US Army Corps of Engineers®

Appendix A

Environmental Appendix

Watsonville Slough Ecosystem Restoration Project
San Francisco District

Continuing Authorities Program (CAP), Section 1135

Environmental Appendix A-1

Watsonville Slough Ecosystem Restoration Project

Continuing Authorities Program Section 1135

Records of Interagency Coordination

US Army Corps of Engineers ®
San Francisco District

Pajaro Storm Drain Maintenance District
Within Santa Cruz County

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
450 GOLDEN GATE AVE.
SAN FRANCISCO, CA 94102

February 2, 2022

SUBJECT: Cooperating and Participating Agency Invitation for the Watsonville Slough Ecosystem Restoration Feasibility Study, Santa Cruz County, California

Dear colleagues,

The U.S. Army Corps of Engineers, San Francisco District (USACE), in partnership with the non-federal sponsor, the Pajaro Storm Drain Maintenance District (PSDMD), has initiated the Watsonville Slough Ecosystem Restoration Feasibility Study. The study is being conducted under the authority of Section 1135 of the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662). Section 1135 studies are part of the larger Continuing Authorities Program (CAP) that allow USACE to plan, design, and restore degraded ecosystems through modification of USACE structures, operations, or implementation of measures in affected areas. The study will develop and evaluate alternatives for restoring degraded habitat along Watsonville Slough, Santa Cruz County, California.

Pursuant to Section 102 of the National Environmental Policy Act (NEPA) as implemented by the regulations promulgated by the Council on Environmental Quality (40 CFR Parts 1500-1508), USACE Engineering Regulation 200-2-2, and California Code of Regulations Title 14 Division 6 Chapter 3, it is expected that NEPA Environmental Assessment (EA) and California Environmental Quality Act (CEQA) Initial Study will be prepared to describe the affected environment, alternatives, and analyze the potential associated effects. The NEPA document will be integrated with the USACE Feasibility Report for the study. The PSDMD will be the lead for CEQA compliance.

The study area is the Watsonville Slough and adjacent lands located near the mouth of the Pajaro River, Santa Cruz County, California, where the Pajaro River discharges into the Pacific Ocean. The study area on the inland side is surrounded by farmland and on the seaward side it borders residential development.

The purpose of the study is to determine if there is a technically feasible, economically justified, and environmentally acceptable recommendation to restore degraded habitat along Watsonville Slough with consideration of sea level rise over time. Since the 1930s, the majority of Watsonville Slough and its tributaries have been affected by activities such as agriculture, residential land use, and federal levees along the Pajaro River. Furthermore, existing structures such as undersized bridges and culverts have contributed to poor hydrologic connectivity. These factors combined have reduced the historical footprint of the slough and degraded the remaining tidal marsh habitat in the study area.

CESPN-PM-PME
SUBJECT: Cooperating and Participating Agency Invitation for the Watsonville Slough Ecosystem Restoration Feasibility Study, Santa Cruz County, California

Project partners are currently in the early stages of alternatives development. Alternatives will consist of one or more measures and both structural and non-structural measures will be considered. Structural measures under consideration may include raising Beach and Shell Roads, modifying operation of or removing existing flap gates and/or the pump station, increasing the size of the floodplain, floodproofing lower elements, removal of invasive vegetation, and/or planting native marsh vegetation. Non-structural measures may include enhancement of flood warning systems, relocation of structures out of the floodplain, promotion of flood insurance, and/or development of a floodplain management plan.

The next steps in this CAP 1135 feasibility study are further development of alternatives and identification of the Tentatively Selected Plan, followed by the development and public release of the integrated feasibility report and environmental document.

We invite you to participate in the environmental review process as either a participating agency (for non-federal entities) or cooperating agency (for federal entities) under NEPA for this project, per requirements of 40 CFR Part 1501.8. In addition, our office would like to solicit your input with respect to issues to be considered in the study area by the proposed project. We ask that you respond in writing to confirm or reject your participation as a cooperating or participating agency by March 15, 2022. Consistent with 40 CFR Part 1501.8 and Section 1005 of the Water Resources Reform and Development Act of 2014, we will assume your agency to be a cooperating or participating agency if no response is received. Please note, new information and comments will be accepted throughout the study process. As the study progresses, additional information may be found on the project website: https://www.spn.usace.army.mil/Missions/Projects-and-Programs/Projects-A-Z/Watsonville-Slough-Ecosystem-Restoration-CAP-Section-1135/

Please contact Fari Tabatabai at fari.tabatabai@usace.army.mil with comments, questions, or for further information.

Sincerely,

BEAGLE.JULIE.RUBEN.1598717792 Digitally signed by BEAGLE.JULIE.RUBEN.1598717792 Date: 2022.02.02 11:33:19 -08'00'

Julie R. Beagle
Chief, Environmental Planning Section
San Francisco District
US Army Corps of Engineers

Watsonville Slough CAP 1135 Cooperating/Participating Agency Invitation

Tabatabai, Farinaz (Fari) CIV USARMY CESPN (USA)

Reply | Reply All | Forward

To

Cc Flannery, Joel R CIV USARMY CESPN (USA); Gerrity, Brian F CIV USARMY CESPN (USA); Tabatabai, Farinaz (Fari) CIV USARMY CESPN (USA); Mark Strudley; Antonella Gentile

Mon 2/7/2022 4:02 PM

Bcc Jeffrey.Jahn@noaa.gov; jeffrey.jahn@noaa.gov; yvette.redler-medina@noaa.gov; prijatel.jean@epa.gov; torres.tomas@epa.gov; Truitt.robin@epa.gov; steve_henry@fws.gov; Leilani_takano@fws.gov; chad_mitcham@fws.gov; Aarn.aarrenberg@wildlife.ca.gov; matthew.t.keeling@waterboards.ca.gov; diane.kukol@waterboards.ca.gov; kim.sanders@waterboards.ca.gov; eric.gillies@slc.ca.gov; Julie.pettijohn@dtsc.ca.gov; citymanager@cityofwatsonville.org; llurie@rcdsantacruz.org; lockwood@pvwater.org; info@pajarowatershed.org; donrosa@pajarosunnymesa.com; reg3assistant@wildlife.ca.gov; reg4assistant@wildlife.ca.gov; nahc@nahc.ca.gov; calshpo@parks.ca.gov; publicinfo@parks.ca.gov; secretary@resources.ca.gov; Nicholas.lavoie@slc.ca.gov; info@waterboards.ca.gov; monique@elkhornslough.org; Paia.levine@santacruzcounty.us;

Follow up. Start by Wednesday, June 29, 2022. Due by Wednesday, June 29, 2022.

Watsonville Participating Agency Ltr_Final2_Feb2_signed.pdf
135 KB

Dear Colleagues,

The U.S. Army Corps of Engineers, San Francisco District (USACE), in partnership with the non-federal sponsor, the Pajaro Storm Drain Maintenance District (PSDMD), initiated a study to evaluate ecosystem restoration opportunities in the Watsonville Slough region, Santa Cruz County, California. Attached please find an invitation to be a cooperating (federal agencies)/participating agency (state, local, regional and tribes) under the National Environmental Policy Act for the Watsonville Slough CAP 1135 study. We look forward to working with your agency on this study and ask that you provide us with the name and contact information for your agency staff member assigned to this project. Please feel free to contact Fari Tabatabai with any questions.

V/R

Fari Tabatabai, D.Env.
Environmental Manager
Regional Continuing Authorities Program (CAP)
U.S. Army Corps of Engineers, San Francisco District
415-503-6849
Fari.Tabatabai@usace.army.mil

From:	Tabatabai, Farinaz (Fari) CIV USARMY CESPN (USA)
To:	You, Jamie K CIV (USA)
Subject:	FW: Watsonville Slough CAP 1135 - FWCA
Date:	Monday, February 13, 2023 4:10:00 PM

Jamie,
This is important. Summary of my conversation and conclusions on Watsonville FWCA.

From: Tabatabai, Farinaz (Fari) CIV USARMY CESPN (USA)
Sent: Thursday, January 27, 2022 2:46 PM
To: Mitcham, Chad J <chad_mitcham@fws.gov>
Subject: Watsonville Slough CAP 1135 - FWCA

Hi Chad,

Thank you for the discussions this afternoon and to summarize:

- Based on your supervisor Leilani Takano's message your office cannot meet the timeline of May 2022 for a full blown FWCA process.
- As you have been and will be intimately involved with development and screening of measures and alternatives and ecosystem model development, we discussed and agreed to following the same process as the Pajaro Flood Risk Management Study GI study took. That is, based on your continued involvement and input you would conclude the FWCA process for this study by providing us a letter (similar to Pajaro) whereby you identify a recommended plan under FWCA including any associated conservation measures (if any) for this study's compliance with FWCA.

Regards,
Fari

Fari Tabatabai, D.Env.
Environmental Manager
Regional Continuing Authorities Program (CAP) Production Center
U.S. Army Corps of Engineers, San Francisco District
415-503-6849
Fari.Tabatabai@usace.army.mil

25, July 2022

Watsonville Slough Interagency Meeting

Meeting Purpose:

To provide a timely overview and gain input on the study's plan formulation and ecosystem restoration benefit modeling strategies.

Presenters:

Joél Flannery	Project Manager/Lead Planner
Mark Strudley	PSDMD Program Manager
Elizabeth Murray	Wetland Biologist, ERDC
Stephanie Bergman	Cultural Resources
Fari Tabatabai	Environmental Planner
Tiffany Cheng	Coastal Engineer/Technical Lead

Attendees:

Antonella Gentile	PSDMD Resource Planner
Brandon George	Geographer at USACE
Brian Lockwood	General Manager / Hydrogeologist, Pajaro Valley Water Management
Casey Meusel	Water Resources Technician/Associate Hydrologist, Pajaro Valley Water Management
Chad J Mitcham	USFWS biologist, Pajaro Valley Water Management
Dane Behrens	ESA Consultant
Gary Kittleson	Local biologist, Kittleson Environmental Consulting
Holly Wyre	Sr. Environmental Scientist, California Coastal Commission
Hugo Hoffman	EPA Region 9, Environmental Engineer, NEPA Cooperating Agency POC
Johnathan Pilch	Local conservation non-profit agency supporting project planning, Watsonville Wetlands Watch
Juliette Robinson	Planning/Biologist, County of Santa Clara
Mark Strudley	PSDMD Program Manager
Matt Johnston	Principal Planner for Code Compliance, County of Santa Clara
Michael Mcguirt	Section 106 Supervisor, Office of Historic Preservation
Rusty Barker	PSDMD Civil Engineer
Serena Stumpf	Environmental Scientist with CDFW, Permitting

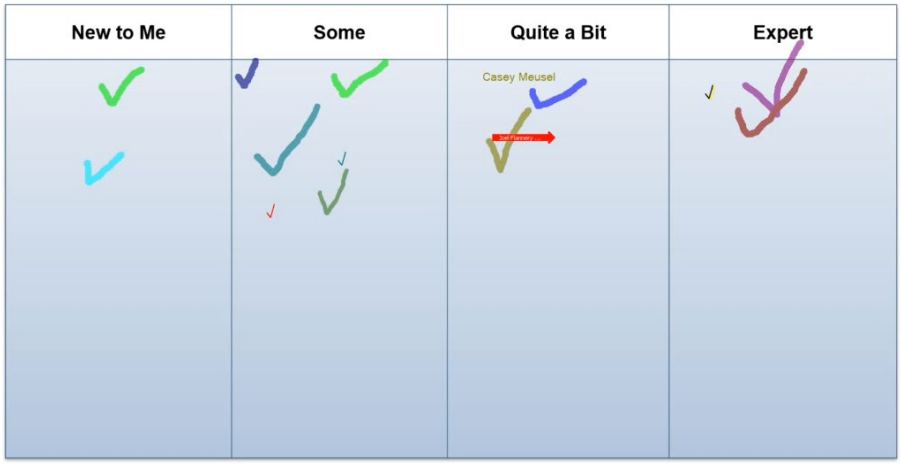
Agenda:

2:00	Welcome, Introductions, Ground Rules – 10 mins (Flannery & Tabatabai)
2:10	Study Authority – 5 mins (Flannery)
2:15	Project Overview -- 10 mins (Flannery & Strudley)
2:25	Planning Strategy & Formulation – 20 mins (Flannery)
2:45	Watsonville Slough Benefit Model - 25 mins (Murray)
3:10	Environmental Planning – 10 mins (Tabatabai)
3:20	Tribal and Cultural Resources – 5 mins (Bergman)
3:25	Schedule/Next Steps – 5 mins (Flannery)
3:30	Questions/Comments – 30 mins (All)
4:00	Adjourn

Presentation: See Attachment

Welcome, Introductions, Ground Rules, Meeting Purpose & Agenda–10 mins (Flannery & Tabatabai)

1. Knowledge of Watsonville Slough:



DURING AND FOLLOWING THE PRESENTATION, FOLLOWING COMMENTS AND QUESTIONS WERE RAISED:

2. What are your:
    - ***a. Concerns***
        i. Chad Mitcham (USFWS): Of greatest need in this area is to reclaim ag land into floodplain. In terms of outreach to ag landowners, in my opinion this should highest priority and be done by individuals that are experienced in this arena, like Moss Landing Marine Lab (MLML) and are knowledgeable on needs of

landowners and incentives that they could receive (e.g., improved water quality benefits). Individuals reaching out to landowners should be those with vested interest in floodplain improvements.

1. Mark Strudely: This study/project is a stepping stone towards the broad need of watershed and sea-level rises. Not specific scope of this project at this point in time in relationship with agriculture partners in the area that are not ready to give up lands, however, this can become a factor as the years to come

ii. Brian Lockwood (PV Water): Concerns that use the water for critical supply of over-drafted wells that are used upstream. The saltwater and brackish infiltration upstream is concerning. Harkins Slough and Watsonville Slough and intending to open Struve Slough to gain more freshwater. This project, (Harkins Slough Facility and Watsonville/Struve Diversion Project) has become more of a retreat project from the spread of brackish water into the Watsonville Slough than the intended recharge basins.

b. Ideas/Suggestions

i. Hugo Huffman (EPA): Suggest using EPA's EJ Screen and other sites such as Cal Enviro Screen EJ Tool to understand and identify EJ communities in the area

1. USACE confirmed knowledge and use of these tools.

c. Considerations/Special Areas of Interest

i. Hugo Huffman (EPA) – Prioritize EJ outreach to communities in advance. The EJ screening tool lists area of linguistically isolated individuals (Spanish, assumption) Encourage special effort for translating materials for community.

1. Fari Tabatabai: We have done preliminary research to identify EJ communities using EPA EJ screen and CDC Social Vulnerability Tool. and will be providing resources in languages of local population.
2. Mark Strudely: Very aware and considerate of impact and history of funding and project implementation across the broad distribution of vulnerable communities, especially Pajaro, this is a recreation area and a calculous for engagement.

ii. Hugo Huffman (EPA)- Unsure whether any soil sampling is underway/completed/available or whether there will be soil relocated as part of this project? What is the potential mobilization of contaminants in the soils that can be increased with new water flow and soil excavations?

1. Mark Strudley: expect that soil sampling will be processed in the lagoon areas, soil sampling will likely be implemented moving forward.
2. Joél Flannery: Defer to after feasibility, 25-35% design and measuring risk will be conducted in later phase of risk register. When we do soil testing will depend on how much this will inflate cost during feasibility and could be done past feasibility.
3. Brian Lockwood (PV Water): Soil sampling has been done in 2005 (unknown sampling sites, to follow-up). Casey can help find what is of interest to USACE. Testing was done for assessment of Recycle Water Supply effects on soil.

iii. Johnathan Pilch (Watsonville Wetlands Watch) – Wants to address low income community engagement concerning coastal and beach access. Parking at Beach Rd and access is used by low-income communities to access recreational. This may be impacting the community short-term and long-term parking consideration. There is high-income rental homes in the area, but the low-income community without state parks pass use Beach Rd to gain access to recreation areas and you'd want to preserve this. Consider negative impact coastal access.

iv. Holly Wyer (CCC): Look at how other alternatives will work along with sea-level rise and how much will transition to mudflat and the evolution of more severe flooding and habitat transition?

1. Coastal Development Permit will be required for this activity?[1]
    a. Fari Tabatabai: Federal agencies are required to comply with Coastal Zone Management Act., We will be preparing a draft Consistency Determination for concurrence by CCC.
    b. Continued Coordination for this.

3. Questions/Comments –30 mins (All)

a. Juliette Robinson (SCC): I wasn't clear whether or not raising the road and increasing the size of the culvert was part of the scope of the project.

i. Joél Flannery: It is part of the scoped project. The flooding of the Beach Road crossing is central to this ecosystem restoration project because the breaching of the lagoon (to alleviate flooding) is believed to be detrimental to the estuary habitat. With this, modification of the road crossing (and associated culverts) is believed to be an essential measure for this project. Modifying the road crossing (and associated culverts) will be included in the preliminary array of alternatives as a standalone alternative and as part of other alternatives.

1. Elizabeth Murry: Conceptual model that shows bridge and breeching to measure the ecological restoration benefits.

ii. Juliette Robinson (SCC): I agree that raising the road and getting the water to the other side without overtopping the road is an important/necessary component. I assume you have consulted with transportation engineers regarding the proposed road height and slope needed to raise the road and associated width constraints-as Jonathan pointed out, parking is one issue, but there are also additional wetland areas along the road and of course adjacent ag land

1. Mark Strudley will conduct more consultation with transportation agencies as we move forward.

b. Hugo Huffman (EPA): What is the time horizon for modelling and measuring the project benefits?

i. Tiffany Cheng: We are assuming a 50-year time horizon for the project life, starting from base year 2025.

[1] Confirmed by Holly Wyre, CCC in a later e-mail to Fari Tabatabai that this CAP study will not need a Coastal Development Permit and will only go through CZMA review.

WHAT ARE YOUR…

PVWater: does have soil sampling results as related to recyled water (since 2009). Not in slough but close to slough.

70

Concerns	Ideas/Suggestions	Considerations/ Special Areas of Interest
PVWater: becuase we use water upstream, remain concerned about salt/brackish moving upriver in the system. Hopeful that water can spread out and NOT move upstream to water supply stations.	Holly Wyer: How alts will perform in lieu of SLR- how related to transition of habitats. Might need coastal development permit. Fari: must comply with CZMA and prepare CD for coastal commission. We don't need coastal dev permit. Juliette (SC County) - Question about whether the project has consulted with transportation engineers. Mark: we will do additional consultation once we have more information.	EPA- env justice. outreach to communities in advance. Linguistically isolated pops located closely. Need translated materials for outreach. EJscreen is a great resource. EPA- soil sampling. Fari - some reseach done/used CDC and EPA screeing tool. (EJ related) Mark S- Env justice important and related to funding/success. Broad distribution of disadvantaged communities. Santa Cruz familiar with using outreach in spanish language. EPA

Please use the chat box, or raise 'your hand' in the webex to make a verbal comment.

USACE Responses to USFWS Comments via Chad Mitcham's E-mail on 3/27/2023

On July 25, 2022, the Corps (USACE) conducted an interagency meeting with cooperating agencies and interested stakeholders to solicit stakeholder input for the problems and potential solutions to the challenges that Watsonville Slough channel and tidal marsh system was experiencing. The purpose of the meeting was to provide a timely overview of the project and gain input on the study's plan formulation and ecosystem restoration benefit modeling strategies. Since then, we have completed Hydrology & Hydraulics (H&H) modeling, ecosystem benefit modeling, Cost Effectiveness/ Incremental Cost Analysis (CE/ICA) and selected a recommended plan for the project. When the Corps received your comments via email on July 26, 2022 (Attachment 1 of this document), the project team was in the early stages of formulating a technical approach that would capture key Slough and lagoon mouth hydrology and morphologic processes and evaluating project alternatives quantitatively. Considerations around selecting a higher lagoon breach threshold and ancillary flooding of assets around the Slough were taken into account and reflected in the technical analyses performed through Fall 2022.

On March 23, 2023, the Corps conducted another interagency meeting to present the project progress and to obtain stakeholders' feedback on the final array of restoration measures, results of the ecosystem benefit modeling and alternatives evaluation. After the March 23, 2023 meeting, the project team received another comment from the USFWS via email from Chad Mitcham on March 27, 2023 (Attachment 2 of this document), which led to a meeting on April 20, 2023 focused on providing background information of the technical approach and analyses conducted. Please refer to meeting notes and presentation materials submitted to all invitees on April 21, 2023 for more details. This written response is to solidify our responses and discussions from three interagency meetings mentioned above, regarding USFWS' written (via email) and verbal comments during those meetings. Now that the Corps has completed the hydraulic and lagoon modeling for the project alternatives with and without project conditions, we are better equipped to address the comments.

USFWS Comment 1: *"As you know I provided comments in an email to you in July of last year that centered on my concern that raising a portion of Beach Road would have no substantive effect on the frequency of Pajaro River lagoon breaches. To allay this concern I suggested that your team provide information to the group that provides a realistic understanding of what would trigger a lagoon breach (post-project). For example, if Beach Road is raised and that threat is reduced, other low-lying infrastructure, development, agricultural fields, or other private properties would be next to be flooded. Last week staff from the non-federal sponsor stated that extensive study has been conducted and based on that information they have determined that raising Beach Road would allow for up to 14 inches of increased water elevation before other "critical infrastructure" would be affected, thereby triggering a lagoon breach. It would be helpful if this study were provided to the group for review. In my opinion it would be ideal if a mapping exercise were conducted (and shared with the group) that clearly illustrates what areas are anticipated to be affected by up to 14 inches of increased water elevation adjacent to the project area."*

USACE Response 1: The County conducted the Pajaro Dunes and Lagoon Flood Vulnerability Assessment Study (ESA 2018[1]) to understand flooding vulnerability at a local level for the Pajaro Dunes community. Ground and below-water (bathymetry) elevation surveys were conducted and combined with publicly available elevation data to create a digital terrain model of lower Watsonville Slough, which was used to develop still water flooding extents using Geospatial Information Software (GIS). The flooding extents, along with a ground survey of critical community features, were used to better understand the risk of inundation for County and Pajaro Dunes communities with a range of water levels that may potentially cause flooding under the existing conditions. The digital terrain model and flooding threshold survey data were also used to assess the future flooding vulnerability assessments under the H&H modeling scenarios for the Watsonville Slough and assumed sea level rise (SLR) for this project.

Over Fall 2022, the USACE team and County conducted a review of assets by Watsonville Slough that would potentially be impacted by a higher lagoon breach threshold based on inundation mapping derived from the H&H modeling results. Based on the review of the characteristics and criticality of existing assets, a new lagoon breach threshold elevation, 9.2 ft NAVD88 (which is a 1.2 ft increase from the current breach threshold of 8.0 ft NAVD88), was selected as it would allow for higher water levels in the Slough marsh plain without flooding impacts to critical community assets. Structures that may experience flooding with the new breach threshold were determined not to be critical features (e.g., 0.1 ft water depth on parking lot). A higher lagoon breach threshold than 9.2 ft NAVD88 would result in impacts to existing assets that are more difficult to adapt/retrofit. The results/outcomes of this review were presented at the April 20, 2023 meeting (see Slide 18 of the presentation material).

During the April 20, 2023 meeting, the project team discussed impacts to vulnerable assets with the 9.2 ft NAVD88 breach threshold in more detail. The County stated that with any adjustment of the new breach threshold, some of the utilities would need to be elevated as part of LERRDs (Lands, Easements, Rights-of-way, Relocations and Disposal Areas) agreement with USACE. LERRD is a local sponsor's responsibility, and some structures may have to be relocated; some owners may need to elevate their assets in order to protect against the new breach threshold and SLR. The County has been monitoring the behavior of the lagoon mouth, and with road raise and SLR effects, there may be a reduction in manual breaching in the future with the new breach threshold. The higher roadway elevation of 9.2 ft NAVD88 at Beach Road crossing and Beach/Shell Road intersection would continue to be the trigger for manually breaching the lagoon. It is anticipated that the extra room of 1.2 ft would provide more opportunities for the lagoon to naturally breach during closure events.

USFWS Comment 2: *"In my previous comments to you I also conveyed that it should be clear what interval of breach delay should be considered beneficial (i.e., hours, days, a week, month...). As most in this group are aware, lagoon water levels can increase 14 inches in well under a couple of hours following a moderate precipitation event. Of course lagoons are dynamic and there are many factors that would contribute to this including existing water level, precipitation amount, tides, etc. Taking all*

[1] ESA 2018 Report is available upon request. Please request it via email to Rusty Barker (rusty.barker@santacruzcounty.us) at Santa Cruz County.

this into consideration, ultimately success of this project would in large part be determined on the actual reduction in mechanical breaching events. Therefore, if breaching reduction is one of the primary factors to be used to justify success of this CAP 1135 project then there should be sufficient information provided to the group that clearly describes anticipated effects on breaching frequency post-project."

USACE Response 2: The County's consultant, ESA, modeled lagoon mouth responses under the future-without project (FWOP) and with-project (FWP; road raise and increased lagoon breach threshold) conditions under a range of SLR (see Slides 25 to 27) using the Lagoon Quantified Conceptual Model (QCM). The modeling results showed that under the FWOP condition with SLR, the duration of a lagoon closure event would be shortened because the lagoon water levels would rise with ocean water levels and exceed the existing breach threshold of 8.0 ft NAVD88 more frequently. Thus, more frequent manual breaching would be needed under the FWOP condition until the lagoon effectively transitions to a permanent open tidal connection under high SLR amounts.

Mechanical breaching will still be necessary when the lagoon water level approaches the increased lagoon breach threshold under with-project conditions. However, under the FWP condition, the QCM results showed that the average number of flood stage events per year in the lagoon would be reduced compared to the FWOP condition until SLR reaches +1.5 ft above current MSL (approx. 4.47 NAVD88). However, the number of events where the lagoon water level would reach the breach threshold would decline with higher SLR for both FWOP and FWP conditions because the lagoon system would start transitioning to a permanently open connection beyond SLR of +1.5 ft above current MSL (Figure 1).

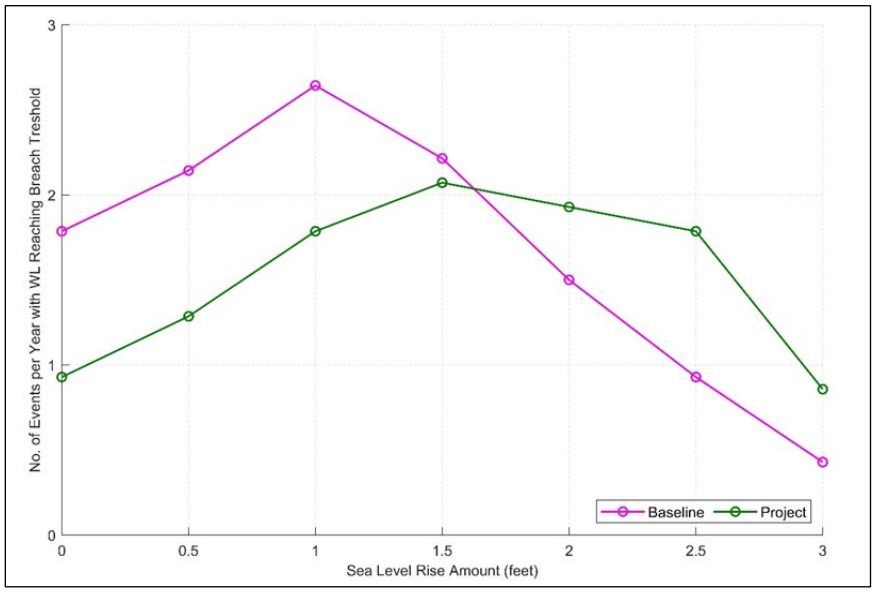


Figure 1. Predicted Average Number of Events per year where Lagoon Water Level Reaches respective Breach Thresholds under FWOP (Baseline) and FWP (Project) Conditions (Source: ESA, 2023[2])

[2] These modeling results are presented and discussed in the Lagoon QCM modeling memo provided to USACE, which will be included as an attachment in the forthcoming Feasibility Study/NEPA document.

The QCM results showed that for the lagoon closure events that last longer than a week, the average delay in manual breaching under the FWP condition is approximately 5 days compared to FWOP. Please note that the QCM results were derived from simplifying assumptions so that only the relative difference between the FWOP and FWP conditions is considered a meaningful comparison. The delay in breaching would allow perched areas of the marsh plain that are dry under the typical tidal cycle to become wet during closure events (see Response #3 below). The duration in delay would be event-specific depending on the specific streamflow, wave, and tide levels.

USFWS Comment 3: "*Lastly, I inquired during the last charrette about effects to existing high-quality marsh habitat by the potential raising of water levels within the slough up to 14 inches. Your team indicated that increased inundation would have beneficial effects to existing marsh habitat, as well as benefiting habitat that currently does not receive water due to being at a higher elevation. In my opinion, if raising of County road infrastructure resulted in an increase in water levels up to 14 inches there would be a high likelihood that an undetermined amount of existing high-quality marsh habitat would be lost due to inundation. This topic also intersects with the paragraph above, in that beneficial effects to currently dry habitat would primarily be affected by the duration of ponding in those areas. Has your team conducted an analysis that takes the above points into consideration? If so it would be helpful if this information were provided to the group.*"

USACE Response 3: The H&H model runs were set up for 3 time-steps at Year 0, 25, and 50 for each of the ecosystem modeling scenarios: 1) FWOP (a.k.a. No Action Alternative), 2) Road Raise, 3) Earthwork in all 3 land parcels considered (County, State and Lower Mile), and 4) the combination of Road Raise and Earthwork. The annualized inundation maps were created based on the modeling results and compared with the existing vegetation mapping for the study area. The vegetation mapping was completed by Watsonville Wetlands Watch in 2023 (Figure 2). The inundation map under the modeled existing condition (i.e., FWOP at Year 0) showed the areas with 50% or higher annualized inundation were generally mapped as mudflat or open water. Low marsh areas generally corresponded with approximately 15-50% annualized inundation. Areas of healthy pickleweed middle marsh were closely associated with annualized inundation ranges from 1 to 15%. Areas with 0-1% annualized inundation were mapped as one of the following: stressed pickleweed marsh, middle marsh co-dominant with xeric and exotic species, high marsh codominant with xeric exotic vegetation, or high marsh scrub, some of which was stressed.

For establishing goals for ecological benefits from the project across the restoration measures, the target "marsh hydrology" was determined to be 1-50% annualized inundation because the existing condition indicated those areas are generally healthy pickleweed middle marsh and low to middle marsh areas. The annualized inundation range of 0-1% was excluded because significant portions of this range included stressed vegetation or were co-dominant with xeric non-native and invasive species, indicating that those are the "high and dry" areas affected by the truncated hydrology.

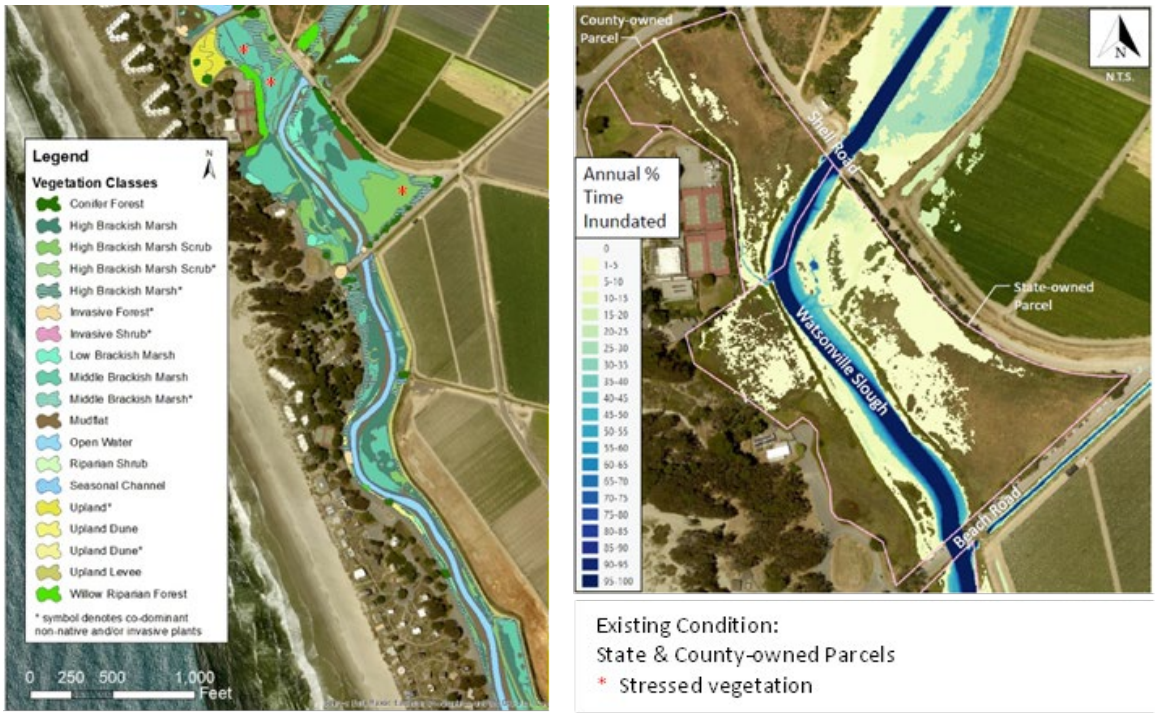


Figure 2. Comparison of existing vegetation mapping and modeled existing inundation ranges. Open water and mudflats correspond with 50-100% modeled annual inundation. Low marsh corresponds with 15-50% modeled annual inundation. Middle marsh corresponds with 1-15% modeled annual inundation. Areas mapped as 0-1% support stressed middle marsh, exotics, high marsh, and stressed high marsh scrub.

Figure 3 presents bar charts showing acres falling within the ranges of habitat-based annualized inundation for each ecosystem modeling scenario at three time-steps: Year 0, Year 25, and Year 50. Note that the open water inundation ranges are essentially identical across all restoration scenarios in all three parcels, though open water increases over time because of sea level rise. Therefore, based on this modeling exercise, the Corps expects a little to no risk of drowning the existing high-quality marsh habitat and converting it to mudflat/open water. Please note that the model output data were broken down with smaller bins like 0-1%, 1-5%, 6-10%, etc. up to 100%, but all data in the bins from 1-50% were processed and lumped together into one 1-50% category because 1-50% range of inundation represented healthy marsh. Similarly, the data in the bins greater than 50% were lumped together for the 50-100% category which represents mudflat/open water for the ease of data presentation.

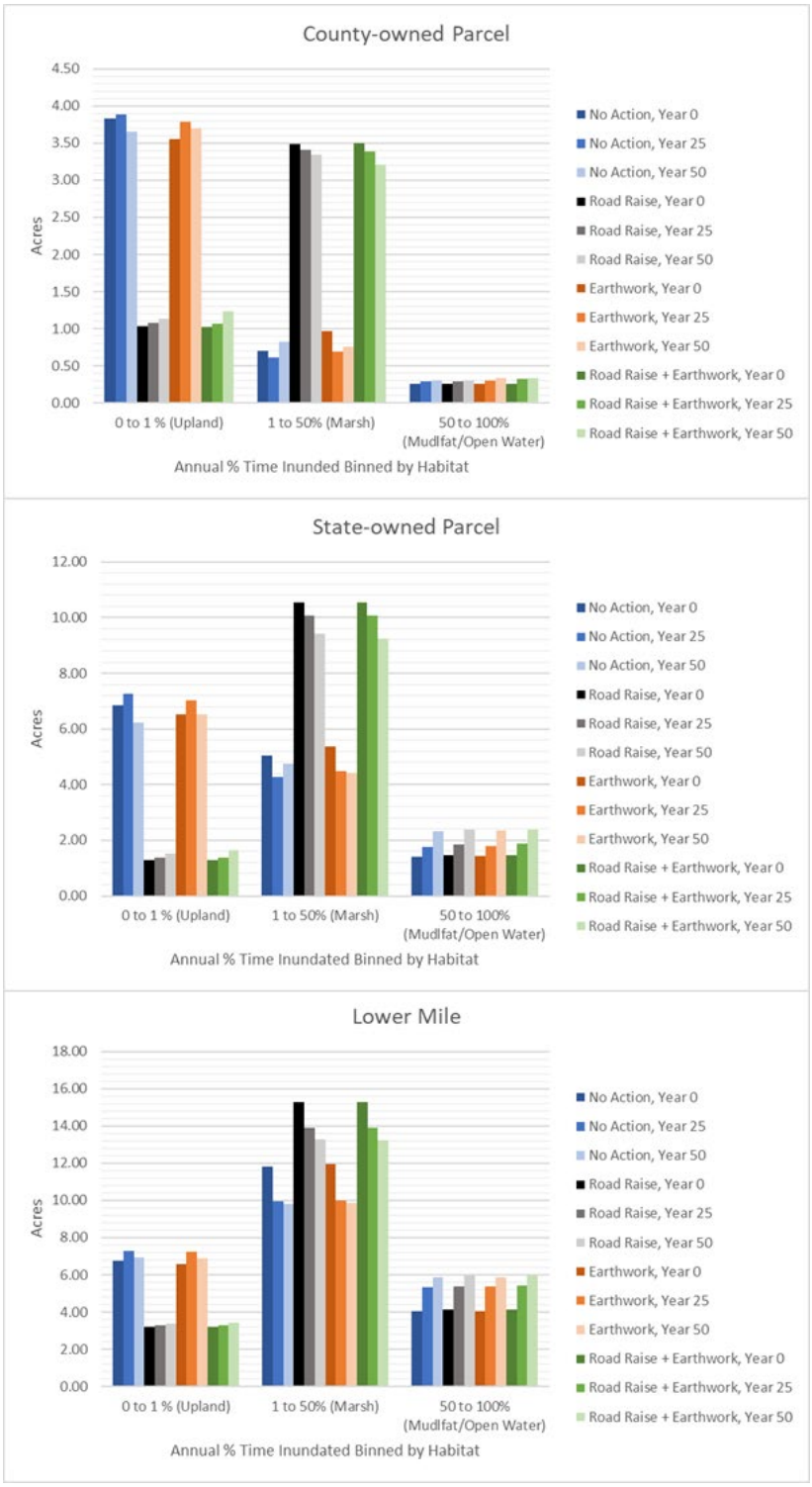


Figure 3. Total Acreage of Habitat-based Inundation Range for County, State and Lower Mile Parcels. Note that the open water inundation ranges (50-100%) are essentially identical across all restoration scenarios in all three parcels, though open water increases over time because of sea level rise.

