrubs. Dominant overstory species include black cottonwood, blue gum (*Eucalyptus globulus*), arroyo willow, shining willow, and red willow (*Salix laevigata*). Willow species are also dominant in the understory along with American dogwood (*Cornus sericea* ssp. *occidentalis*), white alder (*Alnus rhombifolia*), box elder, poison oak, and blue elderberry (*Sambucus mexicana*). Near road crossings and along the adjacent agricultural fields, the vegetation is disturbed and non-native plant species are present. However the vegetation is still composed primarily of native species. The low understory along Corralitos Creek is dominated by California blackberry, California manroot (*Marah fabaceus*), hoary nettle (*Urtica dioica* ssp. *holosericea*), panicled bulrush (*Scirpus microcarpus*), smartweed (*Polygonum* sp.), horsetail (*Equisetum arvense*), mugwort, Cape ivy, and English ivy.

Wildlife Habitat

The variety of vegetative habitat types within the action area support numerous wildlife species. Typical birds found within the action area include mallard (*Anas platyrhynchos*), Anna's hummingbird (*Calypte anna*), Allen's hummingbird (*Selasphorus sasin*), Downy woodpecker (*Picoides pubescens*), Pacific-slope flycatcher (*Empidonax difficilis*), black phoebe (*Sayornis nigricans*), warbling vireo (*Vireo gilvus*), western scrub-jay (*Aphelocoma californica*), Chestnut-backed chickadee (*Poecile rufescens*), bushtit (*Psaltriparus minimus*), yellow warbler (*Dendroica petechia*), Wilson's warbler (*Wilsonia pusilla*), California towhee (*Pipilo crissalis*), song sparrow (*Melospiza melodia*), black-headed grosbeak (*Pheucticus melanocephalus*), and American goldfinch (*Carduelis tristis*) (ENTRIX and Lee and Pierce, Inc. 2003). Common mammals found within the action area include raccoon (*Procyon lotor*), California ground squirrel (*Spermophilus beecheyi*) brush rabbit (*Sylvilagus bachmani*), black-tailed hare (*Lepus californicus*), Virginia opossum (*Didelphis virginiana*), muskrat (*Ondatra zibethicus*), dusty-footed woodrat (*Neotoma fuscipes*), broad-footed mole (*Scapanus latimanus*), deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), red bat (*Lasiurus borealis*), and hoary bat (*Lasiurus cinereus*) (ENTRIX and Lee and Pierce, Inc. 2003).

4.2 Channel Maintenance

The Santa Cruz County Department of Public Works (SCCDPW) and Monterey County Water Resources Agency (MCWRA) are responsible for the maintenance of the existing levee system under an agreement with USACE. The Counties perform ongoing maintenance that includes annual vegetation thinning and sediment removal on an as-needed basis. Santa Cruz County has previously conducted sediment removal from the channel and benches along Salsipuedes Creek from 1995 through 2002.

4.2.1 Vegetation Removal

Vegetation removal is performed along the Pajaro River main stem from Highway 1 to Murphy Road (Murphy's Crossing). This consists of vegetation removal along the river channel, banks and benches prior to the onset of the winter rainy season. Santa Cruz County also conducts vegetation removal along Salsipuedes Creek from Highway 129 to Highway 152 on the right bank and from Highway 129 to Lakeview Road on the left bank. The purpose of the vegetation removal is to maintain high flood conveyance capacity of the channel by maintaining relatively low channel roughness (n-value)[2] in the active channel and bench areas. Target n-values under the current maintenance program range from 0.02 to 0.056 in the channel and 0.032 to 0.07 on the benches, for a composite n-value of 0.04 (USACE 2004).

Vegetation removal activities conducted since 2006 along the Pajaro River and Salsipuedes Creek are as follows (Santa Cruz County 2004):

Pajaro River Main Stem

1. Outer Channel Bench – remove vegetation by mowing twice per year (in March and June) followed by spraying with Aqua Master[3] herbicide to kill grasses and broadleaf vegetation.
2. Inner Channel Bench – mow and spray with Aqua Master twice a year in March and June. Flag and retain cottonwood (*Populus* sp.) and sycamore (*Platanus racemosa*) tree sprouts, working toward an eventual spread of trees every 40 feet in all bench areas that are greater than 32 feet wide.
3. Upper Channel Bank (top eight feet of stream bank) – use a combination of mowing and manual thinning to remove vegetation. The mower can reach the top eight feet of the stream bank from the bench. Manually remove vegetation by thinning an average of 100-125 sprouts and shoots every 0.1 mile.
4. Lower Bank (between the lower limit of the top eight feet and the toe of the bank slope) – remove vegetation by hand thinning plants over three inches in diameter, averaging 20-40 sprouts and shoots every 0.1 mile. Flag and retain one willow (*Salix* sp.) clump every 40 feet on average and allow it to grow to maturity.
5. Channel Bottom – remove by hand an average of 100-200 sprouts every 0.1 mile of channel. Maintain a riparian buffer zone that is five feet on both sides of the low flow channel. In the riparian buffer zone, manually remove only vegetation greater than three inches in diameter.

Salsipuedes Creek

[2] Manning's Roughness Coefficient, or n-value, is a measure of resistance to flood flows in channels and flood plains. The higher the n-value, the greater the channel roughness. Typical values are 0.03 for grass; 0.06-0.75 for moderate willow cover; and 0.12 for dense willows, trees and underbrush.

[3] Aqua Master, formerly called Rodeo, is an herbicide that is registered for use in aquatic areas.

1. Levee Slopes and Benches – twice per year in March and June, mow area and spray with Aqua Master to kill grasses and broadleaf vegetation.
2. Stream Bank (upper and lower channel banks) – thin by manually cutting all woody vegetation.
3. Channel Bottom – remove an average of 100-200 sprouts by hand every 0.1 mile of channel. In the riparian buffer zone, remove only vegetation greater than three inches in diameter.

These vegetation removal activities are authorized by a CDFW Streambed Alteration Agreement (1602 agreement) issued jointly to SCCDPW and MCWRA (CDFG 2004). This agreement authorized all of the above activities up to December 31, 2004, but authorizes only mowing and herbicide spraying in 2005.

Hydraulic analysis conducted by Northwest Hydraulic Consultants (NHC 2005) has indicated that removal of sediment from the gravel bar below Highway 152 would have little effect on reducing water surface elevation and would not increase the flood conveyance capacity of the existing levee system. Consequently, SCCPWD will not be conducting regularly scheduled sediment excavation in Salsipuedes Creek in the future (J. Wolcott, pers. comm. 2005). Considering past maintenance records and ongoing deposition in this area, sediment removal may eventually be needed in the future, and SCCPWD may need to develop new criteria for removing sediment from the creek when channel cross-sectional measurements decrease below a defined threshold.

4.2.2 Adaptive Management

The Counties adopted an adaptive management strategy for channel maintenance. The plan is based on the performance of annual surveys of the channel cross-section and then comparing changes to historical cross-sections. The Counties use these surveys and this analytical approach to determine the need for vegetation thinning and sediment removal on an annual basis. This approach enables the Counties to implement a more efficient and site-specific maintenance program. It forms the foundation of a long-term, adaptive management plan for channel maintenance improving flood conveyance and floodplain function as well as increasing opportunities for habitat enhancement within the project footprint.

4.3 Previous Species-specific Management Direction

This section describes existing management goals and guidelines that apply to species covered in this BA within the project's action area.

4.3.1 Steelhead

The SCCDPW has previously been directed by the CDFW to conduct fish sampling in the Pajaro River Lagoon and Watsonville Slough prior to and after sandbar breaching. All steelhead captured during sampling are to be counted, measured for fork length, and assessed for degree of smoltification (CDFG 2003).

4.3.2 California Red-legged Frog

The action area is located within a core area for recovery of the California red-legged frog (Core Area #19, Watsonville Slough-Elkhorn Slough) (USFWS 2002d). Although the Pajaro River does not provide breeding habitat for this species, it and the sloughs may provide a foraging and migration corridor for this species. Populations are present in the Watsonville Sloughs system within the lower Pajaro River watershed. Management goals for California red-legged frog in this core area are to protect existing populations, protect habitat connectivity, reduce impacts of agriculture, improve water quality, and reduce impacts of urbanization.

The CDFW has stated the following condition to protect California red-legged frogs in its 1602 agreement with the Counties for vegetation removal activities along the Pajaro River and Salsipuedes Creek (CDFG 2002:4):

> "No more than 72 hours prior to beginning work, a qualified biologist shall survey the work area for the possible presence of California red-legged frogs and western pond turtles....If California red-legged frogs are found, work shall not begin until consultation with the [CDFG] and [USFWS] has been undertaken and permission to proceed has been issued. If red-legged frogs are found after work begins, operations shall cease until consultation has occurred and permission to proceed has been issued."

5.0 SPECIES ACCOUNTS

Species accounts are provided below for all species included on the USFWS IPaC list of federally listed species potentially affected by the project for which there is suitable habitat present within the action area (Appendix A).

5.1 Plants

5.1.1 Santa Cruz Tarplant

The Santa Cruz tarplant (*Holocarpha macradenia*) was federally listed as threatened on March 20, 2000 (USFWS 2000). It is in one of only four species in the genus *Holocarpha* in the sunflower family (Asteraceae) and is found only in coastal terrace prairie habitat along the central California coast. Most of the existing populations occur in Santa Cruz County, where they occur on flat to gently sloping terrace platforms divided by steep-sided gulches. This species also occurs on alluvium resulting from terrace deposits. The soil that this plant requires usually includes a higher clay component that retains water longer than the surrounding sandy soils. These high clay soils are typically saturated for much of the spring growing season. The ability of this plant to survive under these wet conditions and the fact that it blooms in midsummer when most of the surrounding grasslands have become dry allow it to compete for light and other resources in the remaining patches of coastal terrace prairie habitat.

Occurrence in Relation to the Action Area

There are several records of this species in the Watsonville area within two miles of the action area. According to the CNDDB, a large extant population is located at the Watsonville Municipal Airport approximately 0.5 mile west of Corralitos Creek at the upstream end of the project area (CDFG 2005). Several other documented occurrences in the Watsonville area are likely extirpated as a result of urban development. Other nearby locations include a population at the Spring Hills Golf Course approximately 1.7 miles southeast of the Pajaro River and an occurrence near Struve Slough approximately 1.9 miles north of the Highway 1 crossing of the river. Santa Cruz tarplant was not found within the action area and is unlikely to occur there because the area lacks suitable grassland habitat for this species. Grassland vegetation within the action area is limited to the mowed benches and levee surfaces, which are dominated by non-native grasses and ruderal species and do not provide favorable soil or microhabitat conditions for the Santa Cruz tarplant.

Critical Habitat

The USFWS designated critical habitat for the Santa Cruz tarplant on October 16, 2002 (USFWS 2002c). The action area is located near, but not within, two of these critical habitat units. Critical habitat Unit I (Watsonville) is located around Watsonville Municipal Airport approximately 0.5 mile west of Corralitos Creek. Unit K (Elkhorn) is approximately 1.2 miles southeast of the action area south of the town of Pajaro.

5.2 Animals

5.2.1 South Central California Coast Steelhead

The South Central California Coast steelhead (*Oncorhynchus mykiss*) was federally listed as threatened on June 17, 1998 (USFWS 1998c). The life history of steelhead in this evolutionarily significant unit (ESU), as well as that of steelhead in general, is complex and highly variable in response to a wide variety of continually changing environmental conditions, including stream flow and flow dynamics, water temperature, dissolved oxygen, pH, stream substrate, and vegetation. The *Oncorhynchus mykiss* species exists in two forms that are commonly referred to as "steelhead" and "rainbow trout" or "redband trout." Either of these forms can be the offspring of the same parents. The steelhead trout is the anadromous form of this species, spending part of its life in fresh water and the rest in the marine environment. In contrast, the rainbow or redband trout never enters the ocean at all and spends its entire life in fresh water. These two forms of *Oncorhynchus mykiss* make it well adapted to changing stream conditions including drought and river barriers that can sometimes prevent it from returning to sea for up to several years.

The South Central California Coast steelhead consists of winter-run steelhead populations that are found in the Pajaro, Salinas, and Carmel rivers, all tributaries to Monterey Bay (Moyle 2002). Steelhead seasonally migrate upstream from the ocean to their native spawning areas once heavy rains increases river flows sufficiently to breach the sandbars that form at the mouths of these rivers during the dry season. The timing of this steelhead migration is also dependent upon stream flow and water temperature conditions. Steelhead must have sufficient water velocities and depths to facilitate their upstream migration (Bell 1986). Although steelhead migration generally occurs during the winter months, it may take place as early as late fall and as late as early spring. Also, during periods of drought, these sandbars may remain intact and unbreached for up to several years with the steelhead remaining at sea.

Spawning occurs in a riffle or in the tail end of a pool that is protected from high velocity river flows. These pools sometimes form in a scoured portion of a river bend or by an obstruction in the water such as a root wad, large rock, or man-made structure such as a bridge overpass support column. Steelhead usually spawn in the same stream and area where they were hatched. The female uses her tail to create a depression in the gravel forming a redd where she buries her eggs in packets. After spawning, the spent adults called "kelts" begin their gradual descent back downstream. Depending on water temperature, incubation of eggs can take anywhere from several weeks to four months before hatching (Moyle 2002).

The development of steelhead begins with a larval stage, during which the larvae or "alevins" are totally dependent upon food stored in a yolk sac. When the yolk sac has been depleted approximately two to three weeks after hatching, juvenile steelhead or "fry" emerge from the gravel. At first, the fry remain close to the redd. As they grow, they move closer to the stream edges and upper portions of the pool where increased stream flow provides an adequate supply of aquatic invertebrates and other sources of food. Deeper waters and more vegetated areas also provide cooler water conditions and some protection from predators including fish and birds.

Smoltification is the physiological process that steelhead undergo when migrating from fresh water to the sea. This journey to the sea and entrance into ocean waters is largely dependent upon the size of the juvenile. Smolting can begin as early as the fall season following their emergence, but it typically takes one to three years before steelhead enter the ocean. Most enter the sea after two years in fresh water. In the estuary prior to migration into the ocean, they begin feeding on estuarine, planktonic and benthic invertebrates. Once in the ocean, steelhead feed on planktonic marine invertebrates including euphausiid krill. As they grow, fish gradually become a more important component of their diet. They generally spend two to three years in the ocean where they grow and become sexually mature before returning to their natal stream in winter to spawn as four or five year olds (Moyle 2002). This spawning cycle may begin again the following year because, unlike the Pacific salmon (*Oncorhynchus* sp.) species, the adult steelhead trout does not always die after spawning and is capable of spawning more than once in its lifetime.

Steelhead trout are dependent upon specific stream temperature ranges for their various life stages. These temperatures directly influence the rate at which they grow, develop, and survive from the spawning stage through smolting (ENTRIX and Lee and Pierce, Inc. 2003). Steelhead appear to spawn at temperatures between 3.9°C (39°F) and 9.4°C (49°F). The embryos develop normally between 7.0°C (45°F) and 12.0°C (54°F). At approximately 13°C (56°F), the eggs and embryos begin to die, with the rate of mortality increasing with higher temperatures. Fry and juvenile rearing occurs at temperatures between 7 and 10°C (45° and 50°F), and smoltification occurs at under 14°C (57°F) (Goals Project 2000).

Occurrence in Relation to the Action Area

The Pajaro River is the second largest drainage of the South-Central California Coast ESU. In the mid-1960s, the Pajaro River steelhead runs were estimated to have between 1,000 and 2,000 fish (McEwan and Jackson 1996). Since that time, population numbers have declined substantially. During the drought years of 1987 – 1991, less than 500 steelhead spawned annually in the five largest rivers of the South-Central California Coast ESU combined (Moyle 2002). These rivers include the Pajaro, Salinas, Carmel, Big Sur, and Little Sur. In 1991, following several years of drought starting in 1987, the steelhead run in the Pajaro River alone was estimated to consist of less than 100 fish (Nehlsen et al. 1991). Some of the main factors contributing to this decline include water diversions for agriculture, flood control, and hydroelectric power; sedimentation from adjacent land use activities; fish passage and access to spawning areas; and urbanization (NMFS 1996).