The model results for the existing condition showed that the estimated areas of 1-50% annualized inundation range were 0.71, 5.05 and 11.82 acres for County, State and Lower Mile, respectively (Table 1). Assuming the SLR and current breach threshold of 8.0 ft NAVD88 under the FWOP scenario, the 1-50% annualized inundation areas for State and Lower Mile parcels would decrease with time except County parcel. The County parcel is most perched, and only about 15% of the total area had marsh hydrology to begin with. Therefore, it initially gets drier with an increased frequency of manual breaching due to SLR at Year 25, and then the area becomes wetter as the SLR dominates the hydrology at Year 50. Lower Mile is the lowest in grade elevation with approximately 52% of the marsh hydrology at the existing condition. Some portions of that parcel would gradually shift to mudflat and open water at Year 25 and Year 50 as SLR effects are dominant in the lower elevation; however, none of the upland hydrology areas would convert to marsh plain because of the current breaching threshold of 8.0 ft NAVD88. As you can see from Table 1, the dynamics of hydrology in these three land parcels is non-linear and affected by the interplay of varying grade elevations, SLR effects, conversions to mudflat/open water and increased breaching frequencies with time under FWOP condition.

Table 1. Total Areas in 1-50% Annualized Inundation Range by Parcel (acres) under FWOP Condition

Parcel	Total Area (acres)	Area (in acres) in 1-50% Annualized Inundation			Percent of Total Area		
		Year 0 (Existing Condition)	FWOP at Year 25	FWOP at Year 50	Year 0 (Existing Condition)	FWOP at Year 25	FWOP at Year 50
County	4.80	0.71	0.61	0.82	14.8	12.7	17.1
State	13.40	5.05	4.26	4.74	37.7	31.8	35.4
Lower Mile	22.60	11.82	9.96	9.80	52.3	44.1	43.4

Table 2 presents the annual average areas in 1-50% annualized inundation over the 50-year project life, and percent changes from the existing condition (i.e., Year 0) for all four modeling scenarios by parcel. Negative percent values denote decrease in 1-50% annualized inundation areas compared to the existing condition.

As shown in Table 2, the 1-50% annualized inundation areas would gradually decrease with time under FWOP condition over the 50-year project life on average. There was significant increase in 1-50% annualized inundation areas for Road Raise and the combination of Road Raise and Earthwork, compared to the existing condition. Interestingly, the combination scenario yielded a lower benefit because carved channels tend to cause faster draining than Road Raise scenario alone. Based on these ecosystem modeling results, CE/ICA modeling was performed, and the Road Raise scenario was determined to be the most cost-effective alternative.

Table 2. Annual Average Habitat Units (in acres) in 1-50% Annualized Inundation over 50-year Project Life and Percent Change from Existing Condition

Parcel	Annual Average Area (in acres) in 1-50% Annualized Inundation over 50-year Project Life				Percent (%) Change of Annual Average Area (in acres) in 1-50% Annualized Inundation over 50-year Project Life from Existing Condition			
	FWOP (No Action Alternative)	Road Raise (RR)	Earthwork (EW)	Road Raise + Earthwork (RREW)	FWOP (No Action Alternative)	Road Raise (RR)	Earthwork (EW)	Road Raise + Earthwork (RREW)
County	0.69	3.41	0.78	3.37	-2.8	380.3	9.9	374.6
State	4.58	10.03	4.69	9.98	-9.3	98.6	-7.1	97.6
Lower Mile	10.39	14.1	10.45	14.08	-12.1	19.3	-11.6	19.1

Attachment 1

From: Flannery, Joel R CIV USARMY CESPN (USA)
Sent: Tuesday, July 26, 2022 10:35 AM
To: Mitcham, Chad J <chad_mitcham@fws.gov>
Cc: Takano, Leilani <leilani_takano@fws.gov>; Tabatabai, Farinaz (Fari) CIV USARMY CESPN (USA) <Fari.Tabatabai@usace.army.mil>; Murray, Elizabeth O CIV USARMY CEERD-EL (USA) <Elizabeth.O.Murray@usace.army.mil>; Cheng, Tiffany K SPN <Tiffany.K.Cheng@usace.army.mil>; Achenbach, Joel <Joel.B.Achenbach@usace.army.mil>; Rusty Barker <Rusty.Barker@santacruzcounty.us>; Mark Strudley Ph. D. (Mark.Strudley@santacruzcounty.us) <mark.strudley@santacruzcounty.us>
Subject: RE: Watsonville Slough Ecological Restoration Project

Hi Chad,

Thank you for your thoughts/comments below. I'm copying those on the team that will help use this comments to inform our analysis and discussion.

Sincerely,
Joél

Desk: 415.503.6848
Mobile/Text: 415.876.8635 or 707.362.1795
Joel.R.Flannery@usace.army.mil

From: Mitcham, Chad J <chad_mitcham@fws.gov>
Sent: Tuesday, July 26, 2022 9:47 AM
To: Flannery, Joel R CIV USARMY CESPN (USA) <Joel.R.Flannery@usace.army.mil>
Cc: Takano, Leilani <leilani_takano@fws.gov>
Subject: [Non-DoD Source] Watsonville Slough Ecological Restoration Project

Hi Joel, after our meeting yesterday I was thinking about this project, and wanted to convey additional thoughts. I understand that hydrologic modeling and other data collection is being conducted to evaluate anticipated post-restoration conditions in the project vicinity. This is going to be interesting to see, and I hope that this evaluation provides sufficient information for the group to make an informed decision on the preferred project.

My skepticism is in regards to what this information will provide, in terms of providing confidence that the selected project would perform as expected. This concern is primarily in regards to an assumption that any project, or combination of projects, that we are considering, would have a substantive effect on reducing the need to breach the lagoon.

For example, I've previously expressed that if Beach Road is raised and that threat is reduced, certainly other low-lying infrastructure, development, agricultural fields in the vicinity would be next at risk and instead of the road being the trigger to breach it would be one of these other reasons. Of course I may be wrong, and raising of the road may actually contribute in terms of the purpose of this funding source, but I think the group should

have a complete and realistic understanding of what would trigger a lagoon breach (in concert with consideration of the post-restoration conditions analysis).

Additionally, if breaching reduction is used as justification for selecting this ecological restoration project, in my opinion the group should discuss and it should be clear what is considered beneficial. For instance, should delaying breaching by hours, a day, a week, a month... be considered beneficial when talking about breaching the Pajaro Lagoon. What are the likely or proven ecological benefits that delaying breaching (by some particular amount) would provide. Of course I am available to discuss further at your convenience.

Thank you for your time and allowing me to memorialize these thoughts.

Chad Mitcham
Fish and Wildlife Biologist
Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service

email is the best way to contact me

Attachment 2

From: Mitcham, Chad J <chad_mitcham@fws.gov>
Sent: Thursday, March 30, 2023 8:38 AM
To: Flannery, Joel R CIV USARMY CESPN (USA) <Joel.R.Flannery@usace.army.mil>
Cc: You, Jamie K CIV (USA) <Jamie.You@usace.army.mil>; Antonella Gentile <Antonella.Gentile@santacruzcounty.us>; Cheng, Tiffany K CIV USARMY CESPN (USA) <Tiffany.K.Cheng@usace.army.mil>; Achenbach, Joel B CIV USARMY CESPN (USA) <Joel.B.Achenbach@usace.army.mil>; Beagle, Julie R CIV USARMY CESPN (USA) <Julie.R.Beagle@usace.army.mil>; mark.strudley@prfma.org; Rusty Barker <Rusty.Barker@santacruzcounty.us>; Dane Behrens <DBehrens@esassoc.com>; Takano, Leilani <leilani_takano@fws.gov>; Kelli Camara <kcamara@rcdsantacruz.org>; Bryan Largay <Bryan.largay@landtrustsantacruz.org>; Jonathan Pilch <jonathan@watsonvillewetlandswatch.org>; Dan Medeiros <dmedeiros@conservationfund.org>; Gary Kittleson <garykit@pacbell.net>; joel.casagrande@noaa.gov; Murray, Elizabeth O CIV USARMY CEERD-EL (USA) <Elizabeth.O.Murray@usace.army.mil>; 'Sanders, Kim@Waterboards (Kim.Sanders@waterboards.ca.gov)' <Kim.Sanders@waterboards.ca.gov>; Ryan Diller <Ryan.Diller@parks.ca.gov>
Subject: [URL Verdict: Neutral][Non-DoD Source] Re: [EXTERNAL] RE: lower Watsonville Slough/Pajaro River

Thanks Joel, I look forward to having a discussion around these fundamental topics.

Chad Mitcham
Fish and Wildlife Biologist
Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service

email is the best way to contact me

From: Flannery, Joel R CIV USARMY CESPN (USA) <Joel.R.Flannery@usace.army.mil>
Sent: Tuesday, March 28, 2023 11:40 PM
To: Mitcham, Chad J <chad_mitcham@fws.gov>
Cc: You, Jamie K CIV (USA) <Jamie.You@usace.army.mil>; Antonella Gentile <Antonella.Gentile@santacruzcounty.us>; Cheng, Tiffany K CIV USARMY CESPN (USA) <Tiffany.K.Cheng@usace.army.mil>; Achenbach, Joel B CIV USARMY CESPN (USA) <Joel.B.Achenbach@usace.army.mil>; Beagle, Julie R CIV USARMY CESPN (USA) <Julie.R.Beagle@usace.army.mil>; mark.strudley@prfma.org <mark.strudley@prfma.org>; Rusty Barker <Rusty.Barker@santacruzcounty.us>; Dane Behrens <DBehrens@esassoc.com>; Takano, Leilani <leilani_takano@fws.gov>; Kelli Camara <kcamara@rcdsantacruz.org>; Bryan Largay <Bryan.largay@landtrustsantacruz.org>; Jonathan Pilch <jonathan@watsonvillewetlandswatch.org>; Dan Medeiros <dmedeiros@conservationfund.org>; Gary Kittleson <garykit@pacbell.net>; joel.casagrande@noaa.gov <joel.casagrande@noaa.gov>; Murray, Elizabeth O CIV USARMY CEERD-EL (USA) <Elizabeth.O.Murray@usace.army.mil>
Subject: RE: [EXTERNAL] RE: lower Watsonville Slough/Pajaro River

Hi Chad,

Thank you so much for taking the time to write this email. We are internally syncing to help ensure we respond adequately and are thinking that it would be best to schedule a call together. We could use that meeting (in person or virtual) to discuss the specific points you raise below and walk through the underpinning analyses related to lagoon mouth behavior in the future, predicted inundation in/around the slough, and our cross-walking with vulnerable assets.

We appreciate you sharing your thoughts with the team and wider group. This type of feedback helps us ensure our project thinking, even at feasibility stage, is robust. Look forward to discussing more.

Sincerely,
Tiffany Cheng (techincal lead and coastal engineer) & Joel Flannery (PM)

From: Mitcham, Chad J <chad_mitcham@fws.gov>
Sent: Monday, March 27, 2023 12:33 PM
To: Flannery, Joel R CIV USARMY CESPN (USA) <Joel.R.Flannery@usace.army.mil>; Kelli Camara <kcamara@rcdsantacruz.org>; Bryan Largay <Bryan.largay@landtrustsantacruz.org>; Jonathan Pilch <jonathan@watsonvillewetlandswatch.org>; Dan Medeiros <dmedeiros@conservationfund.org>; Gary Kittleson <garykit@pacbell.net>; joel.casagrande@noaa.gov; Murray, Elizabeth O CIV USARMY CEERD-EL (USA) <Elizabeth.O.Murray@usace.army.mil>
Cc: You, Jamie K CIV (USA) <Jamie.You@usace.army.mil>; Antonella Gentile <Antonella.Gentile@santacruzcounty.us>; Cheng, Tiffany K CIV USARMY CESPN (USA) <Tiffany.K.Cheng@usace.army.mil>; Achenbach, Joel B CIV USARMY CESPN (USA) <Joel.B.Achenbach@usace.army.mil>; Beagle, Julie R CIV USARMY CESPN (USA) <Julie.R.Beagle@usace.army.mil>; mark.strudley@prfma.org; Rusty Barker <Rusty.Barker@santacruzcounty.us>; Dane Behrens <DBehrens@esassoc.com>; Takano, Leilani <leilani_takano@fws.gov>
Subject: [URL Verdict: Neutral][Non-DoD Source] Re: [EXTERNAL] RE: lower Watsonville Slough/Pajaro River

Hi Joel, thank you for continuing to coordinate the subject project. During the charrette last week I inquired about specific topics and I want to be sure that I clearly convey these thoughts to the group to ensure they are adequately considered and addressed.

As you know I provided comments in an email to you in July of last year that centered on my concern that raising a portion of Beach Road would have no substantive effect on the frequency of Pajaro River lagoon breaches. To allay this concern I suggested that your team provide information to the group that provides a realistic understanding of what would trigger a lagoon breach (post-project). For example, if Beach Road is raised and that threat is reduced, other low-lying infrastructure, development, agricultural fields, or other private properties would be next to be flooded. Last week staff from the non-federal sponsor stated that extensive study has been conducted and based on that information they have determined that raising Beach Road would allow for up to 14 inches of increased water elevation before other "critical infrastructure" would be affected, thereby triggering a lagoon breach. It would be helpful if this study were provided to the group for review. In my opinion it would be ideal if a mapping exercise were conducted (and shared with the group) that clearly illustrates what areas are anticipated to be affected by up to 14 inches of increased water elevation adjacent to the project area.

In my previous comments to you I also conveyed that it should be clear what interval of breach delay should be considered beneficial (i.e., hours, days, a week, month...). As most in this group are aware, lagoon water levels can increase 14 inches in well under a couple of hours following a moderate precipitation event. Of course lagoons are dynamic and there are many factors that would contribute to this including existing water level, precipitation amount, tides, etc. Taking all this into consideration, ultimately success of this project would in large part be determined on the actual reduction in mechanical breaching events. Therefore, if breaching reduction is one of the the primary factors to be used to justify success of this CAP 1135 project then there should be sufficient information provided to the group that clearly describes anticipated effects on breaching frequency post-project.

Lastly, I inquired during the last charrette about effects to existing high-quality marsh habitat by the potential raising of water levels within the slough up to 14 inches. Your team indicated that increased inundation would have beneficial effects to existing marsh habitat, as well as benefiting habitat that currently does not receive water due to being at a higher elevation. In my opinion, if raising of County road infrastructure resulted in an increase in water levels up to 14 inches there would be a high likelihood that an undetermined amount of existing high-quality marsh habitat would be lost due to inundation. This topic also intersects with the paragraph above, in that beneficial effects to currently dry habitat would primarily be affected by the duration of ponding in those areas. Has your team conducted an analysis that takes the above points into consideration? If so it would be helpful if this information were provided to the group.

Thank you for your time and consideration of the above points.

Chad Mitcham
Fish and Wildlife Biologist
Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service

email is the best way to contact me

Central Coast Water Quality Control Board Staff (Central Coast Water Board) Comments for Watsonville Slough Ecosystem Restoration Project, Continuing Authorities Program Section 1135, PROPOSED PROJECT DESCRIPTION dated May 24, 2024.

June 14, 2024

USACE Responses in blue font (June 25, 2025).

1. You are required to meet post-construction stormwater control requirements as identified in an email from Kiim Sanders to Joel Flannery on March 4, 2024. If the County is requiring a post-construction stormwater control plan, please submit the final approved SWCP. >> The post-construction stormwater control plan will be developed by the County during Design and Implementation (D&I) Phase.

2. How did you model the marsh habitat changes, i.e., which modeling program did you use?
   >> Early in the planning process, truncated hydrology was identified as a stressor leading to stunted marsh vegetation and invasion by xeric invasives. Since no existing model seemed to address the benefits to the marsh associated with restoring the lagoon to a more natural state, the project team developed a model based on HEC-RAS, which included lagoon openings and closures during both wet and dry seasons, synthesizing the information into a "Percent Annual Inundation" that allowed the comparison of with and without project conditions. Details of how the percent annual inundation was modeled can be found in the Hydrology and Hydraulics Engineering Appendix of the report. The annualized inundations were then binned into 5% bins and model year 0 was compared to existing marsh vegetation mapping to determine what existing inundations correlated with healthy marsh vegetation that did not exhibit stunting, invasion by xeric exotics, etc. This allowed the binning of inundation ranges into Upland, Healthy Marsh, and Mudflat/Open Water categories. The benefits of the alternatives showed expansion of the healthy marsh inundation ranges, reduction of the upland ranges, and virtually no change in the open water ranges. Details of this work can be found in the Ecosystem Benefit Modeling Appendix of the draft report. Additional benefits are derived by the removal of exotic vegetation and replacement with native mash species, but these were addressed separately from the modeling. Reduction of invasives species and dominance by natives is also included in the Monitoring and Adaptive Management Plan.

3. Your planting plan and restoration plan is required to include a robust strategy for eradication of the invasive plant species based on current scientific knowledge. Please cite your sources for invasive plant species removal strategies. We will review this plan once you have it fleshed out. You will need specific success criteria along with other information typically included in a habitat mitigation and monitoring plan.
   >> The preliminary planting plan (see Environmental Appendix A-3) was developed and will be refined during D&I through coordination with the Tribes. The Feasibility-level monitoring and adaptive management plan (Environmental Appendix A-3) has success criteria for vegetation as well as a trigger for adaptive management if invasive species percentages are too high. These will be further refined in the D&I phase.

4. Central Coast Water Board staff has found that the best way to protect water quality with oncoming rainy seasons is to not allow construction from October 1 through May 31.

Please plan to move your construction window. And please carefully plan your sequence of construction so that you are not pouring concrete on the last days of the construction window. Please submit your construction plan with dates that identify concrete pouring. Need for diversions or dewatering earlier in the window. Since you are currently proposing precast concrete culverts, please identify any other concrete that you propose is necessary to complete this project.
>> Changed work window to June 15 through September 30 from June 15 through October 31. Cast-in-place (CIP) concrete is planned to be small in volume and likely to bond sections of precast footings for the future culvert unless deep foundations are used and then CIP could be used for reinforced concrete pile caps. We're at feasibility phase so it is still to be determined. Construction schedules will be developed as the D&I begins. CIP concrete will be installed in a dry excavation with a gravel base for a safe and uniform work surface so please clarify any concerns with anticipated future work.

5. Thank you for proposing to remove and dispose of existing concrete slabs. Are these part of the current culvert infrastructure? >> Yes. The concrete slab debris in the slough appears to have been dumped (at an unknown date) at both ends of the existing (6) culverts likely to reduce potential for scour. Debris will be removed as part of the proposed project and to help reestablish the benthic habitat in the slough.

6. One of your options for a coffer dam includes an earthen berm. Why would you not cover the earthen berm in visqueeen? >> We can specify that contractor wrap or cover any temporary earthen structure in the marsh or waterway with poly sheeting (visqueen) or similar to limit loss of soil fines. They may also be able to compact and use jute matting (depending on elevation on bank of berm) or similar yet can discuss details with RWQCB or other interested parties.

7. For any aqua barrier dams, please identify the stress that the barriers can safely handle. We have seen them fail and want to understand that they are sized correctly before approving their use. >> This "option" has not been investigated besides listing as an idea/option that we'd like to keep open at this early (feasibility) stage of planning and design. We can investigate suitability for this site, base condition (silt), and lessons learned or caveats from regulatory agencies at next phase of design. If not seemingly feasibly for this site we can eliminate from discussion yet we should be cognizant that a contractor (even if excluded in permit condition language) may propose use of this or similar "structure" to temporarily impound water from the work zone.

8. Please do not use hay bales anywhere in any waterbody and remove them from your dewatering section. A marsh plain is part of the waterbody.
>> Hay bales are typically rice straw bales that are low-impact to native species, however, they are removed from the project description. Alternate means such as using sprinklers to disperse water into the marsh can be employed.

9. More information is needed to understand how you calculate the expected flows and where you propose to discharge the dewatering pipe(s). >>The summer flows into the slough (through Shell Road pups/crossing) were well-documented and were noted as

very small for summer months. We showed the dewatering pumps being discharge onto the marshes on both sides of the culvert site.

10. Where will the water be routed during the time that a coffer dam is in place in front of the ag ditch east of the culvert replacement site. Please elaborate on how you will determine the expected volume of water in the ag ditch. >> This is a good question and was posed during the Feb. 2024 site visit. The agriculture ditch flows are variable (in volume and frequency) and may not be on a known schedule. That said, there should be a historical range of flows for summer and early fall months that can be used for the contractor to design a bypass system.

11. Please demonstrate how you know that 2-inch gas powered pumps would be suitable for nuisance water pumping. You should have other pumps ready to handle greater leaking amounts. >> An estimated 95% of similar projects would use gas-powered, portable pumps (often Honda brand yet up to the contractor) because they are easy to move around to capture water to pump to desired locations and the 2-inch gas pumps are by far the most common. The number of pumps can be varied as most contractors may own several and would rent more if needed. The volume of water is easily handled with one or more 2-inch portable (or “trash” pumps) and larger pumps can be on hand or easily rented if more volume is needed. Contractors can and will use the size inlet and fuel type that is most efficient to pumping of nuisance water. Sometimes, smaller electric pump(s) are best to use and they can be run off of a small gas-powered generator. Any combination of the above mentioned pumps can be used, which is commonly used.

12. You have barely touched on the diversion of the Watsonville Slough water except for number 15 in section 9.5 and the short section 8.2.4. Please elaborate. And as we specified in an email from Kiim Sanders to Joel Flannery on March 4, 2024, you are required to answer the questions in our Diversion and Dewatering Requirements document within your diversion and dewatering plan. >> The revised project description includes descriptions of a brief de-watering method and locations of water diversion. The dewatering plan will be developed during D&I Phase, and will be required of the future contractor at the time of contract before mobilization is authorized.

Environmental Appendix A-2

Watsonville Slough Ecosystem Restoration Project

Continuing Authorities Program Section 1135

DRAFT

BIOLOGICAL ASSESSMENT

April 2025

US Army Corps of Engineers ®
San Francisco District

Pajaro Storm Drain Maintenance District
Within Santa Cruz County

Table of Content

1 Introduction 1
2 Project Description 1
2.1 Permanent Project Components 4
2.1.1 Culvert Replacement 4
2.1.2 Raise West Beach Road 4
2.1.3 Flapgate Installation on Adjacent Agricultural Ditch 5
2.1.4 Utility Relocation 5
2.1.5 Removal of Invasives and Planting of Native Plants 6
2.1.6 Parking Lot Raise 6
2.1.7 Install Interpretive Signage 6
2.2 Temporary Project Components 7
2.2.1 Temporary Road, Staging Areas and Access 7
2.2.2 Dewatering 7
2.2.3 Cofferdam Installation 8
2.2.4 Temporary Water Diversion 10
2.2.5 Emergency Lagoon Breaching 10
2.3 Mitigation Measures 10
2.3.1 BMPs 10
2.3.2 AMMs 11
3 Status of the Species 12
3.1 Tidewater Goby 13
3.1.1 Range 13
3.1.2 Life History 13
3.1.3 Preferred Habitat 14
3.1.4 Critical Habitat 14
3.2 California Red-legged Frog 15
3.2.1 Range 15
3.2.2 Life History 16
3.2.3 Preferred Habitat 16
3.2.4 Critical Habitat 17
4 Environmental Baseline 19
4.1 Hydrology 19
4.2 Water Quality 19
4.3 Biological Resources 21
4.4 Potential Occurrence of Listed Species 23
4.4.1 Tidewater Goby 23
4.4.2 California Red-legged Frog 24
5 Effects of the proposed action 24
5.1 General Habitat Impacts 24
5.1.1 Aquatic Species 25
5.1.2 Vegetation 26
5.2 Effects on Tidewater Goby 27
5.3 Effects on Tidewater Goby Designated Critical Habitat 27
5.4 Effects on California Red-legged Frog 28

5.5 Cumulative Effects 28
6 Conclusion 29
7 References 30

List of Figures

Figure 1. Location of Project Area 2
Figure 2. Proposed Project Elements 3
Figure 3. Conceptual Design of Proposed Fish-Friendly Culvert 4
Figure 4. Plan View of Culvert Replacement Work Area 5
Figure 5. Dewatering Schematic 8
Figure 6. Action Area 12
Figure 7. Tidewater Goby Critical Habitat (USFWS 2013) 15
Figure 8. California Red-legged Frog Critical Habitat (USFWS 2006) 18
Figure 9. Lower Watsonville Slough and Pajaro River Lagoon 19
Figure 10. W. Beach Road Crossing and Existing Culverts 22
Figure 11. Shell Road Culverts and Pump Station 23

List of Tables

Table 1. Cofferdam (Barrier) Types 9
Table 2. Beneficial Uses of Watsonville Slough (Central Coast Basin Plan 2019) 20
Table 3. List of 303(d) Water Quality Impairments for Watsonville Slough 21

Attachments

Attachment 1: U.S. Fish and Wildlife Service's (USFWS) Information Planning and Conservation System (IPaC) Database Search and Screening of Federal Special-Status Wildlife, Fish, and Plant Species Potentially to Occur in Action Area

Attachment 2: Central Coast Regional Water Quality Control Board Water Quality Certification No. 34422WQ12 for the Pajaro River Mouth Sandbar Breaching Program, Santa Cruz County

Attachment 3: Mitigation Measures for Watsonville Slough Continuing Authorities Program Section 1135 Ecosystem Restoration Project

1 INTRODUCTION

The purpose of this Biological Assessment (BA) is to evaluate potential effects of the Watsonville Slough Continuing Authorities Program (CAP) 1135 Ecosystem Restoration Project to 1) any threatened, endangered, or candidate wildlife and fish species regulated by the U.S. Fish and Wildlife Service (USFWS); and 2) designated critical habitat of those species that may be present in the action area pursuant to Section 7 of the Endangered Species Act (ESA), as amended.

The U.S. Army Corps of Engineers (USACE) searched a list of federally threatened (T), endangered (E), proposed threatened (PT), proposed endangered (PE) species, and designated and proposed designated critical habitats using USFWS' Information for Planning and Consultation (IPaC) database (Attachment 1). The listed species' potential to occur in the action area was further determined by the presence and absence data based on the data query using RareFind 5 in California Department of Fish and Wildlife (CDFW)'s California Natural Diversity Database (CNDDB). Based on the initial screening, the USACE has determined that two ESA-listed species and one designated critical habitat may have the potential to occur within the action area:

- Tidewater Goby (*Eucyclogobius newberryi*; endangered) and designated critical habitat
- California Red-legged Frog (CRLF; *Rana draytonii*; threatened).

2 PROJECT DESCRIPTION

The project area is in the lower Watsonville Slough in Santa Cruz County adjacent to extensive farmlands and the Pajaro Dunes residential community at the coast of the Pacific Ocean (Figure 1). The purpose of the proposed project is to allow the naturally formed sandbar creating Pajaro River Lagoon to remain in place for longer periods of time by reducing the need for mechanical breaching. This will more closely mimic natural hydrology of the marsh and promote healthy marsh vegetation. The following project elements will be implemented (Figure 2):

1. Improve crossing at W. Beach Road on Watsonville Slough, which will support higher-capacity, fish-friendly culvert(s) that will accommodate the closed-lagoon water levels compared with the existing series of closed conduit culverts;
2. Raise an approximately 1,300 linear feet (LF) of W. Beach Road from the existing elevation to accommodate the new culvert(s) with a higher crown elevation;
3. Implement restoration measures such as invasive plant removal and native planting on both County- and State-owned land parcels;
4. Install a new flap gate on the adjacent Beach Road Agricultural Ditch to prevent the higher lagoon levels from moving upstream;

5. Raise surface elevation of a parking lot at Palm Beach State Park to prevent nuisance flooding; and
6. Install interpretive signage both in English and Spanish to inform locals and visitors to the Palm Beach State Park of the benefits of the wetland restoration.

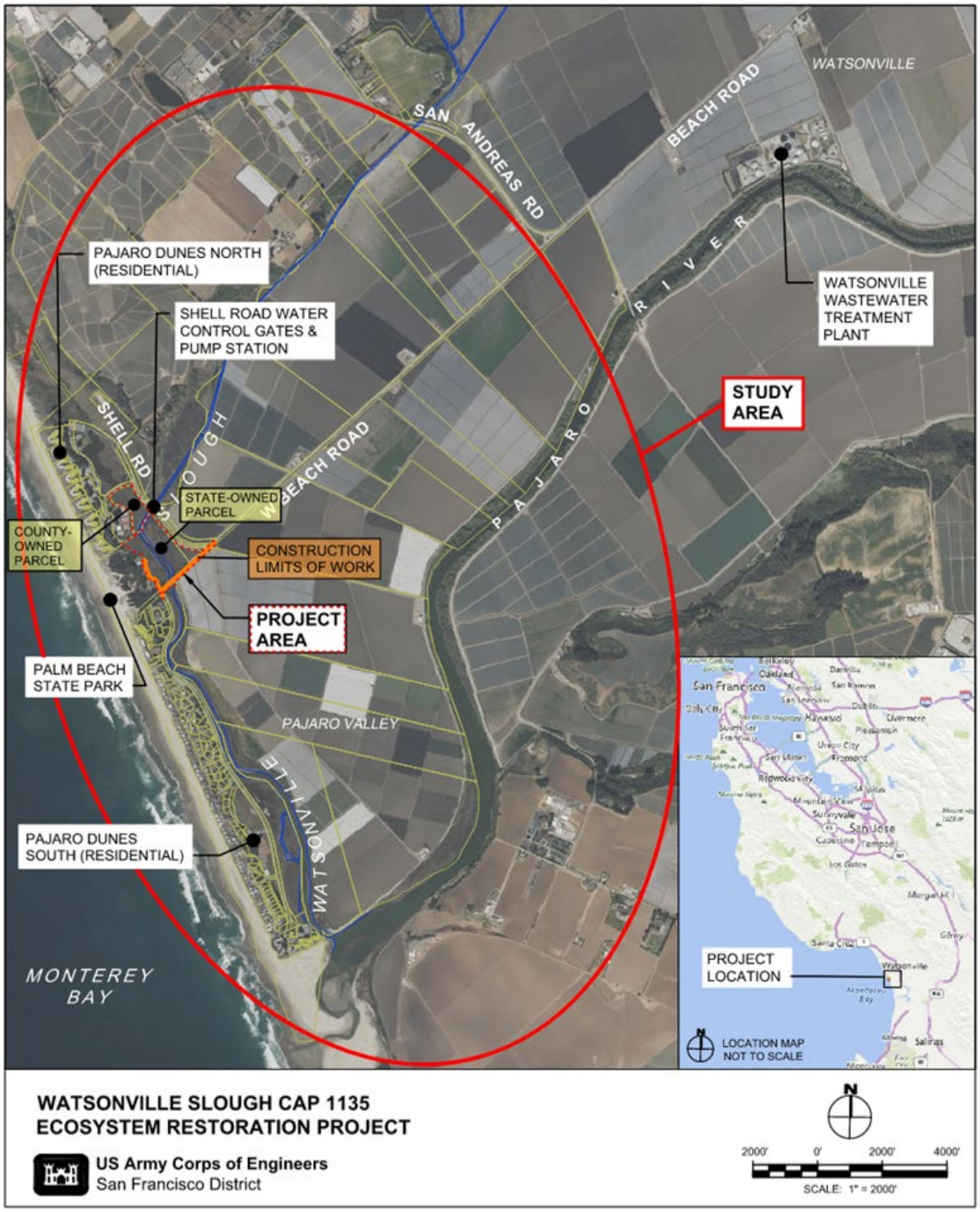


Figure 1. Location of Project Area

Figure 2. Proposed Project Elements

2.1 Permanent Project Components

2.1.1 Culvert Replacement

The proposed project will replace the existing six 48-inch diameter closed culverts, which currently are a barrier to fish passage, with one 32-foot wide, 8-foot high, fish-friendly culvert at the W. Beach Road crossing (Figure 3).

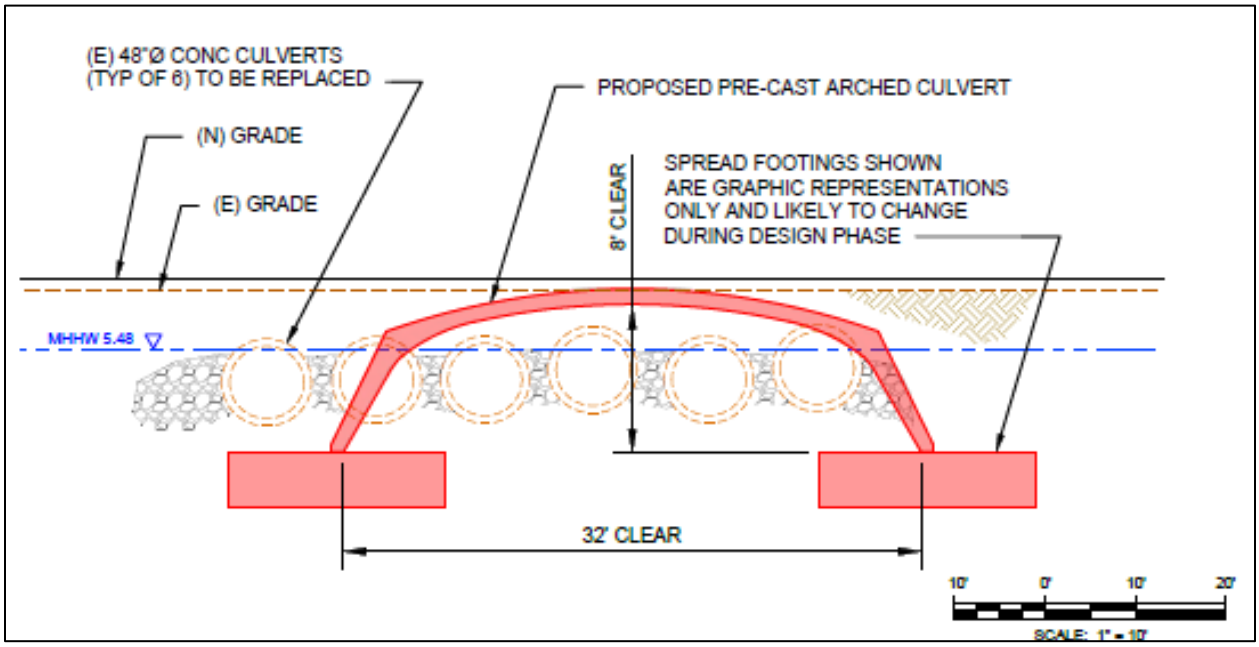


Figure 3. Conceptual Design of Proposed Fish-Friendly Culvert

Because W. Beach Road is the primary access route in and out of the Pajaro Dunes Community and Palm Beach State Park, the proposed project will construct a temporary road to maintain regular traffic and emergency access through W. Beach Road at all times prior to construction for the culvert replacement. Figure 4 shows the temporary bypass road on the north side of the existing roadway.

2.1.2 Raise West Beach Road

To avoid flooding impacts to the roadway from an increased culvert elevation and lagoon breach threshold, an estimated 1,300 LF of W. Beach Road will be raised from existing elevations of about 8.0-8.2 feet NAVD88 to a new surface elevation of 9.2 feet NAVD88. This road modification will occur from the Shell Road intersection to just east of the entrance to Palm Beach State Park (Figure 2). The existing roadway material will be removed, taken off-site and recycled. The road will be re-built with new base material, and new bituminous paving (about 24 feet in width) will be installed at a higher elevation with new gravel shoulders.

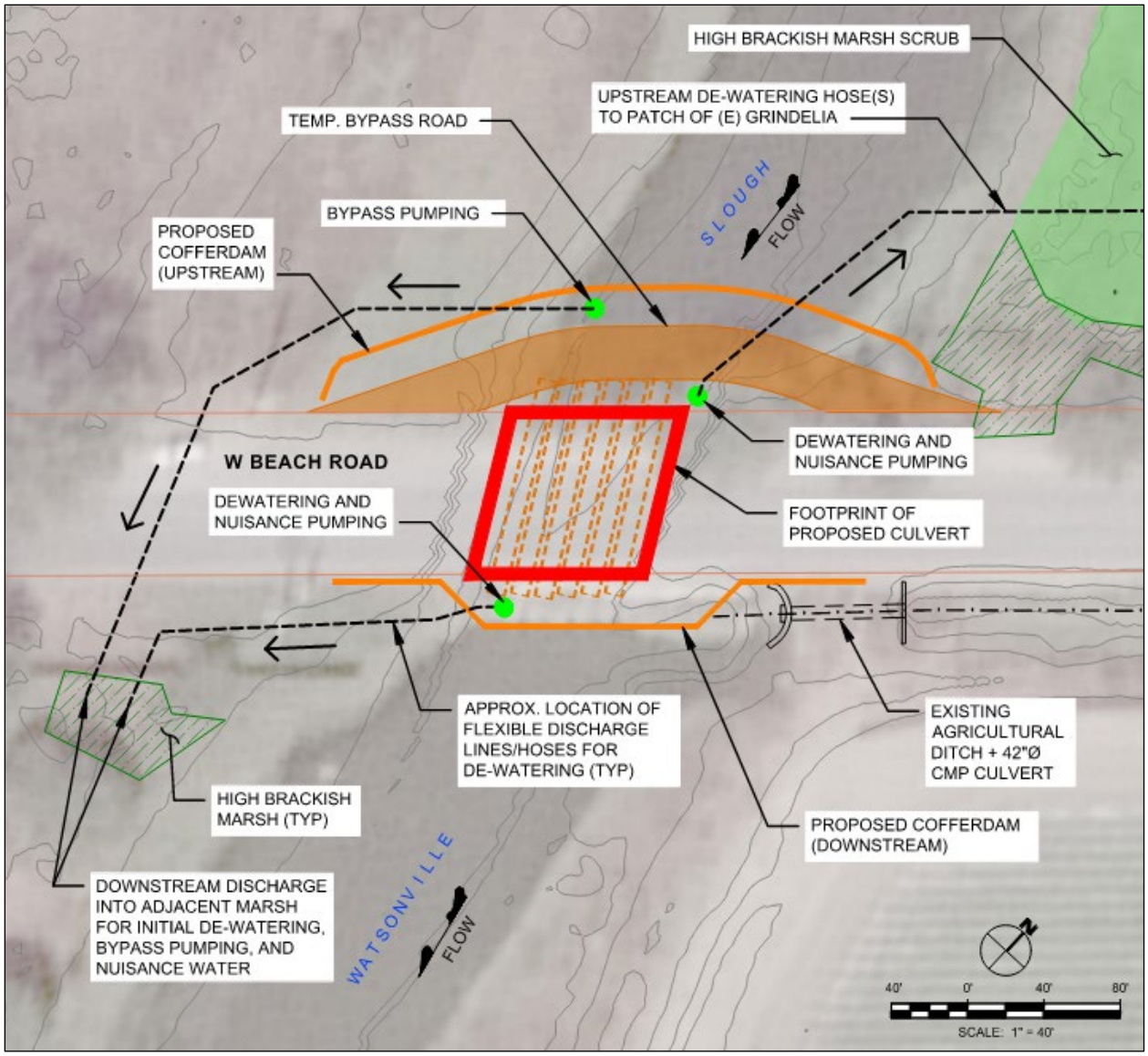


Figure 4. Plan View of Culvert Replacement Work Area

2.1.3 Flapgate Installation on Adjacent Agricultural Ditch

Currently, there is a 42-inch pipe culvert in the Beach Road Agricultural Ditch immediately east of the existing culverts which discharges agricultural runoff into the Slough. The pipe will be replaced with an outlet with a removable flap valve, duck-bill valve, or similar to prevent the higher lagoon water levels from moving upstream. Similar to the main culvert replacement work, the work at this single culvert will need to be isolated by a temporary cofferdam, use of bladders, or similar.