Presently, the lower Pajaro River serves primarily as a migration corridor for steelhead. The Pajaro River provides access to spawning and rearing habitat in the Corralitos and Salsipuedes creek watersheds and the upstream watersheds in Santa Clara County. This migration corridor within the project area consists of a total of approximately 12.4 miles. The Pajaro River portion (Reaches 2 through 4) from California Highway 1 to Murphy's Crossing, consists of approximately 11.4 miles. The Salsipuedes Creek portion (Reaches 5 and 7) from its confluence with the Pajaro River to the outlet at College Lake consists of approximately 2.9 miles; and Corralitos Creek from its confluence with Salsipuedes Creek to Airport Boulevard consists of approximately 2.1 miles. Potential spawning and rearing

habitat exists upstream of Murphy's Crossing in several of tributaries of the Pajaro River, including Pescadero, Uvas, Llagas, and Pacheco creeks (Smith 1982; Smith cited in (ENTRIX and Lee and Pierce, Inc. 2003; Smith 2002). Steelhead spawn and rear in the upper Corralitos Creek watershed, approximately seven miles upstream of the upper boundary of the Pajaro River lagoon (Smith 2002). The number of steelhead that currently use the Pajaro River is unknown; however, juvenile steelhead were present in all of the rearing tributaries in 1997 (Smith, unpublished data). Steelhead are known to use the Pajaro River lagoon to feed and adjust to saltwater conditions before entering the Pacific Ocean (Smith 2002).

Critical Habitat

The action area is within designated critical habitat for South Central California Coast steelhead. The South Central Coast Steelhead ESU is federally listed as threatened (Federal Register 2006). Steelhead trout utilizing the Pajaro River system are considered to be the northern-most component within the South Central Coast Steelhead ESU as designated by the National Marine Fisheries Service (NMFS) (2003). Steelhead within the South Central Coast Steelhead ESU were listed by NMFS as "threatened" on August 18, 1997. The listing was reaffirmed on January 5, 2006. All steelhead within this ESU are considered "winter steelhead" (NMFS 2004) based on their migratory timing and behavior; ascending streams during the winter when winter rainfall results in suitable flow and temperature (Moyle 2002). Recent estimates indicate a run size of fewer than 500 adults in the Pajaro River (Good et al. 2005). Critical habitat for the South Central Coast Steelhead ESU has been designated to include the Pajaro River Hydrologic Unit and Watsonville Hydrologic subarea (Federal Register 2005). In addition, NMFS ranked the conservation value of the Watsonville watershed of the Pajaro River Basin as high (NMFS 2004) based on the presence of spawning habitat, rearing habitat and its importance as a migratory corridor. Designated critical habitat Unit 1 (Pajaro River sub-basin, Hydrologic Unit 3305) encompasses the Pajaro River and its tributaries, and includes all reaches of the Pajaro River, and Salsipuedes and Corralitos creeks within the action area.

According to NOAA Fisheries (NMFS 2004), the primary constituent elements essential for the conservation of the species within ESUs are those sites and habitat components that support one or more life stages, including:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.

2. Freshwater rearing sites with:
   a. Water quality and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
   b. Water quality and forage supporting juvenile development; and
   c. Natural cover, such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

3. Freshwater migration corridors free of obstruction and excessive predation, with water quantity and quality conditions, and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks, supporting juvenile and adult mobility and survival.

4. Estuarine areas free of obstruction and excessive predation with:
   a. Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;
   b. Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and
   c. Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

5.2.2 Tidewater Goby

The tidewater goby (*Eucyclogobius newberryi*) was federally listed as endangered on February 4, 1994 (USFWS 1994c). It is a small fish that is endemic to the upper ends of coastal lagoons between San Diego and Del Norte counties, California. It generally lives for about a year and rarely exceeds two inches in length. Ideal lagoons for the tidewater goby are those with a low salinity concentration of approximately 10 parts per thousand (ppt) or less. However, they are capable of temporarily surviving at higher salinity concentrations of up to four times that level. This ability enables the tidewater goby to survive in a lagoon with elevated salinity levels and then to move into upstream waters with much lower salinity concentrations. Tidewater gobies have been found in calm waters as far as 12 km upstream from a lagoon (Moyle 2002). This range of salinity concentrations in which the tidewater goby can survive generally restricts this species from entering the open ocean and reduces or eliminates its ability to naturally recolonize lagoons, once extirpated. Tidewater gobies feed on benthic invertebrate prey items such as small crustaceans, amphipods, and aquatic insects.

One of the primary adaptations for the survival of this species is their high reproductive rate. Each female is capable of producing up to 2,400 eggs per spawning period, and can reproduce year-round. Peak nesting activities occur in late April through early May (USFWS 1994c). When streams flood in the winter and breach the sandbars that often protect the coastal lagoons, numbers of tidewater gobies may go from abundant to sometimes undetectable levels. However, in stable populations, their numbers have been known to quickly recover during the summer. Suitable water temperatures for nesting are 18° to 22°C (75.6° to 79.6°F). Spawning behavior consists of the males creating vertical burrows 4-8 inches deep in clean coarse sand, where the female attaches her eggs. After fertilizing eggs, the male remains in the burrow and guards the embryos for 9-11 days without feeding. After the larvae hatch, they remain in mid-water around vegetation until they are juveniles. Later in their development, when they reach a minimum size of approximately 0.6 inch (USFWS 1994c), they become associated with the benthic environment.

Occurrence in Relation to the Action Area

Tidewater gobies have been found in lagoons of coastal streams from Del Norte County (near the California-Oregon border) to San Diego County, California. Tidewater gobies were present in the Pajaro River Lagoon in 1991 and 1992 (Swanson and HRG, 1993). The last recorded capture of this species in the Pajaro River Lagoon was in 1994 (Smith 2002); however, KEC (2016) reports that they were captured in the upper lagoon as recently as September 2016. Tidewater gobies thrive during years of mild winters when the formation of sandbars creates non-tidal brackish lagoons that are not only preferred by this species, but also allow it to reproduce in large numbers. Under these conditions, tidewater gobies may be abundant and distributed throughout the Pajaro River Lagoon to as far upstream as the Highway 1 Bridge (CDFG 2005). However, during years with heavy storms and late sandbar closure, the population of this species generally drops sharply and is probably restricted to calmer portions of the lagoon and the Watsonville Slough (ENTRIX and Lee and Pierce, Inc. 2003). The Pajaro River Lagoon provides approximately 77.8 acres of habitat for this species.

Critical Habitat

Critical habitat for Tidewater goby was designated on February 6, 2013 (Federal Register, Vol. 78, No. 25) and includes portions of the Pajaro River west of Highway 1 and the estuary at the mouth of the river. The action area is not within designated critical habitat of the tidewater goby.

5.2.3 California Red-legged Frog

The California red-legged frog (*Rana aurora draytonii*) was federally listed as a threatened species on April 23, 1996 (USFWS 1996). This species is found mainly in perennial ponds or pools and perennial or ephemeral streams where water remains long enough for breeding and development of young (Jennings and Hayes 1994). Due to increasingly limited natural habitat, and the nature of their dynamic and variable habitat conditions, this species has become highly adaptable and will utilize a variety of natural and artificial habitats. Ideal aquatic habitats for this species are those that contain dense emergent or shoreline riparian vegetation closely associated with relatively shallow to deep (greater than 1.6 ft deep), still or slow-moving water. The types of riparian and wetland vegetation that seem to be most structurally suitable are willows, cattails, and bulrushes. Another favorable habitat condition is the absence of introduced predators such as bullfrogs (*Rana catesbeiana*) and predatory fish (i.e., sunfish and bass), which may feed on the larvae at higher levels than naturally co-evolved predators (Jennings and Hayes 1994). Emergent vegetation, undercut banks, and semi-submerged root-balls provide shelter from predators (USFWS 1997). However, some stock ponds and other water bodies with little emergent vegetation can sometimes support both red-legged frogs and non-native predators (USFWS 2002d).

The habitats used by the red-legged frog are variable. It may use a pond for all of its life stages or, as is more often the case, use multiple habitat types. Sites used for breeding and rearing of larvae and metamorphs include streams with deep pools, backwater streams and creeks, natural and artificial ponds, and freshwater marshes and lagoons. California red-legged frogs lay their eggs from late November to late April on emergent vegetation such as

cattails and bulrushes. The eggs cannot survive above a salinity of 4.5 and increased siltation during the breeding season can cause asphyxiation of eggs and small larvae (USFWS 2002d). The larvae remain in the aquatic habitats until they metamorphose into juvenile terrestrial frogs several months later. At the age of two years for males and three years for females, these juveniles will reach sexual maturity and become adults. Red-legged frogs can occasionally live as long as eight to ten years.

Adult and juvenile California red-legged frogs may disperse upstream, downstream, or upslope of their breeding habitat to forage and seek sheltering habitat. Juveniles disperse nocturnally and diurnally, while adults primarily move at night. These frogs may take shelter in small mammal burrows, moist leaf litter, and other refugia up to several dozen meters from the water during any time of the year (Jennings and Hayes 1994). During the hot, dry months, if the appropriate aquatic and upland habitats become unavailable, they may take shelter under boulders, downed trees, industrial debris, drains, stock ponds, and watering troughs. Although red-legged frogs prefer deeper pools, they have been observed inhabiting stream pools that are less than 18 inches deep. Occasionally, they will use large, deep cracks in the bottom of dried ponds for moisture and avoidance of sunlight and predators. During wet periods, California red-legged frogs can move long distances between aquatic habitats, traversing upland habitats or ephemeral drainages up to one mile from the nearest known frog populations. One translocated red-legged frog in coastal San Luis Obispo County was known to have moved more than 2,850 meters (1.8 miles) (Rathbun and Schneider 2001). These movements can occur through drainages or in relatively straight lines without much regard to topography, vegetation type, or riparian corridors (USFWS 2002d). Seeps and springs in open grasslands can function as foraging habitat or refugia for wandering frogs (Jennings and Hayes 1994).

Occurrence in Relation to the Action Area

California red-legged frogs are present in the Pajaro River in the project area. CRLF have been observed at 18 distinct locations in the Pajaro River downstream of Murphy's Crossing since 2009 (Kittleson, personal observations). They are also known from Soda Lake and Chittenden Pass upstream of the project site, the Watsonville Slough system to the north and the Elkhorn Slough system to the south. Six known breeding locations are within 1 mile of the project area, with four on the Monterey County side at the Salinas Road pond complex and along the Trafton Road ditch system and two on the Santa Cruz County side at ponds at the Land Trust of Santa Cruz County Watsonville Slough Farm (Kittleson, personal observations). **Figure 4** and **Figure 5** illustrate pertinent project-area red-legged frog observations.

A site assessment for California red-legged frog was previously performed along the Pajaro River portion of the project area (Biosearch Wildlife Surveys 1998). This assessment concluded that the lower Pajaro River does not provide any suitable breeding habitat but contains approximately 580 acres that may be used as potential foraging or sheltering habitat by California red-legged frog, particularly during the non-breeding season. Similarly, an assessment of habitat suitability in Corralitos Creek (GANDA 2005b) did not find deep pools at least 20 inches deep, or slow-moving backwater areas that could provide suitable breeding

Figure 4. Lower Pajaro Valley Red-legged Frog Observations by KEC 2004-2012

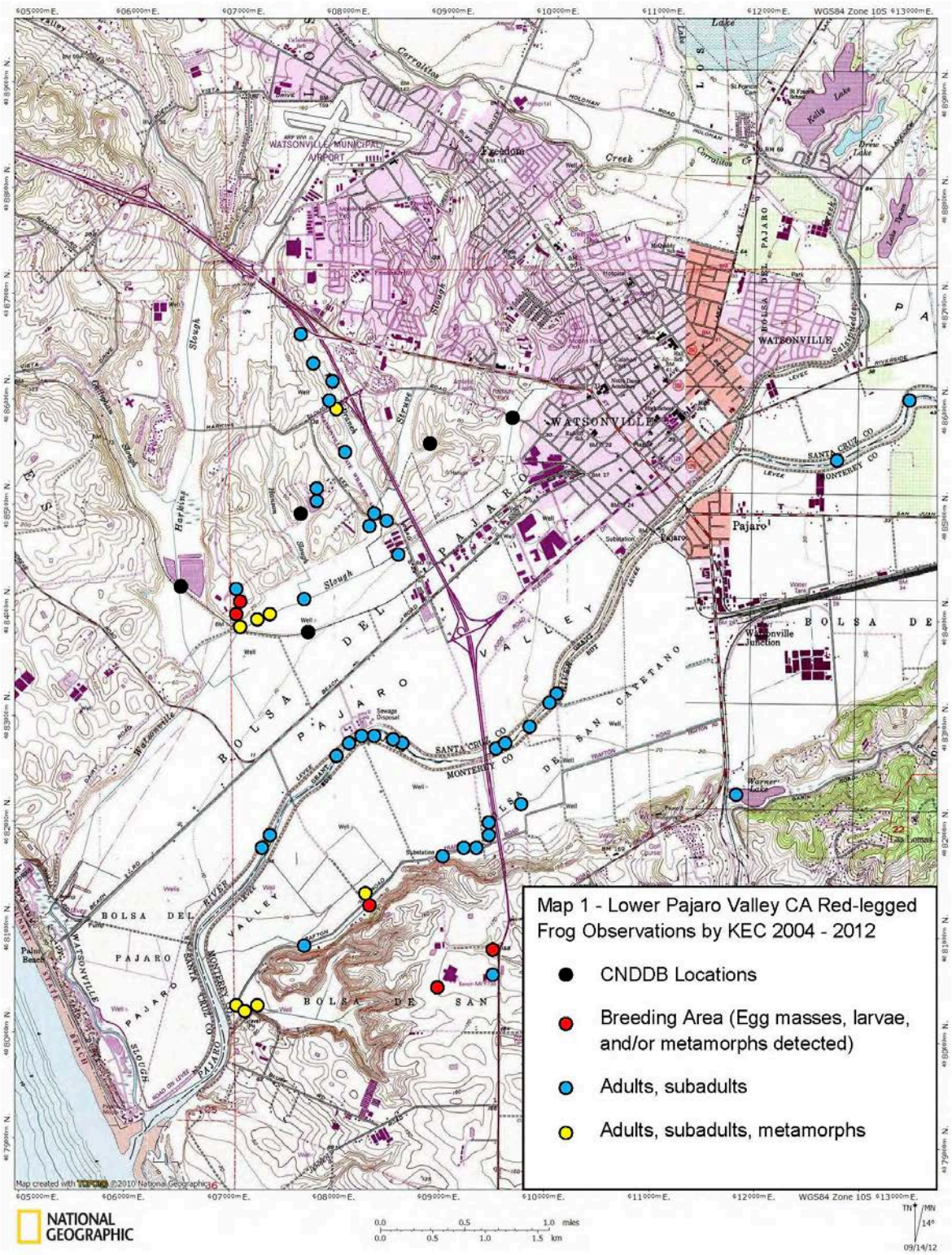
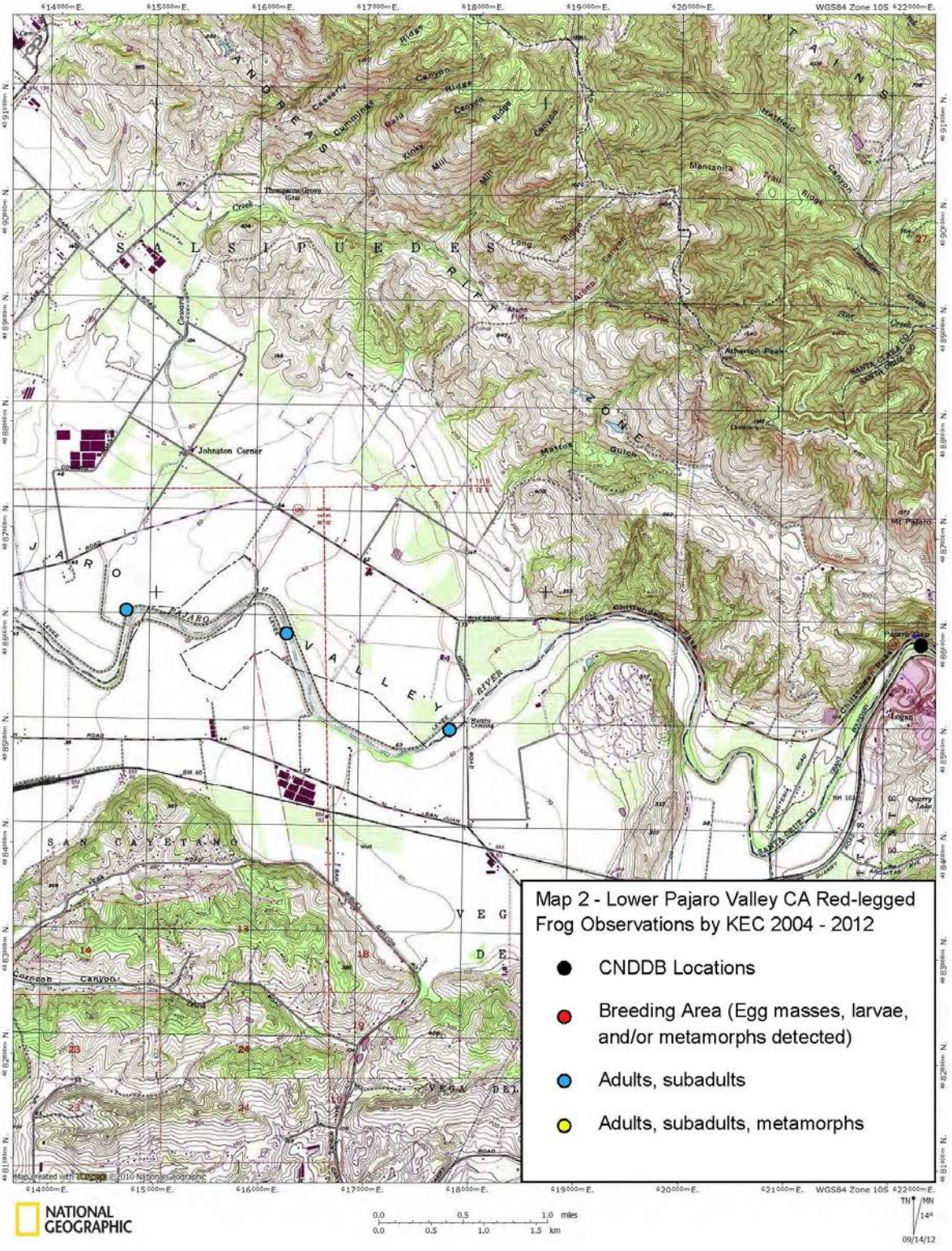


Figure 5. Lower Pajaro Valley Red-legged Frog Observations by KEC 2004-2012



habitat. The riparian corridor of Corralitos Creek could provide upland foraging or sheltering habitat; however, the urban area of Watsonville to the south forms a substantial dispersal barrier between this riparian habitat and known breeding locations of California red-legged frog.