2.1.4 Utility Relocation

During the feasibility study, several utilities have been identified in the project area that may need to be relocated. A water main and sewer line, owned by the City of Watsonville, run below/underneath the W. Beach Road crossing. Pacific Gas & Electric (PG&E) owned utilities

and a low-voltage pressure transducer (which Santa Cruz County owns and maintains to monitor water levels for the Pajaro River Sandbar Mechanical Breaching Program[1] are in the immediate vicinity of the culvert replacement. Gas lines and overhead high-voltage electrical power lines run parallel to W. Beach Road. Existing utilities may impact the options for installation of temporary cofferdams and daily operations, and will need to be further investigated during Design and Implementation (D&I) phase.

2.1.5 Removal of Invasives and Planting of Native Plants

The proposed project will remove exotics and xeric species from the formerly “high and dry” areas and plant native marsh species on both County- and State-owned land parcels. The proposed project will include invasive vegetation removal within the project area, and implementation of a planting plan prior to project completion. The planting plan will be prepared in coordination with Watsonville Wetlands Watch and Amah Mutsun Tribal Band so that the project can leverage local and indigenous knowledge in selection and long-term management of native plants. See Attachment 3 for additional information.

2.1.6 Parking Lot Raise

During the feasibility study, modeling results showed a nuisance ponding impact (1-3 inch water depth) on the inboard side of the parking lot and picnic areas in the Palm Beach State Park, which are low grading areas. The USACE informed California State Parks about the potential nuisance flooding and coordinated with them to address their concerns. The proposed project includes a measure to raise some parts of the parking lot surface and re-paving the low areas to maintain runoff towards the channel. The project team assumed the overall parking lot gradient would continue to be gently sloped towards the channel and so the direction of runoff over the impervious surface would not change. However, USACE will refine this measure to reduce nuisance flooding on state park property during the D&I phase of the project.

2.1.7 Install Interpretive Signage

During the D&I phase of the project, a recreation plan will be prepared, and identify the location of interpretive signage. both in English and Spanish. The interpretive signage will facilitate the use of recreational area and inform locals and visitors to the Palm Beach State Park about the benefits of the restoration to the marsh and the interplay between infrastructure, natural lagoon closures, and marsh health.

[1] The Pajaro River Sandbar Mechanical Breaching Program is not part of the proposed project but a local action by County of Santa Cruz, overseen by the Central Coast Regional Water Quality Control Board (Water Quality Certification No. 34422WQ12; see Attachment 2 of this document), to open the Pajaro River mouth when it becomes closed by naturally formed sandbars, primarily between October 15 and April 15 and to prevent potential flooding on W. Beach Road crossing during winter months with heavy rainfall.

2.2 Temporary Project Components

This section describes the temporary project components and general means and methods of construction for the proposed project.

2.2.1 Temporary Road, Staging Areas and Access

The primary construction zone will be around the area of crossing improvement/ roadway raise along W. Beach Road. Trucking access to the project area will be from Beach Road (coming from City of Watsonville) and Shell Road. The project needs to maintain emergency access through W. Beach Road because it is a primary access route to/from the Pajaro Dunes Community and Palm Beach State Park. Access will be maintained at all times by constructing a temporary road so that emergency and service vehicles (e.g., fire and garbage trucks) will be able to service the area. The USACE will further consult with Santa Cruz County and local fire and safety departments on access needs during D&I.

The USACE has identified a potential staging area (approx. 56,800 sq. ft.) south of the W. Beach Road crossing (Figure 2) to store equipment and stockpile materials, debris, etc. as a primary staging area. The haul route will pass through agricultural fields, approximately 0.35 miles from staging area to the culvert replacement site. Dust control will be required by the contractor to limit impacts to adjacent agricultural, waterways, and residential areas. The USACE has also initiated coordination with California State Parks, which operates Sunset Beach and Palm Beach state parks, and Pajaro Dunes Community on use of a portion of the parking lot next to the intersection of W. Beach Road and Rio Boca Road for contractor use (e.g., rest area, eye wash station, etc.).

2.2.2 Dewatering

The culvert replacement work area will be dewatered and initially pumped dry using a 4 or 6-inch diameter diesel pump. It is anticipated that the contractor will pump the water into the marsh plain (upstream, downstream, or both). The pump outlet discharge momentum will likely be reduced by using a perforated pipe diffuser or sprinklers to disperse with initial flow into vegetated areas before allowing water to flow back into the Slough (Figure 5). Once pumped, the work area around the existing culverts will need to be dried out (by time and wind) and then periodically maintained by pumping out nuisance water. The exact layout and configuration of the dewatering system will be further refined during the D&I Phase.

Nuisance water pumping will be required because of leakage from the cofferdams. Typically, 2-inch gas-powered pumps (or smaller electric pumps) are suitable for this task. The water leakage will be monitored, and the pumps will be run on an as-needed basis. In addition to the nuisance water pumping, a Slough bypass pumping system will be needed to transfer Slough water from the upstream (i.e., the north side cofferdam) to downstream of the south cofferdam during construction. Similarly, there may be bypass pumping required to transfer water from the agricultural/tidal ditch at south bank around the south cofferdam.

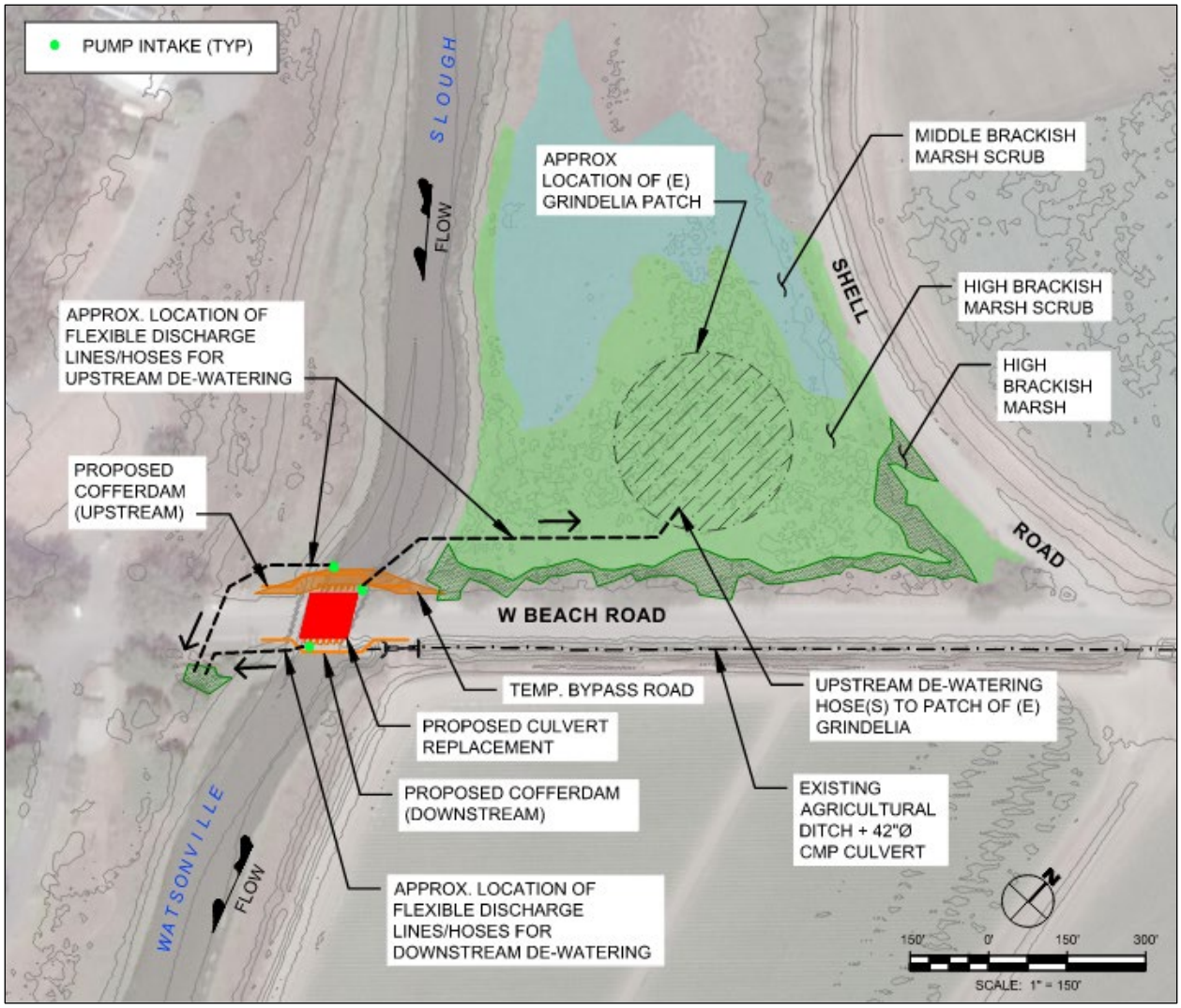


Figure 5. Dewatering Schematic

2.2.3 Cofferdam Installation

Installation of the new culvert at the W. Beach Road crossing will require establishing and maintaining a dry working area in the Slough. This will be accomplished by the installation of cofferdams and dewatering of an approximately 100-foot section of the Slough for construction. The cofferdam installation will also be required for dewatering to replace a pipe and flapgate on the Beach Road Agricultural Ditch, which runs parallel to W. Beach Road near the toe of the south bank.

The in-water work window would be between June 15 and September 30 (i.e., during the dry season) when Slough flow is low, i.e., approximately 1-2 cfs. Slough flow upstream of W. Beach Road is influenced by Shell Road Pump Station, which is located approximately 1,200 feet north of the project area. Flows and releases from this pump station may need to be adjusted and scheduled for safe water handling around the project area in addition to the flow in the Slough. The expected volume of agricultural runoff in the ditch during the construction season will be

further investigated during D&I and incorporated appropriately into the design of the cofferdams and water bypass system.

Prior to cofferdam installation, fish barriers will be installed outside of the expected footprint of the cofferdams for fish capture and relocation (see Section 2.3 and Attachment 3 for more detail on dewatering and fish capture/relocation methods). Cofferdams will be designed to exclude water under all possible flows (including daily tidal fluctuations) during construction. Potential cofferdam types that may be used are presented in Table 1. At this feasibility phase, it is preferred to include a variety of options for cofferdam types. The presence of existing utilities may eliminate some options due to cost and possible public safety. The desired cofferdam type also may vary by contractor.

Table 1. Cofferdam (Barrier) Types

Type	Description	Notes
Earthen Berm	A temporary berm or shallow ridge of compacted soil would be placed to form a barrier to prevent surface water access to the culvert work area. Potential for loss of berm material causing increases in turbidity would be balanced against design considerations, although the berm would be covered with poly sheeting (e.g., visqueen) to minimize this impact.	Loader and excavator to move soil (delivered by dump trucks and loaders) into the Slough.
Sand/Gravel Bag Berm	Reinforced fabric bags (super sacks) would be filled with sand or gravel, and laid end to end to form a barrier that prevents surface water from reaching a specific area (work area). Multiple levels of bags can be used and plastic sheeting incorporated into the barrier to help prevent water seepage through the barrier. Sand bags may be suitable at tidal ditch.	Fill 1 cubic yard (CY) supersacks and install with excavator; may access from slough shore then off of supersack base if needed for ground pressure.
Aqua-Barrier	Inflatable barriers made from laminated industrial grade vinyl coated polyester and available in a variety of sizes (lengths and heights) would be used to prevent surface water from reaching the work area.	Probably least amount of surface and aquatic impact; however, it may not be as reliable as other cofferdam types.
Sheet piles	Long structural sections with a vertical interlocking system, in various sizes, would be used to create a continuous wall to exclude water from work areas.	Sheet piles may be installed with a vibratory hammer mounted on excavator.

As shown in Figure 3, there will be two cofferdams (water barriers), upstream and downstream of the existing culverts. The distance between the two cofferdams will be less than 100 feet. The area of temporary impacts is conservatively estimated to be less than 1 acre as calculated approximately 160' times 100' = 16,000 sq. feet, say 20,000 sq. feet (i.e., 0.5 acres) assuming the area outside the cofferdams that contractors will have to access and work around. As soon as the culvert replacement work is completed, the cofferdams and associated water bypass system will be removed.

2.2.4 Temporary Water Diversion

The in-water work for the proposed project will occur between June 15 and September 30 (dry season), when the flow of the Slough is low and the lagoon mouth is typically open, which will reduce the risk of a backwatering event that could flood the work area. The upstream cofferdam will be designed to accommodate all possible flows during construction. Fish barriers will be installed outside of the limits of the cofferdams.

2.2.5 Emergency Lagoon Breaching

If the Pajaro Lagoon mouth is closed or closes during construction, the Santa Cruz County will mechanically breach the sandbar to reduce overtopping of the downstream cofferdam, and implement the Best Management Practices (BMPs) in the existing sandbar breaching protocol using County's breaching permit (see Attachment 2).

2.3 Mitigation Measures

This section describes proposed Best Management Practices (BMPs) and Avoidance and Mitigation Measures (AMMs) that will be incorporated into the project design to minimize temporary impacts of the proposed project.

2.3.1 BMPs

The following BMPs will be implemented to minimize construction impacts:

- Access roads and disturbed ground along construction routes will be wetted regularly to prevent dust from leaving the construction area.
- Stockpiles (e.g., debris, soil, sand, other materials) that can produce dust will be wetted or covered.
- All fill material, rubble, and spoils will be covered while in transport to/from the project site.
- All construction equipment would be cleaned before entering and upon leaving the study area to prevent introduction or spread of invasive species.
- Equipment previously used in a waterway or wetland will be disinfected to prevent spread of aquatic disease organisms.
- Construction mats will be placed at exits to public roads to limit mud from heavy equipment

- Implement additional mitigation measures as required by programmatic permits (see Section 2.3.2 below).

2.3.2 AMMs

To protect the existing sensitive resources and conservation values in the project area during construction activities, general protection measures and applicable site-specific avoidance and minimization measures reduce adverse effects (see Attachment 3 for more detail). Below are the descriptions of some AMMs that are designed to reduce impacts to special status species.

Staging areas will be established for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants in coordination with resource agencies. Staging areas will have a stabilized entrance and exit, and will be located at least 100 feet from bodies of water unless site-specific circumstances do not provide such a setback, in such cases the maximum setback possible will be used. If an off-road site is chosen and if special-status species are potentially present, a biological monitor will survey the selected site to verify that no special status species are present or that staging activities can be modified so that impacts can be avoided or minimized to acceptable levels.

All in-water work will occur between June 15 and September 30. For pile driving, USACE will develop a plan to minimize noise impacts to special-status species and submit it to relevant agencies for approval prior to the start of in-water construction. However, pile driving is expected to be conducted only with vibratory or low/nonimpact methods (i.e., hydraulic) that would result in sound pressures below threshold levels to the extent feasible.

For dewatering, cofferdams will be installed both upstream and downstream to isolate the extent of the work areas. The construction of cofferdams will begin in the upstream area and continue in a downstream direction, allowing water to drain and fish and aquatic wildlife species to leave (under their own volition), from the area being isolated by the cofferdam prior to closure. When construction of the upstream dam is completed and the work area has been naturally drained of flow, the downstream dam will be completed, and then flow will be diverted around the work area. Cofferdams and stream bypass systems will remain in place and fully functional throughout the construction period. In order to minimize adverse effects to aquatic species, stream bypass will be limited to the shortest duration necessary to perform the restoration activity and to allow special-status species time to leave on their own before final clearance surveys and construction can begin. Also, in-water cofferdams will be built with the intent of minimizing siltation and/or turbidity.

When bypass pipes are installed for water diversion, debris racks will be placed at the bypass pipe inlet in a manner that minimizes the potential for fish impingement and/or entrapment. Where feasible, bypass pipes will be monitored for accumulation of debris, and all accumulated debris will be removed. The pipe outlet energy dissipaters will be installed to prevent scour and turbidity at the discharge location. When water is pumped from within the construction area, it will be pumped to upland marsh areas and to a location where it can infiltrate without return

flows to the watercourse. A fish capture and relocation plan will be developed and implemented for review and approval by USFWS. Upon completion of construction activities, any diversions or barriers to flow will be removed in a manner that will allow flow to resume with the least disturbance to the substrate and consideration of turbidity levels.

3 STATUS OF THE SPECIES

According to 50 CFR §402.02, the action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Therefore, the action area was defined as a 2-mile radius from the project area to encompass areas of potential direct and indirect impacts from the proposed project (Figure 6). Attachment 1 includes the official species list referenced for this project and action area. As indicated above in Section 1, the USACE is requesting formal consultation on Tidewater Goby and its designated critical habitat, and CRLF.

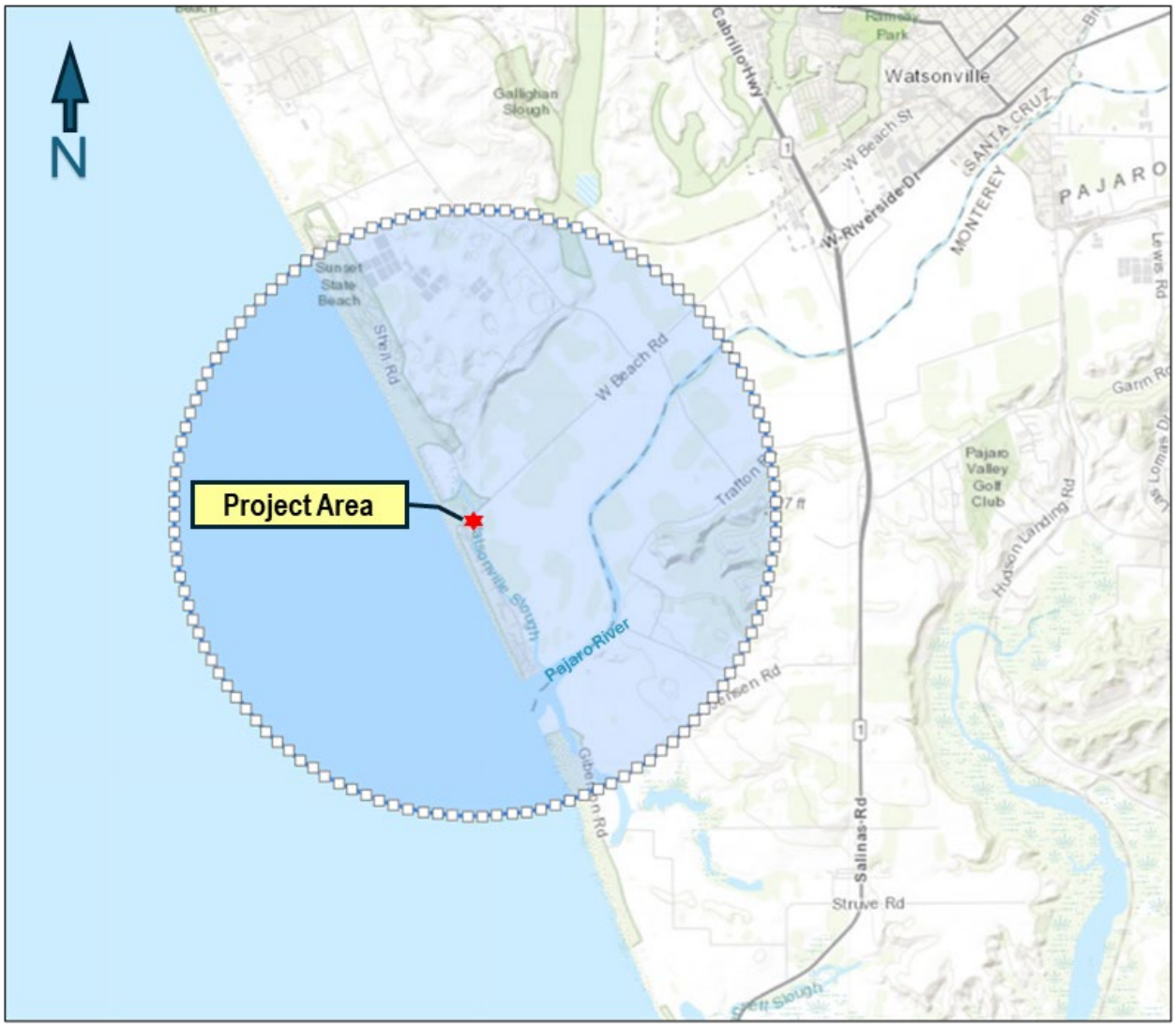


Figure 6. Action Area

3.1 Tidewater Goby

3.1.1 Range

Tidewater Goby was listed as endangered on March 7, 1994 (59 FR 5494). The species is endemic to California, ranging from northern Del Norte County south to San Diego County. Tidewater gobies are absent from areas where the coastline is steep and streams do not form lagoons or estuaries. Tidewater gobies will migrate upstream from lagoons into tributaries. Distances of up to half a mile are common; however, tidewater gobies can travel 3 to 5 miles upstream.

Migration of tidewater gobies to new lagoons is uncommon and often weather dependent. The coastal lagoons where tidewater gobies occur are usually closed to the ocean due to being separated from the marine environment by a sandbar. Fish dispersal typically occurs when high volumes of fresh water flow into lagoons, causing the barrier between the lagoon and the ocean (or bay) to breach thereby opening the lagoon and giving it direct connection to the marine environment. This may cause tidewater gobies to enter the ocean. An expelled tidewater gobies may re-enter the same lagoon or, depending on near shore currents and distance flushed, they may enter a different lagoon (provided it, too, is open). These dispersing individuals may add to existing tidewater goby populations, or they may recolonize a location that does not have gobies (USFWS 2025a).

3.1.2 Life History

Tidewater Goby is a small, elongate, grey-brown fish that rarely exceeds 2 inch standard length. It is characterized by large pectoral fins. Tidewater Goby is primarily an annual species in central and southern California, although some variation in life history has been observed. If reproductive output during a single season fails, few (if any) tidewater gobies survive into the next year. Reproduction typically peaks from late April or May to July and can continue into November or December depending on the seasonal temperature and amount of rainfall. Males begin the breeding ritual by digging burrows (3 to 4 inches deep) in clean, coarse sand of open areas. Females then deposit eggs into the burrows, averaging 400 eggs per spawning effort and males remain in the burrows to guard the eggs. Male tidewater gobies frequently forego feeding, which may contribute to the mid- summer mortality observed in some populations. Within 9 to 10 days, larvae emerge and are approximately 0.20 to 0.27 inch in length. Tidewater gobies live in vegetated areas until they are 0.60 to 0.70 inch long. When they reach this life stage, they become substrate-oriented, spending most of the time on the bottom rather than in the water column. Both males and females can breed more than once in a season, with a lifetime reproductive potential of 3 to 12 spawning events. Vegetation is critical for over-wintering tidewater gobies because it provides refuge from high water flows (USFWS 2016).

3.1.3 Preferred Habitat

Tidewater Goby typically inhabits coastal lagoons, estuaries, and marshes, preferring relatively low salinities of approximately 12 parts per thousand (ppt). The Tidewater Goby habitat is characterized by brackish estuaries, lagoons, and lower stream reaches where the water is fairly still but not stagnant. Tidewater gobies tend to be found in the upstream portions of lagoons. They can withstand a range of habitat conditions and have been documented in waters with salinity levels that range from 0 to 60 ppt, temperatures from 46 to 77 degrees Fahrenheit, and depths from approximately 10 inches to 6.5 feet. Tidewater Goby feeds on small invertebrates, including mysids, amphipods, ostracods, snails, aquatic insect larvae, and particularly chironomid larvae; however, tidewater gobies of less than 0.30 inch in length probably feed on unicellular phytoplankton or zooplankton, similar to many other early-stage larval fishes (USFWS 2016).

3.1.4 Critical Habitat

Critical habitat was designated for Tidewater Goby on February 6, 2013 (78 FR 8746). Critical habitat Unit SC-8 (Pajaro River) includes the lower reach of the Pajaro River and Lagoon, as well as the lowermost 1.2 miles of Watsonville Slough south of W. Beach Road. Unit SC-8 is currently considered occupied by Tidewater Goby (Figure 7). The Federal Register critical habitat designation notice for tidewater gobies defines the primary constituent elements as follows (78 FR 8746):

- Persistent, shallow (in the range of approximately 0.3 to 6.6 feet (0.1 to 2 meters)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 parts per thousand, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following:
    - Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
    - Submerged and emergent aquatic vegetation, such as Sago pondweed (*Stuckenia pectinata*), ditch grass (*Ruppia maritima*), broadleaf cattail (*Typha latifolia*), and bulrushes (*Scirpus* spp.), that provides protection from predators and high flow events; or
    - Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

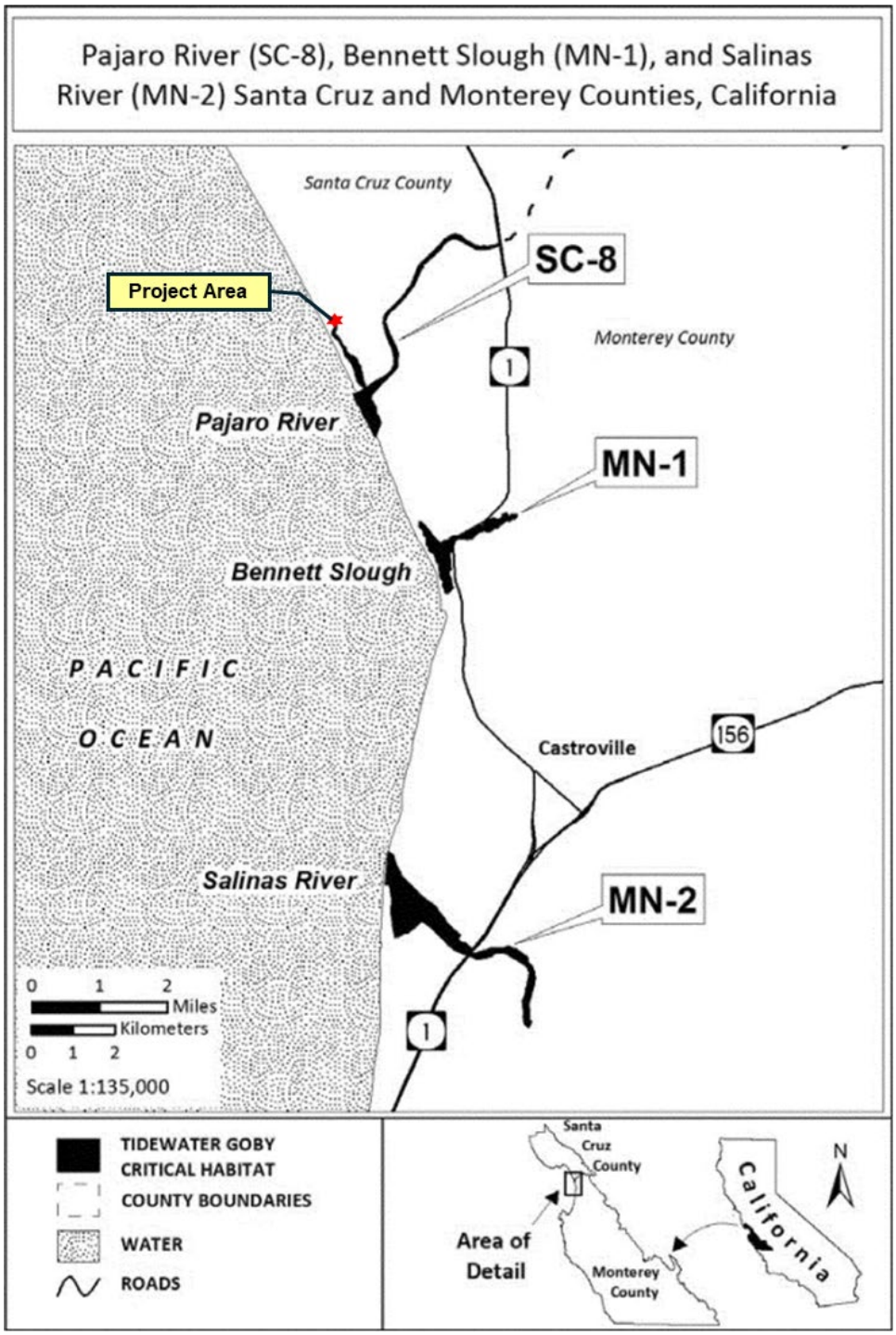


Figure 7. Tidewater Goby Critical Habitat (USFWS 2013)

3.2 California Red-legged Frog

3.2.1 Range

The CRLF was federally listed as threatened on May 23, 1996 (61 FR 25813) throughout its range in California. CRLF is known to occur in 35 counties in California extending along the

California Coast Range from southern Mendocino County to Santa Barbara County, through the northern transverse ranges from Santa Barbara County to Los Angeles County, and in isolated populations in the Sierra Nevada foothills, Riverside County, and San Diego County. CRLF is no longer found in the Central Valley of California, but is still common in the San Francisco Bay Area and along the Central Coast of California. Additional populations are found in Baja California, Mexico (USFWS 2025b).

3.2.2 Life History

CRLF is the largest native frog in the western United States. Adult females are larger than males at 5.4 inches (138 millimeters) while males reach 4.5 inches (116 millimeters). The CRLF is a colorful amphibian. The abdomen and hind legs of adults are often red or salmon pink. The back of this species is characterized by small black flecks and larger irregular dark blotches, with indistinct outlines on a brown, gray, olive or reddish-brown background color.

Most male CRLF reach sexual maturity at 2 years and females at 3 years of age and are often prolific breeders. In the wild, a few individuals may live up to 5 years. They lay their eggs during or shortly after large rainfall events in late winter and early spring between November through May. Each egg mass contains about 300 to 4,000 eggs, but fewer than 1% of eggs laid survive the tadpole phase (USFWS 2025b).

Adult CRLF are largely nocturnal whereas juveniles are active both day and night. Frogs are inactive in cold temperatures in the winter months and in hot, dry conditions in the late summer. They may be active all year in coastal areas where temperatures don’t fluctuate as much.

3.2.3 Preferred Habitat

CRLF 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 feet 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 non-native 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 CRLF and non-native predators (USFWS 2002).

The habitats used by the CRLF may vary throughout its life. The CRLF 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. CRLF 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 ppt and increased siltation during the breeding season can cause asphyxiation of eggs and small larvae (USFWS 2002). The larvae remain in the aquatic habitats until they metamorphose into juvenile terrestrial frogs several months later.

Adult and juvenile CRLF 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 CRLF 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, CRLF can move long distances between aquatic habitats, traversing upland habitats or ephemeral drainages up to 1 mile from the nearest known frog populations. One translocated CRLF 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 2002). Seeps and springs in open grasslands can function as foraging habitat or refugia for wandering frogs (Jennings and Hayes 1994).

3.2.4 Critical Habitat

The final critical habitat was designated for CRLF on March 17, 2010 (75 FR 12816). The critical habitat Unit SCZ–2 (Watsonville Slough) is located along the coastal plain in southern Santa Cruz County, north of the mouth of the Pajaro River and seaward of California State Route (SR) 1. It includes locations in the Watsonville Slough system, including all or portions of Gallighan, Hanson, Harkins, Watsonville, Struve, and the West Branch of Struve sloughs. The critical habitat Unit SCZ–2 does not overlap with the action area (see Figure 8).

The Federal Register critical habitat designation notice for CRLF defines the primary constituent elements (PCEs) for the CRLF as follows (50 FR Part 17):

- Space for individual and population growth and for normal behavior;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, or rearing (or development) of offspring; and,

- Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

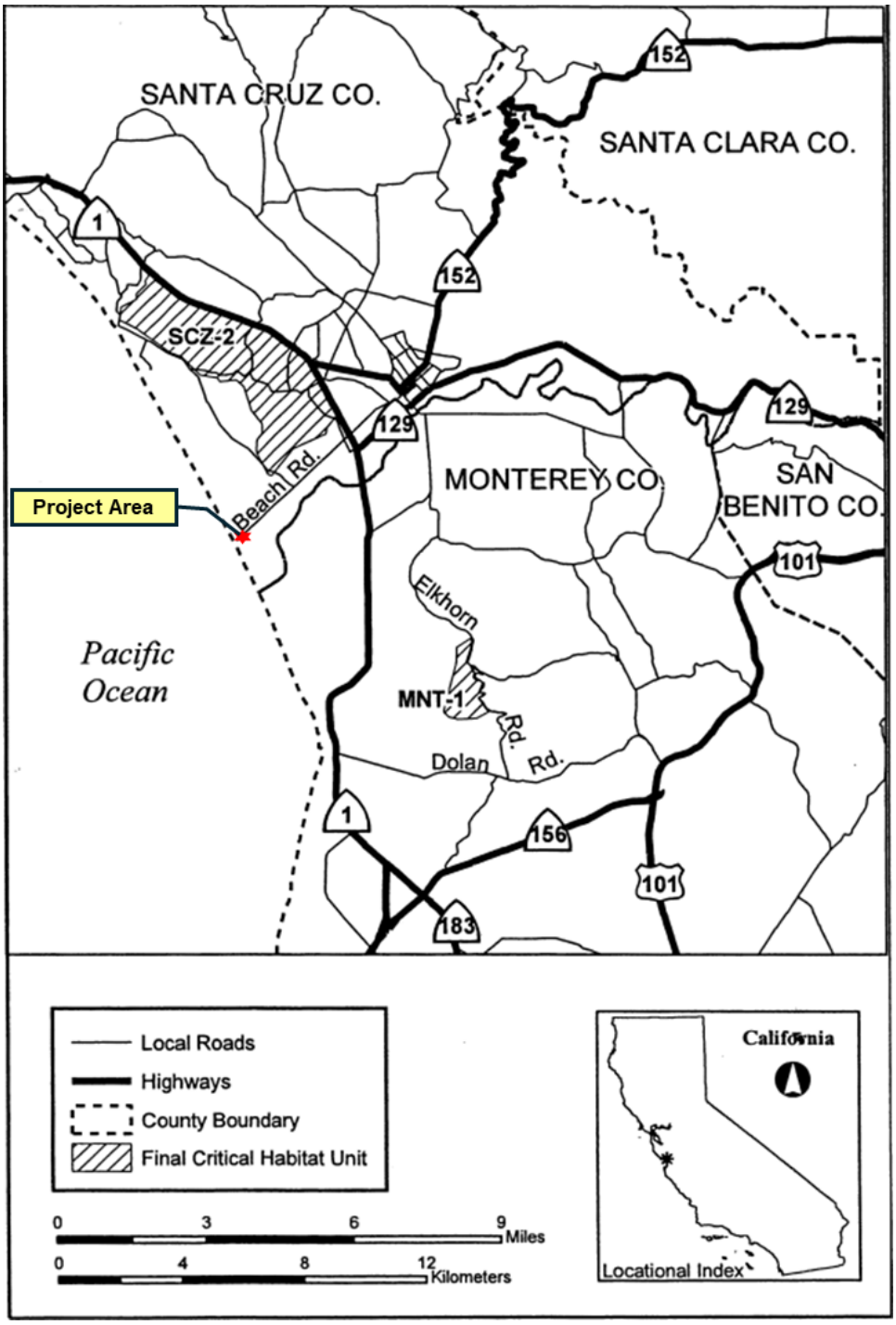


Figure 8. California Red-legged Frog Critical Habitat (USFWS 2006)

4 ENVIRONMENTAL BASELINE

4.1 Hydrology

The mouth of the Pajaro River Lagoon periodically closes due to the formation of a barrier beach that is created by wave-driven sand transport during low river flows. When the lagoon is closed, the project area becomes disconnected from tidal forcing, and water levels in the lower Watsonville Slough are determined predominantly by upstream inflows, runoff from adjacent agricultural lands, and losses due to evapotranspiration and seepage/infiltration. When the lagoon is open, both stream flow and tidal forcing play a role in water levels of the Slough, with tidal fluctuations having a more significant impact on the water levels. In general, these seasonal lagoon closures contribute significant hydrology and water availability to marsh plains adjacent to the sloughs and rivers associated with these lagoons, and the marsh plains are higher in elevation than those associated with strictly tidal, open estuaries. Therefore, much of the marsh plain in these systems is only inundated during lagoon closure events.