However, in 2012 Kittleson reported that California red-legged frogs were neither observed in College Lake, or the Corralitos Creek/Salsipuedes Creek corridor, nor have they been observed in previous annual daytime surveys conducted in those areas by KEC for flood control maintenance from 2001 to 2011.

Critical Habitat

Critical habitat for the CRLF was designated in 2001 (Federal Register 1996). However, on November 6, 2002, the U.S. District Court for the District of Columbia entered into a consent decree, vacating the critical habitat designation (except Units 5 and 31), and remanding the designation to the USFWS to conduct an economic analysis. Critical habitat was again designated on April 13, 2006 (Federal Register 2006c). The Project area has no designated critical habitat for CRLF. The Watsonville Slough Complex, situated just north of the Pajaro River mouth, was designated as Critical Habitat unit SCZ-2 (50 Federal Register 19244-19292). This unit includes locations north of the mouth and seaward of Highway 1 and includes all or portions of Gallighan, Hanson, Harkins, Watsonville, Struve, and the West Branch of Struve sloughs.

Critical habitat for the California red-legged frog provides for breeding and non-breeding habitat, and for dispersal between these habitats, as well as allowing for the expansion of frog populations, which is vital to the recovery of the species. Critical habitat includes: (a) essential aquatic habitat; (b) associated uplands; and (c) dispersal habitat connecting essential aquatic habitat. The primary constituent elements that must be included within a designated critical habitat unit are summarized by USFWS (2004c) as:

1. Aquatic habitat with a permanent water source with pools having a minimum depth of 20 inches for breeding and which can maintain water for the entire tadpole rearing season.
2. Upland areas up to 300 feet from the water's edge associated with the above-described aquatic habitat that will provide for shelter, forage, and maintenance of the water quality of the aquatic habitat and dispersal.
3. Upland barrier-free habitat that is at least 300 feet in width and connects at least two (or more) suitable breeding locations defined by the aquatic habitat described above, all within 1.25 miles of one another.

6.0 EFFECTS OF THE PROPOSED ACTION

This section describes the potential effects of the Pajaro River flood risk management project on federally listed species and on designated critical habitats. The proposed action is described in Section 3.0. The environmental baseline is described in Section 4.0, and include the existing levee project and the ongoing channel maintenance practices performed by the Counties.

Both direct and indirect effects are analyzed in this assessment. Direct effects of the project include temporary (construction-related) direct effects and long-term direct effects. Direct effects on general vegetation/habitat is shown in **Table 5**. In this table "grass," "shrub," "forest," and "palustrine emergent" acreages pertain to any vegetation that is encompassed within the riparian, coastal scrub, and marsh habitat types. The shrub and forest impacts occur in areas that may serve as habitat to the special stats species that could occur within the action area, and may affect cover and shading for CRLF and juvenile steelhead, with the exception of the Pinto Creek ditch, which is a previously altered waterway and does not serve as habitat for any of the special status species.

Table 5. Area of Effect for the Proposed Project Action

Landcover Type	Impact Area (acres)	Benefit Area[1] (acres)
TOTAL Affected	203.9	89.6
Bare	20.3	
Cultivated	128.3	
Developed	12.1	
Existing Levees	7.6	
Forest	4.5	
Grass	23.3	
Shrub	7.1	
Palustrine Emergent Marsh[2]	0.06	
Water[2]	0.7	
Offset Floodplain		89.6

[1] Offset floodplain area created by constructing new setback levees and removing existing levees.
[2] Wetlands are not well captured with the GIS tools used in this analysis. Where present they may be included within water or grassland.

Temporary direct effects could include reparable damage to natural vegetation and wildlife habitats within work areas, displacement of individuals of listed species from temporary work areas, and short-term disruption of life-cycle activities such as breeding and migration. For example, aquatic species could be affected during construction activities by temporary increases in water turbidity and sedimentation. Terrestrial wildlife species could be displaced or harmed by earth moving and vegetation removal activities. Disturbance to listed

wildlife species could also result from construction-related increases in noise, dust, vibration, human presence, and nighttime lighting.

Long-term direct effects could include any permanent alteration of habitats for listed species including other significant modification of stream habitats; effects of on-going channel maintenance activities; the inadvertent introduction or spread of non-native, invasive species; or other permanent alterations to the biological communities. Long-term effects on species and habitats could either be adverse or beneficial, depending on the projected future conditions relative to the existing conditions for listed species.

Indirect effects are project-related effects that would typically occur later in time and which could occur outside of the area directly affected. For this project, indirect effects could include long-term changes in sediment transport mechanisms and deposition patterns within the stream channels, significant changes in adjacent land uses, and increased human access and presence within the action area. The proposed action is not expected to have any growth-inducing effect because the surrounding floodplain is already fully utilized for cultivated agriculture and urban development. While increases in human population and conversions of land to urban or suburban uses are likely to occur in the future within the action area, these changes would occur independent of the proposed action and would not be promoted or facilitated by the action.

6.1 Effects on Listed Species

The following section evaluates direct and indirect effects of the action on listed species based on the anticipated changes to the physical environments and habitats in the action area and the species life history, habitat use, and distribution in the action area.

6.1.1 Santa Cruz Tarplant

The Santa Cruz tarplant occurs in the vicinity of the action area, within 0.5 mile of Corralitos Creek at the Watsonville Municipal Airport. However, it is not likely to occur within the action area because the area lacks suitable grassland habitat for this species.

Direct Effects

No direct effects on the Santa Cruz tarplant are expected because the proposed action would not result directly or indirectly in any increased risk of harm to individuals or existing populations of the species.

Indirect Effects

No indirect effects on the Santa Cruz tarplant are expected because the proposed action would not result indirectly in any increased risk of harm to individuals or existing populations of the species.

6.1.2 South Central California Coast Steelhead

The current numbers of steelhead in the migratory run into the Pajaro River are not known (Smith 2002); however, juvenile fish have been noted in the major rearing tributaries in 1997 (Smith, unpublished). The primary spawning and rearing area in the Pajaro Basin is in upper Corralitos Creek approximately seven miles above the project boundary (Smith 2002). The juveniles also would likely migrate downstream into the estuarine lagoon to complete their smoltification prior to moving out to sea.

The direct impacts to steelhead are centered around their ability to move through the project area on their upstream migration and the outrun of spawned adults back to sea, and juveniles to the lower reaches of the Pajaro River to complete the smoltification process. The spawning adults normally come upstream in the winter and early spring during the high flow periods and return to their natal streams to spawn. After spawning, the surviving adults quickly move downstream, through the estuary and back to sea. After the eggs hatch, juvenile steelhead typically stay in the stream for two years. The older juveniles then move downstream into the lagoon, where they can spend some time continuing the process of smoltification. Depending upon stream flow and water availability, the juveniles will move downstream into the areas of more perennial water.

Direct Effects

When considering the constituent elements for steelhead habitat, the action area does not contain spawning or rearing sites; however, it does provide a freshwater migration corridor to an estuarine area that is both free of obstructions and excessive predation. The project has been designed to minimize to the extent possible any impacts to migrating adult as well as juvenile steelhead. All of the river and tributary habitats in the project area are primarily migratory routes for both adults and juveniles.

The project would have little impact, if any, on the stream habitat utilized by the steelhead. Since the river in these reaches is primarily used as a migration corridor any minor loss of shading effects are not expected to have a measurable effect. No construction activities are planned within in the stream channel except potentially those associated with two bridge raises. No in-stream construction activities will be permitted from October 15 to June 15 to permit unobstructed migration for any steelhead.

Construction of the setback levee system will provide additional floodplain during high flow periods potentially increasing the sinuosity of the channel and improving overall habitat conditions for fish passage in both directions. An approved stormwater management plan will be in place to minimize any increase in sediment flow and turbidity, as will a plan to prevent the spill of toxic or potentially toxic materials (including concrete) into the stream during all construction.

Indirect Effects

The primary indirect effects will be potentially an increased habitat value for juveniles in the reaches (primarily Reaches 2 and 4) with setback levees and the associated floodplain that will be reconnected to the river.

6.1.3 Tidewater Goby

Direct Effects

No direct effects on the tidewater goby are expected because the proposed action would not result directly or indirectly in any increased risk of harm to individuals or existing populations of the species. No in-water work is proposed, except potentially with the two bridge raises, and all work would occur upstream of tidally influenced Pajaro River lagoon habitat known to support goby. Presence in this area is not expected and no direct or indirect effects would occur.

Indirect Effects

No indirect effects on the tidewater goby are expected because the proposed action would not result indirectly in any increased risk of harm to individuals or existing populations of the species.

6.1.4 California Red-legged Frog

California red-legged frogs are present in the Pajaro River in the project area; however, no suitable breeding habitat exits for this species in the action area. CRLF have been observed at 18 distinct locations in the Pajaro River downstream of Murphy's Crossing since 2009 (Kittleson, personal observations). They are also known from Soda Lake and Chittenden Pass upstream of the project site, the Watsonville Slough system to the north and the Elkhorn Slough system to the south. Six known breeding locations are within 1 mile of the project area, with four on the Monterey County side at the Salinas Road pond complex and along the Trafton Road ditch system and two on the Santa Cruz County side at ponds at the Land Trust of Santa Cruz County Watsonville Slough Farm (Kittleson, personal observations). Suitable foraging and refuge habitat (and movement/dispersal corridor) is present for the species within the action area. Reach 2 of the Pajaro River is within dispersal range of the existing populations of this species in the Watsonville Sloughs System, and could provide temporary refuge habitat.

In terms of suitable habitat, the action area does not contain permanent deep pools or upland barrier-free habitat that is at least 300 feet in width connecting at least two or more suitable breeding locations within 1.25 miles of one another. However, portions of the Pajaro River and Corralitos Creek provide upland areas up to 300 feet from the waters' edge that could provide sheltering and foraging habitat for this species.

Although California red-legged frog critical habitat could be adversely affected by the proposed action, a site assessment for California red-legged frog performed along the Pajaro River portion of the project area (Biosearch Wildlife Surveys 1998) concluded that the lower Pajaro River does not provide any suitable breeding habitat, although Kittleson in 2012 observed adults and juveniles in the lower Pajaro River.

Direct Effects

Project construction activities could directly affect California red-legged frogs if they are present within the work areas. Although there is no suitable breeding habitat within the action area, individuals from nearby source populations could potentially be present in the work areas during project construction, or could move into the area at a later time. Individual frogs could be crushed or buried during levee construction, vegetation removal, or bank excavation activities.

Installing levees along Corralitos Creek could affect upland migration habitat by impeding California red-legged frog movement between the river banks and surrounding habitats; however, the degree to which this species would be impeded would probably be small due to the red-legged frogs' ability to traverse over steep hillsides and other. Vegetation removal within the footprints of the proposed levees and floodwalls, and subsequent vegetation management on and within 15 feet of those structures, could reduce the amount of potential upland shelter and foraging habitat along Corralitos Creek. However, presence/absence of California red-legged frogs within the Corralitos Creek portion of the project area will be determined in accordance with the 2005 USFWS survey protocol (USFWS 2005a) prior to construction.

Maintenance activities for the project include mowing and spraying with herbicides on and within 15 feet of the levees and floodwalls. The project includes the actions identified in Section 3.5, Conservation and Mitigation Measures. These measures would avoid and minimize potential direct effects on CRLF. The project would also result in increased riparian vegetation and floodplain along the main stem of the Pajaro River, primarily in reaches 2 and 4.

Indirect Effects

The project could have temporary, indirect effects on habitat for the CRLF related to increased turbidity. Although erosion control measures will be implemented to effects could still include a slight increase in turbidity during levee construction that could be carried downstream.

6.2 Effects on Designated Critical Habitat

6.2.1 South Central California Coast Steelhead

The primary constituent elements for steelhead are defined in Section 5.2.1. Of those four elements, the action area does not contain spawning or rearing sites; however, it does provide

a freshwater migration corridor and an estuarine area that are both free of obstructions and excessive predation.

The proposed project has been designed to minimize to the extent possible any effects to migrating adult as well as juvenile steelhead. All of the river and tributary habitats included in this project are primarily migratory routes for both adults and juveniles. Changes in the shade component of the habitat will be insignificant in the project area

7.0 CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA. There are several activities in the watershed that may have a cumulative effect on listed steelhead, Tidewater goby, and California red-legged frog. These activities include regular Pajaro River flood system maintenance activities, the Pajaro River Lagoon Flood Control Program conducted by Santa Cruz County, the Salsipuedes and Corralitos Creek Flood Control Program conducted by Santa Cruz County, operation of the College Lake Reclamation Project, and impaired water quality from agricultural and urban runoff.

7.1 Anticipated Non-Federal Actions in the Action Area

The following non-federal actions are reasonably certain to occur within the action area considered in this Biological Assessment.

1. Pajaro River and Salsipuedes and Corralitos Creeks Management and Restoration Plan. A Final Environmental Impact Report (EIR) was completed in February 2002 for a proposed project to implement a short-term management program along the lower Pajaro River and Salsipuedes and Corralitos creeks. The objectives of the program are to maintain the flood carrying capacity of the system, install and maintain bank erosion control measures as necessary, and preserve and enhance habitat values for wildlife. The project includes resurfacing and maintenance of the existing levees, installation and monitoring of bank protection measures, management and restoration of vegetation inside the levees, and periodic sediment removal. This project is designed as a short-term, interim management project that would reduce the environmental impacts of management actions within the existing levee system. It does not preclude the development of the proposed Lower Pajaro River Flood Control Project.

2. Pajaro River Total Maximum Daily Loads (TMDLs) for Sediment and Nutrients. The California Regional Water Quality Control Board (RWQCB) determined sediment and nutrient TMDLs for water bodies within the Pajaro River watershed. Watershed studies were conducted to assess water quality conditions and assist in TMDL development.

3. The city of Watsonville is planning an upgrade to their wastewater treatment plan on the River between the Thurwachter and Highway 1 bridges. They are going to increase or add recycled water treatment and distribution at that location. The change in discharge is currently unknown.

4. The Pajaro Dunes Community may be in the process or have just completed construction of a flood wall near the river mouth.

5. The Santa Cruz County Resources Conservation District (SCCRCD) is planning a flood improvement project for Watsonville Slough above the County's Shell Road Pump Station.

6. The Santa Cruz County 1994 General Plan calls for the Pajaro River Levee System to be used as a public bike path along the entire length of the main stem levee and a portion of the Salsipuedes Creek levee. Section 3.8.6.i calls for the development of a Master Plan of Countywide Bikeways that delineates existing and proposed bikeways. For the main stem, the General Plan's Figure 3-1 depicts the entire length of the Pajaro River levee as a planned bike route from Murphy's Crossing to the Monterey Bay river mouth.

7. The Monterey County General Plan calls for public use of the levee via provision of two access points downstream of Hwy 1. The *21st Century Monterey County General Plan Public Review Draft, January 2004* (Monterey County 2004) designates public use of the Pajaro River levee in 'Chapter XII, the Coastal Areas Element.' The General Plan's Map NCC-3, 'Public Access, North County Coastal,' highlights public access at #NCC-8 and #NCC-9.

> #NCC-8 - The designated access area is: McGowan Road Access to Pajaro River (Thurwachter Bridge). Provision/Acquisition and Management Tasks are:
>
> a. Provide improved parking capacity of 15-30 vehicles.
> b. Supervise pullout parking trail along levee.
> c. Restrict unauthorized motorcycle and dirt bike use.
> d. Recommend preparation of a Pajaro River Trail Management Plan.
> e. Re-growth of riparian vegetation.
> f. Develop trail or path on levee, principally for hikers.
>
> #NCC-9 - The designated access area is: Trafton Road Access to Pajaro River. Provision/Acquisition and Management Tasks are:
>
> a. Investigate acquisition to provide parking area for levee trail.
> b. Supervision to reduce impacts of public use.
> c. Discourage use of areas by motorcycles.
> d. Designate trail on levee.
> e. Monitor visitor use and capacity.
> f. Investigate feasibility of trail to bluff top.
> g. Discourage informal trails.
> h. Restrict access on private lands/agricultural areas.
> i. Protect archaeological site.

8. The Pajaro River levee currently interfaces with two regional recreation pathways: the Pacific Coast Bike Route and the California Coastal Trail (CCT). A third pathway is the planned Santa Cruz County Rail Trail. The Rail Trail is planned to connect Santa Cruz County to Monterey County by adding a recreational path along 31 miles of railroad from Davenport to the Pajaro River levee in Watsonville at the Walker Street Union Pacific Railroad Bridge.

The Pacific Coast Bike Route enters Santa Cruz County along Highway 1 and, via San Andreas Road, leads to the Pajaro River levee. At the Thurwachter Road Bridge, the route crosses the Pajaro River levee and continues through Monterey County and on southward.

The CCT crosses over the Pajaro River at the river mouth. This trail crossing depends on River flows being low enough to wade across; otherwise, the nearest pedestrian river crossing is roughly 2.5 miles upstream at the Thurwachter Bridge.

7.2 Cumulative Effects

The potential for long-term cumulative impacts on the listed species identified in this Biological Assessment appears to be low. The minimization of sediment flow into the stream through the TMDL process, the long-term maintenance of the riparian corridors both along the Pajaro River and in the tributary streams, and the elimination in the in-stream construction-related processes have the potential to increase the amount of suitable habitat available for the special status species. The upgrade to the Watsonville wastewater plant may change the amount and quality of the discharge and would require evaluation as part of that environmental documentation. The majority of the proposed actions are designed to provide increased public access through bike paths and hiking trails and should have no impact on the listed species based upon analyses conducted prior to their development.

8.0 CONCLUSIONS

For the proposed action, the determination of effects on federally listed species is based on the potential for these species to occur within the action area, and the potential for adverse or beneficial effects of the action on these species. **Table 6** defines the possible determinations for listed species and designated critical habitat (USFWS and NMFS 1998).

Table 6. Definition of Determinations for Listed Species

Determination	Definition
No effect (NE)	No direct or indirect effects
May Affect, Not Likely to Adversely Affect (NLAA)	Effects are beneficial, insignificant (very small in scale and cannot be meaningfully measured, detected, or evaluated), or discountable (extremely unlikely to occur)
May Affect, Likely to Adversely Affect (LAA)	Adverse effects that are not insignificant or discountable

8.1 Determinations for the Proposed Action

Table 7 lists the determinations for the species that are addressed in this BA. The rationale for these determinations is provided above in the discussion of effects for each species (see Section 6.0) and is briefly summarized in the text that follows.

Table 7. Determinations for Species and Designated Critical Habitat Considered in this Biological Assessment

Species	Determination
Santa Cruz tarplant	NE
South Central California Coast steelhead	NLAA
Tidewater goby	NE
California red-legged frog	NLAA
South Central California Coast steelhead Designated Critical Habitat	NLAA

Santa Cruz Tarplant

The proposed action is expected to have no effect on the Santa Cruz tarplant, because this species is not known or expected to occur within the action area.

South Central California Coast Steelhead

The proposed action may affect, but is not likely to adversely affect South Central California Coast steelhead. Effects would be avoided and minimized by implementing the conservation

and mitigation measures identified in Section 3.5, most importantly, a limited operating period (LOP) will be imposed activities from October 15 to June 15 on any in-water construction. The setback levees and increased floodplain will provide some beneficial effects for steelhead by increasing the sinuosity of the channel and improving overall habitat conditions for fish passage in both directions. An approved stormwater management plan will be in place to minimize any increase in sediment flow and turbidity, as will a plan to prevent the spill of toxic or potentially toxic materials (including concrete) into the stream during all construction.

Tidewater Goby

The proposed action is expected to have no effect on the Tidewater goby because the project is located above Highway 1 and the area of tidal influence, and this species is not expected to be present within the action area. In addition, in water work will be very limited and associated primarily with two bridge raises.

California Red-legged Frog

The proposed action may affect, but is not likely to adversely affect California red-legged frog. Individual frogs could be crushed or buried during levee construction. While this is unlikely, individuals may encounter construction activities during migration and foraging. Effects would be avoided and minimized though the implementation of the conservation and mitigation measured discussed in Section 3.5.

South Central Steelhead Designated Critical Habitat

The proposed action may affect, but is not likely to adversely affect designated critical habitat for the South Central California Coast steelhead because the project has been designed to avoid and minimize any impacts to migrating adult as well as juvenile steelhead, including their habitat, to the extent possible.

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Appendix A

Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish And Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003-7726
Phone: (805) 644-1766 Fax: (805) 644-3958

In Reply Refer To: September 13, 2017
Consultation Code: 08EVEN00-2017-SLI-0644
Event Code: 08EVEN00-2017-E-01430
Project Name: Lower Pajaro River Flood Control Project

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

To Whom It May Concern:

The enclosed list identifies species listed as threatened and endangered, species proposed for listing as threatened or endangered, designated and proposed critical habitat, and species that are candidates for listing that may occur within the boundary of the area you have indicated using the U.S. Fish and Wildlife Service's (Service) Information Planning and Conservation System (IPaC). The species list fulfills the requirements under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the species list should be verified after 90 days. We recommend that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists following the same process you used to receive the enclosed list. Please include the Consultation Tracking Number in the header of this letter with any correspondence about the species list.

Due to staff shortages and excessive workload, we are unable to provide an official list more specific to your area. Numerous other sources of information are available for you to narrow the list to the habitats and conditions of the site in which you are interested. For example, we recommend conducting a biological site assessment or surveys for plants and animals that could help refine the list.

If a Federal agency is involved in the project, that agency has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a major construction project*, the Federal agency has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If the Federal agency determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to a

written request for formal consultation. During this review process, the Federal agency may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

Federal agencies are required to confer with the Service, pursuant to section 7(a)(4) of the Act, when an agency action is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10(a)). A request for formal conference must be in writing and should include the same information that would be provided for a request for formal consultation. Conferences can also include discussions between the Service and the Federal agency to identify and resolve potential conflicts between an action and proposed species or proposed critical habitat early in the decision-making process. The Service recommends ways to minimize or avoid adverse effects of the action. These recommendations are advisory because the jeopardy prohibition of section 7(a)(2) of the Act does not apply until the species is listed or the proposed critical habitat is designated. The conference process fulfills the need to inform Federal agencies of possible steps that an agency might take at an early stage to adjust its actions to avoid jeopardizing a proposed species.

When a proposed species or proposed critical habitat may be affected by an action, the lead Federal agency may elect to enter into formal conference with the Service even if the action is not likely to jeopardize or result in the destruction or adverse modification of proposed critical habitat. If the proposed species is listed or the proposed critical habitat is designated after completion of the conference, the Federal agency may ask the Service, in writing, to confirm the conference as a formal consultation. If the Service reviews the proposed action and finds that no significant changes in the action as planned or in the information used during the conference have occurred, the Service will confirm the conference as a formal consultation on the project and no further section 7 consultation will be necessary. Use of the formal conference process in this manner can prevent delays in the event the proposed species is listed or the proposed critical habitat is designated during project development or implementation.

Candidate species are those species presently under review by the Service for consideration for Federal listing. Candidate species should be considered in the planning process because they may become listed or proposed for listing prior to project completion. Preparation of a biological assessment, as described in section 7(c) of the Act, is not required for candidate species. If early evaluation of your project indicates that it is likely to affect a candidate species, you may wish to request technical assistance from this office.

Only listed species receive protection under the Act. However, sensitive species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. We recommend that you review information in the California Department of Fish and Wildlife's Natural Diversity Data Base. You can contact the California Department of Fish and Wildlife at (916) 324-3812 for information on other sensitive species that may occur in this area.

[*A Biological Assessment is required for construction projects (or other undertakings having

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

Ventura Fish And Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003-7726
(805) 644-1766

Project Summary

Consultation Code: 08EVEN00-2017-SLI-0644

Event Code: 08EVEN00-2017-E-01430

Project Name: Lower Pajaro River Flood Control Project

Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES

Project Description: The Pajaro River Watershed has a long history of flooding that results in substantial damages in the Towns of Pajaro and Watsonville and surrounding agricultural areas. The study is analyzing various alternatives to provide additional flood risk management (FRM) improvements along the Pajaro River and its tributaries. The project area is located within the lower Pajaro River watershed. It encompasses an area of approximately 10,000 acres, which includes the stream channels, active floodplains, and terraces along the Pajaro River and Salsipuedes Creek. The area is divided by the Pajaro River, which serves as a border for two counties, with Santa Cruz County lying to the north of the Pajaro River, and Monterey County lies to the south. Salsipuedes and Corralitos Creeks, which join just north of the Pajaro River in Santa Cruz County, are tributaries of the Pajaro River. The project area was divided into seven reaches (2-8)based on land use practices, major confluences, and existing significant bridges: Reach 2 is the stretch of the main stem of the Pajaro River extending from the Highway 1 Bridge to the west side of Watsonville's city limits. It is approximately 1.5 miles long, Reach 3 is the stretch of the main stem of the Pajaro River extending from the west side of Watsonville's city limits to the confluence with Salsipuedes Creek. It is approximately 0.9 mile long, Reach 4 is the stretch of the main stem of the Pajaro River extending from the confluence with Salsipuedes Creek to Murphy's Crossing Road. It is approximately 5.0 miles long, Reach 5 is the stretch of Salsipuedes Creek from its confluence with Pajaro River main stem to Highway 152. It is approximately 2.6 miles long, Reach 6 is the stretch of Corralitos Creek from Highway 152 to Green Valley Road. It is approximately 1.8 miles long, Reach 7 is the stretch of Salsipuedes Creek from Highway 152 upstream, below College Lake and including the ring levee at the Orchard Park subdivision,and it is approximately 0.3 miles long, Reach 8 is the stretch of Corralitos Creek from Green Valley Road to Airport Road, which is approximately 0.3 miles long.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.9115668056014N121.72995540293778W

Counties: Monterey, CA | Santa Cruz, CA

Endangered Species Act Species

There is a total of 18 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered
Southern Sea Otter *Enhydra lutris nereis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8560	Threatened

Birds

NAME	STATUS
California Condor *Gymnogyps californianus* Population: U.S.A. only, except where listed as an experimental population There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Least Bell's Vireo *Vireo bellii pusillus* There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Western Snowy Plover *Charadrius alexandrinus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia*	Endangered

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/5956

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii*	Threatened

There is **final designated** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/2891

California Tiger Salamander *Ambystoma californiense*	Threatened

Population: U.S.A. (Central CA DPS)
There is **final designated** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/2076

Santa Cruz Long-toed Salamander *Ambystoma macrodactylum croceum*	Endangered

There is **proposed** critical habitat for this species. The location of the critical habitat is not available.

Species profile: https://ecos.fws.gov/ecp/species/7405

Fishes

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi*	Endangered

There is **final designated** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/57

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Marsh Sandwort *Arenaria paludicola* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2229	Endangered
Monterey Gilia *Gilia tenuiflora ssp. arenaria* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/856	Endangered
Monterey Spineflower *Chorizanthe pungens var. pungens* There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/396	Threatened
Santa Cruz Tarplant *Holocarpha macradenia* There is **final designated** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6832	Threatened

Critical habitats

There are 5 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Steelhead *Oncorhynchus (=Salmo) mykiss* Population: Northern California DPS For information on why this critical habitat appears for your project, even though Steelhead is not on the list of potentially affected species at this location, contact the local field office. https://ecos.fws.gov/ecp/species/1007#crithab	Final designated
Steelhead *Oncorhynchus (=Salmo) mykiss*	Final

Population: South-Central California Coast DPS — designated
For information on why this critical habitat appears for your project, even though Steelhead is not on the list of potentially affected species at this location, contact the local field office.
https://ecos.fws.gov/ecp/species/1007#crithab

Steelhead *Oncorhynchus (=Salmo) mykiss* — Final designated
Population: Central California Coast DPS
For information on why this critical habitat appears for your project, even though Steelhead is not on the list of potentially affected species at this location, contact the local field office.
https://ecos.fws.gov/ecp/species/1007#crithab

Steelhead *Oncorhynchus (=Salmo) mykiss* — Final designated
Population: California Central Valley DPS
For information on why this critical habitat appears for your project, even though Steelhead is not on the list of potentially affected species at this location, contact the local field office.
https://ecos.fws.gov/ecp/species/1007#crithab

Steelhead *Oncorhynchus (=Salmo) mykiss* — Final designated
Population: Southern California DPS
For information on why this critical habitat appears for your project, even though Steelhead is not on the list of potentially affected species at this location, contact the local field office.
https://ecos.fws.gov/ecp/species/1007#crithab

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

April 30, 2018 **In response refer to:** WCR-2017-8412

Lieutenant Colonel Travis J. Rayfield
Commander and District Engineer
United States Army Corps of Engineers
San Francisco District
1455 Market Street Number 16
San Francisco, California 94103

Re: Notice of consultation close out due to insufficient information to initiate informal consultation under 7(a)(2) of the Endangered Species Act

Dear Colonel Rayfield:

Thank you for your November 6, 2017, letter requesting initiation of informal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), for Pajaro River Flood Risk Management Study.

Unfortunately, the materials provided with your consultation request are insufficient to initiate informal consultation under the ESA. We contacted you on November 30, 2017 by letter, to provide comments on the draft integrated General Reevaluation Report and Environmental Assessment and draft Finding of No Significant Impact for the Pajaro River Flood Risk Management Study, and to request additional information on the Tentatively Selected Plan which was the basis of the submitted Biological Assessment. We again contacted you on March 27, 2018 by letter, to notify you that we would close out this consultation and consider it withdrawn if we did not receive the requested information within 30 days.

Because we have not received the additional information needed within 30 days, we have closed out your consultation request by considering it withdrawn. If you are still interested in consulting, please provide us a new request for consultation once you have complete information.

We would like to work with you to avoid the need to close out consultations in this manner. Please do not hesitate to contact us when you are preparing a consultation request if you would like assistance determining the content and timelines for the consultation. Please contact Joel

Casagrande at (707) 575-6016, or at joel.casagrande@noaa.gov if you have any questions concerning this letter or if you require additional information.

Sincerely,

A. Ingham for

Barry A. Thom
Regional Administrator

Enclosure

cc: Christopher Eng, Corps, San Francisco
Tanis Toland, Corps, Sacramento

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, US ARMY CORPS OF ENGINEERS
1455 MARKET STREET,
SAN FRANCISCO CALIFORNIA 94103-1398

CESPN-ET-PB 1 April 2018

MEMORANDUM FOR RECORD

SUBJECT: Pajaro River Flood Risk Management General Reevaluation Study – Endangered Species Act Compliance

1. This memorandum responds to guidance provided by HQUSACE regarding Endangered Species Act (ESA) compliance documentation required to be incorporated into the integrated environmental assessment (EA) for the Pajaro River FRM final report (Scott Nicholson e-mail to Tom Kendall, dated 19 March 2018).

2. The Memorandum for Record (MFR) documenting the 8 November 2017 resource agency meeting is provided as Attachment 1.

3. HQUSACE provided four specific points of guidance regarding ESA documentation to be included in the integrated EA. Our response to each point is provided below.

HQ GUIDANCE #1: In the EA disclose that ESA requirements have not been satisfied but will be before any actions are taken.