The land parcels immediately adjacent to the Watsonville Slough have been leveled in the past, are partially isolated from the Slough by berms, and are largely devoid of tidal channels or microtopographic heterogeneity. When the Pajaro River Lagoon is closed – which is a natural part of the hydrology in bar-built estuaries – water levels back up into the Slough. The water level at W. Beach Road crossing (Figure 9) periodically approaches the elevation of 8.0 feet NAVD88, which is a threshold indicating street flooding on W. Beach Road and triggers the County of Santa Cruz to mechanically breach the lagoon to prevent flooding and loss of emergency access to the Pajaro Dunes Communities. The mechanical breaching releases the water and drains the marsh plain artificially, truncating the natural hydrology in the perched marsh plain associated with bar-built estuaries.

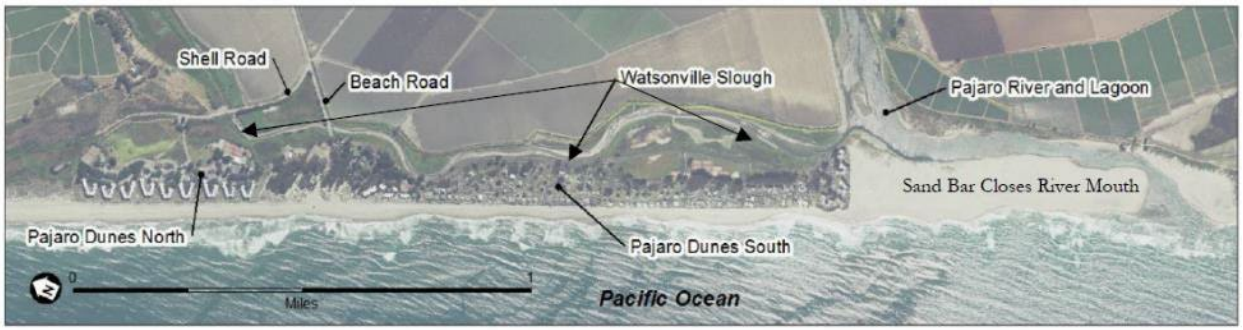


Figure 9. Lower Watsonville Slough and Pajaro River Lagoon

4.2 Water Quality

The Watsonville Slough and adjacent marsh plain have been modified for agriculture and urban development land uses. Two pump stations (Shell Road and Harkin Slough) manage flooding and saltwater intrusion in the lowlands. The water quality conditions of the Watsonville Slough are generally degraded. Degraded water quality in the Watsonville Slough is associated with

sedimentation (from soil erosion); nutrients (nitrate and phosphate, and pesticides); ammonia; pesticides; heavy metals (copper, nickel, lead, and zinc); localized algal blooms, and low dissolved oxygen; and pathogens. The lower Watsonville Slough receives all of the runoff from the entire Watsonville Sloughs watershed complex, including the untreated concentrated agricultural drainage from the Beach Road Agricultural Ditch. The overall value to wildlife in the coastal salt marsh of Watsonville Slough estuary is adversely affected by pesticide runoff from adjacent agricultural lands, reducing the invertebrate fauna on which many vertebrates forage (County of Santa Cruz 2003). Source control BMPs have been determined to be the best method to improve water quality in the Watsonville Slough.

The designated beneficial uses of Watsonville Slough as outlined in the Basin Plan for the Central Coast Region (1994) are presented in Table 2. The beneficial uses of water contact recreation (REC-1) and non-contact water recreation (REC-2) are not supported in the Watsonville Slough because fecal coliform concentrations exceed existing Basin Plan numeric water quality objectives.

Table 2. Beneficial Uses of Watsonville Slough (Central Coast Basin Plan 2019)

Water Contact Recreation	REC-1
Non-Contact Water Recreation	REC-2
Wildlife Habitat	WILD
Warm Fresh Water Habitat	WARM
Spawning, Reproduction, and/or Early Development	SPWM
Preservation of Biological Habitat of Special Significance	BIOL
Rare, Threatened, or Endangered Species	RARE
Estuarine Habitat	EST
Commercial and Sport Fishing	COMM
Source: Central Coast Regional Water Quality Control Board 2019	

The State Water Resources Control Board (SWRCB), with the concurrence of the U.S. Environmental Protection Agency (USEPA) and Regional Water Quality Control Boards (RWCQB), establishes a list of all impaired water bodies within the State under Section 303(d) of the Clean Water Act (CWA), which requires the identification of water bodies that do not meet, or are not expected to meet water quality standards (i.e., impaired water bodies). The affected water body, and associated pollutant or stressor, is then prioritized in the 303(d) List. The CWA further requires the development of a Total Maximum Daily Load (TMDL) for each listing and the Watsonville Slough is listed on the 303(d) List for various pollutants (Table 3).

In terms of groundwater water quality in the region, higher total salt content in the groundwater of the Pajaro Valley Groundwater Basin is predominantly due to the seawater intrusion as the coastal area has the highest potential for salt loading. Approximately 92% of the water used in the Pajaro Valley is pumped groundwater (PV Water 2020), and the groundwater levels in the

Basin have declined as a result of long-term groundwater overdraft. Nitrogen loading to the groundwater in the Pajaro Valley is primarily from agricultural fertilizer and irrigation runoff, streamflow recharge, and sewer and septic systems.

Table 3. List of 303(d) Water Quality Impairments for Watsonville Slough

Pollutant(s)	Potential Source	TMDL Schedule (Category 5 Criteria)*
Nitrate, Dissolved Oxygen	Agriculture, Domestic Animals/Livestock, Natural Sources, Urban Runoff/Storm Sewers	Required by 2018[a]
Toxicity, Turbidity	Unknown	Required by 2023[a]
DDE (Dichlorodiphenyldichloroethylene), Eshcherichia (E. Coli), Malathion		Required by 2027[a]
Fecal Coliform		Approved 2007[b]
Note: *Category 5 criteria: A water segment where standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed for this segment. TMDL requirement status definitions for listed pollutants are: a - TMDL still required, b - being addressed by USEPA approved TMDL.		
Data Source: California State Water Resources Control Board, 2018 California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report); available online: https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2018_integrated_report.html		

4.3 Biological Resources

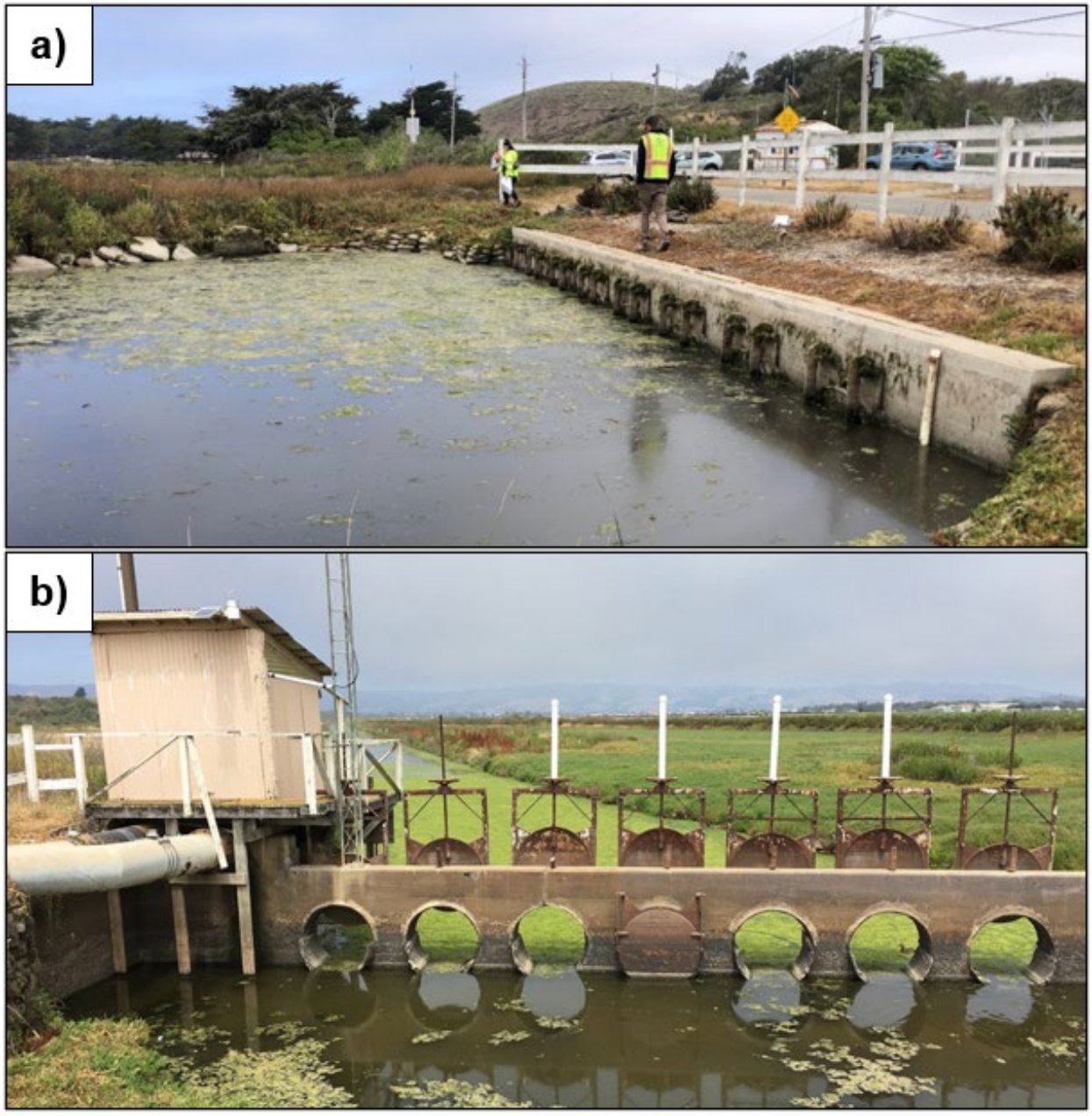
The aquatic habitat conditions in the Watsonville Slough have substantially deviated from those prior to the land use conversion. Aquatic habitat in the Watsonville Slough watershed is limited by the watershed's small size, low elevation, and relatively low gradient. Most tributary streams are dry by early summer. Steelhead and cold-water trout may have historically been present, but the habitat does not presently exist in sufficient abundance to support these species. Also, there are several federally managed fisheries that fall under Magnuson-Stevens Act: Pacific groundfish species and Coastal Pelagic species. These species would use the Pajaro River Lagoon and lower Watsonville Slough system at least seasonally for foraging. The Lagoon and lower Slough system are Essential Fish Habitat for these federally managed fisheries (Casagrande 2024).

The lower Watsonville Slough estuary receives all the runoff from the entire Watsonville Slough Watershed, including the untreated concentrated agricultural drainage from the Beach Road Agricultural Ditch. The overall value to wildlife of the coastal salt marsh in the Watsonville Slough estuary is adversely affected by pesticide runoff from adjacent agricultural lands, reducing the invertebrate fauna on which many vertebrates forage. The narrow width of the vegetated channel also places a constraint on the available habitat within the estuarine portion of the watershed (Swanson Hydrology & Geomorphology 2003).

Estuarine aquatic habitat is limited to the lower Watsonville Slough downstream of the Shell Road Pump Station (see Figure 2 for the location of the pump station in relation to the project area). This reach is a tributary to the Pajaro River Lagoon and supports water quality conditions

and fish populations typical of the larger lagoon environment. Smith (1993) found 25 fish species in the Pajaro River Lagoon of which nine were found in Watsonville Slough between Shell Road and the confluence with the lagoon. None of the species encountered by Smith (1993) are freshwater species. Threespine Stickleback (*Gasterosteus aculeatus*), Arrow Goby (*Clevelandia ios*), and Tidewater Goby (*Eucyclogobius newberryi*) are resident estuarine species. All others are marine species that use the lagoon and lower Watsonville Slough for spawning, juvenile rearing, and/or feeding. The Santa Cruz County has been conducting annual fish surveys in Pajaro Lagoon and Watsonville Slough at the confluence with Pajaro River since 2014, and Tidewater Goby have been found in 2 years of the recent past 6 years. The reach is influenced by tidal circulation as well as freshwater inflows from upper watershed areas. Existing closed culverts on W. Beach Road and flap gates at Shell Road prevent upstream movement of estuarine fish (Figure 10 and Figure 11, respectively; see Figure 2 for locations).

Figure 10. W. Beach Road Crossing and Existing Culverts



Note: a) Photo of Shell Road crossing with culverts and vent array, looking upstream; b) Photo of Shell Road crossing pump station with old flow control weir, looking upstream

Figure 11. Shell Road Culverts and Pump Station

4.4 Potential Occurrence of Listed Species

4.4.1 Tidewater Goby

Tidewater Goby have the potential to occur in the action area and have been documented in the lowermost reach of Watsonville Slough, downstream of the Shell Road Pump Station and Pajaro River with the highest abundance observed at the most upstream site sampled in Pajaro River approximately 2.9 miles above the confluence with Watsonville Slough (USFWS 2016).

4.4.2 California Red-legged Frog

The Pajaro River and Watsonville Slough system are known habitat for CRLF. However, this species has not been observed at the Pajaro Lagoon and extensive surveys have not revealed breeding within the lower Pajaro River or lower Watsonville Slough. The closest known breeding site is off-channel on the Monterey County side of the Pajaro River and approximately 0.75 mile upstream from the Lagoon (USFWS 2016). The critical habitat for CRLF does not overlap with the action area and the nearest occurrence of this species in Watsonville Slough is approximately 1.25 miles upstream from the project area (CNDDB 2024).

5 EFFECTS OF THE PROPOSED ACTION

5.1 General Habitat Impacts

Construction and maintenance activities associated with the proposed project will mainly take place within the wetland area around W. Beach Road and result in temporary impacts to wetland and terrestrial habitats. Construction activities will include clearing of some existing riparian vegetation to construct a temporary road within the Slough on either south or north side of the existing crossing at W. Beach Road, demolition of the existing culverts, and installation of a new culvert with fish passage. Approximately 1,300 LF of road raise from the crossing to the intersection of Shell Road will also be part of construction activities. Staging of equipment would be on a vacant land located approximately 1,000 feet south from the project area, and immediately adjacent to agricultural lands and riparian habitat along the Slough. The staging area identified for this project is already used for stock-piling of soils and staging of agricultural equipment, and temporary easement will be obtained prior to construction.

Construction effects to soil erosion would be localized to the project area, specifically to those areas cleared, grubbed, excavated, and graded. A detailed tree survey in the project area has not yet been done, but will be conducted during the D&I phase. Impacts to mature trees > 6 inches dbh will be avoided or minimized (See Attachment 3 for details). All temporarily disturbed areas will be de-compacted and seeded/planted with an assemblage of native plant species suitable for the project area. A planting plan will be prepared in coordination with Watsonville Wetland Watch and Amah Mutsun Tribal Band so that the proposed project can leverage local and indigenous knowledge in selection and long-term management of native plants. The planting plan will include details such as a schedule; plans for grading of disturbed areas to pre-project contours; planting palette with plant species native to the project area; invasive species removal; performance standards; success criteria; and maintenance requirements (e.g., weeding and replanting). Revegetation activities will commence as soon as practicable after construction activities at the project area are complete. The proposed project will have a temporary impact due to increased erosion from the exposure of topsoil immediately following the construction period. However, with successful revegetation of the disturbed areas, they would become stabilized, resulting in a long-term benefit to channel erosion beyond the existing conditions.

As part of habitat restoration efforts on both State- and County-owned parcels, patches of invasives and non-native plants will be removed, and plantings will be installed in any areas disturbed by construction (approximately 0.5 acre on the State-owned parcel), and in patches where exotics have been removed or native plants are particularly stressed (approximately 1 acre on the County-owned parcel and 0.5 acre on the State-owned parcel outside of areas affected by construction), and replace them with native marsh plantings.

Overall, the proposed project is expected to provide long-term beneficial effects to the wildlife habitat and prevention of soil erosion as vegetation that is planted matures and invasive species are reduced over time. The improvement of understory cover will also benefit wildlife as it provides enhanced habitat complexity and provides for additional refuge opportunity.

5.1.1 Aquatic Species

The proposed project will replace the existing culverts (which currently are a fish barrier, preventing the movement of fish upstream) at W. Beach Road crossing with a larger, fish friendly culvert that can accommodate the high water present during natural lagoon closures. By replacing the culverts and raising the road, a more natural hydrologic regime and connectivity between the Slough and the marsh plain would be maintained and improve ecosystem function. The inundation of the marsh plain during lagoon closures is primarily backwater flooding, which is typically less saline than the normal tidal flows. Native and non-native fish species are located above and below the W. Beach Road crossing and both would benefit from the removal of the existing closed culverts, daylighting the slough bottom substrates and the reconnection of aquatic habitat. Also, transitioning the stressed wetland environment back to a healthy marsh and riparian habitat would benefit native fish, protected fish species and amphibians. Therefore, the proposed project would have long-term benefits on aquatic habitat by restoring the quality and removing fish barrier at W. Beach Road.

During construction and maintenance activities, short-term sediment impacts downstream of the project area are expected due to temporarily increased turbidity and suspended particulate concentration during dewatering and stream diversion. The potential for the adverse effects on turbidity and other water quality constituents is expected to be minor and temporary, and measures that will be implemented to avoid or minimize these effects are discussed in Section 2.3 and Attachment 3. Overall, construction impacts to aquatic species would be minor, temporary, and localized. Construction impacts to aquatic habitat are expected to be fully offset by long-term beneficial effects to the function and value of the aquatic habitat. Specifically, the purpose of the completed project is to allow Pajaro River Lagoon to function as a more natural lagoon, and to restore and improve estuarine marsh and related wetland habitat for native, culturally significant, and federally listed species.

The only adverse effects expected from the proposed project would occur from capture and handling of Tidewater Goby should fish relocation be necessary. In that case, the relocation would be done by qualified fish biologists. A fish capture and relocation plan will be developed

prior to the start of in-water construction and submitted to USFWS for review. Measures would be implemented as described in the relocation plan and Attachment 3 to minimize adverse effects.

5.1.2 Vegetation

Although the construction activities will include clearing of some existing riparian vegetation, removal of riparian vegetation will be avoided where feasible, and vegetation clearing will be carefully designed to preserve wherever feasible trees with high ecological value (snags, living trees with cavities, or other large, mature trees), as well as any special status plants, and to remove invasive species. Preconstruction surveys for special status plants and high ecological value native trees will be conducted to identify and preserve them where possible. In areas where avoidance is not practicable, native trees and shrubs to be removed for construction will be preserved, transplanted, and incorporated into the planting scheme to the extent possible (see Attachment 3).

During construction, the spread of noxious weeds and invasives will be controlled to the greatest extent practicable. Equipment will be required to be washed and free of weed seeds and inspected to ensure it is compliant before starting work. Disturbed areas will be seeded with a native grass seed mix, including a fast-germinating sterile grass to provide immediate cover and reduce bare ground. See Attachment 3 for specific measures intended to prevent spread of invasive species and revegetate disturbed areas during construction.

Post-construction, all graded areas outside of active channels will be revegetated with native riparian species to restore habitat, control erosion, and prevent invasive re-establishment. During revegetation, erosion control fabric, hydromulch, or other mechanisms will be applied as appropriate to provide protection to seeds and help them retain moisture. Revegetated areas will be regularly monitored for survival until minimum survival or cover is achieved. If soil moisture is deficient, new vegetation will be supplemented with water until vegetation is firmly established. If invasive plant species colonize revegetated areas, hand and or mechanical removal and replanting with additional native species will be performed.

As part of habitat restoration efforts on both State- and County-owned parcels, patches of invasives and non-native plants will be removed, and plantings will be installed in any areas disturbed by construction (approximately 0.5 acre on the State-owned parcel), and in patches where exotics have been removed or native plants are particularly stressed (approximately 1 acre on the County-owned parcel and 0.5 acre on the State-owned parcel outside of areas affected by construction), and replace it with native marsh plantings. The removal of these patches of non-native vegetation will help prevent the spread of non-natives to other portions of the lower Watsonville Slough. The proposed action is expected to provide a higher long-term benefit to native plant communities in the study area as revegetated areas become stabilized over time.

Operation and maintenance activities of the proposed action will primarily consist of vegetation management, and they could infrequently include activities such as repairing or adjusting structures using heavy equipment. These activities would follow standard BMPs to avoid or minimize impacts to sensitive species and habitats. Overall, project construction impacts to vegetation are expected to be offset by long-term beneficial effects of replanting with native plants and removal of invasives.

5.2 Effects on Tidewater Goby

Tidewater Goby have moderate to low potential to occur in the action area, and their presence has been documented in the lowermost reach of the Watsonville Slough, downstream of the Shell Road Pump Station and Pajaro River. The highest density of tidewater gobies was observed at the most upstream site sampled in Pajaro River approximately 2.9 miles upstream of the confluence with Watsonville Slough (USFWS 2016). The Santa Cruz County has been conducting annual fish surveys in Pajaro Lagoon and Watsonville Slough at the confluence with Pajaro River since 2014, and the tidewater gobies have been found in 2 years of the recent past 6 years.

In the event that they are observed during the preconstruction survey, should relocation of Tidewater Goby (and other native fish) be necessary, it would involve capturing and handling the species and follow NMFS' Capture and Relocation of Salmonids Guidelines (see Attachment 3) prior to construction of the water diversion structures (e.g., cofferdams). This work will be conducted by qualified fisheries biologists, and a plan for conducting the capture and relocation will be submitted to USFWS prior to construction.

Potential adverse effects to Tidewater Goby would occur due to the proposed capture/handling/relocation measures (should they be necessary) prior to construction of the water diversion structures for dewatering. However, the species is considered to have low potential to be present in the project area because the construction will occur during a period of low flows (1 to 2 cfs) and water temperatures are expected to be high. Therefore, adverse effects to the species may not occur if no individuals are detected.

Over the long term, the proposed project will result in beneficial effects to tidewater gobies because of the replacement existing closed culverts with an open-bottom, fish friendly culvert, daylighting the slough bottom substrates and reconnection of aquatic habitat.

5.3 Effects on Tidewater Goby Designated Critical Habitat

The purpose of the proposed project is to create a more natural hydrology in the Pajaro River Lagoon, and improve fish passage in Watsonville Slough by replacing the existing culverts with a fish-friendly culvert at the W. Beach Road crossing. Non-native vegetation will be removed, and replanted with native plants. Consequently, the long-term effects of the project are expected to be beneficial. Construction impacts are expected to be minor, temporary and localized and

construction activities will include extensive BMPs and AMMs as described in Attachment 3. The USACE has determined that construction impacts are not likely to adversely affect Tidewater Goby designated critical habitat.

5.4 Effects on California Red-legged Frog

CRLF has low potential to be present in the project area because the nearest recorded observation of the CRLF occurred approximately 1.25 miles upstream from the project area. In the rare event that CRLF are observed during the preconstruction survey, a USFWS-approved biologist will coordinate with USFWS and will determine measures for avoiding or minimizing impacts to CRLF individuals.

Potential effects to CRLF are expected to be minimal because it is very unlikely that this species is present in the project area during construction. Additionally, the implementation of BMPs and AMMs (Attachment 3) including the environmental work window for in-water work between June 15 and September 30 is expected to avoid and minimize adverse impacts during construction activities. As mentioned in Section 3.2.2, the CRLF breeding season typically is from late November to late April, which is outside of the construction period. The sites used for rearing of larvae and metamorphs include streams with deep pools, backwater streams and creeks, natural and artificial ponds, and freshwater marshes and lagoons. The lower Watsonville Slough does not provide rearing habitat of deep pools and backwater for CRLF in the summer because the flow is very low and the Pajaro Lagoon is typically open.

Preconstruction surveys and monitoring will be conducted and ensure that young-of-year (recently metamorphosed) amphibians have dispersed from the breeding habitat. In a rare event that any CRLF are detected, adverse effects may occur because they likely will be captured and handled depending on the avoidance and minimization measures implemented.

Overall, USACE has determined that the proposed project is not likely to adversely affect CRLF because the likelihood that this species would be present in the project area during construction is discountable. However, preconstruction surveys for CRLF will be conducted and USACE will coordinate with USFWS prior to construction on how to proceed should any individuals be detected.

5.5 Cumulative Effects

Under ESA, cumulative effects are “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation” [50 CFR §402.02]. Future State or private actions not involving federal permits in the action area are expected to be limited to the Pajaro River Lagoon Sand Bar Breaching Project Program, and ongoing farming activities or vegetation management on State or private lands, which are not requiring encroachment into waterways.

The Pajaro River Lagoon Sand Bar Breaching Program is ongoing and would continue to occur in the reasonably foreseeable future. However, this project would not have significant effect on the environment with required mitigation measures according to the findings documented in the Initial Study under California Environmental Quality Act (Attachment 2). Cumulative impacts to human environment are not expected to be significant or unmitigable.

The proposed project would reduce the frequency of the sand bar breaching (which would in turn reduce the impacts associated with the sand bar breaching although they are insignificant) and restore more natural hydrology of tidal marsh and wetlands and improve fish passage in the lower Watsonville Slough. Native plantings and invasive vegetation removal would increase in habitat value in the study area and provide long-term benefits for air quality, GHG reduction through carbon sequestration, biological resources, and public service (i.e., emergency access for fire protection, medical services, and improved public access to beach).

6 CONCLUSION

Based on the effects analysis discussed in Section 5, the determination of effects on Tidewater Goby and CRLF is based on the potential for these species to occur within the action area, and the potential for adverse or beneficial effects of the proposed project on these species. For the Tidewater Goby, it is determined that the proposed project may affect, and is likely to adversely affect because of capture and handling from relocation should that be necessary prior to construction activities. Effects from project construction activities are expected to be minor, temporary, and localized and hence not likely to adversely affect Tidewater Goby or its designated critical habitat. The USACE has determined that the proposed project may affect, but is not likely to adversely affect CRLF because the likelihood that the species will occur in project area during construction is discountable, and its designated critical habitat for CRLF does not occur in the action area.

7 REFERENCES

California Department of Fish and Wildlife (CDFW). 2024. California Natural Diversity Database (CNDDB) RareFind 5. Biogeographic Information Observation System data query. Accessed 3/1/2024. Available online: CNDDB RareFind 5 (ca.gov)

Casagrande, J. 2024. Fisheries Biologist, California Coastal Office. NOAA Fisheries. Electronic mail to Jamie You, U.S. Army Corps of Engineers, dated May 13, 2024. Subject: Re: Watsonville Slough CAP 1135 Study - Draft Project Description.

Central Coast Regional Water Quality Control Board. 2019. Water Quality Control Plan for the Central Coastal Basin, June 2019 Edition. California Environmental Protection Agency.

County of Santa Cruz. 2003. Watsonville Sloughs Watershed Resource Conservation & Enhancement Plan. Prepared for County of Santa Cruz Planning Department. Prepared by Swanson Hydrology & Geomorphology. January 2003. Available online: WSCEPTechnicalAppendices.pdf. Accessed 2/20/2024.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Report prepared for the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.

Pajaro Valley Water Management Agency (PV Water). 2020. Watsonville Sloughs Hydrologic Monitoring, Santa Cruz County, California, Water Year 2021. Prepared by: Balance Hydrologics, Inc. Prepared for: Pajaro Valley Water Management Agency. Dated September 6, 2022. Available online. Accessed on 3/1/2024: https://www.pvwater.org/images/Watsonville_Slough_System_Hydrologic_Monitoring_Water_Year_2021.pdf

Rathbun, G. B., and J. A. Schneider. 2001. Translocation of California red-legged frogs (*Rana aurora draytonii*). Wildlife Society Bulletin 29:1300-1303.

Smith, J.J. and The Habitat Restoration Group. 1993. Technical Appendix A: Aquatic Habitat and Fisheries. In: Pajaro River Lagoon Management Plan, Mitchell Swanson & Associates. 1993.

Swanson Hydrology & Geomorphology. 2003. Watsonville Sloughs Watershed Resource Conservation & Enhancement Plan. Prepared for County of Santa Cruz Planning Department. Prepared by Swanson Hydrology & Geomorphology. January 2003. Available online: WSCEPTechnicalAppendices.pdf. Accessed 2/20/2024.

U.S. Fish and Wildlife Service (USFWS). 1997. Guidance on Site Assessment and Field Surveys for California Red-legged Frogs (*Rana aurora draytonii*) U.S. Fish and Wildlife Service. February 18.

USFWS. 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland Oregon. 173 pp.

USFWS. 2016. Biological Opinion for Sandbar Breaching at the Mouth of the Pajaro River, Santa Cruz County, California. Date: January 6, 2016. 08EVEN00-2016-F-0101

USFWS. 2025a. Tidewater Goby. https://www.fws.gov/species/tidewater-goby-eucyclogobius-newberryi

USFWS. 2025b. California Red-legged Frog. https://www.fws.gov/species/california-red-legged-frog-rana-draytonii

Attachment 1

U.S. Fish and Wildlife Service's (USFWS) Information Planning and Conservation System (IPaC) Database Search and Screening of Federal Special-Status Wildlife, Fish, and Plant Species Potentially to Occur in Action Area

Based on database searches from U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) website (see search results in this Attachment), the table below provides a list of potential federally endangered and threatened species that may be present within the action area. The listed species' potential to occur in the action area is further determined by the presence and absence data based on the data query using RareFind 5 in California Department of Fish and Wildlife (CDFW)'s California Natural Diversity Database (CNDDB). The table presents the CDFW's CNDDB data review, and evaluation of the special-status species with a likely potential to occur within the action area. Based on the initial screening of species from the IPaC search results for the potential to occur within the action area, two species – California Red-legged Frog (*Rana draytonii*) and Tidewater Goby (*Eucyclogobius newberryi*) – are advanced to evaluate potential effects of the proposed project to these species.

Federal Special-Status Wildlife, Fish, and Plant Species Potentially to Occur in Action Area

Common Name	Scientific Name	Status	Potential to Occur in Action Area
Mammals			
San Joaquin Kit Fox	*Eumetopias jubatus*	Endangered	Unlikely – although the species' current range overlaps the action area, there is no record of occurrence on CNDDB in the action area.[1,2]
Southern Sea Otter	*Enhydra lutris nereis*	Threatened	Unlikely – the species range does not overlap with Watsonville Slough.[2]
Birds			
California Condor	*Gymnogyps californianus*	Endangered	Unlikely – although the species' current range overlaps the action area, there is no record of occurrence on CNDDB in the action area.[1,2]
California Least Tern	*Sterna antillarum browni*	Endangered	
California Ridgway's Rail	*Rallus obsoletus obsoletus*	Endangered	
Hawaiian Petrel	*Pterodroma sandwichensis*	Endangered	
Least Bell's Vireo	*Vireo bellii pusillus*	Endangered	
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened	
Short-tailed Albatross	*Phoebastria (=Diomedea) albatrus*	Endangered	
Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	
Western Snowy Plover [CH]	*Charadrius nivosus nivosus*	Threatened	Unlikely – the action area is within its critical habitat, and area of recently known distribution and relative abundance of snowy plovers and their seasonal use of beach habitats; there is no suitable habitat in the project area.
Reptiles			
San Francisco Garter Snake	*Thamnophis sirtalis tetrataenia*	Endangered	Unlikely – although the species' current range overlaps the action area, there is no record of occurrence on CNDDB in the action area.[1,2]
Amphibians			
California Red-legged Frog	*Rana draytonii*	Threatened	**Likely** – the action area is not within its critical habitat; however, it is within a high likelihood of species' predicted habitat by

Common Name	Scientific Name	Status	Potential to Occur in Action Area
			CNDDB; the nearest occurrence of California Red-legged Frog is approximately 1.25 miles upstream from the project area in Watsonville Slough.[1]
California Tiger Salamander	*Ambystoma californiense*	Threatened	Unlikely – although the species' current range overlaps the action area, there is no record of occurrence on CNDDB in the action area.[1,2]
Foothill Yellow-legged Frog	*Rana boylii*	Endangered	
Santa Cruz Long-toed Salamander	*Ambystoma macrodactylum croceum*	Endangered	
Western Spadefoot	*Spea hammondii*	Proposed Threatened	
Fish			
Tidewater Goby CH	*Eucyclogobius newberryi*	Endangered	**Likely** – although the species' current range overlaps the action area, there is no record of occurrence on CNDDB in the immediate vicinity of W. Beach Road; tidewater gobies are present in the Pajaro River Lagoon year-round and recede upstream in the Pajaro River during storm events; gobies may be beneficially affected by the project.[1,2]
Insects			
Monarch Butterfly	*Danaus plexippus*	Candidate	Unlikely – the action area is within the CDFW's Areas of Conservation Emphasis (ACE) for Monarch overwintering sites[1]; Monarch butterflies typically arrive in Santa Cruz County in mid-October and leave in mid-February, therefore, it is unlikely that they would be affected by the project.
Crustaceans			
Vernal Pool Fairy Shrimp	*Branchinecta lynchi*	Threatened	Unlikely – the study area partially overlaps with the species' range which is exclusively in Pajaro River and Monterey County; there are no vernal pools and no record of occurrence on CNDDB in the action area.[1,2]
Flowering Plants			
Marsh Sandwort	*Arenaria paludicola*	Endangered	Unlikely – although the species' current range overlaps the study area, there is no record of occurrence on CNDDB in the action area.[1,2]
Monterey Gilia	*Gilia tenuiflora ssp. Arenaria*	Endangered	
Monterey Spineflower CH	*Chorizanthe pungens var. pungens*	Threatened	
Robust Spineflower CH	*Chorizanthe robusta var. robusta*	Endangered	
Santa Cruz Tarplant	*Holocarpha macradenia*	Threatened	

Table Notes:
CH = There is final critical habitat for this species and the search area overlaps the critical habitat.
1. CDFW 2024 - Based on RareFind 5 database searches in California Natural Diversity Database (CNDDB); available online at https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data#43018407-rarefind-5
2. USFWS 2024 – Available online at https://ecos.fws.gov/

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
Email Address: FW8VenturaSection7@FWS.Gov

In Reply Refer To: 03/26/2024 21:07:30 UTC
Project Code: 2024-0068560
Project Name: Watsonville Slough CAP 1135 Ecosystem Restoration Project

Subject: List of threatened and endangered species that may occur in your proposed project location 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
- Bald & Golden Eagles
- Migratory Birds
- Marine Mammals
- Wetlands

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

Project Code: 2024-0068560
Project Name: Watsonville Slough CAP 1135 Ecosystem Restoration Project
Project Type: Fish Passage Structure - Construction/Modification
Project Description: The purpose of the CAP 1135 Watsonville Slough Aquatic Ecosystem Restoration study is to review and modify structures and operations of water resources projects constructed by the USACE for the purpose of improving the quality of the environment, and to identify a technically feasible, economically justified, and environmentally acceptable recommendation to restore degraded aquatic habitat along the lower Watsonville Slough with consideration of sea level rise over time to a more natural and less degraded condition.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.868287699999996,-121.81729998715412,14z

Counties: Monterey and Santa Cruz counties, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 25 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica*	Endangered
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	
Southern Sea Otter *Enhydra lutris nereis*	Threatened
No critical habitat has been designated for this species. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/8560	

BIRDS

NAME	STATUS
California Condor *Gymnogyps californianus*	Endangered
Population: U.S.A. only, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	
California Least Tern *Sternula antillarum browni*	Endangered
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	
California Ridgway"s Rail *Rallus obsoletus obsoletus*	Endangered
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	
Hawaiian Petrel *Pterodroma sandwichensis*	Endangered
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6746	
Least Bell's Vireo *Vireo bellii pusillus*	Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	
Marbled Murrelet *Brachyramphus marmoratus*	Threatened
Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus*	Endangered
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	
Western Snowy Plover *Charadrius nivosus nivosus*	Threatened
Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	

NAME	STATUS
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

REPTILES

NAME	STATUS
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5956	Endangered

AMPHIBIANS

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened
Foothill Yellow-legged Frog *Rana boylii* Population: Central Coast Distinct Population Segment (Central Coast DPS) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5133	Threatened
Foothill Yellow-legged Frog *Rana boylii* Population: South Coast Distinct Population Segment (South Coast DPS) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5133	Endangered
Santa Cruz Long-toed Salamander *Ambystoma macrodactylum croceum* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/7405	Endangered
Western Spadefoot *Spea hammondii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

FISHES

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRUSTACEANS

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location does not overlap 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** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/396	Threatened
Santa Cruz Tarplant *Holocarpha macradenia* There is **final** critical habitat for this species. Your location does not overlap 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
California Red-legged Frog *Rana draytonii* https://ecos.fws.gov/ecp/species/2891#crithab	Final
Monterey Spineflower *Chorizanthe pungens var. pungens* https://ecos.fws.gov/ecp/species/396#crithab	Final
Robust Spineflower *Chorizanthe robusta var. robusta* For information on why this critical habitat appears for your project, even though Robust Spineflower is not on the list of potentially affected species at this location, contact the local field office. https://ecos.fws.gov/ecp/species/9287#crithab	Final
Tidewater Goby *Eucyclogobius newberryi*	Final

NAME	STATUS
https://ecos.fws.gov/ecp/species/57#crithab	
Western Snowy Plover *Charadrius nivosus nivosus* https://ecos.fws.gov/ecp/species/8035#crithab	Final