SPN RESPONSE: *Concur*. In Chapter 5, Sections 5.2.1 and 5.2.2, and Table 5-1, have been modified to disclose that ESA requirements have not been satisfied but will be before any actions are taken. The modified text is provided in Attachment 2.

HQ COMMENT #2: In the EA disclose what assumptions have been made regarding measures that will have to be implemented to address ESA species/habitat.

SPN RESPONSE: *Concur*. Section 4.14.3 describes mitigation measures USACE has identified to avoid and minimize adverse effects on federally listed species and designated critical habitat. Mitigation measures required to conserve these species and their habitats are described in the biological assessment (BA) for this project, which was transmitted to USFWS and NMFS in November 2017, and is included in Appendix E of the final report. Mitigation measures include, but are not limited to performing presence and absence surveys for listed species during prior and during construction, working within the recognized environmental regulatory windows for the project area and implementing construction best management practices approved by the resource agencies.

HQ COMMENT #3: In the EA disclose a commitment to implement any and all measures required to minimize the impact on species below the significance threshold.

SPN RESPONSE: *Concur.* The final report Chapter 6 Recommended Plan, Section 6.3 Mitigation will identify the mitigation measures that are part of the Recommended Plan to avoid and minimize adverse effects on native plants and animals, including federally listed species and designated critical habitat and will specify that implementing these measures will ensure that effects of the Recommended Plan are less than significant, which also function to conserve the listed species addressed in the BA.

HQ COMMENT #4: In the EA disclose that the EA may have to be supplemented if unanticipated measures are required by the biological opinion/incidental take statement (BiOp/ITS) that are out of scope of what has been considered.

SPN RESPONSE: Chapter 5, section 5.5 Compliance with Applicable Laws, Regulations, and Policies, has been revised and now read as follows: "Table 5-1 provides a summary of the status of consultation and other requirements that must be met before the proposed Pajaro River Flood Risk Management Project could be implemented. If the project is approved and funded, any refinements to the project that result from ESA, CWA, and/or CZMA consultations completed during PED would be reviewed and compared to what was evaluated in this GRR/EA to determine if supplemental NEPA documentation would be required, if the unanticipated measures rise to the level of significance. CEQ regulations specify that supplements are required if: (i) there are substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."

ATTACHMENT 1 - Resource Agency Meeting

CESPN-ET-PB 1 April 2018

MEMORANDUM FOR RECORD

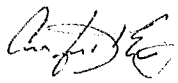
SUBJECT: Resource Agency Meeting on the Pajaro River Draft GRR/EA

Under the federal Endangered Species Act, USACE has been informally coordinating with the National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) shortly after USACE published a Notice of Intent (NOI) in the Federal Register (June 8, 2001, 66 FR 30894) to advertise the USACE's intent to study this project.

USFWS first engaged USACE in July 2001. Between 2002 and 2003, bi-monthly ESA/Resource Agency Meetings were held with USACE, NMFS, USFWS, and CDFW to actively engage in the alternative planning stages of this project. In 2003 and 2004, NMFS provided a technical letter written jointly with the resource agencies, which outlined the performance standards that the agencies are looking for with this project that wouldn't result in a jeopardy opinion from NMFS. Between 2004 and 2005, this morphed into a larger group called the Pajaro River Technical Stream Team, which led to performance standards for ESA during operations and maintenance of the project after construction. In 2008, USACE and the non-federal sponsors held a meeting with NMFS to discuss and receive input on potential ESA impacts to a newer suite of alternatives. Continuing resource agency meetings with NMFS and USFWS were held in 2010 and 2012 to discuss the ability to obtain concurrences to construct the existing set of various alternatives. NMFS later provided a conceptual alternative that they preferred (Channel Migration Zone alternative). Over a three day period in August, NMFS and USFWS participated in a USACE-led Charette and discussed the newer project alternatives and ESA compliance for the project. It's also worth noting that over the past 16 years there have been numerous site visits with USACE, NMFS and USFWS that resulted in further discussions of the project alternatives and ESA issues.

On November 2017, USACE invited NMFS and USFWS to a Resource Agency Meeting on the publically released Draft GRR/EA to discuss ESA compliance on the project alternatives. The agencies were in favor of the project but wanted more detailed plans of the tentatively selected plan. USFWS stated at the meeting and in a follow-up letter that they want to have more discussion on operation and maintenance (O&M) of the project and the effect on the federally listed species under their jurisdiction. They affirm again that they believe that a reduction in activities would reduce potential impacts to the species. NMFS requested that they would need a set of cross sections, plans, locations, and extent of the rip-rap required for this project. Also, a more detailed plan on how the sponsors would manage the "vegetation-free" zone around the flood control features. In a follow up letter they further requested more detail about the project. Both agencies agreed that the construction of the project is of lesser concern than the potential impacts of post-construction O&M activities. USACE stated that we will provide the request information when it's developed and continue to engage them in consultation during PED. This ensures that the consultation will be based on specific detailed project information, which NMFS and USFWS concurs with and would allow the agencies to provide a fair and effective

evaluation of the agency alternative. Throughout this long informal consultation process with NMFS and USFWS, it has been a consistent request to provide the most detailed information on the agency's selected alternative for ESA consultation and not to request analysis of all the proposed alternatives. USACE is committed to provide NMFS and USFWS the requested information on the selected plan and continuing to informally consult with them during the GRR phase and provide the necessary detailed information during PED.



CHRISTOPHER ENG
Senior Environmental Planner
Environmental Section B
Planning Branch

ATTACHMENT 2 – ESA Compliance Section in the GRR/EA

PUBLIC INVOLVEMENT, COORDINATION, CONSULTATION, AND COMPLIANCE

1. U.S. Fish and Wildlife Service

The USACE has been informally consulting with the USFWS under the Federal ESA regarding the potential effects of the action alternatives on federal-listed species and designated critical habitat, including California red-legged frog (CRLF), tidewater goby, and the western snowy plover. The USACE prepared a Biological Assessment (BA) (Appendix E-1 of the GRR/EA) and determined that the proposed action, construction and operation of the RP, would have no effect on the tidewater goby and western snowy plover or on the Santa Cruz tarplant. In a letter dated, November 2, 2017, USACE requested concurrence from USFWS with our determination that the proposed action may affect, but is not likely to adversely affect, the federally listed California red-legged frog. USFWS has advised USACE that formal consultation will be required. USACE is continuing to informally consult with USFWS during the General Reevaluation Study and will formally consult with USFWS during PED if the project is approved and funded and additional information developed during PED does not result in USFWS concurrence with our determination that the project may effect, but is not likely to adversely affect the federally listed California red-legged frog. Construction will not be initiated until the project is in full compliance with the ESA.

2. National Marine Fisheries Service

The South Central California Coast ESU steelhead, which are listed under the Federal ESA as Threatened, is known to occur within the Project area. USACE has been informally consulting on an ongoing basis with NMFS regarding the steelhead and prepared a BA (Appendix E-1) that addresses the potential effects on steelhead from construction, operation, maintenance, and repair of the RP. In a letter, dated November 2, 2018, USACE requested concurrence with our determination that the project may affect, but is not likely to adversely affect, this species. NMFS has advised USACE of the need for additional information prior to making a decision on our concurrence request. USACE will continue to informally consult with NMFS throughout the General Reevaluation Study. If the project is approved and funded, we will formally consult during PED if additional information developed during that project phase does not result in NMFS concurrence with our determination of may affect, not likely to adversely affect the steelhead or is designated critical habitat. Construction will not be initiated until the project is in full compliance with the ESA.

3. Summary of Federal Environmental Compliance for Proposed Project

The entry for ESA now reads: *Partial Compliance*. USACE has informally consulted with USFWS and NMFS during the General Reevaluation study and preparation of the integrated GRR/EA. USACE prepared a BA (see Appendix E) to address potential project effects on

federally listed species and designated critical habitat, and transmitted this document to both agencies. USFWS has advised that formal consultation will be needed and NMFS requested additional information. If the project is approved and funded, and if additional information developed during PED does not result in concurrence with our "not likely to adversely affect" determination, USACE will formally consult with USFWS for effects on California red-legged frog (Threatened) and with NMFS for effects on the South Central California Coast ESU steelhead (Threatened) and conference on designated critical habitat for the steelhead. Full compliance will be achieved once concurrence is received or formal consultation is concluded with issuance of biological opinions from USFWS and NMFS. Construction will not commence until the project is in full compliance with the ESA. Compliance will be maintained by implementing the mitigation measures in this GRR/EA and any terms and conditions in the biological opinions

Appendix E-2

Fish and Wildlife Coordination Act

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2017-CPA-0226

September 29, 2017

Thomas Kendall
Chief, Planning Branch
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, California 94103

Subject: Pajaro River Flood Risk Management General Reevaluation Study, Santa Cruz and Monterey Counties

Dear Mr. Kendall:

The U.S. Army Corps of Engineers (Corps) has requested that the U.S. Fish and Wildlife Service (Service) provide comments under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended, 16 U.S.C. 661 *et seq.*) for the Pajaro River Risk Management General Reevaluation Study (Study) in Santa Cruz and Monterey Counties. The Corps is in the process of completing the Study and has requested that the Service provide information specifying our preferred alternative(s). The proposed project is located along the Pajaro River, traversing the city of Watsonville and the town of Pajaro, in Santa Cruz and Monterey Counties.

The following supplementary information accompanied your request for comments. The purpose of the Study is to investigate and determine the extent of Federal interest in alternatives that would improve the flood risk management system to further reduce flood risk primarily to the city of Watsonville and town of Pajaro. This area has experienced multiple flooding events since the levee system was initially constructed. The primary study area includes a portion of Salsipuedes and Corralitos Creeks and the Pajaro River. Specifically, the alternatives are all located within the following reaches: Corralitos Creek just upstream of Airport Boulevard to the confluence with Salsipuedes Creek; Salsipuedes Creek from the confluence with Corralitos Creek downstream to the confluence with the Pajaro River; and, the Pajaro River downstream to Highway 1. You also provided summarized information regarding the range of focused alternatives that consists of four alternatives associated with the mainstem of the Pajaro River, and four alternatives associated with tributary improvements.

In accordance with and as stated in the FWCA, the Service provides the following comments in order to ensure that "wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation…" We also submit the following recommendations under the authority of the

Endangered Species Act of 1973, as amended (Act). The purpose of the Act is to protect and recover federally listed species and the ecosystems upon which they depend. Under section 7(a)1, Federal agencies shall utilize their authorities in furtherance of the purpose of the Act by carrying out programs for the conservation of endangered and threatened species.

Based on our review of information provided by the Corps, the Service believes that in regards to the proposed mainstem alternatives, Alternative 3 (Alternative 1 plus Optimized Channel Migration Zone (CMZ)) provides the most benefit to wildlife resources, specifically including the federally threatened California red-legged frog (*Rana draytonii*) and migratory birds, which are known to inhabit this area, and the federally endangered tidewater goby (*Eucyclogobius newberryi*), which may inhabit this area. As stated in the information you provided, the CMZs are designed to provide for cost savings on levee construction and operations and maintenance as well as to provide for a more self-sustaining channel. The Service believes that a reduction in operations and maintenance activities (habitat clearing, dredging, bench excavation, etc.) would reduce potential impacts to federally listed species while at the same time a more self-sustaining channel would provide an increase in natural habitat features, increasing the potential for the subject species to persist and thrive in this area. As such, the Service recommends that Alternative 3 be selected as the preferred mainstem alternative.

In regards to the proposed tributary alternatives, the Service believes that Alternatives 7 (Optimized CMZ with Corralitos Left-Bank Levee Alternative) and 8 (Optimized CMZ with Ring Levee or Relocations Along Corralitos Left-Bank Alternative) similarly provide the greatest benefits to wildlife resources, specifically including the California red-legged frog, tidewater goby, and migratory birds. As stated above, the Service believes that the CMZ aspect of these alternatives would result in a reduction in operations and maintenance activities, and therefore, a reduction in potential impacts to federally listed species. Additionally, a more self-sustaining channel would provide an increase in natural habitat features, increasing the potential for the subject species to persist and thrive in this area. As such, the Service recommends that Alternative 7 or 8 be selected as the preferred tributary alternative.

We appreciate the opportunity to provide our recommendations on the proposed project and are happy to provide further technical assistance at your request. If you have any questions, please contact Chad Mitcham of my staff at (805) 677-3328 or by electronic mail at Chad_Mitcham@fws.gov.

Sincerely,

Stephen P. Henry
Field Supervisor

Appendix E-3

National Historic Preservation Act

This Appendix has been moved to Appendix J

Appendix E

Farmland Protection Policy Act

- Farmland Conversion Impact Rating for Monterey County

- Farmland Conversion Impact Rating for Santa Cruz County

Calculations for Farmland Conversion Impact Rating AD-106							
Pajaro River Project							
Direct Conversion - Monterey County							
Soil Map Unit Symbol	Acres Measured	Acres Adjusted	Storie Index	Acres * SI	Acres of Prime Farmland	Acres of Farmland of Statewide Importance	Condition
AkD	0.2	0.2	43	8.6		0.2	
Mf	15.4	15.4	95	1463.0	12.4		3.0 acres not irrigated
MnA	17.3	17.3	100	1730.0	12.3		5.0 acres not irrigated
Pa	11.2	11.2	68	761.6	11.2		
SaA	7	7	100	700.0	7.0		
SbA	7.1	7.1	85	603.5	7.1		
Total		58.2		5266.7	50.0	0.2	
Weighted Ave.			90				
Rank			5.69				
Direct Conversion - Santa Cruz							
Soil Map Unit Symbol	Acres Measured	Acres Adjusted	Storie Index	Acres * SI	Acres of Prime Farmland	Acres of Farmland of Statewide Importance	Condition
104	35.60	35.60	72	2563.2	35.6		
120	9.00	9.00	95	855.0	0.0		9.0 acres not irrigated
123	1.90	1.90	57	108.3	1.9		
129	22.50	22.50	90	2025.0	22.5		
139	2.90	2.90		0.0		2.9	
162	1.20	1.20	62	74.4	1.2		
166	15.30	15.30	90	1377.0	15.3		
Total		88.40		7002.9	76.5	2.9	
Weighted Ave.			79				
Rank			10.06				
Without an irrigation system there is no Prime Farmland or Farmland of Statewide Importance.							

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 3/19/18	4. Sheet 1 of 2
1. Name of Project **Pajaro River**	5. Federal Agency Involved **U.S. Army Corps of Engineers**	
2. Type of Project **Flood Risk Management Project**	6. County and State **Monterey County, CA**	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 3/19/18	2. Person Completing Form Ken Oster
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐	4. Acres Irrigated 263835	Average Farm Size 1076
5. Major Crop(s) **Strawberries, grapes, lettuce**	6. Farmable Land in Government Jurisdiction Acres: 358294 % 16.9	7. Amount of Farmland As Defined in FPPA Acres: 401184 % 18.9
8. Name Of Land Evaluation System Used **Revised Storie Index CA**	9. Name of Local Site Assessment System **None**	10. Date Land Evaluation Returned by NRCS 3/23/18

PART III *(To be completed by Federal Agency)*	Maximum Points	Alternative Corridor For Segment ____ Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		58.2			
B. Total Acres To Be Converted Indirectly, Or To Receive Services		-			
C. Total Acres In Corridor		58.2			
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland		50.0			
B. Total Acres Statewide And Local Important Farmland		0.2			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0.013			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		5.69			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*		90			
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15	9			
2. Perimeter in Nonurban Use	10	6			
3. Percent Of Corridor Being Farmed	20	14			
4. Protection Provided By State And Local Government	20	10			
5. Size of Present Farm Unit Compared To Average	10	5			
6. Creation Of Nonfarmable Farmland	25	25			
7. Availablility Of Farm Support Services	5	2			
8. On-Farm Investments	20	10			
9. Effects Of Conversion On Farm Support Services	25	15			
10. Compatibility With Existing Agricultural Use	10	10			
TOTAL CORRIDOR ASSESSMENT POINTS	160	106	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	90	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	106	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	196	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
A	50	3/23/18	YES ☐ NO ☑

5. Reason For Selection:

Signature of Person Completing this Part: [signature] DATE 3/23/18

NOTE: Complete a form for each segment with more than one Alternate Corridor

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 3/19/18	4. Sheet 1 of 2
1. Name of Project **Pajaro River**	5. Federal Agency Involved **Ken Oster**	
2. Type of Project **Flood Risk Management Project**	6. County and State **Santa Cruz County, CA**	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 3/19/18	2. Person Completing Form **Ken Oster**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐	4. Acres Irrigated **22897**	Average Farm Size **150**
5. Major Crop(s) **Grapes, apples, strawberries**	6. Farmable Land in Government Jurisdiction Acres: **41094** % **14.4**	7. Amount of Farmland As Defined in FPPA Acres: **51638** % **18.1**
8. Name Of Land Evaluation System Used **Revised Storie Index for CA**	9. Name of Local Site Assessment System **None**	10. Date Land Evaluation Returned by NRCS **3/23/18**

PART III *(To be completed by Federal Agency)*	Maximum Points	Alternative Corridor For Segment ____ Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		88.4			
B. Total Acres To Be Converted Indirectly, Or To Receive Services		-			
C. Total Acres In Corridor		88.4			
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland		76.5			
B. Total Acres Statewide And Local Important Farmland		2.9			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0.15			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		10.06			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*		79			
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*					
1. Area in Nonurban Use	15	9			
2. Perimeter in Nonurban Use	10	6			
3. Percent Of Corridor Being Farmed	20	14			
4. Protection Provided By State And Local Government	20	10			
5. Size of Present Farm Unit Compared To Average	10	5			
6. Creation Of Nonfarmable Farmland	25	25			
7. Availablility Of Farm Support Services	5	2			
8. On-Farm Investments	20	10			
9. Effects Of Conversion On Farm Support Services	25	15			
10. Compatibility With Existing Agricultural Use	10	10			
TOTAL CORRIDOR ASSESSMENT POINTS	160	106	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	79	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	106	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	185	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
A	76.5	3/23/18	YES ☐ NO ☑

5. Reason For Selection:

Signature of Person Completing this Part: [signature] DATE 3/23/18

NOTE: Complete a form for each segment with more than one Alternate Corridor

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

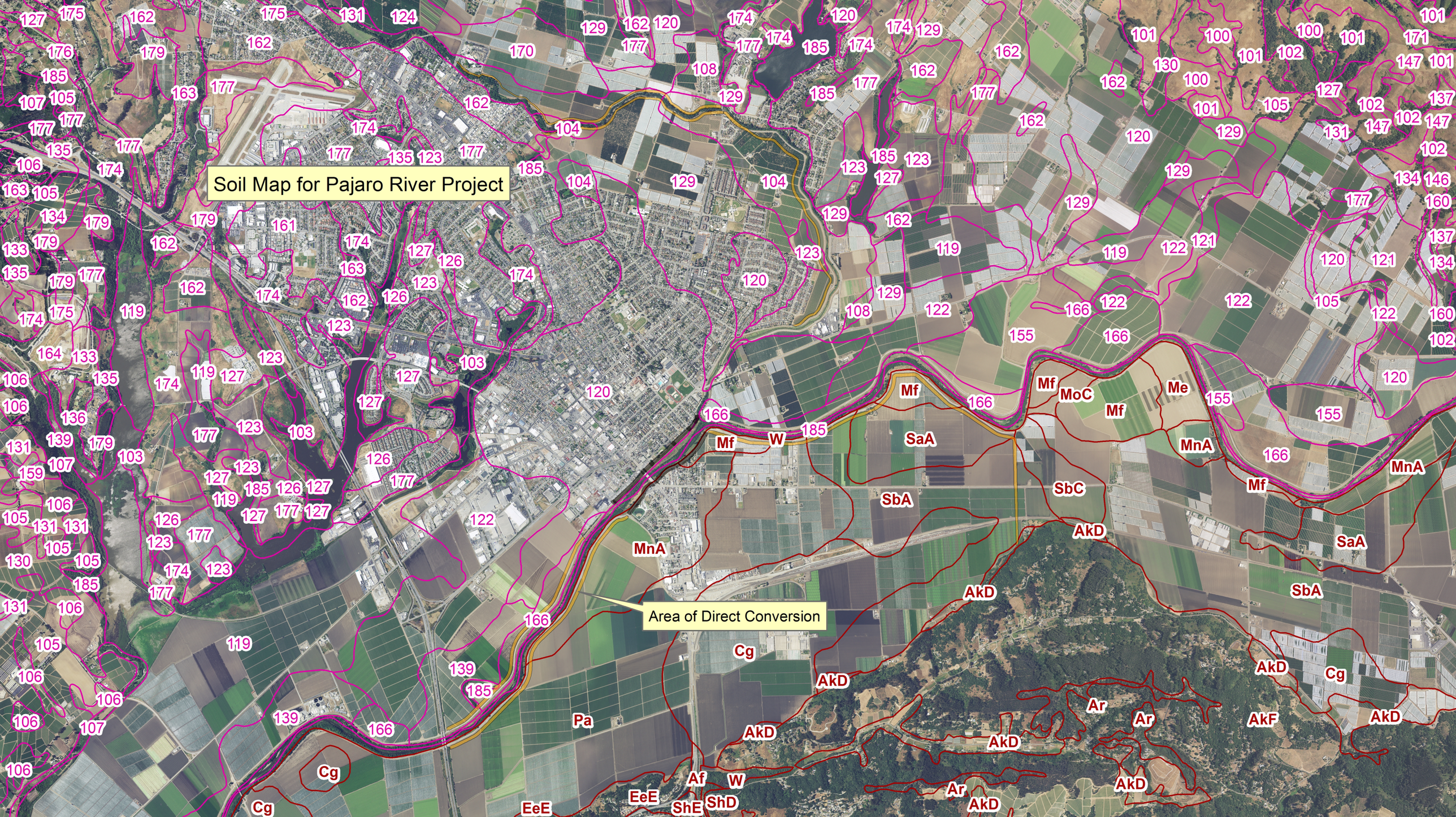
(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points


Soil Map for Pajaro River Project
Area of Direct Conversion
Mf
W
SaA
MnA
SbA
SbC
AkD
Cg
Pa
Af
EeE
ShE
ShD
Ar
AkF
MoC
Me

Appendix E-5

Clean Water Act

- Section 404(b)(1) Evaluation

APPENDIX E-5

SECTION 404(b)(1) WATER QUALITY EVALUATION

PAJARO RIVER FLOOD RISK MANAGEMENT PROJECT
INTEGRATED GENERAL EVALUATION AND ENVIRONMENTAL ASSESSMENT

MONTEREY AND SANTA CRUZ COUNTIES, CALIFORNIA

April 2018

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Section 404(b)(1) Clean Water Act Compliance Evaluation
Pajaro River Flood Risk Management Project

I. Introduction

This document constitutes the Statement of Findings, and review and compliance determination according to the Section 404(b)(1) guidelines for the proposed project described in the integrated General Reevaluation Report and Environmental Assessment (GRR/EA) issued by the San Francisco District. This analysis has been prepared in accordance with 40 CFR Part 230- Section 404(b)(1) guidelines and U.S. Army Corps of Engineers (USACE) Planning Guidance Notebook, Engineering Regulation (ER) 1105-2-100.

The Clean Water Act sets national goals and policies to eliminate the discharge of water pollutants into navigable waters. Any discharge of dredged or fill material into Waters of the United States by USACE requires a written evaluation that demonstrates that a proposed action complies with the guidelines published at 40 CFR Part 230. These guidelines, referred to as the Section 404(b)(1) Guidelines (Guidelines) are the substantive criteria used in evaluating discharges of dredged or fill material under Section 404 of the Clean Water Act.

Fundamental to the Guidelines is the precept that "dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated such a discharge will not have an unacceptable, adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern."

The procedures for documenting compliance with the Guidelines include the following:

- Examining practicable alternatives to the proposed discharge that might have fewer adverse environmental impacts, including not discharging into a Water of the United States or discharging into an alternative aquatic site.

- Evaluating the potential short-term and long-term effects, including cumulative effects, of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment.

- Identifying appropriate and practicable measures to mitigate the unavoidable, adverse environmental impacts of the proposed discharge.

- Making and documenting the Findings of Compliance required by §230.12 of the Guidelines.

This Clean Water Act, Section 404(b)(1) evaluation of compliance with the Guidelines is not intended to be a "stand alone" document; it relies heavily on information provided in the integrated GRR/EA to which it is attached.

II. Project Description

A final set of ten alternatives, including the No Action Alternative, were developed, evaluated, and documented in the GRR/EA. See Chapter 3 and Appendix A for the details of alternatives development. Chapter 4 documents the environmental review of the nine Action Alternatives, including the Recommended Plan (RP), which is the subject of this 404(b)(1) evaluation. Requirements for the alternative plan the U.S. Army Corps of Engineers (USACE) may recommend are prescribed in the Economic and Environmental Guidelines for Water and Related Land Resources Implementation Studies (Principles and Guidelines), dated March 10, 1983, and Engineer Regulation (ER) 1105-2-100. This includes incorporation of an Environmental Quality Account (EQ). For the Pajaro River FRM project, collaboration with state and Federal resource agencies and other stakeholders shaped development of the alternatives analyzed in the GRR/EA, including avoidance and minimization measures. As a result, the RP is considered the Least Environmentally Damaging Practicable Alternative (LEDPA) and is the alternative described in this evaluation.

a. Proposed Project

The Pajaro River Flood Risk Management Project (Pajaro Project) is a cooperative effort by USACE and non-Federal sponsors, the counties of Monterey and Santa Cruz. USACE completed an integrated GRR/EA, dated October 2017. The GRR/EA will be referenced throughout this 404(b)(1) analysis to describe the existing conditions near the project site, as well as some potential impacts of the proposed project. Detailed descriptions of the project features are included in Chapter 3, Chapter 4 (Section 4.1.6), Chapter 6, and in the Civil Design Appendix (Appendix B). The main features are summarized below.

The RP includes features along the Pajaro River in Reaches 2, 3, 4, and 5, and work along Salsipuedes Creek and Corralitos Creek in Reaches 5, 6, 7, and 8 (see **Figure 4**) Some existing levees would be improved, some existing levees would have a new floodwall incorporated on top (1.85 miles on Pajaro, 0.6 miles on the Salsipuedes/Corralitos), some new levees would be constructed (5.75 miles on the Pajaro Reaches, 4.1 miles on the Salsipuedes/Corralitos Reaches), of the new levees some will be setback levees (5.10 miles on Pajaro, 1.5 miles on Salsipuedes/Corralitos), and some existing levee demolition in areas where setback levees are being built (5.1 miles on Pajaro, 1.5 miles on Salsipuedes/Corralitos), and on Salsipuedes/Corralitos Creeks 1 mile of floodwall would be constructed. Two bridges would be raised that cross the tributaries. On the Pajaro River, erosion protection (riprap) would be placed on the waterside of existing levees that would be improved in place along 2.9 miles of the left bank and 2.6 miles of the right bank The erosion protection would cover about 80 percent of the waterside levee slope. Offset areas created by the new setback levees would establish a total of 77.3 acres of connected floodplain habitat (full floodplain would be 103.2 acres, but some is part of the required vegetation free zone). On the Pajaro River mainstem, this floodplain is activated at the 20% AEP (1/5 ACE). From the start to finish, water would be on the floodplain about 18 hours. For the Salsipuedes setback, floodplain activation starts at the 50% AEP (1/2 ACE). Water would be on the floodplain for about 23 hours. Scattered native trees and some

shrubs will be established in these floodplain offset areas to develop open woodland and savanna habitats.

The proposed project has the potential to discharge fill material into Waters of the United States under Section 404 of the Clean Water Act and could include the following proposed elements:

Levee Improvements - To correct levee geometry, suitable material would be placed along the both sides of the levee to provide minimum slope, required height and crest width to meet USACE levee design criteria. In areas that are constrained on the landside due to urban infrastructure, materials may be placed along the waterside. After construction, slopes would be hydro-seeded native grasses for erosion control. The additional area added to the landside or waterside toe would vary depending upon the width of the existing levee, and would be determined during PED if the project is approved and funded. Slope reshaping may require relocation of landside toe drains and ditches, which would be reestablished landward of the improved levee toe and would continue to function as they did before levee improvements were constructed. Levee slope reshaping could require removal of erosion protection such as rock revetment. Upon completion of reshaping, existing erosion protection would be replaced.

New Levees and Setback Levees - Construction of new levees would conform to USACE levee design criteria, with suitable material placed in 6 to 8 inch lifts, moistened and compacted to specification until the design elevation is reached. For any required erosion protection, quarry stone riprap would be applied to armor the levee's waterside slope of existing levees. Fill material would be obtained and delivered using haul trucks. A gravel road would be constructed on the crown of the new levees. After construction, levee slopes would be reseeded with native grasses to prevent erosion.

Floodwall – The floodwall would primarily be constructed from pre-fabricated materials, though it may be cast or constructed in place almost completely upright. Floodwalls installed on the top of the levee would require the levee be degraded about half way and the floodwall installed. The floodwall design methodology and construction would depend on the quality of the existing levee fill material and it may be necessary to demolish the levee in its totality and/or, at the very least it would require reinforcement of the existing soil before erection of the wall can move forward. The levee material would then be replaced (as described for new levees above), and the levee crown would grade away from the wall and be surfaced with aggregate base. For stand-alone flood walls the ground would be excavated. Once the floodwall is in place soil would be replaced. The height of the levee as a purely average height estimate would vary from 6.5’ in the upper reaches of the project to 9.5’ along the lower reaches feet as required by water surface elevations. Where a floodwall is constructed on top of a levee, the floodwall would be 2 to 4 feet tall. The height of stand-alone floodwall would vary from 4 to 7 feet.

Sliding Floodgate – Levee improvements in Reach 4 would leave a gap where the railroad line crosses the levees and river. This area will be protected by a flood gate as wide as the railroad tracks and as high as the adjacent levees. A sliding floodgate closure structure would be installed across the railroad tracks, in between a gap in the levee to prevent flood waters from

entering the tracks. The floodgate would close during high flows.

New Bridges - All of the mainstem Pajaro River bridges, including the Main Street, the railroad, Highway 1, and the Thurwachter-McGowan Bridge would remain predominantly in their present condition. In Reach 5 the bridge over Highway 129 would be raised. In reach 6, the bridge over Highway 152 would be raised. This may require some construction work in the channel.

Erosion Protection – Erosion protection would be placed on the waterside face of existing levees on the Pajaro River (about 2.9 miles on the left bank and 2.6 miles on the right bank) and cover about 80 percent of the slope. The diameter of the riprap stone would vary from 6 to 24 feet or larger and usually it is measured in tons. Approximately 10,000 to 12,000 tons of imported quarry stone with an average diameter of 12 feet is estimated to be needed for the RP Alternative. A sand filter would also be placed prior to the riprap layer to prevent gravel instability and decreased erosion protection performance.

b. Location

The Pajaro River watershed is located on the central coast of California about 75 miles south of San Francisco and includes portions of Santa Clara, San Benito, Santa Cruz, and Monterey Counties (**Figure 1**). The watershed, which is approximately 88 miles long and 30 miles wide, drains an area of approximately 1,300 square miles of the southern section of the California Coastal Ranges, emptying into the Pacific Ocean six river miles southwest of the City of Watsonville.

Figure 1. Regional Map of Study Area Setting

The project area is located within the lower Pajaro River watershed. It encompasses an area of approximately 10,000 acres, which includes the stream channels, active floodplains, and terraces along the Pajaro River and Salsipuedes Creek. The area is divided by the Pajaro River,

which serves as a border for the two counties. Santa Cruz County lies to the north of the Pajaro River, and Monterey County lies to the south. Salsipuedes and Corralitos Creeks, which join just north of the Pajaro River in Santa Cruz County, are tributaries of the Pajaro River.

The City of Watsonville, north of the Pajaro River, and the unincorporated town of Pajaro, south of the Pajaro River, are the two urban areas within the project area (**Figure 2**). The project area includes both widespread agricultural land devoted to high–value crops (e.g., strawberries, raspberries, and lettuce) and extensive residential, commercial, and industrial structures within the two urban areas.