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project

activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

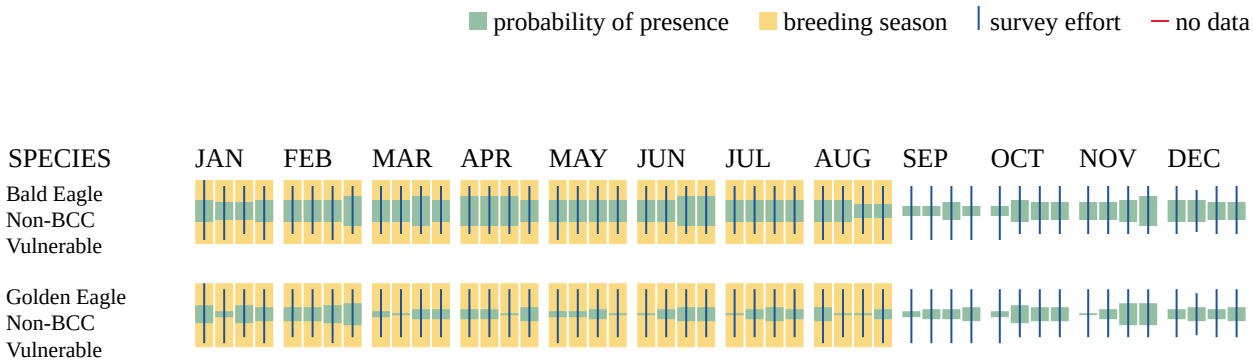
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird *Selasphorus sasin* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Belding's Savannah Sparrow *Passerculus sandwichensis beldingi* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8	Breeds Apr 1 to Aug 15
Black Oystercatcher *Haematopus bachmani* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9591	Breeds Apr 15 to Oct 31
Black Scoter *Melanitta nigra* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10413	Breeds elsewhere

NAME	BREEDING SEASON
Black Skimmer *Rynchops niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Black Swift *Cypseloides niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Black Turnstone *Arenaria melanocephala* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10557	Breeds elsewhere
Black-legged Kittiwake *Rissa tridactyla* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10459	Breeds elsewhere
Black-vented Shearwater *Puffinus opisthomelas* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9623	Breeds elsewhere
Brown Pelican *Pelecanus occidentalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/6034	Breeds Jan 15 to Sep 30
Bullock's Oriole *Icterus bullockii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9458	Breeds Mar 21 to Jul 25
California Gull *Larus californicus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10955	Breeds Mar 1 to Jul 31
California Thrasher *Toxostoma redivivum* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9436	Breeds Jan 1 to Jul 31
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10575	Breeds Jun 1 to Aug 31

NAME	BREEDING SEASON
Common Loon *gavia immer* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/4464	Breeds Apr 15 to Oct 31
Common Murre *Uria aalge* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10453	Breeds Apr 15 to Aug 15
Common Yellowthroat *Geothlypis trichas sinuosa* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31
Double-crested Cormorant *phalacrocorax auritus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/3478	Breeds Apr 20 to Aug 31
Elegant Tern *Thalasseus elegans* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8561	Breeds Apr 5 to Aug 5
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Gull-billed Tern *Gelochelidon nilotica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31
Heermann's Gull *Larus heermanni* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/11955	Breeds Mar 15 to Aug 31
Long-tailed Duck *Clangula hyemalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/7238	Breeds elsewhere

NAME	BREEDING SEASON
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Mountain Plover *Charadrius montanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3638	Breeds elsewhere
Northern Harrier *Circus hudsonius* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8350	Breeds Apr 1 to Sep 15
Oak Titmouse *Baeolophus inornatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656	Breeds Mar 15 to Jul 15
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pomarine Jaeger *Stercorarius pomarinus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10458	Breeds elsewhere
Red Knot *Calidris canutus roselaari* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8880	Breeds elsewhere
Red Phalarope *Phalaropus fulicarius* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10469	Breeds elsewhere
Red-breasted Merganser *Mergus serrator* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10693	Breeds elsewhere

NAME	BREEDING SEASON
Red-necked Phalarope *Phalaropus lobatus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10467	Breeds elsewhere
Red-throated Loon *Gavia stellata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/9589	Breeds elsewhere
Ring-billed Gull *Larus delawarensis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10468	Breeds elsewhere
Royal Tern *Thalasseus maximus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10471	Breeds Apr 15 to Aug 31
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Sooty Shearwater *Ardenna grisea* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10417	Breeds elsewhere
Surf Scoter *Melanitta perspicillata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10463	Breeds elsewhere
Tricolored Blackbird *Agelaius tricolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Tufted Puffin *Fratercula cirrhata* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/430	Breeds elsewhere

NAME	BREEDING SEASON
Western Grebe *aechmophorus occidentalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Western Gull *Larus occidentalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/11969	Breeds Apr 21 to Aug 25
White-winged Scoter *Melanitta fusca* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/10462	Breeds elsewhere
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10669	Breeds elsewhere
Wrentit *Chamaea fasciata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10668	Breeds Mar 15 to Aug 10

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▪)

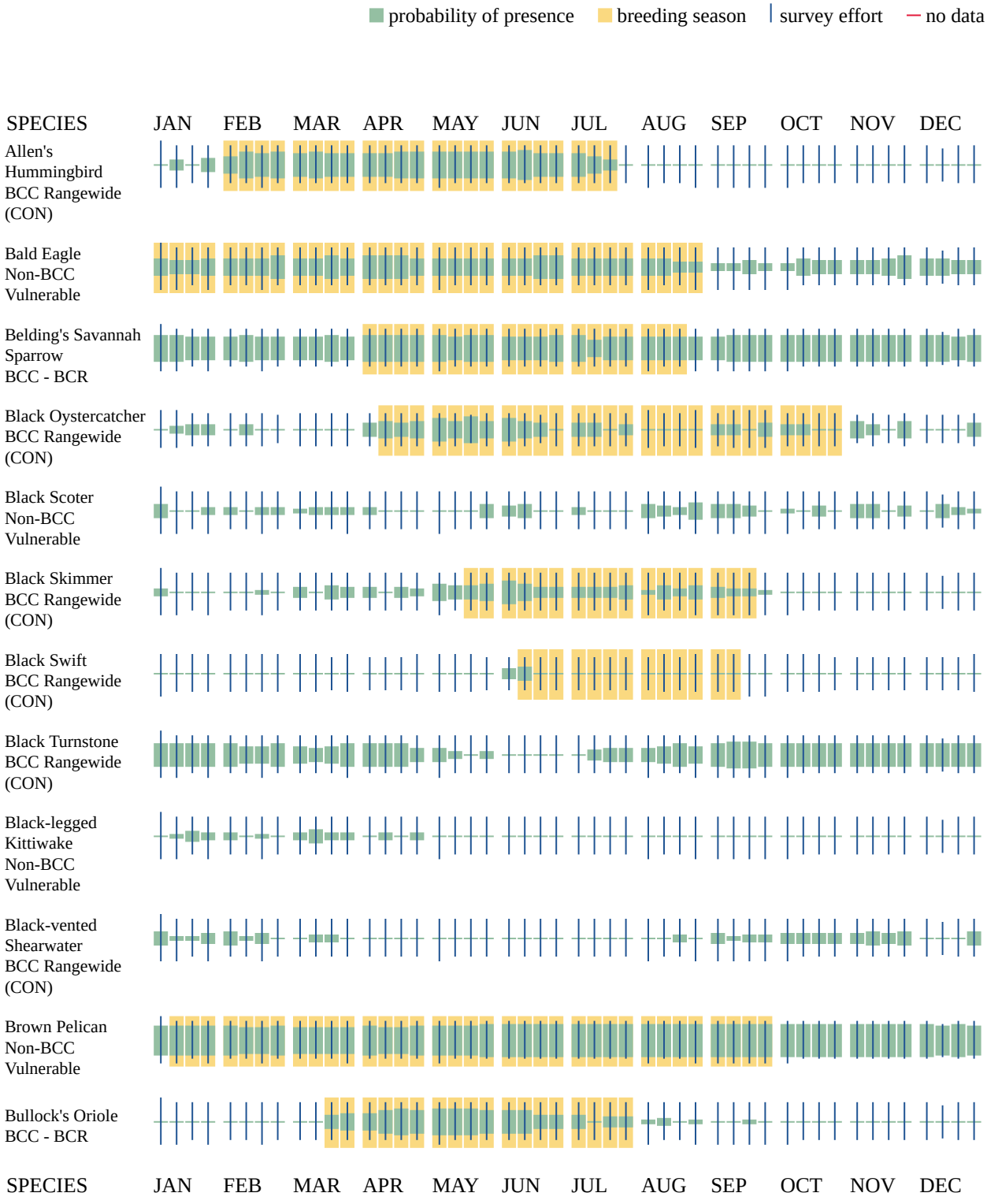
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

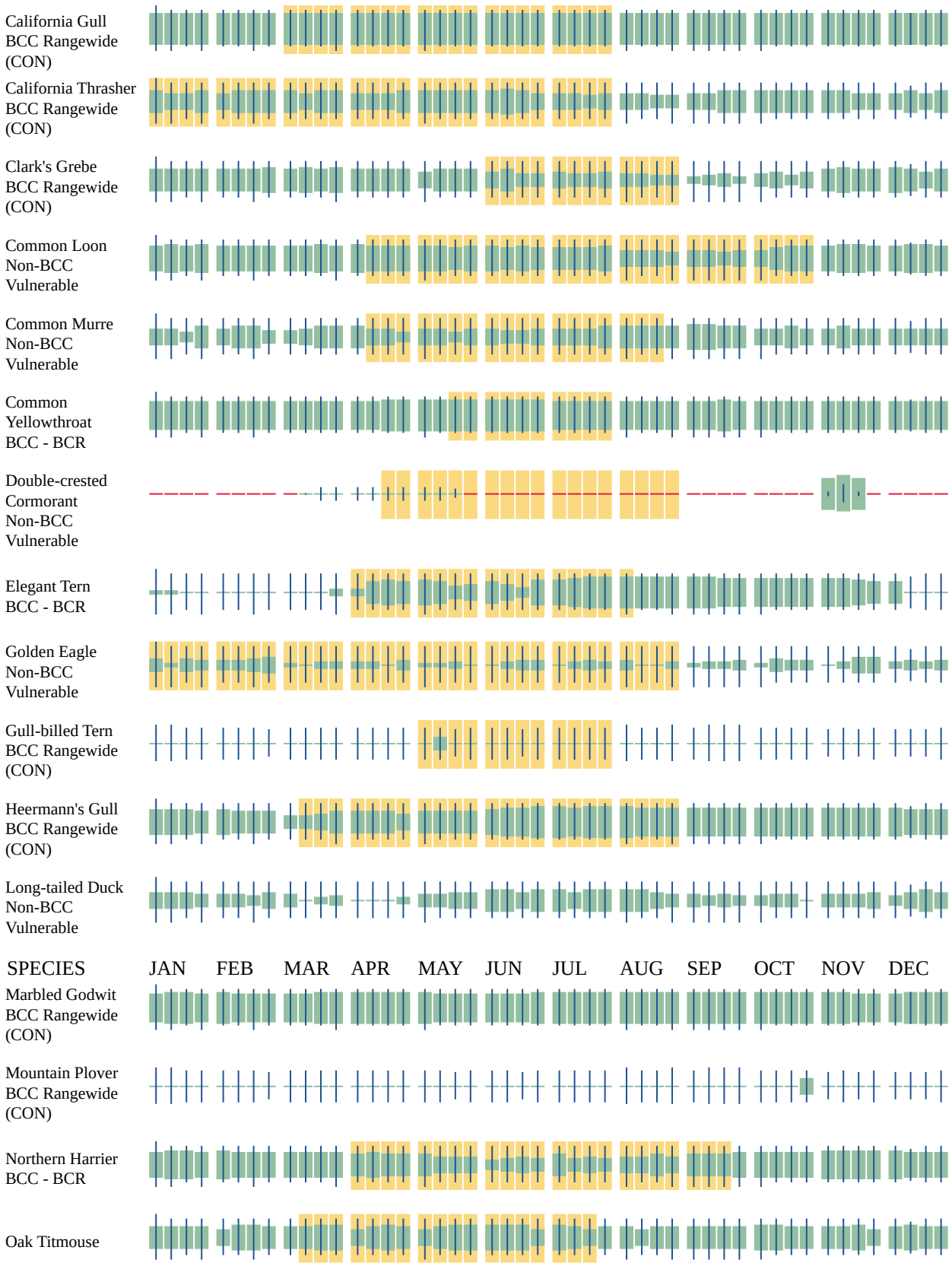
Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)

A week is marked as having no data if there were no survey events for that week.




California Gull BCC Rangewide (CON)
California Thrasher BCC Rangewide (CON)
Clark's Grebe BCC Rangewide (CON)
Common Loon Non-BCC Vulnerable
Common Murre Non-BCC Vulnerable
Common Yellowthroat BCC - BCR
Double-crested Cormorant Non-BCC Vulnerable
Elegant Tern BCC - BCR
Golden Eagle Non-BCC Vulnerable
Gull-billed Tern BCC Rangewide (CON)
Heermann's Gull BCC Rangewide (CON)
Long-tailed Duck Non-BCC Vulnerable
SPECIES
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Marbled Godwit BCC Rangewide (CON)
Mountain Plover BCC Rangewide (CON)
Northern Harrier BCC - BCR
Oak Titmouse

BCC Rangewide (CON)

Olive-sided Flycatcher
BCC Rangewide (CON)

Pomarine Jaeger
Non-BCC Vulnerable

Red Knot
BCC Rangewide (CON)

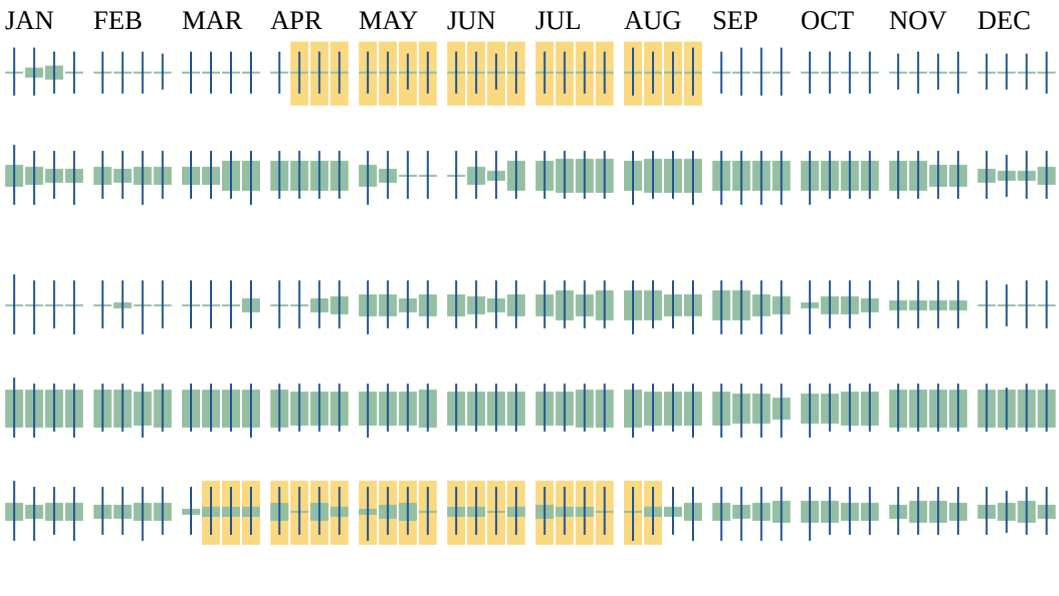
Red Phalarope
Non-BCC Vulnerable

Red-breasted Merganser
Non-BCC Vulnerable

Red-necked Phalarope
Non-BCC Vulnerable

Red-throated Loon
Non-BCC Vulnerable

Ring-billed Gull
Non-BCC Vulnerable



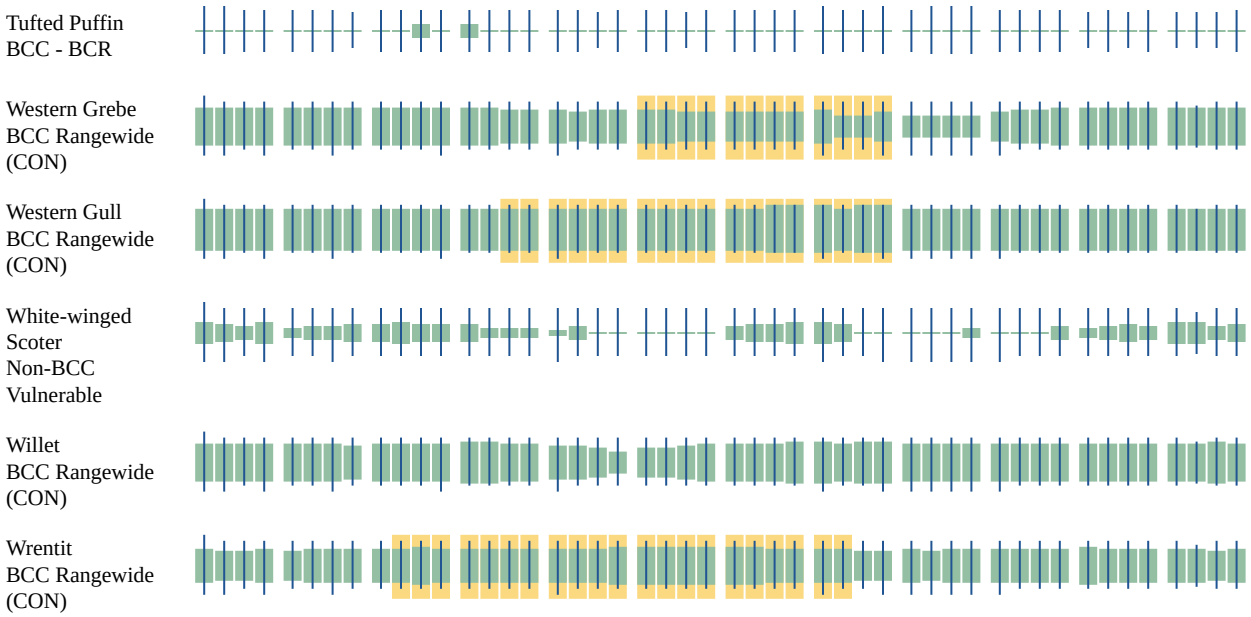
Royal Tern
Non-BCC Vulnerable

Short-billed Dowitcher
BCC Rangewide (CON)

Sooty Shearwater
Non-BCC Vulnerable

Surf Scoter
Non-BCC Vulnerable

Tricolored Blackbird
BCC Rangewide (CON)



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MARINE MAMMALS

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

Southern Sea Otter *Enhydra lutris nereis*
Species profile: https://ecos.fws.gov/ecp/species/8560

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R1ABVx
- R4SBCx
- R2UBHx
- R5UBFx
- R5UBF
- R4SBC

FRESHWATER FORESTED/SHRUB WETLAND

- PSSRx
- PSSR
- PSSC
- PSSB
- PFOC
- PSSA
- PFOSx
- PSSCx

LAKE

- L2ABH

ESTUARINE AND MARINE DEEPWATER

- E1UBLx
- E1UBL
- M1UBL

FRESHWATER POND

- PUBF
- PABHx
- PUBFx
- PUBHx
- PUSCx
- PABF
- PABFx

ESTUARINE AND MARINE WETLAND

- E2EM1P
- E2EM1N
- E2EM1Px
- E2USP
- E2USN
- E2USNx
- M2USN
- M2USP

FRESHWATER EMERGENT WETLAND

- PEM1Ch
- PEM1R
- PEM1C
- PEM1Af
- PEM1Kx
- PEM1F
- PEM1Cx
- PEM1Cf
- PEM1A
- PEM1B

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Jamie You
Address: 450 Golden Gate Ave
City: San Francisco
State: CA
Zip: 94102
Email jamie.you@usace.army.mil
Phone: 4155032906

Attachment 2

Central Coast Regional Water Quality Control Board Water Quality Certification No. 34422WQ12 for the Pajaro River Mouth Sandbar Breaching Program Santa Cruz County

Central Coast Regional Water Quality Control Board

October 16, 2023

VIA ELECTRONIC MAIL

Matt Machado
Santa Cruz County
Flood Control and Water Conservation District, Zone 7
701 Ocean Street, Room 410
Santa Cruz, CA 95060
Email: matt.machado@santacruzcounty.us

Dear Matt Machado:

WATER QUALITY CERTIFICATION NO. 34422WQ12 FOR THE PAJARO RIVER MOUTH SANDBAR BREACHING PROGRAM, SANTA CRUZ COUNTY

Thank you for the opportunity to review your November 16, 2022 application for water quality certification of the Pajaro River Mouth Sandbar Breaching Program (Program). The application was completed on December 6, 2022. All supplemental information requested was received on October 10, 2023. The Program, if implemented as described in your application and with the additional mitigation and other conditions required by this Clean Water Act Section 401 Water Quality Certification (Certification), appears to be protective of beneficial uses of State waters. We are issuing the enclosed Certification. Should new information come to our attention that indicates a water quality problem, we may require additional monitoring and reporting, issue waste discharge requirements, or take other action.

Your Certification application and submitted documents indicate that Program activities have the potential to affect beneficial uses and water quality. The Central Coast Regional Water Quality Control Board (Central Coast Water Board) issues this Certification to protect water quality and associated beneficial uses from Program activities. We need reports to determine compliance with this Certification. All technical and monitoring reports requested in this Certification, or any time after, are required per section 13383 of the California Water Code. Failure to submit reports required by this Certification, or failure to submit a report of technical quality acceptable to the Executive Officer, may subject you to enforcement action per section 13385 of the California Water Code.

Any person affected by this Central Coast Water Board action may petition the State Water Resources Control Board (State Water Board) to review this action in accordance with California Water Code section 13320; and Title 23, California Code of Regulations, sections 2050 and 3867-3869. The State Water Board, Office of Chief Counsel, PO Box 100, Sacramento, CA 95812, must receive the petition within 30 days of the date of this Certification. We will provide upon request copies of the law and regulations applicable to filing petitions.

In compliance with Title 40, Code of Federal Regulations (CFR) Part 121.7(d)(2), an explanation for each certification condition is provided in Attachment A.

If you have questions, please contact **Kim Sanders** at (805) 542-4771 or via email at Kim.Sanders@waterboards.ca.gov, or Phil Hammer at (805) 549-3882. Please mention the above certification number in all future correspondence pertaining to this Program.

Sincerely,

Digitally signed by Phillip Hammer
Date: 2023.10.16 10:19:23 -07'00'

for
Ryan E. Lodge
Executive Officer

Enclosure: Action on Request for CWA Section 401 Water Quality Certification

cc: With enclosures

Antonella Gentile, Santa Cruz County Flood Control and Water Conservation District, Zone 7: Antonella.Gentile@santacruzcounty.us

Katerina Galacatos, U.S. Army Corps of Engineers: Katerina.galacatos@usace.army.mil

Wes Stokes, CA Department of Fish and Wildlife: Wesley.Stokes@wildlife.ca.gov

Serena Stumpf. CA Department of Fish and Wildlife: Serena.Stumpf@wildlife.ca.gov

U.S. Environmental Protection Agency: R9cwa401@epa.gov

CWA Section 401 WQC Program, SWRCB: Stateboard401@waterboards.ca.gov

Jesse Woodard, Central Coast Water Board: Jesse.Woodard@waterboards.ca.gov

Hayden Reed, Central Coast Water Board: Hayden.Reed@waterboards.ca.gov

Kim Sanders, Central Coast Water Board: Kim.Sanders@waterboards.ca.gov

Phillip Hammer, Central Coast Water Board: Phillip.Hammer@waterboards.ca.gov

R:\RB3\Shared\401\Certifications\Santa Cruz\2022\34422WQ12 Pajaro River Sandbar Breaching\R3_PajaroRiverMthSndbrBrch_34422WQ12_Cert.docxfinal

Action on Request for
Clean Water Act Section 401 Water Quality Certification
for Discharge of Dredged and/or Fill Materials

PROJECT: Pajaro River Mouth Sandbar Breaching Program

PERMITTEE: Matt Machado
Santa Cruz County Flood Control and Water Conservation District, Zone 7
701 Ocean Street, Room 410
Santa Cruz, CA 95060

ACTION:
1. ☐ Order for Standard Certification
2. ■ Order for Technically Conditioned Certification
3. ☐ Order for Denial of Certification

STANDARD CONDITIONS:

1. This Certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment per section 13330 of the California Water Code and section 3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This Certification action is not intended to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Certification application was filed per 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license was being sought.

3. The validity of any non-denial Certification action (Actions 1 and 2) is conditioned upon total payment of the fee required under 23 CCR section 3833, unless otherwise stated in writing by the certifying agency.

ADMINISTRATIVE CONDITIONS:

1. This Certification is subject to the acquisition of all local, regional, state, and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any conditions contained in any other permit or approval issued by the State of California or any subdivision thereof may result in the revocation of this Certification and civil or criminal liability.

2. In the event of a violation or threatened violation of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions as provided for under state law. For purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with

the water quality standards and other pertinent requirements incorporated into this Certification.

3. In response to a suspected violation of any condition of this Certification, the Central Coast Water Board may require the holder of any permit or license subject to this Certification to furnish, under penalty of perjury, any technical or monitoring reports the Central Coast Water Board deems appropriate, provided that the burden, including costs, of the reports shall have a reasonable relationship to the need for the reports and the benefits obtained from the reports.

4. In response to any violation of the conditions of this Certification, the Central Coast Water Board may add to or modify the conditions of this Certification as appropriate to ensure compliance.

5. The Central Coast Water Board reserves the right to suspend, cancel, or modify and reissue this Certification, after providing notice to the Permittee, if the Central Coast Water Board determines that the Program fails to comply with any of the terms or conditions of this Certification.

6. A copy of this Certification, the application, and supporting documentation must be available at the Program implementation site during construction for review by site personnel and agencies. A copy of this Certification must also be provided to the contractor and all subcontractors who will work at the Program implementation site. All personnel performing work on the proposed Program shall be familiar with the content of this Certification and its posted location on the Program implementation site.

7. The Permittee shall grant the Central Coast Water Board, or an authorized representative, upon presentation of credentials and other documents as may be required by law, permission to enter the Program implementation site at reasonable times, to ensure compliance with the terms and conditions of this Certification and/or to determine the impacts the Program may have on waters of the State.

8. The Permittee must, at all times, fully comply with the application, engineering plans, specifications, and technical reports submitted to support this Certification; all subsequent submittals required as part of this Certification; and the attached Program Information and Conditions. The conditions within this Certification and attachment(s) supersede conflicting provisions within Permittee submittals.

9. The Permittee shall notify the Central Coast Water Board within 24 hours of any unauthorized discharge to waters of the U.S. and/or State; measures that were implemented to stop and contain the discharge; measures implemented to clean-up the discharge; the volume and type of materials discharged and recovered; and additional best management practices (BMPs) or other measures that will be implemented to prevent future discharges.

10. This Certification is not transferable to any person except after notice to the Executive Officer of the Central Coast Water Board. The Permittee shall submit this notice in writing at least 30 days in advance of any proposed transfer. The notice must include a written agreement between the existing and new responsible party containing a specific date for the transfer of this Certification's responsibility and coverage between the current responsible party and the new responsible party. This agreement shall include an acknowledgement that

the existing responsible party is liable for compliance and violations up to the transfer date and that the new responsible party is liable from the transfer date on.

11. This Order and conditions contained herein continue to have full force and effect regardless of the expiration or revocation of any federal license or permit issued for the Program. For purposes of Clean Water Act, section 401(d), this condition constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements of state law. This Order expires five years from the date it is issued.

12. The total certification fee for this Program is $2,417. The remaining certification fee payable to the Central Coast Water Board is $0. Annual fees may apply.

CALIFORNIA ENVIRONMENTAL QUALITY ACT FINDINGS:

1. Environmental Review
   On January 22, 2003, the County of Santa Cruz, as lead agency, adopted an initial study/mitigated negative declaration (IS/MND) (State Clearinghouse No. 2002122066) for the Program and filed a Notice of Determination at the State Clearinghouse on April 9, 2003. The Central Coast Water Board is a responsible agency under CEQA (Public Resources Code section 21069) and in making its determinations presumes the County of Santa Cruz's adopted environmental document comports with the requirements of CEQA and is valid (Public Resources Code section 21167.3). The Central Coast Water Board has reviewed and considered the environmental document and the environmental effects of the Program on water quality and beneficial uses. (California Code of Regulations, title 14, section 15096(f)).

2. Incorporation by Reference
   CEQA impacts of the Program are analyzed in the Program's adopted IS/MND which is incorporated herein by reference. Requirements under the purview of the Central Coast Water Board in the mitigation monitoring and reporting program are incorporated herein by reference. The Permittee's application for this Order, including all supplemental information provided, is incorporated herein by reference.

CENTRAL COAST WATER BOARD CONTACT PERSON:

Kim Sanders
(805) 542-4771
Kim.Sanders@waterboards.ca.gov

Please refer to the above certification number when corresponding with the Central Coast Water Board concerning this Program.

WATER QUALITY CERTIFICATION:

I hereby issue an order certifying that as long as all the conditions listed in this Certification are met, any discharge from the Pajaro River Mouth Sandbar Breaching Program shall comply with the applicable provisions of sections 301 ("Effluent Limitations"), 302 ("Water Quality Related Effluent Limitations"), 303 ("Water Quality Standards and Implementation Plans"), 306 ("National Standards of Performance"), and 307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated pursuant to State Water Board Water

Quality Order No. 2003-0017-DWQ, which requires compliance with all conditions of this Certification.

Except insofar as may be modified by any preceding conditions, all Certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with the Permittee's Program description, Certification conditions, and the attached Program Information and Conditions, and (b) compliance with all applicable requirements of the Central Coast Water Board's policies and Water Quality Control Plan (Basin Plan).

Digitally signed by Phillip Hammer
Date: 2023.10.16 10:20:06 -07'00'

for
Ryan E. Lodge
Executive Officer
Central Coast Water Board

PROGRAM INFORMATION AND CONDITIONS

Application Date	Received: November 16, 2022 Completed: December 6, 2022
Permittee	Matt Machado Santa Cruz County Flood Control and Water Conservation District, Zone 7 701 Ocean Street, Room 410 Santa Cruz, CA 95060 matt.machado@santacruzcounty.us 831-454-2160
Representative	Antonella Gentile Santa Cruz County Flood Control and Water Conservation District, Zone 7 701 Ocean Street, Room 410 Santa Cruz, CA 95060 antonella.gentile@santacruzcounty.us 831-454-2632
Program Name	Pajaro River Mouth Sandbar Breaching Program
Application Number	34422WQ12
Type of Program	Bank and Channel and Beach Modification
Program Location	Pajaro River mouth between Santa Cruz and Monterey Counties Latitude: 36.8480 Longitude: -121.8086
County	Border between Santa Cruz and Monterey Counties
Receiving Water(s)	Pajaro River and Pacific Ocean 305.00 Pajaro River Hydrologic Unit
Water Body Type	Streambed, ocean, lagoon
Designated Beneficial Uses	Municipal and Domestic Supply Agricultural Supply Industrial Service Supply Ground Water Recharge Water Contact Recreation Non-Contact Recreation Wildlife Habitat Cold Fresh Water Habitat Warm Fresh Water Habitat Migration of Aquatic Organisms Spawning, Reproduction, and/or Early Development Preservation of Biological Habitats of Special Significance Rare, Threatened, or Endangered Species Estuarine Habitat Freshwater Replenishment Commercial and Sport Fishing Shellfish Harvesting
Program Description (purpose/goal)	The purpose of this Program is to prevent: 1. High water levels from causing flooding of agricultural and residential lands and roads; 2. Intermingling of lagoon waters with raw sewage; 3. Shallow flooding of public roads in a manner hazardous to public

	traffic and first responder access; and 4. Health and safety hazards and property damage. The Central Coast Regional Water Quality Control Board (Central Coast Water Board) understands that the Program includes the following activities: 1. Excavating the breach channel as demarcated by a qualified biologist;[1] 2. Fanning out the termination of the breach channel to reduce scour; 3. Leaving a sand plug in place to prevent the lagoon from draining too quickly; and 4. Monitoring the Watsonville Slough water level sensor twice a day.
U.S. Army Corps of Engineers Permit No.	The final, signed copy of the U.S. Army Corps of Engineers Permit shall be forwarded immediately upon execution.
California Dept. of Fish and Wildlife (CDFW) Streambed Alteration Agreement	Streambed Alteration Agreement file no. 1600-2018-0081-R3 issued October 18, 2018, extended September 15, 2022
CEQA Information	Mitigated Negative Declaration Lead Agency: Santa Cruz County Flood Control and Water Conservation District, Zone 7
Total Certification Fee	$2,417

Authorized Individual Breach Channel Fill/Excavation Quantity

Aquatic Resource Type	Temporary Impact			Permanent Impact					
				Physical Loss of Area			Degradation of Ecological Condition		
	Acres	CY[2]	LF[1]	Acres	CY	LF	Acres	CY	LF
Stream Channel	0.115	556	500						
Mitigation Requirements	Compensatory mitigation and/or restoration is not required, due to direct impacts that involve only temporary movement of beach sand which will redistribute without intervention.								
Program Requirements	The Permittee shall comply with the following requirements: 1. Mobilization of a hydraulic excavator and support vehicles to the Palm Beach State Park parking lot may begin only when the staff gage at Watsonville Slough reads at least 3.5 feet above mean sea level (MSL). 2. The Permittee may excavate the breach channel to the Pacific Ocean and breach the lagoon only a. During daylight hours; and b. When the staff gage at Watsonville Slough reads at least 4.5 feet above MSL and substantial flows or surf conditions that would likely engender overwash are forecast; or								

[1] A qualified biologist is an individual with a minimum of five years of academic training and professional experience in biological sciences and related resource management activities with a minimum of two years conducting surveys for each species that may be present within the Program area.

[2] Cubic Yards (CY); Linear Feet (LF)

	c. When flooding is evident on Beach or Shell Roads. 3. The Permittee shall construct the breach channel by excavating a channel from the lagoon diagonally to the south, behind the barrier beach crest, and then in a direct line to the ocean, through the barrier beach crest. The distance of the outlet channel from the lagoon and the location, angle, depth and width of the outlet channel shall be determined based on the current lagoon and barrier beach conditions and shall not exceed the minimum excavation necessary to achieve the Program purpose. The Permittee shall consult with wildlife agencies regarding breach channel design if time allows. 4. The Permittee shall conduct no more than 10 breaches within 5 years. Breaches in excess of two times per year are prohibited unless a case-by-case exception has been granted by Central Coast Water Board staff by prior written approval. 5. The Permittee shall post signs in locations that are effective in advising the public against water contact recreation in the Pacific Ocean. The signs shall be posted during breach channel construction when 1) Pacific Ocean water quality does not meet indicator bacteria standards identified below in section 3.b. of the Water Quality Monitoring and Reporting Requirements; 2) indicator bacteria monitoring results are not available prior to breach channel construction; or 3) cyanotoxins in the lagoon are present at levels sufficient to warrant a health advisory posting at the lagoon pursuant to the Voluntary Guidance for Response to Harmful Algal Blooms identified below in section 3.c. of the Water Quality Monitoring and Reporting Requirements. 6. All personnel who engage in construction activities or their oversight at the Program implementation site (superintendent, construction manager, foreman, crew, contractor, biological monitor, etc.) must attend trainings on the conditions of this Certification and how to perform their duties in compliance with those conditions. Every person shall attend an initial training on or before each breach channel excavation event. Trainings shall be conducted by a qualified individual with expertise in 401 Water Quality Certification conditions and compliance. 7. All work performed within waters of the State shall be completed in a manner that minimizes impacts to beneficial uses and habitat. Measures shall be employed to minimize land disturbances that will adversely impact the water quality of waters of the State. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete Program implementation. 8. The Permittee shall retain a spill plan and appropriate spill control and clean up materials (e.g., oil absorbent pads) onsite in case spills occur. 9. The Permittee shall confine all trash and debris in appropriate enclosed bins and dispose of the trash and debris at an approved site at the close of the construction *each day* that construction occurs. 10. Before staging equipment all construction vehicles and equipment to be used on site shall be checked for hydraulic fluid leaks or other problems that could result in spills of toxic materials. All construction vehicles and equipment used on site shall be well maintained and checked daily for fuel, oil, and hydraulic fluid leaks or other problems that could result in spills of toxic materials.

	11. The Permittee shall designate a staging area for equipment and vehicle fueling and storage at least 100 feet away from waterways, in a location where fluids or accidental discharges cannot flow into waterways. 12. All vehicle fueling and maintenance activity shall occur at least 100 feet away from waterways and in designated staging areas, unless a requested exception on a case-by case basis granted by prior written approval has been obtained from the Central Coast Water Board. 13. All construction-related equipment, materials, and any temporary BMPs no longer needed shall be removed and cleared from the site upon completion of Program implementation. 14. The Central Coast Water Board shall be notified if mitigations as described in the 401 Water Quality Certification application for this Program are altered by the imposition of subsequent permit conditions by any local, state or federal regulatory authority. The Permittee shall inform the Central Coast Water Board of any modifications that interfere with compliance with this Certification.
Monitoring and Reporting Requirements	The Permittee shall conduct the following monitoring and reporting: **1. Erosion and Instability Monitoring** Visually inspect the breach channel excavation site and areas of waters of the State adjacent to breach channel impact areas following the breach event and for the following month to ensure that Program implementation is not causing excessive erosion, river instability, Pacific Ocean impacts such as inadvertent creation of barrier islands, or other water quality impacts. If breach channel excavation does cause water quality impacts, contact the Central Coast Water Board staff member overseeing the Program. You will be responsible for implementing corrective measures to protect water quality and obtaining any additional permits necessary for corrective measure implementation. **2. Fish Monitoring** a. During and following outlet channel construction, the Permittee shall have qualified biologists on-site to monitor and record: i. Fish presence by species; and ii. An estimate of the number of relocated fish and dead fish, and cause of death, by species. The biologist(s) recording fish presence shall perform their duties without monitoring other wildlife species, human safety, or equipment pathways. b. For the period of three days post breaching, a qualified biologist shall survey the breach channel and adjacent areas for stranded native fish every day. Stranded native fish shall be relocated to the nearest appropriate site where they will not be subject to stranding or inappropriate habitat. The qualified biologist shall have all applicable permits for the relocation of native fish. **3. Water Quality Monitoring and Reporting** a. 2019 Pajaro River Lagoon Water Quality Sampling and Fish Survey Plan: The Permittee shall implement the 2019 Pajaro River Lagoon Water Quality Sampling and Fish Survey Plan dated February 8, 2019. b. Indicator Bacteria Monitoring: The Permittee must conduct sampling and analysis of water as described below if a breach event occurs and

	if the lagoon or ocean adjacent to the lagoon is not already posted by Santa Cruz County for high bacteria levels. i. Sampling surrounding breach events: The Permittee shall collect a grab sample within 24 hours before each breach event. A grab sample shall also be collected within 12-24 hours following each breach event. Grab samples shall be collected where the ocean is approximately knee to waist depth at the location where the Lagoon water enters the ocean and allows monitoring staff to safely collect the sample. While the culvert or lagoon remains open, grab samples shall be collected at the same frequency that AB411 samples are required to be collected, but no less frequent than weekly, until ocean water quality is in compliance with fecal indicator bacteria objectives identified in 2.b.ii. ii. Compliance with ocean fecal indicator bacteria objectives: The Permittee shall assess the ocean water samples for compliance with indicator bacteria objectives pursuant to Section II.A and II.B.1. pp. 4 and 5 of the Water Quality Control Plan, Ocean Waters of California Revised 2019 (Water Quality Control Plan for Ocean Waters of California). The Permittee must report an exceedance of water quality objectives to the Central Coast Water Board as soon as possible and no later than 24 hours after the monitoring results are first available. c. Cyanotoxins Monitoring: Based on the Permittee's detection of olfactory conditions (odors like gasoline, septic, or fishy scents) and/or visual conditions[3] that suggest cyanotoxin presence in the lagoon or isolated waterbodies on the beach, the Permittee shall conduct sampling and analysis of lagoon water and or isolated waterbodies for cyanotoxins that are harmful to humans and pets, if a breach event occurs. i. The Permittee shall employ the sampling and analysis methods identified in the California Voluntary Guidance for Response to Harmful Algal Blooms in Recreational Inland Waters and shall post health advisories if cyanotoxin levels meet or exceed the cyanotoxin trigger levels established in that guidance. ii. If cyanotoxins are present and meet or exceed the cyanotoxin trigger levels in any lagoon samples, and/or if the Permittee has knowledge of any potential human- or animal-related illnesses, the Permittee must report the information to: A. Central Coast Water Board staff as soon as possible and no later than 24 hours after the information is first available; and B. The Harmful Algal Bloom Hotline (within 5 business days): • Online: Freshwater Bloom Incident Form (https://mywaterquality.ca.gov/habs/do/bloomreport.html); • By phone: 1 (844) 729-6466 (toll free); or • By email: CyanoHAB.Reports@waterboards.ca.gov.

[3] The Permittee shall use this Visual Guide to Observing Blooms Version 1.0, March 8, 2017 for detecting visual conditions that suggest cyanobacteria presence: SOP - Bloom Observation Guide - Google Docs

iii. The Permittee shall maintain posting of areas adjacent to affected ocean receiving waters pursuant to the guidance in the California Voluntary Guidance for Response to Harmful Algal Blooms in Recreational Inland Waters (at the link provided above).

The Permittee shall submit the following general reporting to RB3_401Reporting@waterboards.ca.gov [Note: Annual fees are based on submittal and approval of reporting item 1.b below]:

1. General Reporting

a. Construction Commencement Notification – Approximately 24 hours in advance of any breach channel excavation, submit notification to the Central Coast Water Board of the date when breach channel excavation will begin.

b. **Certification Termination Report – To terminate Certification coverage, the Permittee must submit for Central Coast Water Board review and approval a Certification Termination Report demonstrating monitoring completion.** The Certification Termination Report shall include all information required for Annual Program Status Reports as specified below. The Certification Termination Report may serve as the final Annual Program Status Report. The Certification Termination Report submittal must include "Certification Termination Report" in the report and email title.

c. **Annual Program Status Report – The Permittee shall submit to the Central Coast Water Board an Annual Program Status Report by May 31 of each year following the issuance of this Certification, regardless of whether the Program was implemented or not.** At a minimum, Annual Program Status Reports shall address activities conducted during the prior calendar year. The Permittee shall submit Annual Program Status Reports until the Permittee has conducted all required monitoring and the Permittee has submitted a Certification Termination Report. Each Annual Program Status Report shall include at a minimum:

i. The status of the Program (e.g., implementation (a breach channel exaction event) occurred, implementation did not occur, or status of current implementation).

ii. The date of breach channel excavation initiation, if applicable.

iii. The date of breach channel excavation completion, if applicable.

iv. The date of the breach event (water emptying from the lagoon into the Pacific Ocean).

v. If sand manipulation/construction is complete:

A. A summary of daily activities, monitoring and inspection observations, and problems incurred and actions taken;

B. Identification of when site personnel trainings occurred, description of the topics covered during trainings, and confirmation that every person engaged in construction activities or their oversight at the breach channel excavation site was trained for each breach channel excavation event.

C. A description of the results of the erosion and instability monitoring that occurred following completion of a breach

	event to ensure that the breach event did not cause excessive erosion, river instability, Pacific Ocean impacts such as inadvertent creation of barrier islands, or other water quality impacts. D. Water quality and other data collected for: • Fish monitoring; • The 2019 Pajaro River Lagoon Water Quality Sampling and Fish Survey Plan dated February 8, 2019; • Indicator bacteria monitoring; and • Cyanotoxins monitoring. vi. Beneficial use conditions; and vii. Clearly identified photo-documentation of all areas of temporary impact, prior to and after a breach event. d. If the erosion and instability monitoring period is over, but water quality problems persist, the Annual Program Status Report shall identify corrective measures to be undertaken, including extension of the monitoring period until the Program is no longer causing water quality problems.

Attachment A - 40 CFR Part 121.7 Information

The purpose of Attachment A is to provide information pursuant to title 40, Code of Federal Regulations (40 CFR) part 121.7(d)(2), which necessitates that all Certification conditions be accompanied by an explanation of why the condition is necessary to assure that any discharge authorized under the Certification will comply with water quality requirements, and a citation to federal, state, or tribal law that authorizes the condition.

Notwithstanding any determinations by the U.S. Army Corps of Engineers or other federal agency made pursuant to 40 CFR section 121.9, dischargers must comply with the entirety of this Certification because the Certification also serves as waste discharge requirements in accordance with State Water Resources Control Board (State Water Board) Water Quality General Order No. 2003-0017-DWQ.

This attachment includes citations to some sources of authority that are applicable to all Certification conditions. These sources are specifically identified where they are most relevant but are also generally applicable to the conditions below. California Code of Regulations, title 23[4] chapter 28 sets forth regulations pertaining to water quality certifications. Conditions are set forth in this Certification to assure that the discharge complies with water quality objectives adopted or approved under sections 13170 or 13245 of the California Water Code. These conditions are also generally required to comply with the state's Anti-Degradation Policy (State Water Board Resolution No. 68-16), which requires that for any "activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the state will be maintained." All Regional Water Boards' Water Quality Control Plans incorporate the state's Anti-Degradation Policy by reference. The state Anti-Degradation Policy incorporates the federal Antidegradation Policy (40 CFR Part 131.12 (a)(1)), which requires "[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." According to the United States Environmental Protection Agency (USEPA), discharges of dredged or fill material comply with the federal Antidegradation Policy by complying with USEPA's section 404(b)(1) Guidelines. The State Water Board adopted a modified version of USEPA's section 404(b)(1) Guidelines in the State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State Revised April 6, 2021 (Dredge or Fill Procedures).

STANDARD CONDITIONS

Standard Condition No. 1

This is a standard condition that "shall be included as conditions of all water quality certification actions" (California Code of Regulations section 3860(a)).

[4] Unless as otherwise noted, all citations are to title 23 of California Code of Regulations.

Standard Condition No. 2
This is a standard condition that "shall be included as conditions of all water quality certification actions" (California Code of Regulations section 3860(a)).

Standard Condition No. 3
This is a standard condition that "shall be included as conditions of all water quality certification actions" (California Code of Regulations section 3860(a)). This fee requirement condition is also required pursuant to California Code of Regulations sections 3861(c)(4) and 3833(b), which require payment of fees by Program proponents discharging dredge or fill material.

ADMINISTRATIVE CONDITIONS

Administrative Condition No. 1
This condition is required pursuant to California Code of Regulations section 3856(e), which requires that copies be provided to the Water Boards of "any final and signed federal, state, and local licenses, permits, and agreements (or copies of the draft documents, if not finalized) that will be required for any construction, operation, maintenance, or other actions associated with the activity. If no final or draft document is available, a list of all remaining agency regulatory approvals being sought shall be included."

Administrative Condition No. 2
This condition provides notice of the Water Boards' rights to levee penalties as allowed by state law in order to protect water quality.

Administrative Condition No. 3
California Water Code section 13267 authorizes the Central Coast Water Board to require any person or entity who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within the region to furnish, under penalty of perjury, technical or monitoring reports when necessary to investigate the quality of any waters of the state. These reports are necessary to ensure compliance with water quality standards.

Administrative Condition Nos. 4 and 5
In the event of non-compliance, modified conditions may be necessary to return the discharger to compliance and prevent violation of water quality standards. If a Permittee is violating the terms of a Certification that protect water quality standards, canceling the Certification halts authorization to discharge, which can ensure compliance with water quality standards. California Water Code section 13381 states that waste discharge requirements or dredged or fill material permits may be terminated or modified for cause, including, but not limited to, all of the following: (a) Violation of any condition contained in the requirements or permits; (b) Obtaining the requirements by misrepresentation, or failure to disclose fully all relevant facts; and (c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

Administrative Condition No. 6
This condition requires site personnel and agencies to be familiar with the content of the Certification and availability of the document at the Program site. This condition is required to assure that any authorized discharge will comply with the terms and conditions of the Certification, which requires compliance with water quality objectives and beneficial uses adopted or approved under sections 13170 or 13245 of the California Water Code.

Administrative Condition No. 7
Conditions related to site access requirements are authorized pursuant to the Central Coast Water Board's authority to investigate the quality of any waters of the state within its region under California Water Code section 13267. California Water Code section 13267(c) provides that "the regional board may inspect the facilities of any person to ascertain whether the purposes of this division are being met and waste discharge requirements are being complied with."

Administrative Condition No. 8
This Certification is issued based on information submitted by the Permittee. If the Permittee does not implement the Program in accordance with the submitted information, the Program may not comply with water quality standards. Therefore, the Permittee must implement the Program as described in order for compliance with water quality standards to be assured, in accordance with water quality objectives and beneficial uses adopted or approved under sections 13170 or 13245 of the California Water Code.

Administrative Condition No. 9
This condition related to the accidental discharge of hazardous materials is necessary to assure that discharges comply with any water quality objectives adopted or approved under sections 13170 or 13245 of the California Water Code. Conditions related to notification and reporting requirements in the event of an accidental discharge of hazardous materials are required pursuant to section 13271 of the California Water Code, which requires immediate notification of the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the state toxic disaster contingency plan adopted pursuant to article 3.7 (commencing with Section 8574.16) of chapter 7 of division 1 of title 2 of the Government Code. These monitoring and reporting requirements are also consistent with the Central Coast Water Board's authority to investigate the quality of any waters of the state within its region under California Water Code sections 13267 and 13383. The reports related to accidental discharges also ensure that corrective actions, if any, that are necessary to minimize the impact or clean up such discharges can be taken as soon as possible in order to achieve compliance with water quality standards.

Administrative Condition No. 10
Authorization under this Certification is granted based on the application information submitted, including the legally responsible party. Notification is necessary to confirm whether the new owner wishes to assume legal responsibility for compliance with this Certification. If not, the original discharger remains responsible for compliance with this Certification. Correct identification of a legally responsible party is necessary to ensure compliance with water quality standards. California Water Code section 13264 prohibits any discharge that is not specifically authorized in this Certification.

Administrative Condition No. 11
In accordance with State Water Resources Control Board Water Quality Order No. 2003-0017-DWQ, waste discharge requirements are issued to all persons proposing to discharge dredged or fill material to waters of the United States where such discharge is also subject to the water quality certification requirements of Clean Water Act section 401 and such certification has been issued by the Central Coast Water Board. In order to meet the provisions contained in Division 7 of Clean Water Act and regulations adopted thereunder, Order No. 2003-0017-DWQ requires dischargers to implement all the terms and conditions of the applicable certification issued for

the discharge irrespective of whether the federal license or permit for which the Certification was obtained is subsequently deemed invalid because the water body subject to the discharge has been deemed outside of federal jurisdiction. In addition, continued compliance with certification/waste discharge requirements is necessary, regardless of federal permit status, to ensure compliance with water quality standards is maintained.

Administrative Condition No. 12
This fee requirement condition is required pursuant to California Code of Regulations sections 3861(c)(4) and 3833(b), which require payment of fees by Program proponents enrolling in this Certification.

PROGRAM INFORMATION AND CONDITIONS

Program Requirements

Program Requirement No. 1
Requiring breach equipment mobilization only at a specific water surface elevation is necessary to keep from potentially impacting beneficial uses unnecessarily before flooding alleviation is needed. The mission of the State Water Resources Control Board and the Regional Water Quality Control Boards (Water Boards) includes the preservation, enhancement, and restoration of the quality of California's water resources for the protection of the environment and all beneficial uses for the benefit of present and future generations. In accordance with the Porter-Cologne Water Quality Control Act (Water Code, § 13000 et seq.), the Water Boards are authorized to regulate discharges of waste, which includes discharges of dredged or fill material, that may affect the quality and beneficial uses of waters of the state.

Program Requirement No. 2
Limiting work to daylight hours is required because water quality and beneficial use impacts may go undetected during dusk or darkness. Excavating a breach channel pursuant to specific conditions that include monitoring water surface elevation and potential flooding in nearby urban areas where flood waters may contact urban infrastructure potentially entraining pollutants is required because impacts to water quality and beneficial uses are prohibited pursuant to the state's Anti-Degradation Policy (State Water Board Resolution No. 68-16). The Anti-Degradation Policy requires that any "activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the state will be maintained."

Program Requirement Nos. 3 and 4
Minimizing the excavation area to not exceed the area necessary to achieve the Program's purpose, consulting wildlife agencies if time allows, and limiting the number of breaches is required because Dredge or Fill Procedures Subpart B section 230.10(d) states that no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem. The number of breaches and disturbance to the beach and lagoon habitat must be minimized to the greatest extent pursuant to the Dredge or Fill Procedures section IV.B.a. that states that the permitting authority has the discretion to approve a project only if the applicant has demonstrated the following: A sequence of actions has been taken to first avoid, then to

minimize, and lastly compensate for adverse impacts that cannot be practicably avoided or minimized to waters of the state.

Program Requirement No. 5
Posting signs that advise the public against water contact recreation in the Pacific Ocean when the water contact recreation beneficial use may be impaired is required because Chapter 2 of the Basin Plan reads, “State policy for water quality control in California is directed toward achieving the highest water quality consistent with maximum benefit to the people of the State.” The Central Coast Water Board is responsible for implementing the Basin Plan pursuant to the Porter-Cologne Water Quality Control Act.

Program Requirement No. 6
This condition requires site personnel and agencies to be familiar with the content of the Certification. Familiarity with the requirements of this Certification is necessary to assure that any authorized discharge will comply with the terms and conditions of the Certification, which requires compliance with water quality objectives and beneficial uses adopted or approved under sections 13170 or 13245 of the California Water Code.

Program Requirement No. 7
Conditions related to compliance with water quality objectives and designated beneficial uses are required pursuant to the state’s Anti-Degradation Policy (State Board Resolution No. 68-16), which requires that for any “activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the state will be maintained.” The state Anti-Degradation Policy incorporates the federal Antidegradation Policy (40 CFR Part 131.12 (a)(1)), which states: "[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." According to USEPA, dischargers of dredged or fill material comply with the federal Antidegradation Policy by complying with USEPA’s section 404(b)(1) Guidelines.

Program Requirement No. 8
On-site availability of materials and supplies ensures BMPs can be reasonably implemented and that the discharge complies with water quality objectives. This condition and other conditions related to BMPs are consistent with the Central Coast Water Board’s authority to establish, “[w]ater quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area” pursuant to Water Code section 13241(c). The activities authorized under this Certification have the potential to result in a discharge that exceed water quality objectives and work in waters of the state must not cause an exceedance of water quality objectives. As required by California Water Code section 13369, all Water Quality Control Plans incentivize the use of BMPs to prevent prohibited discharges into waters of the state.

Conditions regarding restoration, compensatory mitigation, and monitoring are necessary to ensure compliance with state and federal anti-degradation policies. Restoration and compensatory mitigation requirements are consistent with Dredge or Fill Procedures section IV.A.2.d. and section IV.B.1.a, which specifies that the Water Boards will approve a project only after it has been determined that a sequence of actions has been taken to first avoid, then to minimize, and lastly to compensate for adverse impacts that cannot be practicably avoided or

minimized (see also California Code of Regulations section 3856(h), requiring submittal of proposed mitigation and description of steps taken to avoid, minimize, or compensate).

Program Requirement No. 9
California Water Code section 13264 prohibits any discharge that is not specifically authorized in this Certification. This condition is necessary to prevent violation of state discharge prohibitions that protect water quality objectives. Water Quality Control Plans prohibit the discharge of construction materials and byproducts from being discharged into waters of the state. For example, section 4.6.4.1 of the Water Quality Control Plan for the Central Coast Region prohibits the discharge of solid wastes "to rivers, streams, creeks, or any natural drainageways or flood plains of the foregoing." This condition prohibiting discharge of materials detrimental to water quality or hazardous to aquatic life is also consistent with the Dredge or Fill Procedures, Appendix A, Subpart H, which requires actions to minimize and avoid adverse effects, including actions concerning the location of discharged material and controlling the material after the discharge (section 230.70 et seq.).

Program Requirements Nos. 10 - 12
These conditions are required pursuant to the Water Quality Control Plan for the Central Coastal Basin and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), which prohibit the discharge of substances in concentrations toxic to human, plant, animal, or aquatic life. For example, the SIP states: "All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life." In addition, "Survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality conditions, shall not be less than that for the same waterbody in areas unaffected by the waste discharge …" (Water Quality Control Plan for the Central Coastal Basin, section 3.3.2.1). Conditions related to toxic and hazardous materials are necessary to ensure that discharges comply with any water quality objectives adopted or approved under sections 13170 or 13245 of the California Water Code.

Program Requirement No. 13
California Water Code section 13264 prohibits any discharge that is not specifically authorized in this Certification. This condition is necessary to prevent violation of state discharge prohibitions that protect water quality objectives. Water Quality Control Plans prohibit the discharge of construction materials and byproducts from being discharged into waters of the state. For example, "Unless authorized, or exempt by the California Water Code or the Basin Plan, the discharge or threatened discharge of sand, silt, clay, bark, slash, sawdust, or other organic or earthen materials into any waters of the State from soil disturbance activities in quantities deleterious to fish, wildlife, and other beneficial uses is prohibited. Unless authorized, or exempt by the California Water Code or the Basin Plan, placing or disposal of sand, silt, clay, bark, slash, sawdust, or other organic or earthen materials from soil disturbance activities at locations above the anticipated high water line of any waters of the State where they may be washed into said waters by rainfall or runoff in quantities deleterious to fish, wildlife, and other beneficial uses is prohibited." (Basin Plan, section 4.8.5.1).

This condition prohibiting discharge of materials detrimental to water quality or hazardous to aquatic life is also consistent with the Dredge or Fill Procedures, Appendix A, Subpart H, which requires actions to minimize and avoid adverse effects, including actions concerning the location of discharged material and controlling the material after the discharge (section 230.70 et seq.).

Program Requirement No. 14
Authorization under this Certification is granted based on the submitted application information. California Water Code section 13264 prohibits any discharge that is not specifically authorized in this Certification. As such, dischargers must inform the Central Coast Water Board of modifications so they may be addressed. This condition is necessary to ensure the Project remains eligible for coverage under this Certification if Project modifications become necessary after Certification has occurred. California Water Code sections 13267 and 13383 authorize the Central Coast Water Board to require submittal of information.

Monitoring and Reporting Requirements

These monitoring and reporting requirements are consistent with the Central Coast Water Board's authority to investigate the quality of any waters of the state within its region under California Water Code sections 13267 and 13383. The reports confirm that the BMPs and other measures required under this order are sufficient to protect beneficial uses and water quality objectives. Conditions regarding monitoring and reporting of BMP implementation are necessary to ensure compliance with state and federal anti-degradation policies and Executive Order W-59-93, commonly referred to as California's "no net loss" policy for wetlands.

The condition for a streamed alteration agreement submittal is required pursuant to California Code of Regulations section 3856(e), which requires that copies be provided to the Water Boards of "any final and signed federal, state, and local licenses, permits, and agreements (or copies of the draft documents, if not finalized) that will be required for any construction, operation, maintenance, or other actions associated with the activity. If no final or draft document is available, a list of all remaining agency regulatory approvals being sought shall be included."

Attachment 3

Mitigation Measures for Watsonville Slough Continuing Authorities Program Section 1135 Ecosystem Restoration Project

The mitigation measures are used to avoid, minimize, or compensate for adverse effects caused by a proposed action as described in an environmental document or record of decision and that have a connection to those adverse effects. Mitigation includes, in general order of priority:

(1) Avoiding the adverse effect altogether by not taking a certain action or parts of an action.

(2) Minimizing the adverse effect by limiting the degree or magnitude of the action and its implementation.

(3) Rectifying the adverse effect by repairing, rehabilitating, or restoring the affected environment.

(4) Reducing or eliminating the adverse effect over time by preservation and maintenance operations during the life of the action.

(5) Compensating for the adverse effect by replacing or providing substitute resources or environments.

The mitigation measures described below were incorporated into the analysis contained in ***Draft Detailed Project Report and Environmental Assessment of Watsonville Slough CAP 1135 Ecosystem Restoration Project*** and its associated ***Finding of No Significant Impact*** in order to reduce or compensate for adverse effects resulting from the proposed project.