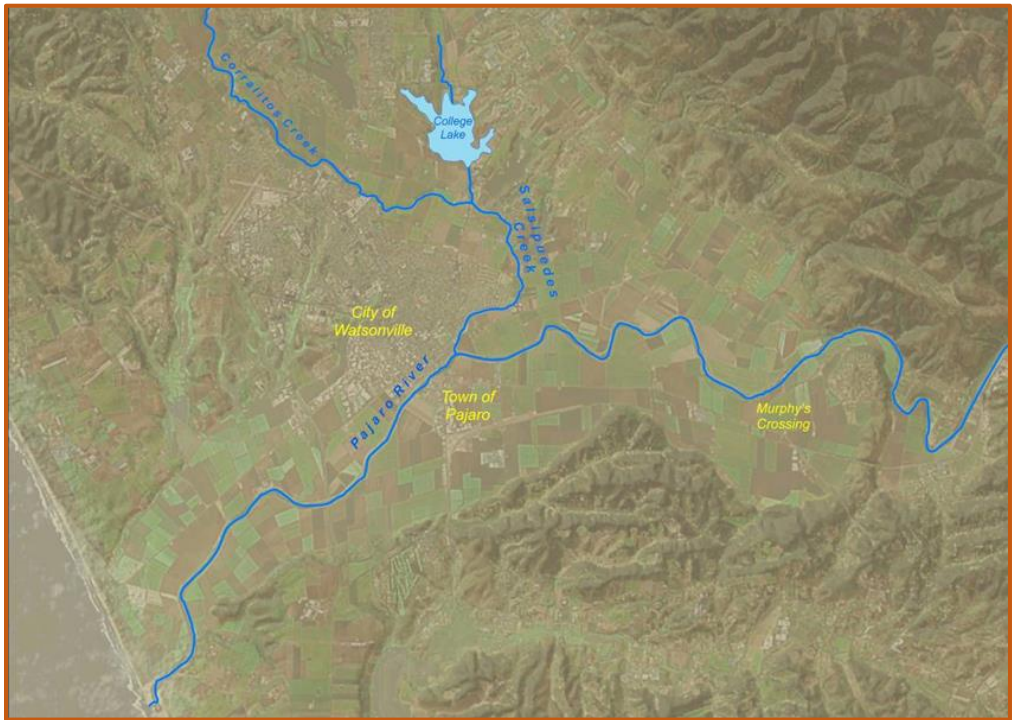

Figure 2. Study Area

The project area is divided into eight reaches based on land use practices, major confluences, and existing significant bridges (**Figure 3**):

- **Reach 1** is the most downstream reach of the Pajaro River mainstem, located between the Highway 1 Bridge and the Pacific Ocean. It is approximately 4.0 miles long. No work is planned in this reach under any of the action alternatives.
- **Reach 2** is the stretch of the main stem of the Pajaro River extending from the Highway 1 Bridge to the west side of Watsonville's city limits. It is approximately 1.5 miles long.
- **Reach 3** is the stretch of the main stem of the Pajaro River extending from the west side of Watsonville's city limits to the confluence with Salsipuedes Creek. It is approximately 0.9 mile long.
- **Reach 4** is the stretch of the main stem of the Pajaro River extending from the confluence with Salsipuedes Creek to Murphy's Crossing Road. It is approximately 5.0 miles long.

- **Reach 5** is the stretch of Salsipuedes Creek from its confluence with Pajaro River main stem to Highway 152. It is approximately 2.6 miles long.
- **Reach 6** is the stretch of Corralitos Creek from Highway 152 to Green Valley Road. It is approximately 1.8 miles long.
- **Reach 7** is the stretch of Salsipuedes Creek from Highway 152 upstream, below College Lake and including the ring levee at the Orchard Park subdivision. It is approximately 0.3 miles long
- **Reach 8** is the stretch of Corralitos Creek from Green Valley Road to Airport Road. It is approximately 0.3 miles long.

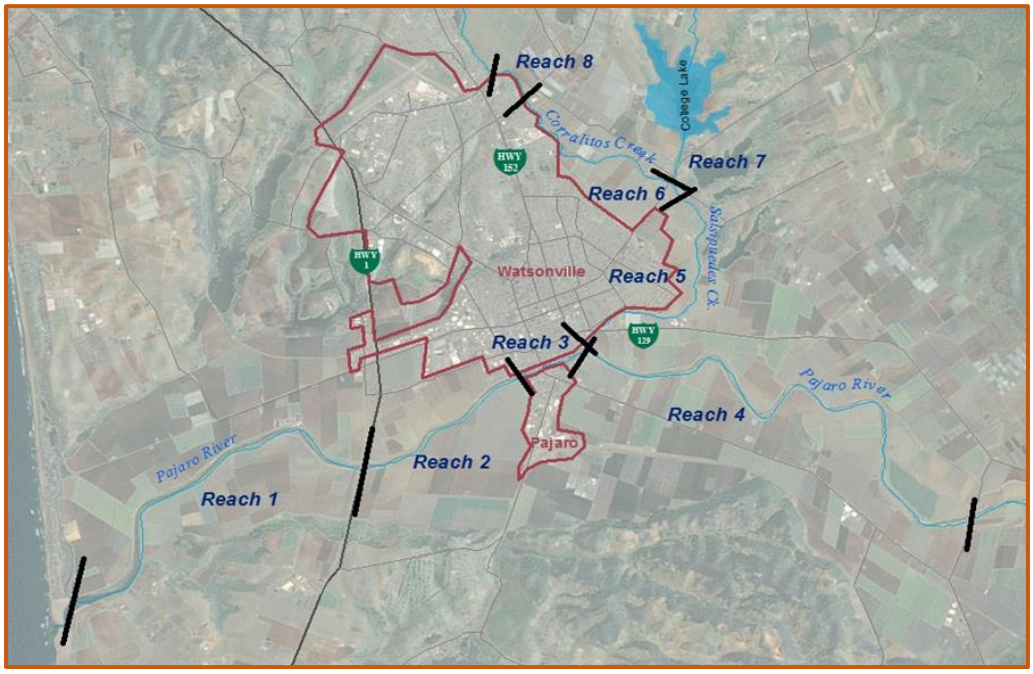

Figure 3. Study Reaches

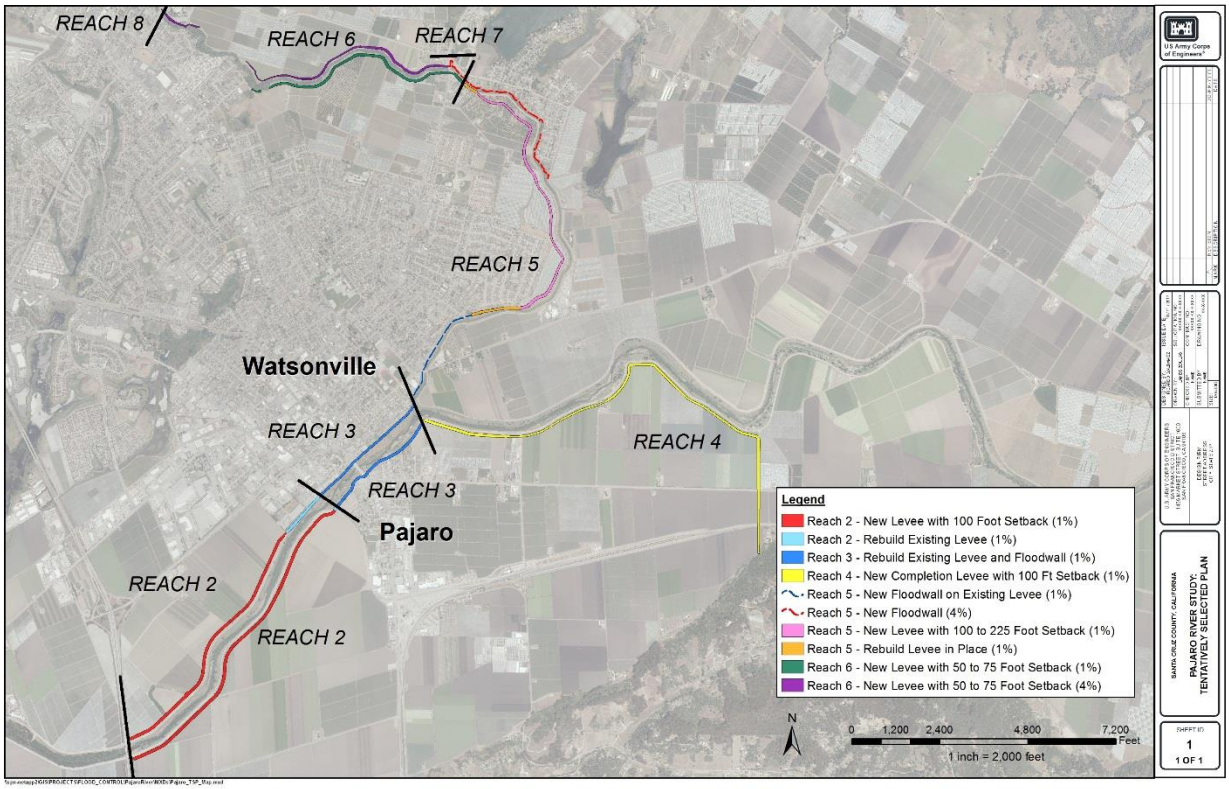

Figure 4: The Recommended Plan

c. Purpose and Need

The overall purpose of the project is to reduce flood risk to the City of Watsonville, the town of Pajaro, and surrounding agricultural lands. The project is needed to address the long history of flooding in the study area (see Chapter 2 of the main report). This flooding has resulted in substantial damages in the City of Watsonville, the town of Pajaro, and surrounding agricultural areas.

d. Authority

See Chapter 1 of the GRR/EA for a discussion of the authority for the Pajaro River Flood Control Project and the Pajaro River Flood Risk Management General Reevaluation Study.

e. Alternatives [40 CFR 230.10]

See Chapter 2 and Chapter 4 (Section 4.1.5) of the GRR/EA for a description of the No Action Alternative (also called the Future Without Project Condition). See Chapter 3 for a description of the nine Action Alternatives evaluated in detail in the GRR/EA. The RP is the focus of this 404(b)(1) evaluation.

f. General Description of Dredged or Fill Material

The following sections only pertain to project actions that have the potential to directly impact Waters of the United States (WOUS). For the proposed project, with the exception of toe drains and irrigation canals, fill would be placed below the ordinary high water (OHW) line in Pajaro River and Salsipuedes and Corralitos Creeks but would not be placed into water since construction would be accomplished during the dry season when and water in these waterbodies occupies a narrow low water channel away from the banks and levees.

(1) General Characteristics of Material

Fill into WOUS is required for the purpose of 1) reshaping levee slopes and repairing levee heights, 2) placing erosion protection (riprap) on existing levees to be improved in place, constructing a closure structures (flood gate) between two levee segments to keep high water off of existing railroad tracks, and 3) raising two existing bridges. Materials for levee slope and height repairs would be suitable soils acquired from within 25 miles of the project area. Fill materials for bank protection would consist of large stone riprap to armor the waterside slope. Construction of closure structures may require excavation of fines, and the placement of the concrete and sheet pile for the control structure. The substrate is mostly fine sand and silt. The proposed fill would come from on-site construction or imported fill material.

(2) Quantity of Material

Approximately 10,000 to 12,000 tons of rock would be placed on the waterside slope of existing levees along the Pajaro River for erosion protection. Not all of this would be below the OHW line. The quantity of material that would be added to the waterside slope of existing levees would be determined in PED during advanced engineering and design refinement. On sliding floodgate would be constructed in Reach 4. The amount of material for the two bridge raises that would be required to be placed below the OHW line would be determined during PED.

(3) Source of Material

Potential sources for borrow material include the existing levees and commercial facilities within 25 miles of the project area. Riprap required would be imported from a licensed, permitted facility that meets all Federal and State standards and requirements. Concrete material for the flood walls would be imported from a licensed, permitted facility or made by the on-site batch plant. The material would be transported along existing roadways and construction access roads.

g. <u>Description of the Proposed Discharge Site</u>

(1) Location

The location of the proposed discharge sites would be Reaches 2, 3, 4, and 5 along the Pajaro River and Reaches 5, 6, 7, and 8 along Salsipuedes and Corralitos Creeks. These reaches are in Santa Cruz and Monterey County, California.

(2) Size

Construction activities associated with the RP could result in the loss of WOUS. The project is located along the levees and waterways of Pajaro River and Salsipuedes and Corralitos Creeks. A jurisdictional wetland delineation was not carried out. For purposes of the planning phase of the study, any wetlands or waterbodies identified from aerial imagery and GIS were assumed to be jurisdictional under Section 404 of the Clean Water Act. A wetland delineation would be carried out during the design phase of the study.

(3) Type of Site

The type of disposal sites are waterside levee slopes along river and creeks, river bed, and toe drains and agricultural ditches.

(4) Type of Habitat

Habitat types recorded in the study area are further described in Section 4.17 of the GRR/EA. Just Perennial Drainages and Perennial to Intermittent Drainages are identified below.

Perennial Drainages

Pajaro River, Salsipuedes Creek, and Corralitos Creek are are the perennial drainages in the project area.

Perennial to Intermittent Drainages

Landside levee toe drains are present throughout the project area. Agricultural canals and ditches are present in agricultural lands outside urban areas. In the project area, most of these agricultural canals and ditches are located on both the right and left banks in Reaches 2 and 4, and on the left bank of Reaches 5, 6, 7, and 8. Levee toe drains and agricultural ditches may contain water seasonally or year-round.

(5) Timing and Duration of Discharge

Full project construction would occur over from eleven to twenty years, depending upon available funding and construction sequencing. Timing and construction would correspond to low water levels to minimize impacts to water quality.

h. <u>Description of Disposal Method</u>

Construction of the proposed project would be performed using typical construction equipment such as motor graders, backhoes, bulldozers, track and wheel loaders, dump trucks, and similar equipment. Construction would take place from heavy equipment on the top of the levee on from the landside of the levee. Construction could disturb riparian communities

established on the levee slope and within 15 feet of the levee toe. Construction of the two bridge raises and the railroad protection sliding floodgate could affect the aquatic environment and would require removal of vegetation on and adjacent to the levee (i.e., within 15 feet). The remainder of the materials would be hauled off-site and disposed of at a designated disposal site.

II. Factual Determinations

a. Physical Substrate Determinations (Sections 230.11 (a) and 230.20)

(1) Comparison of Existing Substrate and Fill

The description of the current substrate is found in Appendix B of the GRR/EA.

Fill material used to construct levee slope reshaping measures would come from commercial sources within a 25-mile radius of the project area and from existing on-site levee materials removed to make the proposed levee improvements. This material would be placed in waterside habitat and landside toe drains and ditches as a result of the adjustment to the levee slope. Riprap used for erosion protection would be placed on the waterside levee slope of existing levees, including placement below OHW.

(2) Changes to Disposal Area Elevation

The description of changes to the disposal sites within the proposed project area are describes in Appendix B of the GRR/EA. The RP would involve placement of permanent materials into Pajaro River and Salsipuedes and Corralitos Creeks in order to improve existing levees, place erosion protection, construct a sliding floodgate between two levee reaches to protect an existing railroad track, and to raise two bridges. Placement would be accomplished when waters in those channels are low and it is not anticipated that fill would be placed directly into water, but may be placed below the ordinary high water line. The RP would also include relocation of some landside toe drains and agricultural ditches and canals. Levee improvements could somewhat alter the in-channel geometry or characteristics, in that the waterside levee slope would be constructed to required levee geometry standards. This would not change the hydraulics of the system (see the Hydraulics Appendix of the GRR/EA).

(3) Migration of Fill

Levee improvements including levee height fixes, slope reshaping, sliding floodgate structure implementation, and bridge raises would require ground disturbing activities that would potentially cause erosion and soil disturbance, subsequently resulting in sediment transport and delivery to aquatic habitats. An increase in sedimentation and turbidity could occur in adjacent water bodies during earth moving activities and could be considered significant. These indirect effects would be reduced to less than significant with the implementation of BMPs discussed in the GRR/EA in Section 4.18, Water Quality. Fill materials being directly placed below the OHW line (but not into waters) and are not expected to migrate.

(4) Duration and Extent of Substrate Change

The RP would have localized impacts due to ground disturbing activities that would potentially cause erosion and soil disturbance, subsequently resulting in sediment transport and delivery to aquatic habitats within the entire study area during the construction period. However, these impacts are not expected to migrate outside of the study area and would not continue following the completion of construction.

(5) Changes to Environmental Quality and Value

There is not expected to be a permanent change to the environmental quality and value of the drainage ditches, as they will be relocated during construction and restored to their pre-project condition. There would be a permanent minor change to the environmental quality and value of the footprints of the sliding flood gate (less than 1 acre in Reach 4), as the existing materials would be replaced with concrete and stainless steel structures. There would be a permanent change to the environmental quality and value of the waterside areas adjacent to the levees where slope reshaping is required. Additional information regarding environmental quality and value with vegetation, wildlife, and aquatic resources is found in the GRR/EA, Sections 4.6 (Aquatic Resources), 4.14 (Vegetation and Wildlife), and 4.17 (Special Status Federal Species). Any excavated materials would be disposed at approved locations on land. The RP poses potential significant temporary impacts on environmental quality and value, and permanent effects on WOUS, but implementation of the mitigation would reduce the impacts to less than significant.