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
General Protection Measures					
Receipt and Copies of All Permits and Authorizations	USACE	Prior to construction; during construction	Work will not begin until all necessary permits and authorizations have been received (e.g., USFWS, NMFS, State and Regional Boards, CDFW). USACE will ensure that a readily available copy of the applicable agency permits and authorizations (e.g., USFWS Biological Opinion, NMFS Biological Opinion, Section 404 permit, etc.) is maintained by the construction foreman/manager on the project site for the duration of project activities.	Delays and stoppage of construction activities	Construction General Funds
Construction Work Windows	USACE	During construction	Construction work windows is required in order to avoid impacts to aquatic resources and associated beneficial uses during the wet season. USACE will follow the applicable Regional Board's construction work windows, unless otherwise approved.	Delays and stoppage of construction activities	Construction General Funds
Construction Hours	USACE	During construction	Construction activities will generally be limited to daylight hours, to the extent feasible. If nighttime construction is necessary, including in tidally influenced waters where tides may limit daylight access and work schedules, all project lighting (e.g., staging areas, equipment storage sites, roadway, and construction footprint) will be selectively placed and directed onto the roadway or construction site and away from aquatic habitats. Light glare shields will be used to reduce the extent of illumination into aquatic habitats. If the work area is near surface waters, the lighting will be shielded so that it does not shine directly into the water.	Delays and stoppage of construction activities	Construction General Funds
Environmental Awareness Training	USACE	Prior to construction; during construction	Prior to engaging existing or new personnel in construction activities, new construction personnel will participate in environmental awareness training conducted by an agency-approved biologist or resource specialist.* Construction personnel will be informed regarding the identification, potential presence, legal protections, avoidance and minimization measures, and applicable general protection measures for all aquatic resources with the potential to occur within or immediately adjacent to the project site. Construction personnel will be informed of the procedures to follow should aquatic resources be disturbed during construction activities. For projects where the agency-approved biologist or resource specialist is not regularly on the project site, training may be provided via online/web-based meeting with an interactive portion (e.g., web-based or in-person discussion) to be included during remote training sessions. For projects that may continue over an extended duration and require excessive training events, a training video developed under the supervision of the FWS-approved biologist or resource specialist may be used to train new personnel, as long as an FWS-approved biologist or resource specialist is available via phone to answer questions about the training or that may arise during construction. Footnote: * Agency-approve monitor refers to monitors who demonstrate qualifications and can be approved by CDFW, NMFS, and/or USFWS and accepted by approving Water Board.	Delays and stoppage of construction activities	Construction General Funds
Environmental Monitoring	USACE	Prior to construction; during construction	A resource specialist will ensure that all applicable protective measures are implemented during project construction. The resource specialist will have authority to stop any work if they determine that any permit requirement is not fully implemented. The resource specialist will prepare and maintain a monitoring log of construction site conditions and observations, which will be kept on file.	Delays and stoppage of construction activities	Construction General Funds
Work Area and Speed Limits	USACE	Prior to construction; during construction	Construction work and materials staging will be restricted to designated work areas, routes, staging areas, temporary interior roads, or the limits of existing roadways. Prior to initiating construction or grading activities, brightly colored fencing or flagging or other practical means will be erected to demarcate the limits of the project activities, including the boundaries of designated staging areas; ingress and egress corridors; stockpile areas for spoils disposal, soil, and materials; and equipment exclusion zones. Flagging or fencing will be maintained in good repair for the duration of project activities. Vehicles will obey posted speed limits on public roadways and will limit speeds to 20 miles per hour (mph) within the project area on unpaved surfaces and unpaved roads (to reduce dust and soil erosion) or in areas where special status species have the potential to occur. Speeds greater than 20 mph may be permitted in the project area where special-status species are not expected to occur (e.g., within areas from which special-status species have been excluded) and where there is no risk of generating excessive dust (e.g., surfaces are paved, saturated, or have been treated with other measures to prevent dust).	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Environmentally Sensitive Areas	USACE	During construction	Monitoring, flagging, or fencing will be used, where appropriate, to minimize disturbance to environmentally sensitive areas (e.g., waters and wetlands). If fencing is used: - Fencing used must be approved by CDFW and/or USFWS for compatibility with species under their jurisdiction, as applicable, that may occur on site. - The agency-approved biologist or resource specialist will determine the location of fencing prior to the start of construction (e.g., between active work area(s) and sensitive resources). - Fencing will remain in place throughout the duration of the construction activities and will be inspected and maintained regularly by the agency approved biologist or resource specialist until completion of the project. - Repairs to the fencing will be made within 24 hours of discovering any failure. - Fencing will be removed when all construction equipment is removed from the site, the area is cleared of debris and trash, and the area is returned to natural conditions.	Delays and stoppage of construction activities	Construction General Funds
Prevent Spread of Invasive Species	USACE	During construction	The spread or introduction of invasive exotic plant species by arriving vehicles, equipment, imported gravel, and other materials, will be avoided to the maximum extent possible. When practicable, invasive exotic plants in the project areas will be removed and properly disposed of in a manner that will not promote their spread. Equipment will be cleaned of any sediment or vegetation at designated wash stations before entering or leaving the project area to avoid spreading pathogens or exotic/invasive species. Isolated infestations of noxious weeds identified in the project area will be treated with approved eradication methods at an appropriate time to prevent further formation of seed and destroy viable plant parts and seed. Wash sites must be in confined areas that limit run-off to any surrounding habitat and on a flat grade. Upland areas will use rice straw or invasive species-free local slash/mulch for erosion control, while the remainder of the project area will use certified, weed-free erosion control materials. Mulch must be certified weed free. USACE will follow the guidelines in the CDFW's California Aquatic Invasive Species Management Plan (CDFW 2008) and Aquatic Invasive Species Disinfection/Decontamination Protocols (CDFW 2016), where relevant. Construction supervisors and managers will be educated on weed identification and the importance of controlling and preventing the spread of noxious weeds. USACE will follow any applicable local guidance to prevent the spread of invasive animal species. Construction supervisors and managers will be responsible for implementation of appropriate protocols (e.g., disinfection of equipment and footwear) to prevent the spread of invasive animals.	Delays and stoppage of construction activities	Construction General Funds
Practices to Prevent Pathogen Contamination	USACE	Prior to construction; during construction	USACE will review and implement restoration design considerations and best management practices as published by the Working Group for Phytophthoras in Native Habitats (www.calphytos.org), when there is a risk of introduction and spread of plant pathogens in site plantings. (http://www.suddenoakdeath.org/ welcome-to-calphytos-org-phytophthoras-in-native-habitats/resources/#restoration.)	Delays and stoppage of construction activities	Construction General Funds
Equipment Maintenance and Materials Storage	USACE	During construction	Vehicle traffic will be confined to existing roads and the proposed access route(s). All machinery must be in good working condition, showing no signs of fuel or oil leaks. Oil, grease, or other fluids will be washed off at designated wash stations prior to equipment entering the construction site. Inspection and evaluation for the potential for fluid leakage will be performed daily during construction. Where possible, and where it would not result in greater impact to aquatic resources, no equipment refueling, or fuel storage will take place within 100 feet of a body of water. All fuel and chemical storage, servicing, and refueling will be done in an upland staging area or other suitable location (e.g., barges) with secondary containment to prevent spills from traveling to surface water or drains. USACEs will establish staging areas for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants in coordination with resource agencies. Staging areas will have a stabilized entrance and exit and will be located in upland areas to the extent possible and at least 100 feet from bodies of water unless site-specific circumstances do not provide such a setback or would result in further damage to sensitive resources, in which case the maximum setback possible will be used. Fluids will be stored in appropriate containers with covers and properly recycled or disposed of offsite. Machinery stored on site will have pans or absorbent mats placed underneath potential leak areas as a precautionary measure to further reduce the potential for impact from an unintended or previously undetectable leak.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Material Disposal	USACE	During construction	All refuse, debris, unused materials, and supplies that cannot reasonably be secured will be removed daily from the project work area and deposited at an appropriate disposal or storage site. All construction debris will be removed from the project work area immediately upon project completion. The Water Quality and Hazardous Materials measures (below), will be implemented as applicable to ensure proper handling and disposal of hazardous materials.	Delays and stoppage of construction activities	Construction General Funds
Fugitive Dust Reduction	USACE	During construction	To reduce dust, construction vehicles will be speed restricted as described in GPM-6, Work Area and Speed Limits when traveling on non-paved surfaces. Stockpiled materials susceptible to wind-blown dispersal will be covered with plastic sheeting or other suitable material to prevent movement of the material. During construction, water (e.g., trucks and portable pumps with hoses) or other approved methods will be used to control fugitive dust, as necessary. Dust suppression activities must not result in a discharge to waters of the state unless such discharges are approved by the State or Regional Board.	Delays and stoppage of construction activities	Construction General Funds
Trash Containment and Removal	USACE	During construction	During project activities all trash will be properly contained within sealed containers and removed from the work site and disposed of as necessary to maintain a trash-free work area (e.g., trash containers will not be used beyond capacity and fully close/seal).	Delays and stoppage of construction activities	Construction General Funds
Project Cleanup after Completion	USACE	During construction	Work pads, temporary falsework, and other construction items will be removed from the 100-year floodplain by the end of the construction window. Removal of materials must not result in discharge to waterbodies.	Delays and stoppage of construction activities	Construction General Funds
Revegetate Disturbed Areas	USACE	Prior to construction; post construction	All temporarily disturbed areas will be de-compacted and seeded/planted with an assemblage of native riparian, wetland, and/or upland plant species suitable for the area. USACE will develop a revegetation plan, including (as applicable) a schedule; plans for grading of disturbed areas to pre-project contours; planting palette with plant species native to the project area; invasive species management; performance standards; success criteria; and maintenance requirements (e.g., watering, weeding, and replanting). Plants for revegetation will come primarily from active seeding and planting; natural recruitment may also be proposed if site conditions allow for natural recruitment to reestablish vegetation and avoid potential negative risks associated with erosion and impacts to water quality. Plants imported to the restoration areas will come from local stock, and to the extent possible, local nurseries. Only native plants (genera) will be used for restoration efforts. Certified weed-free native mixes and mulch will be used for restoration planting or seeding. Revegetation activities within and adjacent to waters of the state will commence as soon as is practicable after construction activities at a site are complete.	Delays and stoppage of construction activities	Construction General Funds
General In-Water Measures					
Appropriate In-Water Materials	USACE	Prior to construction; during construction	Selection and use of gravels, cobble, boulders, and instream woody materials in streams, and other materials (e.g., oyster shells, other substrates) for reef/bed restoration will be performed to avoid and/or minimize adverse impacts to aquatic resources, special-status aquatic species, and their habitats. On-site gravels will be screened and sorted; gravels imported from a commercial source will be clean-washed and of appropriate size. As necessary to protect aquatic species, placement will be overseen by an agency-approved Monitor; implementation timing will be determined based on the least amount of overlap, or impact on, all aquatic natural resources that may be affected and the timing of their use of the receiving area. Imported gravel from outside the project watershed will not be from a source known to contain historic hydraulic gold mine tailings, dredger tailings, or mercury mine waste or tailings. Materials that may foul or degrade spawning gravels, such as sand or soil eroding from sand bag or earthen dams will be managed to avoid release and exposure in salmonid streams. Oyster shells or other substrates for reef/bed restoration will be cured and inspected to be free of pathogens and/or non-native species.	Delays and stoppage of construction activities	Construction General Funds
In-Water Vehicle Selection and Work Access	USACE	During construction	If work requires that equipment enter wetlands or below the bank of a waters of the state, equipment with low ground-pressure (typically less than 13 to 20 pounds per square inch (psi)) should be selected where feasible to minimize soil compaction. Low ground pressure heavy equipment mats should be used if needed to lessen soil compaction. Hydraulic fluids in mechanical equipment working in the waters of the state, will not contain organophosphate esters. Vegetable based hydraulic fluids are preferred, where feasible. The amount of time this equipment is stationed, working, or traveling in the waters of the state will be minimized. All equipment will be removed from the aquatic feature during non-work hours where appropriate or returned to the agency-approved staging area in the aquatic feature.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
In-Water Placement of Materials, Structures, and Operation of Equipment	USACE	During construction	Material used for bank stabilization or in-water restoration will minimize discharge sediment or other forms of waste to waters of the state. Where feasible, construction will occur from the top of the stream bank, or on a ground protection mat underlain with filter fabric, or a barge. All materials placed in streams, rivers or other waters will be nontoxic. Any combination of wood, plastic, cured concrete, steel pilings, or other materials used for in-channel structures will not contain coatings or treatments, or consist of substances toxic to aquatic organisms (e.g., zinc, arsenic, creosote, copper, other metals, pesticides, or petroleum-based products) that may leach into the surrounding environment in amounts harmful to aquatic organisms. Except for the following conditions, equipment must not be operated in standing or flowing waters without site-specific approval from State or Regional Board staff: - All construction activities must be effectively isolated from water flows to minimize the potential for runoff. This may be accomplished by working in the dry season or dewatering the work area in the wet season. - When work in standing or flowing water is required, structures for isolating the in-water work area and/or diverting the water flow must not be removed until all disturbed areas are cleaned and stabilized. The diverted water flow must not be contaminated by construction activities. - All open flow temporary diversion channels must be lined with filter fabric or other appropriate liner material to prevent erosion. Structures used to isolate the in-water work area and/or divert the water flow (e.g., coffer dam or geotextile silt curtain) must not be removed until all disturbed areas are stabilized.	Delays and stoppage of construction activities	Construction General Funds
In-Water Staging Areas and Use of Barges	USACE	During construction	Construction equipment and project materials may be staged in designated agency-approved staging areas. Existing staging sites, maintenance toe roads, and crown roads will be used to the maximum extent possible for project staging and access to avoid affecting previously undisturbed areas. For projects that involve in-water work for which boats and/or temporary floating work platforms are necessary, buoys will be installed so that moored vessels will not beach on the shoreline and anchor lines will not drag. Moored vessels and buoys will not be within 25 feet of vegetated shallow waters.	Delays and stoppage of construction activities	Construction General Funds
Cofferdam Construction	USACE	During construction	Cofferdams may be installed both upstream and downstream, and along portions of the cross section of a channel or other waterway if necessary to isolate the extent of the work areas. When feasible, construction of cofferdams will begin in the upstream area and continue in a downstream direction, allowing water to drain and allowing fish and aquatic wildlife species to leave (under their own volition), from the area being isolated by the cofferdam, prior to closure. The flow will then be diverted only when construction of the upstream dam is completed and the work area has been naturally drained of flow, at this point, the downstream dam, if necessary, would be completed and then flow would be diverted around the work area. Cofferdams and stream diversion systems will remain in place and fully functional throughout the construction period. In order to minimize adverse effects to aquatic species, stream diversions will be limited to the shortest duration necessary to complete in-water work. In-water cofferdams will only be built from materials such as sandbags, plastic, clean gravel (possibly wrapped in impermeable material), rubber bladders, vinyl, steel, or earthen fill, in a manner that minimizes siltation and/or turbidity. Sandbags may only be used to build cofferdams upstream of spawning gravels when filled with clean gravel (or other material acceptable to the approving Water Board). Where possible, cofferdams should be pushed into place. If pile driving (sheet piles) is required, vibratory hammers should be used and impact hammer should be avoided. If necessary, the footing of the cofferdam will be keyed into the channel bed at an appropriate depth to capture the majority of subsurface flow needed to dewater the streambed. When cofferdams with bypass pipes are installed, debris racks will be placed at the bypass pipe inlet in a manner that minimizes the potential for fish impingement and/or entrapment. As needed and where feasible, bypass pipes will be monitored for accumulation of debris. All accumulated debris will be removed. When appropriate, cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour. Cofferdams in tidal waters should be removed during the lowest possible tide and in slack water to the extent feasible to minimize disturbance and turbidity. This will minimize the probability of fish and other aquatic species stranding as the area upstream becomes dewatered. All dewatering/diversion facilities will be installed such that natural flow is maintained upstream and downstream of project areas. An area may need to be dewatered for long enough to allow special-status species to leave on their own before final clearance surveys and construction can begin.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Dewatering/Diversion	USACE	Prior to construction; during construction	The area to be dewatered will encompass the minimum area necessary to perform construction activities. USACE will provide a dewatering plan with a description of the proposed dewatering structures, and appropriate types of BMPs for the installation, operation, maintenance, and removal of those structures. The period of dewatering/diversion will extend only for the minimum amount of time needed to perform the restoration activity and to allow special-status species time to leave on their own before final clearance surveys and construction can begin. Where feasible and appropriate, dewatering/diversion will occur via gravity-driven systems, and where water is pumped from within the construction area, it should be pumped to upland areas (where feasible) and to a location where it can infiltrate without return flows to the watercourse. Dewatering/diversion will be designed to avoid direct and preventable indirect mortality of fish and other aquatic species. If special-status fish species may be present in the area to be dewatered, a fish capture and relocation plan will be developed and implemented for review and approval by appropriate agencies (e.g., CDFW, NMFS, USFWS, as applicable). Stream flows will be allowed to gravity flow around or through the work site using temporary bypass pipes or culverts. Bypass pipes will be sized to accommodate, at a minimum, twice the expected construction-period flow, to not increase stream velocity, and will be placed at stream grade. Conveyance pipe outlet energy dissipaters will be installed to prevent scour and turbidity at the discharge location. When use of gravity-fed dewatering is not feasible and pumping is necessary to dewater a work site, a temporary siltation basin and/or use of silt bags may be required. Silt fences or mechanisms to avoid sediment input to the flowing channel will be installed adjacent to flowing water. Water pumped or removed from dewatered areas will be conducted in a manner that does not contribute turbidity to nearby receiving waters. Where possible, pumps will be refueled in an area well away from the stream channel. Fuel absorbent mats will be placed under the pumps while refueling. Equipment working in the stream channel or within 25 feet of a wetted channel will have a double (i.e., primary and secondary) containment system for diesel and oil fluids. All work will comply with the CDFW Fish Screening Criteria (CDFW 2001) and NMFS Fish Screening Criteria for Anadromous Salmonids (NMFS 1997). Pump intakes will be covered with mesh per the requirements of current fish screening criteria to prevent potential entrainment of fish or other aquatic species that could not be removed from the area to be dewatered. The pump intake will be checked periodically for impingement of fish or other aquatic species. Diverted flows must be of sufficient quality and quantity, and of appropriate temperature, to support existing fish and other aquatic life both above and below the diversion. Pre-project flows must be restored to the affected surface water body upon completion of work at that location. Where diversions are planned, contingency plans will be developed that include oversight for breakdowns, fueling, maintenance, leaks, etc.	Delays and stoppage of construction activities	Construction General Funds
Fish and Aquatic Species Exclusion While Installing Diversion Structures	USACE	During construction	Fish and other aquatic species will be excluded from occupying the area to be dewatered by blocking the stream channel above and below the area to be dewatered with fine-meshed block nets or screens while coffer dams and other diversion structures are being installed. Block net mesh will be sized to ensure aquatic species upstream or downstream do not enter the areas proposed for dewatering. Mesh will be no greater than 1/8-inch diameter. The bottom of the net must be completely secured to the channel bed. Block nets or screens must be checked at least twice daily at the beginning and end of the workday and cleaned of debris to permit free flow of water. Block nets or screens will be placed and maintained throughout the dewatering period at the upper and lower extent of the areas where aquatic species will be removed. Net placement s temporary and will be removed once dewatering has been accomplished or construction work is complete for the day.	Delays and stoppage of construction activities	Construction General Funds
Removal of Diversion and Barriers to Flow	USACE	Post construction	Upon completion of construction activities, any diversions or barriers to flow will be removed in a manner that will allow flow to resume with the least disturbance to the substrate and consideration of turbidity levels. Alteration of creek beds will be minimized to the maximum extent possible; any imported material that is not part of the project design will be removed from stream beds upon completion of the project.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
In-Water Pile Driving Plan for Sound Exposure	USACE	Prior to construction; during construction	USACEs will develop a plan for pile-driving activities to minimize impacts to special-status species and submit it to relevant agencies for approval prior to the start of in-water pile driving activities. Measures will be implemented to minimize underwater sound pressure to levels below fish thresholds for peak pressure and accumulated sound exposure levels. Thresholds levels for special-status fish under NMFS jurisdiction are established in the Fisheries Acoustic Work Group's Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities (FAWG 2008) and may be used as a guideline for special-status fish. The plan will describe the least impactful method to aquatic organisms, and will identify the number, type, and size of piles, estimated sound levels caused by the driving, how many piles will be driven each day, qualifications of monitors, any other relevant details on the nature of the pile driving activity, and the actions that will be taken to ensure a project stays within the required sound exposure thresholds.	Delays and stoppage of construction activities	Construction General Funds
In-Water Pile Driving Methods	USACE	During construction	Pile driving will occur during approved work windows with reduced currents and only during daylight hours. Pile driving will be conducted with vibratory or low/nonimpact methods (i.e., hydraulic) that result in sound pressures below threshold levels to the extent feasible. Applied energy and frequency will be gradually increased until necessary full force and frequency are achieved. If it is determined that impact hammers are required and/or underwater sound monitoring demonstrates that thresholds are being exceeded, the contractor will implement sound dampening or attenuation devices to reduce levels to the extent feasible; these may include the following: - A cushioning block used between the hammer and pile. - Use of a confined or unconfined air bubble curtain. - If feasible, pile driving could be done in the dry area (dewatered) behind the cofferdam. Pile driving will follow the criteria outlined in the most recent version of the California Department of Transportation's Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (Caltrans 2015).	Delays and stoppage of construction activities	Construction General Funds
Sediment Containment during In-Water Pile Driving	USACE	During construction	Caissons or a continuous length of silt curtain, fully surrounding the pile driving area, must be used as necessary and as practicable to protect aquatic resources and to provide sediment containment while construction activities are occurring if working in a wetted channel. The silt curtain will prevent the release of a turbidity plume and trap sediment that may become suspended as a result of the pile driving. The bottom of the silt curtains must be weighted with ballast weights or rods affixed to the base of the fabric to resist the natural buoyancy of the silt curtain fabric and lessen its tendency to move in response to currents. Where feasible and applicable, the floating silt curtains must be anchored and deployed from the surface of the water to just above the substrate. The silt curtain must be monitored for damage, dislocation or gaps and must be immediately repaired where it is no longer continuous or where it has loosened. The silt curtain must restrict the surface visible turbidity plume to the area of pile construction and must control and contain the migration of re-suspended sediments at the water surface and at depth.	Delays and stoppage of construction activities	Construction General Funds
Pile-driving Monitoring	USACE	During construction	An agency-approved biologist will be on site during pile-driving activities to minimize effects to special-status species that could be present. If any stranding, injury, or mortality to special-status species is observed, federal and state wildlife agencies will be notified in writing (e.g., via email) within 24 hours and in-water pile driving will cease until the applicable federal and/or state agencies provide guidance on how to proceed.	Delays and stoppage of construction activities	Construction General Funds
Water Quality and Hazardous Materials					
Staging Areas and Stockpiling of Materials and Equipment	USACE	During construction	Staging, storage, and stockpile areas must be outside of waters of the state. To the extent feasible, staging will occur on access roads or other previously disturbed upland areas, such as developed areas, paved areas, parking lots, areas with bare ground or gravel, and areas clear of vegetation, to avoid aquatic habitats and limit disturbance to surrounding habitats. Similarly, all maintenance equipment and materials (e.g., road rock and project spoil) will be restricted to the existing service roads, paved roads, or other determined designated staging areas. Staging areas will be established for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants in coordination with resource agencies. Staging areas will have a stabilized entrance and exit and will be located at least 100 feet from bodies of water unless site-specific circumstances do not provide such a setback, in such cases	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
			the maximum setback possible will be used. If an off-road site is chosen and if special-status species are potentially present, the Biological Monitor will survey the selected site to verify that no aquatic resources would be disturbed by staging activities. Stockpiling of materials, portable equipment, vehicles and supplies (e.g., chemicals), will be restricted to the designated construction staging areas. If rain is predicted in the forecast during the dry season, and stockpiled soils will remain exposed and unworked for more than 7 days, then erosion and sediment control measures must be used. If there is a high-wind scenario (to be defined by the approving Water Board as appropriate for an individual project site), then soils will be covered at all times. During the wet season, no stockpiled soils will remain exposed, unless properly installed and maintained erosion and sediment controls are in place on and around the stockpile. Temporary stockpiling of material onsite will be minimized. Stockpiled material will be placed in upland areas far enough away from aquatic habitats that these materials cannot discharge to a water of the state.		
Erosion and Sediment Control Measures	USACE	Prior to construction; during construction	USACE will develop and implement erosion and sediment control measures (or plan), which will include appropriate BMPs to reduce the potential release of water quality pollutants to receiving waters. BMPs may include the following measures: - Employ tackifiers, soil binders, or mulch as appropriate for erosion control. - Install sediment erosion control measures, such as straw bales, silt fences, fiber rolls, or equally effective measures, at repair areas adjacent to stream channels, drainage canals, and wetlands, as needed. Sediment control measures will be monitored during and after each storm event for effectiveness. Modifications, repairs, and improvements to sediment control measures will be made as needed to protect water quality. - No sediment control products will be used that include synthetic or plastic monofilament or cross-joints in the netting that are bound/stitched (such as straw wattles, fiber rolls, or erosion control blankets), and which could trap snakes, amphibians, and other wildlife.		
Hazardous Materials Management and Spill Response Plan	USACE	During construction	As part of the SWPPP or Erosion Control Plan, USACE will prepare and implement a hazardous materials management and spill response plan. USACE will ensure that any hazardous materials are stored at the staging area(s) with an impermeable membrane between the ground and hazardous material and that the staging area is designed to prevent the discharge of pollutants to groundwater and runoff water. USACE will stop work, follow the spill response plan, and arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills. USACE will notify regulatory agencies within 24 hours of any leaks or spills. USACE will properly contain and dispose of any unused or leftover hazardous products off-site. USACE will use and store hazardous materials, such as vehicle fuels and lubricants, in designated staging areas located away from stream channels and wetlands, according to local, state, and federal regulations, as applicable.	Delays and stoppage of construction activities	Construction General Funds
In-Water Concrete Use	USACE	Prior to construction; during construction	A dewatering plan must be submitted and approved by State and/or Regional Boards for in-water concrete use. Where possible, poured concrete should be excluded from contact with surface or groundwater during initial curing, ideally for 30 days after it is poured. During that time, runoff from the concrete will not be allowed to enter surface or groundwater. If this is not feasible due to expected flows and site conditions, commercial sealants that are non-toxic to aquatic life may be applied before it comes into contact with flowing water. Only sealants that have been tested and found nontoxic to freshwater aquatic life, including benthic macro-invertebrates, may be used on concrete surfaces that could come into contact with flowing water. Concrete is considered to be cured when water poured over the surface of concrete consistently has a pH of less than 8.5. (Note: Demonstration of nontoxicity to aquatic life may be evaluated by measuring survival of test organisms in a 96-hour bioassay. The bioassay should be performed according to the most up-to-date protocols in 40 C.F.R. part 136, currently Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, 5th Edition (EPA-821-R-02-012), including sample collections, handling, and preservation per U.S. EPA protocols).	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Accidental Discharge of Hazardous Materials	USACE	During construction	Following an accidental discharge of a reportable quantity of a hazardous material, sewage, or an unknown material, the following applies (Wat. Code, Â§ 13271): As soon as (A) discharger has knowledge of the discharge or noncompliance, (B) notification is possible, and (C) notification can be provided without substantially impeding cleanup or other emergency measures then: - first call - 911 (to notify local response agency) - then call - Office of Emergency Services (OES) State Warning Center at: (800) 852-7550 or (916) 845-8911 - Lastly, follow the required OES procedures as set forth in: http://www.caloes.ca.gov/FireRescueSite/Documents/CalOESSpill_Booklet_ Feb2014_FINAL_BW_Acc.pdf Following notification to OES, the discharger will notify the State or Regional Board (and other agencies requiring notification in their respective permits), as soon as practicable (ideally within 24 hours). Notification may be via telephone, e-mail, delivered written notice, or other verifiable means.	Delays and stoppage of construction activities	Construction General Funds
Vegetation/Habitat Disturbance and Revegetation Measures					
Avoidance of Vegetation Disturbance	USACE	During construction	USACE will minimize, to the greatest extent feasible, the amount of soil, terrestrial vegetation, emergent native vegetation, and submerged vegetation (e.g., eelgrass and kelp in marine areas, or submerged aquatic vegetation in brackish and freshwater areas) disturbed during project construction and completion and using methods creating the least disturbance to vegetation. Disturbance to existing grades and native vegetation, the number of access routes, the size of staging areas, and the total area disturbed by the project will be limited to the extent of all temporary and permanent impacts as defined by the final project design. All roads, staging areas, and other facilities will be placed to avoid and limit disturbance to waters of the state and other aquatic habitats (e.g., streambank or stream channel, riparian habitat) as much as possible. When possible, existing ingress or egress points will be used and/or work will be performed from the top of the creek banks or from barges on the waterside of the stream or levee bank, or dry gravel beds. Existing native vegetation will be retained as practicable, emphasizing the retention of shade-producing and bank stabilizing trees and brush with greater than 6-inch diameter branches or trunks. Where possible, vegetation disturbance and soil compaction will be minimized by using low ground-pressure (typically less than 13 to 20 pounds psi) equipment that exerts less pressure per square inch on the ground than other equipment. To minimize impacts to vegetation, select equipment with a greater reach.	Delays and stoppage of construction activities	Construction General Funds
Native and Invasive Vegetation Removal Materials and Methods	USACE	During construction	If riparian vegetation is to be removed with chainsaws or other power equipment, machines that operate with vegetable-based bar oil will be used, as practicable. All invasive plant species (e.g., those rated as invasive by the California Invasive Plant Council or local problem species) will, if feasible, be removed from the project site, using locally and routinely accepted agriculture practices. Invasive plant material will be destroyed using approved protocols and disposed of at an appropriate upland disposal or compost area. Invasive plant materials stockpiled at sites known to experience flash flooding outside the flood season will be removed within 15 days of the initial creation of the stockpile in order to contain the potential spread of invasive plant material. Stockpiling of invasive plant materials is prohibited during the flood season.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Revegetation Materials and Methods	USACE	Post construction	Upon completion of work, site contours will be returned to preconstruction conditions. Where disturbed, topsoil will be conserved (and watered at an appropriate frequency) for reuse during restoration to the extent practicable. Native plant species comprising a diverse community structure (plantings of both woody and herbaceous species, if both are present) that follow an agency-approved plant palette will be used for revegetation of disturbed and compacted areas, as appropriate. Revegetate Disturbed Areas, which also allows for revegetation through natural recruitment (e.g., in tidal and managed wetlands and working landscapes where disturbed areas typically revegetate more quickly through natural recruitment than through seeding). Any area barren of vegetation as a result of project implementation will be restored to a natural state by mulching, seeding, planting, or other means with native trees, shrubs, willow stakes, erosion control native seed mixes, or herbaceous plant species following completion of project construction. Irrigation may also be required in order to ensure survival of containerized shrubs or trees or other vegetation, depending on rainfall. Soils that have been compacted by heavy equipment will be de-compacted, as necessary, to allow for revegetation at project completion as heavy equipment exits the construction area.	Delays and stoppage of construction activities	Construction General Funds
Revegetation Erosion Control Materials and Methods	USACE	During construction; post construction	If erosion control fabrics are used in revegetated areas, they will be slit in appropriate locations as necessary to allow for plant root growth. Only non-monofilament, wildlife-safe fabrics will be used. All plastic exclusion netting placed around plantings will be removed after 2 years or sooner if practicable.	Delays and stoppage of construction activities	Construction General Funds
Revegetation Monitoring and Reporting	USACE	Post construction	All revegetated areas will be maintained and monitored for a minimum of 2 years after replanting is complete and until success criteria are met, to ensure the revegetation effort is successful. The standard for success is at least 60% absolute cover compared to pre-project conditions at the project site or at least 60% cover compared to an intact, local reference site (or an available reference site accepted by the approving Water Board). If an appropriate reference site or pre-project conditions cannot be identified, success criteria will be developed for review and approval by the approving Water Board on a project-by-project basis based on the specific habitat impacted and known recovery times for that habitat and geography. USACE will prepare a summary report of the monitoring results and recommendations at the conclusion of each monitoring year.	Delays and stoppage of construction activities	Construction General Funds
General Herbicide Use	USACE	During construction	Chemical use is restricted in accordance with approved application methods and best management practices designed to prevent exposure to non-target areas and organisms. Any chemical considered for control of invasive species must be approved for use in California, adhere to all regulations per the California Environmental Protection Agency (CEPA 2011 or most recent version), and be applied by a licensed applicator under all necessary state and local permits. Use herbicides only in a context where all treatments are considered, and various methods are used individually or in concert to maximize the benefits while reducing undesirable effects and applying the lowest legal effective application rate, unless site-specific analysis determines a lower rate is needed to reduce non-target impacts. Treat only the minimum area necessary for effective control.		
Herbicide Application Planning	USACE	Prior to construction; during construction	Written chemical application recommendations should be provided by USACE from a certified Pest Control Advisor (PCA) (CEPA 2011). The PCA can ensure that legal, appropriate, and effective chemicals are used with appropriate methodologies. Field scouting must be done before application, and the licensed Applicator (CEPA 2011) must be on-site to lead all applications and will adhere to standard protection measures for application. Prior to field scouting or application, the PCA or licensed applicator, will receive Environmental Awareness Training for the project so that they are aware of special status species and habitats present at the project site.	Delays and stoppage of construction activities	Construction General Funds
Herbicide Application Reporting	USACE	Post construction	The licensed applicator will keep a record of all plants/areas treated, amounts and types of herbicide used, and dates of application, and pesticide application reports must be completed within 24 hours of application and submitted to applicable agencies for review. Wind and other weather data will be monitored and reported for all application reports.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Capture and Relocation of Salmonids Guidelines					
Capture and Relocation of Salmonids Guidelines for a Qualified Biologist	USACE	During construction	A qualified fisheries biologist shall perform all seining, electrofishing, and fish relocation activities. The qualified fisheries biologist shall capture and relocate salmonids and other native fish prior to construction of the water diversion structures (e.g., cofferdams). The qualified fisheries biologist shall note the number of salmonids observed in the affected area, the number of salmonids relocated, and the date and time of collection and relocation. The qualified fisheries biologist shall have a minimum of three years of field experience in the identification and capture of salmonids, including juvenile salmonids. The qualified biologist will adhere to the following requirements for capture and transport of salmonids: a) Determine the most efficient means for capturing fish. Complex stream habitat generally requires the use of electrofishing equipment, whereas in outlet pools, fish may be concentrated by pumping down the pool and then seining or dip netting fish. b) Notify the RC one week prior to capture and relocation of salmonids to provide RC or NMFS staff an opportunity to attend. c) Initial fish relocation efforts will be conducted several days prior to the start of construction. This provides the fisheries biologist an opportunity to return to the work area and perform additional electrofishing passes immediately prior to construction if there is water in the isolated construction area. In these instances, additional fish could be captured that eluded the previous day's efforts. If water is left in the construction area, dissolved oxygen levels sufficient for salmonid survival must be maintained. d) At project sites with high summer water temperatures, perform relocation activities during morning periods. e) Prior to capturing fish, determine the most appropriate release location(s). Consider the following when selecting release site(s): - Similar water temperature as capture location - Ample habitat for captured fish - Low likelihood of fish reentering work site or becoming impinged on exclusion net or screen. f) Periodically measure air and water temperatures and monitor captured fish. Temperatures will be measured at the head of riffle tail of pool interface. Cease activities if health of fish is compromised owing to high water temperatures, or if mortality exceeds three percent of captured salmonids.	Delays and stoppage of construction activities	Construction General Funds
Fish Relocation using Electrofishing	USACE	During construction	The following methods shall be used if fish are relocated via electrofishing: 1. All electrofishing will be conducted according to NMFS' Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act (NMFS 2000). 2. The backpack electro-fisher shall be set as follows when capturing fish: Voltage setting on the electro-fisher shall not exceed 300 volts. Initial Maximum A) Voltage: 100 Volts 300 Volts B) Duration: 500 Î¼s (microseconds) 5 ms (milliseconds) C) Frequency: 30 Hertz 30 Hertz 3. A minimum of three passes with the electro-fisher shall be utilized to ensure maximum capture probability of salmonids within the area proposed for dewatering. 4. Water temperature, dissolved oxygen, and conductivity shall be recorded in an electrofishing log book, along with electrofishing settings. 5. A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and other aquatic vertebrates.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Fish Relocation using Seines	USACE	During construction	The following methods shall be used if fish are removed with seines. 1. A minimum of three passes with the seine shall be utilized to ensure maximum capture probability of all salmonids within the area. 2. All captured fish shall be processed and released prior to each subsequent pass with the seine. 3. The seine mesh shall be adequately sized to ensure fish are not gilled during capture and relocation activities.	Delays and stoppage of construction activities	Construction General Funds
Relocation of Salmonids using either Electrofishing or Seining	USACE	During construction	The following methods shall be used during relocation activities associated with either method of capture (electrofishing or seining): 1. Fish shall not be overcrowded into buckets, allowing no more than 150 0+ fish (approximately six cubic inches per 0+ individuals) per 5 gallon bucket and fewer individuals per bucket for larger/older fish. 2. Every effort shall be made not to mix 0+ salmonids with larger steelhead, or other potential predators, that may consume the smaller salmonids. Have at least two containers and segregate young-of-year (0+) fish from larger age classes. Place larger amphibians in the container with larger fish. 3. Salmonid predators, including other fishes and amphibians, collected and relocated during electrofishing or seining activities shall not be relocated so as to concentrate them in one area. Particular emphasis shall be placed on avoiding relocation of predators into the salmonid relocation pools. To minimize predation of salmonids, these species shall be distributed throughout the wetted portion of the stream to avoid concentrating them in one area. 4. All captured salmonids shall be relocated, preferably upstream, of the proposed construction project and placed in suitable habitat. Captured fish shall be placed into a pool, preferably with a depth of greater than two feet with available instream cover. 5. All captured salmonids will be processed and released prior to conducting a subsequent electrofishing or seining pass. 6. All native captured fish will be allowed to recover from electrofishing before being returned to the stream. 7. Minimize handling of salmonids. However, when handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear insect repellants containing the chemical N,N-Diethyl-meta-toluamide (DEET). 8. Temporarily hold fish in cool, shaded, aerated water in a container with a lid. Provide aeration with a battery-powered external bubbler. Protect fish from jostling and noise and do not remove fish from this container until time of release. 9. Place a thermometer in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds those allowed by CDFW and NMFS, fish shall be released and rescue operations ceased. 10. In areas where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations. 11. Visually identify species and estimate year-classes of fish at time of release. Count and record the number of fish captured. Avoid anesthetizing or measuring fish. Also identify hatchery (clipped adipose fin) and wild fish. 12. If more than 3 percent of the salmonids captured are killed or injured, the project permittee shall contact the RC (currently Joe Pecharich (707) 575-6095 or at joe.pecharich@noaa.gov). The RC will then contact NMFS within 24 hours. 13. The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All salmonid mortalities must be retained, placed in an appropriately sized, zip-sealed bag, labeled with the date and time of collection, fork length, location of capture, and frozen as soon as possible. Frozen samples must be retained until specific instructions are provided by NMFS.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Mitigation Measures for Special Status Species					
Preconstruction Surveys	USACE	During construction	If special-status plants are present and/or special status terrestrial animal species habitat is present (e.g., stationary habitat such as burrows, bird nests, cavities for bats, etc.), where appropriate, based on project-specific requirements, a qualified, agency-approved biologist with experience on the identification of all applicable life stages of the special-status species will conduct reconnaissance-level preconstruction surveys and implement additional measures, as appropriate, to protect the species from construction-related disturbance before work begins. The intent of the survey is to assess current species habitat and use locations in the project area immediately prior to construction. Special-status plant species surveys shall be conducted in the appropriate blooming period, as applicable, prior to the start of construction for proper plant identification. If construction activities cease for more than five consecutive days, and there is potential for special-status species to re-occupy the site, the agency-approved biologist will re-survey the project area and implement measures, as appropriate. USACE can choose to assume animal species presence, forgo preconstruction surveys, and implement additional protection measures, as appropriate, to protect special status species from construction-related disturbance. Additional species guild-specific pre-construction requirements are described below and may supersede this general species protection measure, as applicable.	Delays and stoppage of construction activities	Construction General Funds
Environmentally Sensitive Areas and/or Wildlife Exclusion	USACE	During construction	Monitoring, flagging, and/or fencing will be used to minimize disturbance to environmentally sensitive areas (e.g., waters and wetlands). If fencing is used: - The agency-approved biologist or resource specialist will determine the location of the fencing prior to the start of construction (e.g., between active work area(s) and sensitive resources). - Fencing will remain in place throughout the duration of the construction activities, and will be inspected and maintained regularly by the agency-approved biologist or resource specialist until completion of the project. - Repairs to the fencing will be made within 24 hours of discovery. - Fencing will be removed when all construction equipment is removed from the site, and the area cleared of debris and trash, and returned to natural conditions.	Delays and stoppage of construction activities	Construction General Funds
Species Protection Construction Work Windows	USACE	During construction	Construction work windows may be required, depending on whether or not the project involves in-water construction and/or whether special-status species have potential to occur onsite.	Delays and stoppage of construction activities	Construction General Funds
Species Capture, Handling and Translocation	USACE	Prior to construction; during construction	Special-status species capture, handling, and translocation will only be conducted by an agency-approved biologist(s). Required permitting will be needed prior to any capture, handling, and relocation. If translocation of special-status species is needed, USACE will prepare a special-status species translocation plan to be reviewed and approved by the agency(ies), as appropriate, prior to project implementation. The plan will include capture and translocation methods, translocation site, and post translocation monitoring, if applicable. If capture, handling, and translocation is necessary due to dewatering activities, refer to the protective measures for Dewatering Activities, under general protection measure IWW 6 and follow the agency-approved translocation plan.	Delays and stoppage of construction activities	Construction General Funds
Special-Status Species Entrapment Prevention	USACE	During construction	All excavated, steep-walled holes or trenches will be covered with appropriate covers (e.g., thick metal sheets or plywood) at the end of each workday. Covers will be placed so that trench edges are fully sealed with rock bags, sand, or other appropriate material. Alternatively, one or more escape ramps such as fill dirt or wood planking will be installed at an angle no greater than 30 degrees, to allow wildlife to escape. Before holes or trenches are filled, sealed, or collapsed, the holes or trenches will be thoroughly inspected for trapped animals. Any animals discovered will be allowed to escape voluntarily or will be relocated by an agency-approved biologist.	Delays and stoppage of construction activities	Construction General Funds
Airborne Noise Reduction	USACE	During construction	Equipment, including noise abatement systems, will be maintained in good working order. If construction noise has the potential to adversely affect special-status species, USACE will include site specific measures for construction activities to minimize impacts. Muffler (or spark arrester) damage must be promptly remedied, to the degree practicable, to meet sound attenuation standards.	Delays and stoppage of construction activities	Construction General Funds

Mitigation Measure	Responsible Party	Timeframe	Performance Standards	Consequences of Non-Compliance	Funding Source
Mitigation Measures for California red-legged frog					
Work Windows	USACE	During construction	For the California red-legged frog and California tiger salamander, project activities in uplands will be confined to May 1 through October 31, unless there is a rain event forecast likely to generate measurable fall, rain of 1 inch or greater, at which time work will cease for the fall season. For project activities in occupied aquatic breeding habitat, grading and other disturbance will avoid the breeding season and will be limited to between July 1 and October 31, unless preconstruction surveys and monitoring demonstrate that young-of-year (recently metamorphosed) amphibians have dispersed from the breeding habitat. In that case, based on the recommendation of the USFWS-Approved Biologist, and with written approval from the USFWS (e.g., email), USACE may proceed with work in aquatic breeding habitat prior to July 1. Work in a pool or wetland may also begin before July 1 if the wetland has been dry for a minimum of 30 days before initiating work.	Delays and stoppage of construction activities	Construction General Funds
Nonnative Animal Removals	USACE	During construction	During electrofishing activities, in or near California red-legged frog occupied habitat, a USFWS-Approved Biologist will precede the electrofishing crew and survey for California red-legged frogs. If any California red-legged frogs are detected, they will be captured and held outside the waterbody until the electrofishing activities at that location have been completed. All individuals would then be immediately returned to the point of capture. California red-legged frog tadpoles will not be removed from habitat during electrofishing. If a tadpole is shocked then it should be captured (e.g., placed in shallow container) and monitored until it regains function, and then released at point of capture. If it does not regain function then should be reported as a mortality. If California red-legged frogs are detected but escape capture, the USFWS-Approved Biologist will determine measures for avoiding or minimizing impacts to individuals (i.e., leave the area or limit the duration of shocking pulses).	Delays and stoppage of construction activities	Construction General Funds

Environmental Appendix A-3

Watsonville Slough Ecosystem Restoration Project

Continuing Authorities Program Section 1135

DRAFT

Preliminary Planting Plan and Monitoring & Adaptive Management Plan

July 2025

US Army Corps of Engineers ®
San Francisco District

Pajaro Storm Drain Maintenance District
Within Santa Cruz County

Table of Contents

1.0 INTRODUCTION 1

1.1 Authorization for Adaptive Management for the Watsonville Slough CAP 1135 Study 1

1.2 Adaptive Management Team Structure 1

1.3 Background 2

1.4 Project Location 4

2.0 PROJECT DESCRIPTION 4

2.1 Planning Objectives 4

2.2 Conceptual Ecological Model (CEM) 5

2.3 Project Description Overview 6

2.3.1 Project Components for Improved Hydrology and Fish Access 7

2.3.2 Project Measures for Improved Marsh Vegetation – Planting Plan 10

3.0 MAINTENANCE, MONITORING, & ADAPTIVE MANAGEMENT 15

3.1 Hydrologic Monitoring 16

3.1.1 Success Criteria 16

3.1.2 Monitoring Strategy 16

3.1.3 Adaptive Management Strategy 16

3.2 Vegetation 17

3.2.1 Success Criteria 18

3.2.2 Monitoring Strategy 18

3.2.3 Adaptive Management Strategy 18

3.3 Fish Passage Access 19

3.3.1 Success Criteria 19

3.3.2 Monitoring Strategy 19

3.3.3 Adaptive Management Strategy 20

3.4 Monitoring and Adaptive Management Costs 22

References: 23

Acronyms and Abbreviations

CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
DWR	Department of Water Resources
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
RWQCB	Regional Water Quality Control Board
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

This document outlines the feasibility level monitoring and adaptive management plan (MAMP) for the Watsonville Slough Continuing Authorities Program (CAP) Section 1135 study in Santa Cruz County, California. The U.S. Army Corps of Engineers (USACE), in ongoing cooperation with the non-Federal sponsor, the Pajaro Storm Drain Maintenance District (PSDMD), has developed this plan to describe monitoring and adaptive management activities proposed for the Watsonville Slough CAP 1135 Study, assign costs, and estimate duration. Monitoring and adaptive management addresses sources of uncertainty, steers project implementation and maintenance to ensure that the intended project benefits are attained, and documents project effects for communication to participants and stakeholders.

1.1 Authorization for Adaptive Management for the Watsonville Slough CAP 1135 Study

This MAMP is prepared following the 19 Oct 2017 Implementation Guidance for Section 1161 of the Water Resources Development Act of 2016 (WRDA 2016), Completion of Ecosystem Restoration Projects. This guidance applies to specifically authorized projects and components of projects as well as to those ecosystem restoration projects initiated under the Continuing Authority Program or other programmatic authorities (e.g., CAP Section 1135). Following the Implementation Guidance, this MAMP will list the physical actions to be carried out; contextualize those actions with their functions and ecological outputs; describe the success criteria for the actions; list the means, methods, and frequencies of monitoring for success; list adaptive management measures along with the triggers for implementation of each measure; and establish costs for implementation of the MAMP.

Concurrence by the non-Federal sponsor and cost-shared funding would be needed to implement adaptive management. Any changes to the adaptive management plan in the approved feasibility report must be coordinated with HQUSACE. Significant changes to the project required to achieve ecological success which cannot be appropriately addressed through operational changes or through the approved adaptive management plan may need to be examined under other authorities, such as Section 216 of the River and Harbor and Flood Control Act of 1970.

1.2 Adaptive Management Team Structure

As part of the communication structure for implementation of adaptive management, an Adaptive Management Planning Team will be established. This team will be led by a Senior Planner or Senior Environmental Manager from USACE and may include a counterpart from PSDMD or their parent agency, Santa Cruz County. Other resources and expertise will be brought in as needed, and may include other representatives from USACE, the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), or National Marine Fisheries Service (NMFS). This team is responsible for ensuring that monitoring data and assessments are properly used in the adaptive

management decision-making process. If this team determines that adaptive management actions are needed, the team will coordinate a path forward with project planners and project managers. The Adaptive Management Planning Team is also responsible for project documentation, reporting, and external communication.

1.3 Background

The Watsonville Slough CAP 1135 Study was initiated by USACE in 2021 at the request of PSDMD, the non-Federal sponsor for the study. USACE is the lead agency for the Feasibility Study and is also the lead under NEPA. PSDMD is the lead agency under the California Environmental Quality Act (CEQA).

Watsonville Slough is a tributary of the Pajaro River in Santa Cruz County, the confluence immediately inside the mouth of the river (Figure 1). As such, the lower Watsonville Slough is part of the greater Pajaro Lagoon, a bar-built estuary that forms when the river mouth is closed by the build up of a sand bar. The backwater flooding that occurs during lagoon closures is an important, natural component of the marsh hydrology in these systems, periodically inundating the perched marsh plain. The study focused on the lower Watsonville Slough and Pajaro River Lagoon. On its inland side, the study area abuts extensive farmlands, while on the seaward side it is adjacent to the Pajaro Dunes Community and the Pacific Ocean (Figure 1).

Since the 1930's, most of the original Watsonville Slough channel and tidal marsh system had been reclaimed for agriculture and was further constrained by adjacent residential land use and USACE Federal levees. The total area of tidal marsh and coastal wetland habitat between the Watsonville Slough and the Pajaro River has decreased by approximately 80%. The levees have isolated the slough system from most fluvial processes and overflows. The United States Coast Survey (USCS) topographic sheets (T-sheets) mapped extensive tidal marsh, grasslands, dunes and channels through the lower Watsonville Slough in 1853 (Figure 2, Panel A). By the 1930s, much of the wetlands had been reclaimed for agriculture, especially along the east bank of the lower Watsonville Slough (Figure 2, Panel B). Although side channels were filled and smoothed, the marshes along the slough and side slough persisted. The conversion from tidal marsh and grasslands to agriculture was further fortified by the construction of the USACE levee system on the Pajaro River and its tributaries in 1949 (red arrows, Figure 2, Panel C).

In the late 1960s and early 1970s, the 550 condominiums, townhouses and single-family dwellings that make up Pajaro Dunes were built. The development spans 142 acres of oceanfront property on both sides of Beach Road. The development along the lower Watsonville Slough also created crossings at Beach Road and Shell Road (Figure 2, Panel C). Historical development and land use conversion along the lower marsh and slough system also removed old tidal channels and created berms that impede flows between the slough and the marsh plain, further compromising marsh hydrology.

The constriction of the marsh plain and encroachment of development has proven incompatible with the natural lagoon closures. The marsh floodplain confined by levees (both USACE and agricultural), and lagoon closures have led to flooding of infrastructure.

The County of Santa Cruz has been mechanically breaching the seasonal Pajaro River sandbar for flood control purposes since the 1950s. Flooding at the Beach Road crossing triggers the need for mechanical lagoon breaching to lower the water levels and preserve vehicle and emergency access to the Pajaro Dunes community and Palm Beach State Park. However, modeling has shown that this mechanically breaching of the lagoon has truncated the inundation period of marshes, allowing non-native, upland species to encroach on portions of the marsh.

Figure 1. Location of Project Area.

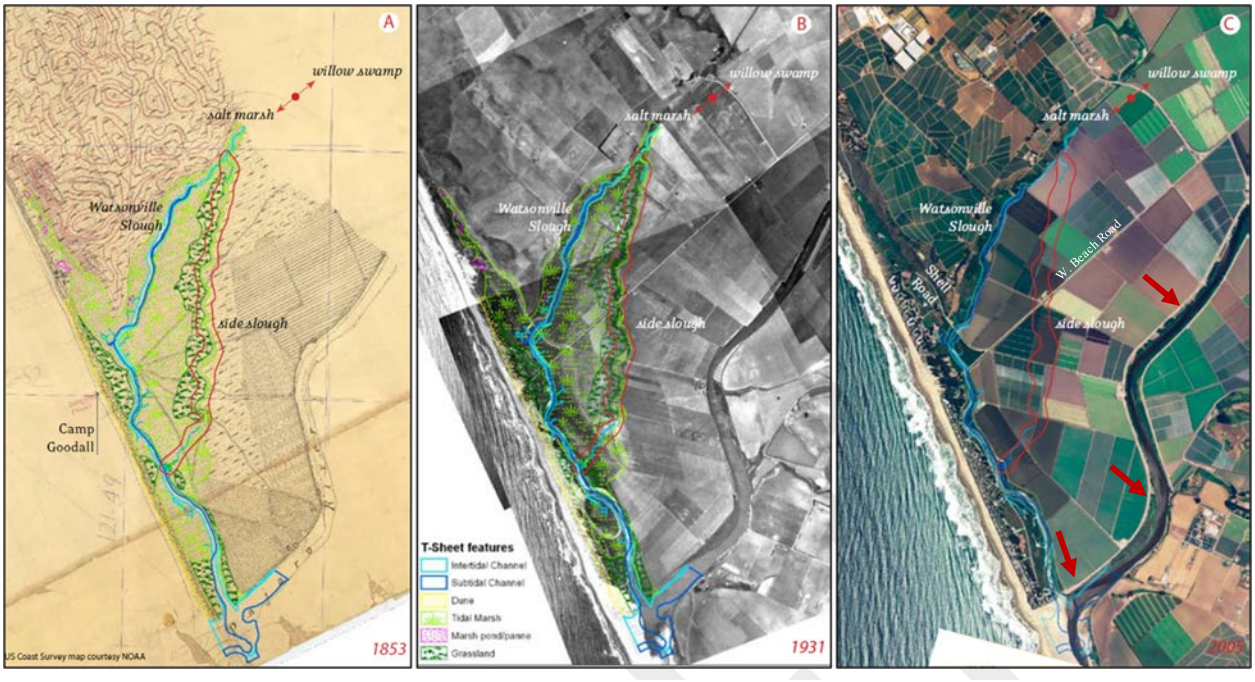


Figure 2. Historical Changes to Lower Watsonville Slough. Adapted from Whipple, A. and Grossinger, R. 2008

The remnant existing marsh plain has areas of robust native marsh, especially in low areas and immediately adjacent to the slough. Other areas exhibit stunted growth of native species and encroachment by upland non-native weeds, suggesting a truncation of marsh hydrology. Protected species under Endangered Species Act (ESA) such as Steelhead and the Tidewater Goby are negatively impacted by the lack of high-quality tidal marsh and coastal wetland habitat. Native and non-federally listed species also affected by the lack of quality tidal marsh and coastal wetland habitat.