(6) Actions to Minimize Impacts

Construction would have minor, short-term impacts. Constructed features (levees, erosion protection, sliding floodgate) would permanently alter the affected waterways. BMPs, like use of silt fences to reduce unintended soil movement and turbidity, would be implemented to avoid impacts. Additional information on mitigation measures, including BMPs is in the GRR/EA Sections 4.6.3, 4.11.3, 4.14.3, 4.17.3, and 4.18.3.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Alteration of Current Patterns and Water Circulation

The operation of the sliding floodgate would reduce the landward extent of high water in Reach 4. Construction of setback levees and deconstruction of existing levees would reconnect 77.3 acres of floodplain with the Pajaro River, Salsipuedes Creek, and/or Corralitos Creeks.

(2) Interference with Water Level Fluctuation

The purpose of the project is to reduce flood risk to existing human-occupied areas of the floodplain. The water levees would remain about the same as currently except that at elevations that currently leave the channels would be more frequently contained within the leveed system

including on the reconnected floodplains.

(3) Salinity Gradients Alteration

Salinity gradients would not be affected.

(4) Effects on Water Quality

The description of the current water quality condition of surface waters in the project area is the GRR/EA Section 4.18.

(a) Water Chemistry

Project activities involving concrete and concrete wash water have the potential to affect pH, turbidity, and hexavalent chromium in receiving waters. Concrete wash water tends to have relatively high pH (between 10 and 14). Approved BMPs for managing concrete wash water include curing / air drying, off hauling for treatment, and active treatment onsite using carbon dioxide or a stronger acid such as sulfuric or acid.

Hexavalent chromium is present in Portland Cement Concrete (PCC) and PCC grindings. Active treatment systems (ATS) targeting pH and turbidity may not remove hexavalent chromium, unless they are augmented with ferrous sulfate or some other chemical agent to reduce hexavalent chromium to trivalent chromium.

Mitigation measures proposed for pH and turbidity would be development and implementation of an approved Stormwater Pollution Prevention Plan (SWPPP), including an ATS if needed to attain water quality objectives. To mitigate for hexavalent chromium risks, the ATS plan would include monitoring and treatment measures to attain no significant increase of hexavalent chromium in receiving waters.

(b) Salinity

The project would not change salinity levels.

(c) Clarity

Placement of fill materials would temporarily reduce clarity due to an increase in total suspended solids within the project area. Clarity is not expected to be substantially affected outside the immediate project area. However, the reduction of clarity caused by construction activities would be short in duration and would return to pre-construction levels upon project completion.

(d) Color

Placement of fill materials would temporarily induce a color change due to an increase in turbidity. However, conditions would return to pre-construction levels upon completion of the project.

(e) Odor

The project would not affect odor.

(f) Taste

The project would not affect taste.

(g) Dissolved Gas Levels

The proposed project would not have impacts on dissolved gas levels within the project vicinity.

(h) Temperature

Construction activities have the potential to create substantial turbidity, thus affecting water temperature. Proposed mitigation measures, specifically conducting work during low flow periods and installing sediment barriers to reduce sediment from entering waterways, would be required to control turbidity and the mobilization of pollutants that may be present in sediments. Removal of trees and shrubs that overhang the waterways could increase water temperature in the immediate vicinity.

(i) Nutrients

Release of suspended sediments from project activities could potentially cause turbidity thresholds to be exceeded. This could concurrently cause thresholds for metals and nutrients to be exceeded. Turbidity would be controlled outside the working area using a combination of BMPs, as appropriate. Development and implementation of an approved SWPPP would also prevent release of excess nutrients.

(j) Eutrophication

The project is not expected to contribute excess nutrients into the stream or promote excessive plant growth due to BMPs and design and operational refinements.

(5) Changes to Environmental Quality and Value

The RP could impact the water quality during construction from earth moving operations, storage and handling of construction materials on-site, and the operation and maintenance of construction equipment on-site. Construction and associated materials, including solvents, paints, waste materials, and fuels associated with operation and maintenance of construction equipment present on-site, could introduce hazardous or toxic materials and silt and debris into surrounding waters, resulting in degradation of the water quality. Although there is risk of substantial effects to water quality during project construction, these effects would be short-term and localized within the project area. Effective compliance with mitigation identified in the GRR/EA, Sections 4.11.3 and 4.18.3, containment plans, and CCRWQCB water quality thresholds is expected to lower risk of changes to environmental quality and value.

(6) Actions to Minimize Impacts

Construction and excavation would be timed with low water levels when possible to minimize impacts. The impacts to water quality due to construction activities would be minimized by compliance with thresholds of the Section 401 Water Quality Certification, issued by the Central Coast Regional Water Quality Control Board (CCRWQCB). In addition, the mitigation measures would reduce the potential impacts of the proposed project on water quality.

The contractor would be required to produce compliance plans and implement the proposed mitigation measures during project construction; therefore, impacts to the water quality from project construction are expected to be minimal.

c. Suspended Particulate/Turbidity Determinations

(1) Alteration of Suspended Particulate Type and Concentration

During construction, risk is present for increased levels of turbidity as soils are exposed during rain events. In addition, the excavation of material and placement of fill materials could result in releases of suspended sediments and increased turbidity into the water. Exposed material could be eroded by wave action or storm runoff. The use of BMPs such as utilizing erosion control devices (silt fencing) within the project area, and side slope stabilization of exposed fills, would minimize increases in suspended sediments or turbidity associated with the proposed project. Additional information on water quality is found in Section 4.18 the GRR/EA.

(2) Particulate Plumes Associated with Discharge

Earthwork would be performed during low flow periods to minimize particulate plumes. However, particulate plumes could occur from the placement of fill materials but are expected to be contained. Plumes would dissipate after construction activity is completed.

(3) Changes to Environmental Quality and Value

Particulate plumes resulting from any construction activity under the RP would not persist after project completion. Particulates suspended within the disposal area are not expected to differ in type from particulates currently within the project area.

(4) *Actions to Minimize Impacts*

Effects would be minimized by performing work during low water level periods when possible. A SWPPP would be prepared for project construction, which would describe and identify BMPs that would minimize impacts during on-site and off-site construction activities. As a result of contractor compliance with the CCRWQCB certification, consistent water quality monitoring, and mitigation measures listed in Section 4.18 of the GRR/EA, increases in sedimentation and turbidity are expected to be minimized and temporary. Potential BMPs that could be implemented during project construction are listed in the Water Quality Section (Section 4.18.3) of the GRR/EA. These BMPs will be coordinated with the CCRWQCB during the design phase of the project and could be adjusted based on the Water Quality Certification process under Section 401 of the Clean Water Act.

d. Contaminant Determinations

Construction activities for the RP would involve the use of hazardous materials such as fuels and lubricants to operate construction equipment, and vehicles such as excavators, compactors, haul trucks, and loaders. Reconnecting floodplains to the main channels could result in release of contaminants including pesticides, fertilizers, organic litter, and debris containing hazardous substances. In addition, contaminated material could be exposed during any excavation associated with construction of the sliding floodgate or the bridge raises. Implementation of the BMPs listed in the GRR/EA, Section 4.11.3 and 4.18.3 Section 5.5) would ensure that there would be minimal impacts to aquatic resources from contaminants.

e. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton

Plankton are drifting organisms that inhabit the pelagic zone of oceans, seas, or bodies of fresh water. Construction of the project would be temporary and short-term, and would include temporary displacement due to in-water construction and decreased plankton density due to increased turbidity. With implementation of mitigation measures and BMPs in the GRR/EA, Sections 4.11.3 and 4.18, the effects would be temporary and less than significant.

(2) Effects on Benthos

Benthic organisms are found in the benthic zone, which is the ecological region at the lowest level of a body of water, such as an ocean or lake, including the sediment surface and some sub-surface layers. Native benthic species could be affected by the excavation required to construct the sliding floodgate and the bridge raises.

(3) Effects on Nekton

Nekton are actively swimming aquatic organisms that range in size and complexity from plankton to marine mammals. Descriptions of aquatic resources are found in the GRR/EA, Sections 4.6 (Aquatic Resources) and Section 4.16 (Special Status Federal Species).

Project construction may disturb soils and the nearshore environment, leading to increases in sediment in the nearshore aquatic habitat. This in turn may increase sedimentation (i.e., deposition of sediment on the substrate), suspended sediments, and turbidity. Increases in suspended solids and turbidity will generally be short-term in nature and not result in a substantial reduction in population abundance, movement, and distribution.

(4) Effects on Aquatic Food Web

The environmental effects of implementing the RP are described in Chapter 4 of the GRR/EA.

The RP levee improvements could cause vibrations from construction equipment that could disturb native resident fish by increasing noise, water turbulence, and turbidity, causing them to move away from the area of placement. For some pelagic native juvenile species utilizing the near shore habitat for cover, moving away from cover could put them at increased risk of predation. This effect is not anticipated because construction would occur during the dry season when the creeks and river waters retreat to a narrow low flow channel away from the levees. Implementation of BMPs and other mitigation measures proposed would result in minimal impacts on fish and aquatic wildlife habitat outside the immediate work area

(5) Effects on Special Aquatic Sites

(a) Sanctuaries and Refuges

No sanctuaries and refuges are within the project area.

(b) Wetlands

Seasonal and permanent wetlands likely occur along portions of the waterways that would be affected by the project. During the next project phase, a qualified biologist would identify and evaluate all wetlands potentially affected by the project.

(c) Mud Flats

No mud flats are within the project area.

(d) Vegetated Shallows

No vegetated shallows are within the project area.

(e) Coral Reefs

No coral reefs are within the project area.

(f) Riffle and Pool Complexes

No riffle and pool complexes are within the project area.

(6) Threatened and Endangered Species

The effects of implementing the RP on Federally listed species and designated critical habitat are described in the GRR/EA, Section 4.14 and Appendix E-1. Listed species with the potential to occur in the project area are California red-legged frog (CRLF) and the South-Central Coast Steelhead Distinct Population Segment (DPS). Designated critical habitat for the steelhead also occurs in the project area. Consultation with NMFS and USFWS is in progress.

Direct and indirect effects could occur to steelhead however suitable habitat for CRLF is absent from the project area. Steelhead could be adversely affected by the permanent removal of trees and shrubs from the levee and within 15 of the levees and by placement of permanent riprap along levee slopes. Steelhead may be positively affect by reconnection of portions of the floodplain with the Pajaro River and Salsipuedes and Corralitos Creeks.

(7) Other Wildlife

Constructing the RP would have short-term and long-term effects on resident mammals, birds, reptiles, and amphibians. Noise from construction equipment and increased human presence could temporarily displace some wildlife, and temporary alteration of riparian and aquatic habitat would occur. Removal of trees and shrubs could eliminate habitat and interrupt movement corridors. Setting back levees and reconnecting floodplains to the main river and creek channels together with natural regeneration of native plant species would provide additional high quality wildlife habitat.

To ensure that there would be no effect to migratory birds, preconstruction surveys would be conducted, if needed, in and around the project area. If any migratory birds are found, a protective buffer would be delineated, and USFWS and California Department of Fish and Wildlife (CDFW) would be consulted for further actions.

(8) Actions to Minimize Impacts

Many mitigation measures to avoid and minimize impacts to the aquatic environment are proposed. Mitigation measures are listed in Sections 4.6.3, 4.11.3, 4.14.3, 1.7.3, and 4.18.3 of the GRR/EA.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Size Determination

Not applicable.

(2) Determination of Compliance with Applicable Water Quality Standards

The fill material would not violate Environmental Protection Agency or State water quality standards, or violate the primary drinking water standards of the Safe Drinking Water Act (42 USC 300f - 300j). Project design, compliance with State water quality thresholds, and standard construction and erosion practices would preclude the introduction of substances into surrounding waters. The proposed project would not affect existing or potential water supplies.

(3) Potential Effects on Human Use Characteristics

a) Municipal and Private Water Supplies

The fill material would not violate Environmental Protection Agency or State water quality standards or violate the primary drinking water standards of the Safe Drinking Water Act (42 USC 300f – 300j).

Project design, compliance with State water quality thresholds, and standard construction and erosion practices would preclude the introduction of substances into surrounding waters. Materials removed for disposal off-site would be disposed of in an appropriate landfill or other upland area.

b) Recreation and Commercial Fisheries

The study area is lightly used for recreational fishing. A description of fish in the project area is provided in the GRR/EA, Section 4.6. Temporary disruption of recreational fishing would occur during construction when the levee crown and adjacent construction and staging areas are closed to public access. However, this effect is temporary and there are alternative locations for this type of recreation would be available in areas not under construction in a given year.

c) Water-related recreation

In addition to recreational fishing, the study area is used for walking, bicycling, and some small boating. Project construction would temporarily disrupt recreational boating and personal watercraft use in the location where construction is occurring in a given year. Implementation of the avoidance, minimization, and other mitigation measures would reduce impacts to less than significant (see GRR/EA, Section 4.12.3).

d) Aesthetics

Construction would temporarily introduce considerable heavy equipment and associated vehicles, including dozers, graders, cranes, scrapers, and trucks into the views of adjacent residents, recreationists, motorists, and businesses. The equipment would be visible throughout the construction season. Presence of the equipment would temporarily degrade the visual quality of the study area. The construction impacts on aesthetics would be temporary, and would primarily affect local residents or recreationists in the immediate vicinity.

Construction has the potential to substantially degrade the existing visual character or quality of the levee reaches and surroundings for viewer groups for two other reasons: 1) a new levee embankment or flood structure (e.g., flood wall, adjacent levee raise, setback levee) would be present, and 2) construction would require the removal of all vegetation the levee surfaces where improvements are to be made and all woody vegetation from the all levee surfaces and fifteen feet water-ward of the levee toe and ten to twenty feet landward of the levee toe. This would degrade the visual character of the area and obstruct views.

e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves.

Not applicable.

g. Effects on the Aquatic Ecosystem

Effects of the proposed action include reductions in riparian habitat that is used by aquatic and terrestrial species and changes in the character of portions of the aquatic habitat, primarily by placement of riprap along the waterside of the levees. Setback levees along portions of the Pajaro River and Salsipuedes and Corralitos Creeks would permanently reconnect floodplain to the main channels would add a habitat element not currently included in the system.

h. Secondary Effects on the Aquatic Ecosystem

The RP would require removal of all trees and shrubs from the levee crown and slopes, and from within fifteen feet waterside of the levee toe and from within twenty feet of the landside levee toe. Vegetation would be removed in order to construct the levee improvements and to establish a Vegetation ETL-compliant no vegetation zone and landside operations, maintenance, and emergency access corridor. At the end of each construction season, disturbed area would be seeded with native herbaceous plants.

Risk exists for the unintentional placement of fill material outside of the proposed project area. Unintentional placement could result in additional adverse impacts to water quality, aquatic and other wildlife habitat, recreation, aesthetics, and air quality. To reduce the risk of

such impacts, contract specifications would require the contractor to mark the project boundaries, and that the contractor install erosion control (i.e. silt fencing, silt curtains) where possible within any standing waters. Implementing the mitigation measures identified in the GRR/EA for Aquatic Resources (Section 4.6.3), Public Health and Environmental Hazards (Section 4.11.3) vegetation and wildlife (Section 4.17.3), and water quality (Section 4.18.3) would void and minimize potential adverse effects.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

(1) No significant adaptations of the guidelines were made relative to this evaluation.

(2) No practicable alternative exists which meets the study objectives that does not involve discharge of fill into Waters of the United States.

(3) The discharges of fill materials would not cause or contribute to, after consideration of disposal site dilution and dispersion, violation of any applicable State water quality standards for waters. The discharge operations would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

(4) The placement of fill materials would not result in significant adverse effects on human health and welfare, including municipal and private water supplies; recreational and commercial fishing; fish, shellfish, and wildlife populations and habitat, and special aquatic sites. The life stages of aquatic species and other wildlife would not be adversely affected in the Pajaro River system. Temporary inhibition of life stages would occur within a localized project area. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values would not occur.

(5) The placement of fill materials in the project area(s) would not jeopardize the continued existence of any species listed as endangered or threatened, or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973.

(6) Appropriate steps to minimize potential adverse effects of the discharge on aquatic systems would be implemented.

(7) On the basis of the guidelines, the proposed disposal site for the discharge of dredged material is specified as complying with the requirements of the guidelines with the inclusion of appropriate and practicable conditions to minimize pollution or adverse effects to the aquatic ecosystem.

The RP has been identified as the Least Environmentally Damaging Practicable Alternative, because it is the alternative that avoids and minimizes effects on waters of the U.S. to the extent practicable and consistent with the project purpose and applicable laws and regulations.

Appendix E-6

Phase I Site Assessment

This document has been removed because it contains Personally Identifiable Information (PII). It is available upon request.