1.4 Project Location

The original study area (Figure 1) included the entire lower Watsonville Slough and Pajaro Lagoon. The final project area of the Tentatively Selected plan includes the Beach Road crossing of Watsonville Slough and two parcels upstream of Beach Road and downstream of Shell Road.

2.0 PROJECT DESCRIPTION

2.1 Planning Objectives

The planning objectives, which are developed specifically for this study, are statements of the study purpose. Planning objectives are more specific than the Federal and non-Federal objectives and reflect the problems and opportunities in the Watsonville Slough CAP 1135 Study area; an objective is developed to address each of the identified problems and opportunities. Planning objectives represent desired positive changes in the future without-project conditions. The planning objectives for the Watsonville Slough

CAP 1135 Study would be attained within the period of analysis for the study, a 50-year timeframe beginning in 2020, pending identification of Federal interest and inclusion in a selected plan. All of the objectives focus on activity within the study area. Objectives 1-4 constitute the Aquatic Ecosystem Restoration (AER) primary objectives:

1. Restore and improve tidal marsh and coastal wetland habitat for native, culturally significant, and federally listed species.
2. Restore a more natural hydrologic regime and connectivity between the Watsonville Slough and its marsh plain to improve ecosystem function.
3. Improve aquatic ecosystem by maintaining fresher (less saline) water quality within the project area that supports the more diverse vegetative community of natural lagoon marshes.
4. Improve fish passage access to increase availability of marsh habitat to native fish species.
5. Increase recreational opportunities and public education.
6. Improve resilience to future extreme weather and sea level change.

2.2 Conceptual Ecological Model (CEM)

As part of the planning process, USACE developed a conceptual ecological model (CEM) to represent current understanding of ecosystem structure and function in the study area (Figure 3). The CEM was used in this MAMP to support the identification of success criteria and help select parameters for monitoring. The model illustrates the effects of important natural and anthropogenic activities that result in different ecological stressors on the system. The model has helped to identify hypothesized effects of restoration actions on selected performance measures defined for broader physical, chemical, and biological attributes of the system. Two potential pathways were identified that could account for the apparent truncation of marsh hydrology. Extensive hydraulic modeling across an array of measures and scenarios showed that the primary pathway is “B”, the premature mechanical breaching of the lagoon when water levels reach approximately 8.0 feet NAVD88 during closure events.

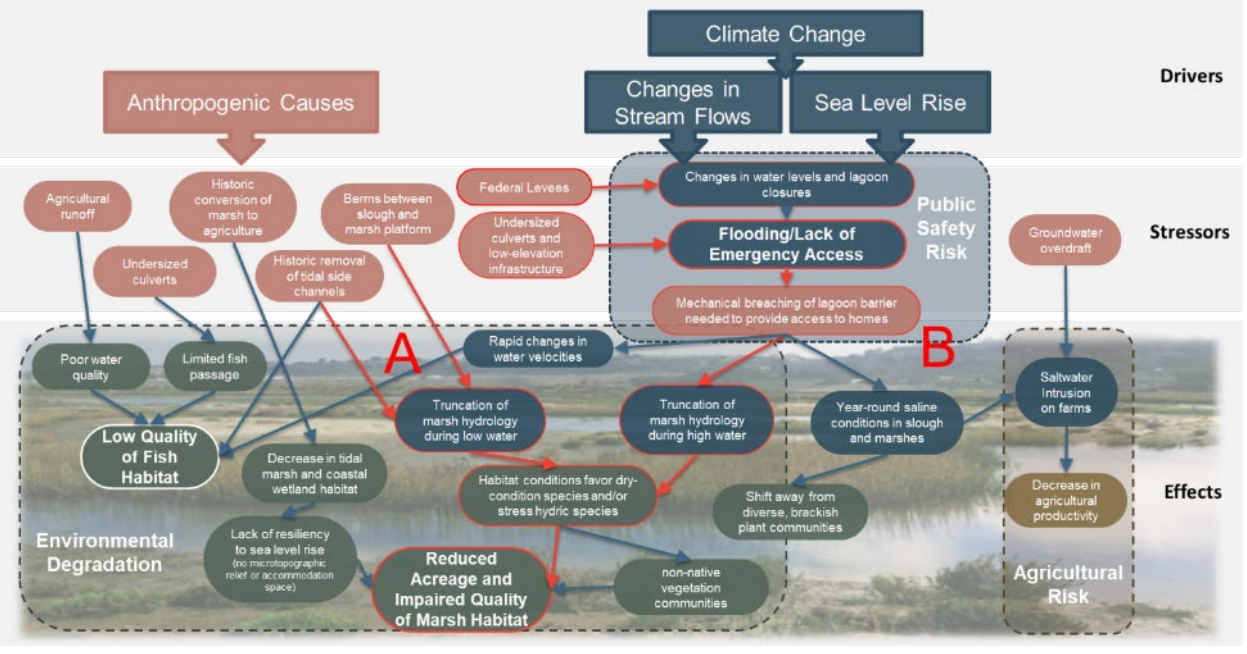


Figure 3. Comprehensive conceptual ecological model of the lagoon and marsh habitat associated with Watsonville Slough. Two pathways are shown that might explain the truncated hydrology apparent on the existing marsh plain.

2.3 Project Description Overview

Through the extensive plan evaluations using existing data, ecosystem benefit modeling, collective expertise, and professional judgement, the USACE San Francisco District determined a proposed plan to increase a lagoon breach threshold that the County of Santa Cruz uses in its manual breaching program from the existing typical threshold +7.0 feet to +9.2 feet NAVD88 by replacing undersized culverts at Beach Road that cannot accommodate the closed-lagoon hydrology, and consequently raise the Beach Road elevation. This proposed project would allow a longer closure of the naturally formed sandbar lagoon, which would more closely mimic natural hydrology of the marsh and promote healthy marsh vegetation.

The proposed project specifically includes the following components (Figure 4):

1. Install one 32-foot wide, 8-foot high, pre-cast, and embedded fish-friendly culvert with higher flow capacity, which would support improved fish passage compared with the existing series of six 48-inch closed conduit culverts;

2. Raise an estimated 1,300 linear feet (LF) of W. Beach Road from the existing elevation to accommodate the new culvert;

3. Install a new flap gate on an adjacent Beach Road agricultural ditch to prevent the higher lagoon levels from moving upstream;

4. Raise surface elevation of a parking lot less than half a foot on average to at least 9.2 feet NAVD88 for Palm Beach State Park immediately adjacent to the crossing of the W. Beach Road and Slough to prevent nuisance flooding;

5. Remove exotic and xeric species and planting approximately 1.5 acres of the formerly high and dry areas and 0.5 acres of temporary impacts with native marsh species; and

6. Install interpretive signage both in English and Spanish, which would facilitate use for underserved communities and inform locals and visitors to the Palm Beach State Park of the benefits of the wetland restoration.

The PDT will consider a higher culvert height and road raise in D&I phase, which may provide additional resilience to SLC at the project site. The project does not include any new areas of recreational access. However, the restored wetland can potentially increase the visual enjoyment of the area and offers educational opportunities. The marsh restoration project remains committed to making a meaningful impact on both the environment and public awareness. With the support of California State Parks and local tribes, one to three bilingual interpretive signs will be installed at Palm Beach State Park to educate visitors about the connections between the beach, lagoon, and marsh ecosystems, and their connection to indigenous people. We plan to collaborate with a local sign maker to ensure quality craftsmanship that support the local community. Additionally, the news signs will incorporate design elements to match existing state park signage for a cohesive visitor experience.

These project elements contribute to different planning objectives in different ways, as shown in Table 1. For the AER primary objectives, the measures combine to affect three aspects of the environment: hydrology, vegetation, and fish access. Those connections are described more fully below, and those three aspects of the environment form the basis of the monitoring plan.

2.3.1 Project Components for Improved Hydrology and Fish Access

Project components 1, 2, 3, and 4 are all in service of creating a more natural lagoon hydrology that periodically and seasonally inundates the majority of the marsh plain (Table 1). Modifying these infrastructure elements will allow for a change in the County's existing lagoon breaching program to allow water levels up to 9.2 feet NAVD88, at which point other infrastructure flooding would trigger the breach. Modeling has shown that this modest increase in breach threshold increases the modeled Percent Time Inundated in portions of the marsh plain currently exhibiting stunted marsh species growth or invasion by non-native xeric species and brings it within a range typical of the portions of the marsh plain currently supporting healthy marsh. The water level inundations between 8 and 9.2 feet NAVD88 are critical to the marsh plain hydrologic restoration. Without that underlying change in hydrology, there's no reason to project that marsh species will thrive in the currently high and dry portions of the marsh plain. The change in hydrology allowed by these infrastructure changes is foundational to the restoration.

Figure 4. Proposed Project Components

Table 1. Matrix showing which Project Components are in support of which Project Objectives. For the primary Aquatic Ecosystem Restoration Objectives, three basic monitoring approaches are needed to document success: Hydrology, Vegetation, and Fish Access.

Project Components	**Project Objectives**					
	(Overarching) Primary Project Objectives: Ecosystem Restoration				***Non-ER Related Objectives***	
	Restore and improve tidal marsh and coastal habitat that can support native species/diversity (Objective 1)	Restore a more natural hydrologic regime and connectivity on the marsh plain to improve ecosystem function (Objective 2)	Improve the aquatic ecosystem by maintaining fresher (less saline) water quality through the project area (Objective 3)	Improve fish passage access to increase availability of marsh habitat to native fish species. (Objective 4)	Increase recreational opportunities and public education (Objective 5)	Improve resilience to climate change and sea level change by increasing accommodation space (Objective 6)
Types of Monitoring	Blue = Hydrology Green = Vegetation Orange = Fish Access	Blue = Hydrology Green = Vegetation Orange = Fish Access	Blue = Hydrology Green = Vegetation Orange = Fish Access	Blue = Hydrology Green = Vegetation Orange = Fish Access	Blue = Hydrology Green = Vegetation Orange = Fish Access	Blue = Hydrology Green = Vegetation Orange = Fish Access
1: Fish-friendly culverts with higher flow capacity to accommodate closed-lagoon conditions (allows higher breach threshold)	X	X	X	X	X	X
2: Raise road to 9.2 ft NAVD88 (allows higher breach threshold)	X	X	X		X	X
3: Install new flap gate to prevent higher lagoon levels moving upstream onto farms (allows higher breach threshold)	X	X	X		X	X
4: Raise surface elevation of State Parks parking lot and adjacent areas to 9.2 ft NAVD88 (allows higher breach threshold)	X	X	X		X	X
5: Remove exotic and xeric species and plant formerly high and dry areas with native marsh species	X					
6: install interpretive signage in both English and Spanish.					X	

The proposed project will replace existing six 48-inch closed culverts with a fish-friendly culvert which will be designed according to NOAA Fisheries Guidelines for Salmonid Passage at Stream Crossings in California (2023). The guidelines are also adapted from culvert design criteria published by many federal and state organizations including the California Department of Fish and Game (CDFG 2001). The conceptual design of the proposed fish-friendly culverts (Figure 5) meets the requirements for Hydraulic Design method based on the NOAA Fisheries Guidelines.

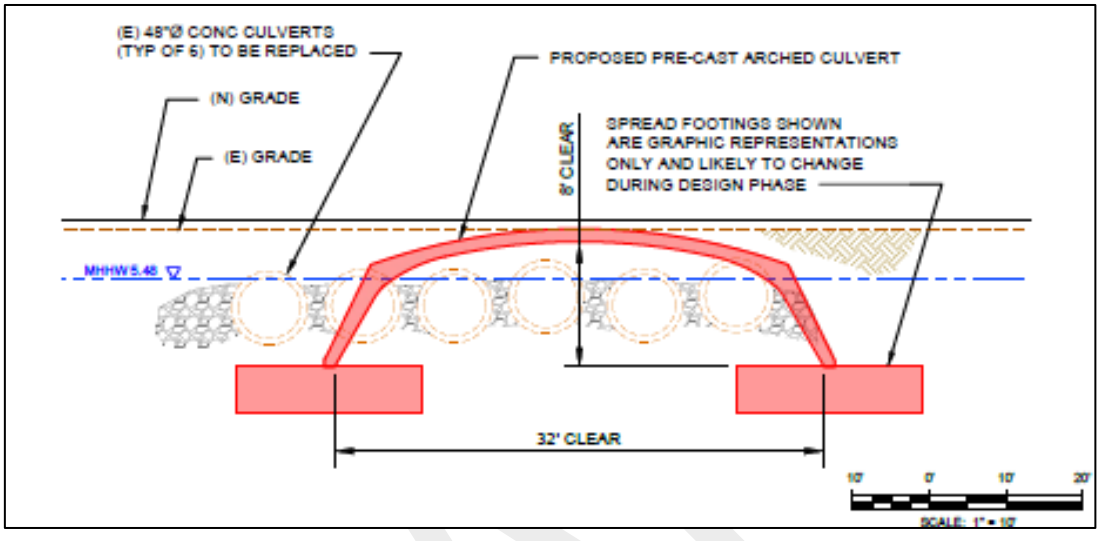


Figure 5. Conceptual Design of Proposed Fish-friendly Culvert.

2.3.2 Project Measures for Improved Marsh Vegetation – Planting Plan

Item 5 of the project — the removal of exotic vegetation and the planting of native marsh species — is designed to jumpstart the vegetative response to the improved marsh hydrology. Mapping of vegetation was conducted by Watsonville Wetland Watch (WWW)[1] within the marsh and surrounding areas from the mouth of Watsonville Slough at the Pajaro River at the southern end of the project area, to the north encompassing the lagoon within the Pajaro Dunes North property and to the north-east where Watsonville Slough is crossed by San Andreas Road. Vegetation mapping efforts included a combination of field data collection and interpretation of aerial photography along with field reconnaissance and verification. Field surveys were conducted in June, July, and August of 2022. The planting plan will be refined in the D&I phase, in coordination with WWW and Amah Mutsun Tribal Band, so that the project can leverage local and indigenous knowledge in selection and long-term management of native plants. WWW also maintains a native plant nursery consisting of native stock may be used on the implementation.

[1] Watsonville Wetland Watch is a local non-profit whose mission is to protect, restore, and foster the appreciation of the wetlands of the Pajaro Valley. See https://www.watsonvillewetlandswatch.org/ for more information.

Exotic Plant Removal

Prior to planting, the project area would be treated to remove existing invasive vegetation. Mapped patches of invasives and non-native plants will be removed in the County-owned parcel and State-owned parcel. Preliminary mapping will be updated in the next phase as the PDT works through D&I, but the priority will be on removal of species rated "high" by the California Invasive Plant Council (Cal-IPC), non-profit dedicated to protecting California's ecology from invasive plants. Preliminary mapping of invasives in the area indicates several notable patches, as described in Table 2. In addition, patches of native marsh co-dominant with exotic species occur in the area, especially on the County-owned parcel, which has approximately an acre of such areas. Exotics would also be removed from these areas, with care take to not disturb natives to the extent possible. A small (approximately 0.1 acre) ecotone would be established at the corner of W. Beach Road and Shell Road to avoid nuisance flooding and enhance the ecosystem of the marsh.

Table 2. Preliminary identification of invasive species to be removed in Watsonville Slough CAP 1135 project.

Scientific Name	Common Name	Cal-IPC rating	Acres
Ammophila arenaria	European Dune Grass	high	0.03
Carpobrotus edulis	Iceplant	moderate	0.51
Cortaderia species	Jubata Grass	high	0.02
Eucalyptus	Eucalyptus ssp.	none	0.51
Lepidium latifolium	Perennial Pepperweed	high	0.09
Myoporum laetum	Ngaio	moderate	0.12

Removed vegetation would be hauled off site to a landfill that accepts green waste. The Restoration Contractor would maintain all habitat restoration sites weed free from the completion of clearing and grubbing until planting of container plants (grow and kill method). Weeding shall occur at least monthly during growing season and at a minimum every other month during winter months.

If night work and consequent lighting are required, a Field Project Biologist would monitor night-time restoration activities in and adjacent to sensitive habitat to avoid and minimize disturbance to listed species. Any night lighting used would be shielded, directed away from potentially sensitive habitats, and utilize the minimum lighting necessary to accomplish the proposed restoration activities. Any night-time project activities with potential to affect listed species would be minimized in duration and extent.

Preliminary Planting Plan

Plantings would be installed in any areas disturbed by construction (approximately 0.5 acre on the State-owned parcel), and in patches where exotics have been removed or native plants are particularly stressed (approximately 1 acre on the County-owned parcel and 0.5 acre on the State-owned parcel outside of areas affected by construction). Collectively, these will now be referred to as habitat restoration sites.

The habitat restoration sites will be planted with native plant material either collected locally from seed, live cuttings, or propagated container plants. Most planting in the

habitat restoration sites would depend on success of collection of local native seeds and live cuttings. Some seed would be propagated, and container grown by the restoration contractor or contract grown by nurseries specializing in the taxa required from plant stock from the local area (e.g., from the nursery run by WWW or local tribes) to ensure the greatest chance of successful establishment.

The preliminary planting plan for the habitat restoration sites incorporates a combination of container plants, seed, and native volunteer recruitment to create the basic structure of the desired habitat. Standard horticultural practices as outlined below and shown on planting and detail plans for Restoration Site planting would be followed. The lead project biologist will review and approve final plant installation plan provided by the restoration contractor.

A planting density of approximately 3-ft on center or 5,000 plants per acre is proposed to achieve the best results. The planting palette would focus on integration of diverse species to provide variation in phenology and physical structure (i.e., grasses, herbs, and shrubs). Hydroseed mixes would be applied to contribute to development of the herbaceous cover.

Although the final plant list will be determined in the next phase in consultation with WWW and local tribes to allow the inclusion of any cultural keystone species or species of tribal significance, Table 3 identifies species generally conducive to the project region and habitat.

Table 3. Marsh Plant Species Native to the Study Area.

Botanical Name	Common Name	Botanical Name	Common Name
Salicornia pacifica	Pickleweed	*Distichlis spicata*	Saltgrass
Frankenia salina	Alkali Heath	*Grindelia stricta*	Gumplant
Jaumea carnosa	Marsh Jaumea	*Juncus mexicanus*	Mexican Rush
Potentilla anserina	Silverweed		

Upon completion of container planting, the habitat restoration sites would be hydroseeded with the prescribed seed mixes that could include native annuals and perennials such as Saltmarsh Heliotrope (*Heliotropium curassavicum*), Saltmarsh Sand Spurrey (*Spergularia marina*), and Alkali weed (*Cressa truxillensis*), as well as seeds from the container list. Container planting and seeding installation should occur during the rainy season (generally November through April) to take advantage of natural rainfall. All hydroseed mixes would include the specified seed mix, at the prescribed rate per acre, and hydroseed slurry mix below. The slurry mix would assist with seed to soil contact to improve seed germination rate and success.

Hydroseed Slurry Mix:

- Virgin cellulose wood Fiber Mulch - 2,500 lbs. per acre
- Ecology Controls M-Binder/Tack (organic) - 150 lbs. per acre
- AM 120 Mycorrhizal Inoculum - 60 lbs. per acre

Temporary Irrigation

The goal of restoration is to create habitats that would persist over time and be self-sustaining. Planting would occur during the late fall and winter months to take advantage of cooler temperatures and seasonal rainfall. The habitat restoration sites would have saturated soils and adequate water under natural seasonal conditions to provide enough moisture to allow the container plants to become established. A temporary irrigation system would be installed throughout the habitat restoration areas. The habitat restoration sites would be irrigated with supplemental water through the plant establishment period (e.g., first three years post-planting) to assure survival of container plantings until root systems are well developed. Water use would be highest during the first growing season, tapering off until minimal supplemental water is necessary. If drought conditions or a prolonged period of water shortage persists for longer than 500 days or two (2) growing seasons, supplemental water would be implemented by the restoration contractor in consultation with the lead project biologist.

Container Planting Practices

Container plants are be planted using standard horticultural practices, using a hole at least twice the diameter of the root ball and leaving the plant crown 1 to 2 inches above grade after planting. All plants are to be thoroughly watered in their pots before planting and the soil in all planting holes would be thoroughly wetted before planting (Figure 6). The following standard horticultural practices will be required:

- Dig hole twice as deep and twice as wide as plant container. Break up large clods and try to avoid the smooth-sided “bathtub” effect in the hole.
- The native soil should be soft and friable. Eliminate large rocks and clods from backfill soil.
- Most native plants are able to find nutrients even in poor soils. If a pre-plant fertilizer is used, application rates should be lower than those used for general landscape ornamentals.
- Fill planting hole with water and allow to percolate (drain) into subsoil.
- Spill some backfill material into the bottom of hole, moisten, tamp and mound slightly.
- Set plant root ball atop the moistened backfill so that plant collar is 1inch higher than finished grade.
- Replace backfill material up to about ⅔ the height of the root ball; moistening, tamping and settling all around.
- Fill remaining portion surrounding the top of root ball with more backfill. Be sure collar is still higher than grade.
- Create an irrigation basin berm, considerably outside the dimension of the hole using remaining backfill and native soil.
- Irrigate thoroughly, filling the basin with water and sprinkling around to settle backfill and berm.

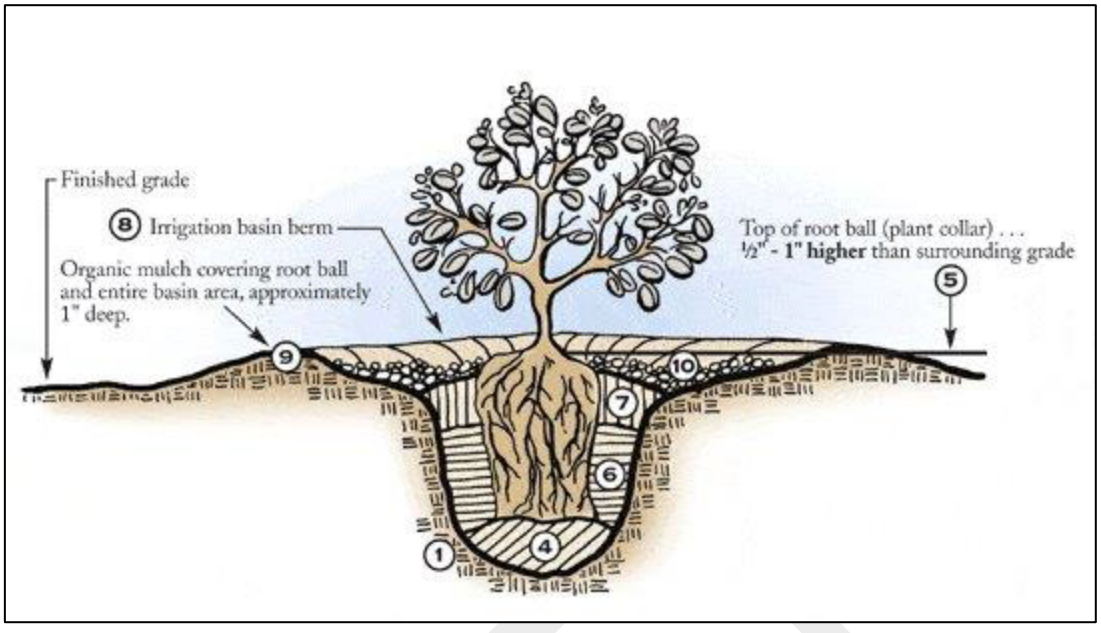


Figure 6. Container Planting Specifications.

3.0 MAINTENANCE, MONITORING, & ADAPTIVE MANAGEMENT

This section will describe the maintenance, monitoring, assessment, and decision-making processes that form the basis of adaptive management. This section will establish maintenance, monitoring proposals, performance standards, schedules, and outline adaptive management measures and costs. Success criteria include specific features to be monitored to determine project performance.

The initial establishment period starts when all the plants have been installed and accepted. The establishment period would be for two continuous years.

Maintenance of the habitat restoration sites include weeding, trash removal, and other activities to maintain the site.

As illustrated in Table 1, restoration project measures address multiple restoration goals and objectives, requiring three types of monitoring: hydrology, fish passage access, and vegetation. Success criteria are established below for each monitoring type, and monitoring would be conducted with the intent of meeting those standards. Adaptive management measures are actions identified to address potential mechanisms for failure of project features meeting performance criteria. Triggers for implementation of adaptive management measures are established below for each monitoring type.

Monitoring must be closely integrated with all other adaptive management components because it is the key to the evaluation, validation, and learning components of adaptive management. Over the 2-year site establishment period, improvements in field and analytic techniques may lead to changes in the monitoring methodology. Furthermore, unrealistic expectations or inaccurate assumptions can lead to the establishment of inappropriate monitoring objectives. It is possible that a decision to modify success criteria might be reached based on results after several years of monitoring. In the future, once a determination has been made that specific success criteria have been met, associated monitoring tasks would cease.

Monitoring for ecological success and adaptive management for the project would be initiated upon completion of the construction phase and would continue until ecological success is achieved, as defined by the success criteria established below. This monitoring plan includes the minimum monitoring actions to evaluate success and to determine adaptive management needs. Although the law allows for up to ten years of cost-shared implementation of the monitoring plan, ten years of monitoring may not be required. Once ecological success has been documented by the District Engineer in consultation with the Federal and State resource agencies, and a determination has been made by the Division Engineer that ecological success has been achieved, which may occur in less than ten years post-construction, no further monitoring would be performed. If success cannot be determined within that ten-year period of monitoring, any additional monitoring would be a non-Federal responsibility. This plan estimates monitoring costs for a period of 7 years, a period between the typical minimum of 5 years and the 10-year maximum allowed Federal contribution to monitoring. This period was chosen because although this is a relatively straightforward restoration, the entire lagoon is highly managed and planning for the potential for adjustments to be made midway is the more conservative planning strategy.

Following successful establishment of project features, the project would be maintained by the non-Federal sponsor as required by the Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) manual. As specified by Section 1161 of WRDA 2016, the requirement for operation and maintenance of the nonstructural and nonmechanical elements of the project by the non-Federal sponsor will cease ten years after ecological success has been determined.

The following discussion outlines key components of a monitoring plan that will support the Watsonville Slough CAP 1135 Study. The plan identifies success criteria, along with desired outcomes and monitoring designs in relation to specific project goals and objectives associated with these three physical actions.

3.1 Hydrologic Monitoring

As illustrated in Table 1, modifying infrastructure elements associated with project components 1, 2, 3, and 4 will create a more natural lagoon hydrology that periodically and seasonally inundates the majority of the marsh plain by allowing a higher breach threshold for the existing and ongoing County breaching program. The typical breaching threshold would change from 7.0 feet NAVD88 to 9.2 feet NAVD88. This is expected to have a cascade positive ecological consequences by reducing the truncation of natural hydrology illustrated in Figure 3's Pathway B.

The Watsonville Sough CAP 1135 project will modify the infrastructure to allow the change in breaching threshold. To ensure the project actually facilitates this ecologically-important change in the lagoon hydrology, water level will be monitored.

3.1.1 Success Criteria

The criteria for success will be periodic and seasonal water levels during on the marsh plain during closures between 7.0 and 9.2 feet NAVD88. There is no requirement for this to occur every year or for a particular percent of year because these conditions would only pertain to closed lagoon conditions. While lagoon closures are generally seasonal and periodic, they do not occur every year, and can last various lengths of time. Modeling has shown that allowing the water level to range between 7.0 and 9.2 feet NAVD88 for even short periods could bring the currently "high and dry" portions of the marsh plain into a hydrology similar to areas supporting robust marsh habitat.

3.1.2 Monitoring Strategy

Monitoring of water levels will leverage monitoring already done by the county for the breaching program. Existing pressure transducer located at Beach Road crossing and maintained by the County will be used to document higher water depths and longer duration data compared with those prior to implementation of the proposed project. Water depths will be used as a success criterion (all depths between 7.0 and 9.2 feet NAVD88). Durations will be noted but not used as a criterion, since natural breaching also occurs in these dynamic systems. Reporting will be submitted annually.

3.1.3 Adaptive Management Strategy

Lagoons are dynamic systems and may not close in every year. The point of the hydrologic restoration is not to ensure a specific return interval on the upper marsh plain, but rather to create space for it when the lagoon closures coincide with storms leading to dynamic

backwater flooding of the lagoon. Natural gaps between closures and storms should not trigger intervention. The following subsections identify triggers that would indicate the need to implement adaptive management measures and the measures that would be implemented accordingly to ensure long term success.

Adaptive Management Triggers

Desired Outcome: Water levels between 7.0 and 9.2 feet NAVD88 during lagoon closures.

Trigger: Water level depth never reaching desired range during closures.

Adaptive Management Measures

If the triggers established above occur, the following measures would be implemented to adaptively manage the site for success.

- If monitoring results show that the lagoon water is not reaching levels between 7.0 and 9.2 feet NAVD88 during closures, an investigation regarding the reason will be conducted. If the reasons are natural (i.e., closures occurred during low-rain years and water levels never surpassed 7.0) no direct action will take place, but the monitoring program may be extended to ensure that higher water levels are reached in this dynamic system.
- If it appears that breaching the sidecast berms would help high water enter the marsh plain, small breaches may be added as directed by a Restoration Biologist.
- If data show that the natural lagoon closure was approaching 7.0 NAVD and no flooding was occurring or was imminent to infrastructure adjacent to Slough and then the lagoon was breached mechanically, the County would be informed that their breach was out of compliance with the goals and requirements of the Watsonville Slough CAP 1135 project and the signed MOU associated with it.

3.2 Vegetation

As illustrated in Table 1 and described in the Planting Plan above, removal of exotic and xeric species and replanting with native marsh species is expected to support the restoration of tidal marsh and coastal habitat that can support native species and diversity. The objectives for the planting plan are to eradicate the existing invasive vegetation and increase native marsh diversity in what have been “high and dry” areas on the marsh plain. All vegetation monitoring will occur only in those parts of the marsh plain that have been replanted (i.e. the habitat restoration sites defined in the Planting Plan). No vegetation monitoring would occur in other portions of the marsh plain.

The planting plan includes two distinct periods. The Plant Establishment Period (PEP), during which the planting contractor would conduct quarterly visits to the site to weed, address the mortality of plantings, inspect the temporary irrigation system, and otherwise maintain the site. This is anticipated to be the first 3 years post-planting. After this point, so long as adaptive management hasn’t been triggered at the end of Year 3, irrigation of the site ceases, as does quarterly weeding and visual inspections.

Monitoring is conducted annually in the spring at peak growth, starting in Year 1 and continuing through the PEP and beyond, until success criteria are met.

3.2.1 Success Criteria

Monitoring of marsh habitat would focus on the percent cover of native species versus non-native species as well as survival of plantings. The marsh vegetation restoration would be considered successful if the following criteria are met: (1) 70% average vegetative cover on replanted areas by Year 5; (2) the percent cover of non-native species has remained less than 10% of the total vegetation in revegetated areas for three consecutive years.

3.2.2 Monitoring Strategy

Vegetation sampling of replanted areas will occur annually for the duration of the monitoring period. Sampling will occur during spring months, at the peak of growing season. Monitoring would involve a site visit to visually inspect the habitat. Monitoring will estimate percent cover of native and non-native plant species, as well as survival of plantings in the plant establishment period.

General observations, such as fitness and health of plantings, native plant species recruitment, and signs of drought stress would be noted during the surveys. Additionally, potential soil erosion, flood damage, vandalism and intrusion, trampling, and pest problems would be qualitatively identified. A visual check of irrigation infrastructure would also be conducted. A general inventory of any wildlife species observed and detected using the restoration site would be documented but are not compared to a success criteria.

Monitoring reports documenting the restoration effort would be prepared following the first monitoring period and would continue annually until the site has met the success criteria. Monitoring reports would include photos. Monitoring reports would also include recommendations for additional adaptive management measures, if necessary. Following the monitoring period, any subsequent monitoring activities would be the responsibility of the local maintaining agency, and would focus primarily on general and biological inspections for the purposes of fire management and habitat evaluation.

3.2.3 Adaptive Management Strategy

If the habitat is not meeting the success criteria established above, then adaptive management would be implemented in order to ensure success. The following subsections identify triggers that would indicate the need to implement adaptive management measures and the measures that would be implemented accordingly.

Adaptive Management Triggers

- Desired Outcome: Increase percent cover of native tidal marsh habitat.

  Triggers: If 50% cover of native tidal marsh habitat is not achieved within 3 years, or 70% cover of native tidal marsh habitat is not achieved within 5 years.

- Desired Outcome: Decrease percent cover of non-native invasive species that outcompete natives.

Trigger: If non-native percent cover is greater than 20% during the monitoring period.

Adaptive Management Measures

If the triggers established above occur, the following measures would be implemented for riparian habitat in order to adaptively manage the site for success.

- Replanting may be needed if triggers for native vegetative cover are being met. Monitoring results should be used to assess the underlying cause of inadequate cover, which may require that additional adaptive management actions be implemented to support successful replanting. Adaptive management actions could include targeted revegetation, such as replanting varieties of species that are exhibiting the greatest growth and survival, or planting at elevations that are exhibiting the greatest growth and survival.

- Nonnative species management may be needed if monitoring results show that the triggers for nonnative species present are met, or if nonnative species are impacting the survival of native species. Adaptive management measures may include adjustments to nonnative control methods, such as plant removal, grading of site to remove nonnative roots, or mowing and selective removal of non-native species at optimal times for native growth.

- Plant protection may be needed if triggers for native vegetative cover are being met. If monitoring results show that plantings are failing due to predation or trampling, then adaptive management actions would include plant cages or protective fencing that could be installed to protect plantings.

3.3 Fish Passage Access

As illustrated in Table 1, replacement of the existing culverts with a new fish-friendly culvert will support improved fish passage access through the Beach Boulevard crossing, allowing fish better access to improved marsh habitats.

3.3.1 Success Criteria

Monitoring of fish passage access would focus on the new culvert openings, ensuring there were no major blockages or excessive shoaling that would cause barriers to fish use.

3.3.2 Monitoring Strategy

The culvert would be inspected in both the downstream and upstream ends when monitors are onsite for the vegetation monitoring. Sampling will occur during spring months and will measure the water level above the bed at low tide, as well as cross-sectional areas free of blockages. Fish passage access will be met if at least 50% of the channel has a foot of water above the bed at low tide and is free of other blockages.

Monitoring reports documenting the restoration effort would be prepared following the first monitoring period and would continue annually until the site has met the success criteria.

3.3.3 Adaptive Management Strategy

The project seeks to remove existing barriers to fish passage and generally increase fish access above existing levels. If the habitat is not meeting the success criteria established above, then adaptive management would be implemented in order to ensure success. The following subsections identify triggers that would indicate the need to implement adaptive management measures and the measures that would be implemented accordingly.

Adaptive Management Triggers

- Desired Outcome: Increased fish passage access.

  Triggers: If <50% of the channel has at least 1 foot of water over the bed at low tide and is otherwise free of blockages that could pose barriers to fish use by the end of 5 years.

Adaptive Management Measures

If the triggers established above occur, the following measures would be implemented for fish passage access in order to adaptively manage the site for success.

- Any large blockages created by trash or other debris would be cleared.
- Excessive shoaling may be scoured or dredged.

Table 4. Ecosystem Restoration Task Schedule, including Maintenance, Monitoring, and Adaptive Management Assessment.

Restoration Site Task Schedule	Design (6 months-1 year)				Construction: Culvert Replacement and Associated Temporary Impacts (6-9 months, dry season) Planting (Fall)				Year 1-3* Monitoring & Maintenance (Plant Establishment Period)				Year 4-5* Monitoring & Maintenance Adaptive Mgmt.				Year 6-7 Monitoring & Maintenance (if needed)			
Final Restoration Design	W	SP	S	F																
Weed Eradication	W	SP	S	F		SP	S	F												
Fine Grading, Soil Salvage, Best Management Practices (BMPs)						SP	S													
Native Seed Collection/Reporting			S	F	W	SP														
Temporary Irrigation Installation							S	F												
Plant Propagation					W	SP	S													
Planting Container Plants								F												
Seeding Restoration								F												
As-Built Report								F	W											
Irrigation/Watering								F	W	SP	S	F								
Weeding/Target Invasive						SP	S	F	W	SP	S	F								
Biological Inspection Monitoring (Photograph Stations)								F	W	SP	S	F								
PEP Report												F	W							
Annual Performance Monitoring/ Reporting										SP				SP				SP		

Note: Separated by season respectively as Winter (W) = January-March, Spring (SP)= April-June, Summer (S) = July-September, and Fall (F) = October- December. Avoidance or biological monitor present for activities during periods for LBVI breeding season (i.e., riparian vegetation would not be cleared between March 15 through September 15) and CAGN breeding season (i.e., coastal sage scrub would not be cleared between February 15 and August 15)

* Adaptive management triggers will be assessed at the end of Year 3 and Year 5. Adaptive Management measures not included in table.

3.4 Monitoring and Adaptive Management Costs

Table 5. Monitoring Costs for Watsonville Slough CAP 1135 project.

Monitoring	Assumed Tasks for Monitoring	Frequency	Cost Assumptions*	Total Cost
Hydrology	Existing pressure transducer located at Beach Road crossing and maintained by the County will be used to document higher water depths and longer duration data compared with those prior to implementation of the proposed project.	Data will be transferred from the County summarized as part of the annual monitoring reports, though no additional field work is necessary	One week of labor for compiling and synthesizing data annually and adding to the report for 7 years	$53,000
Vegetation Monitoring	Visual surveys/transects during peak growing season. Assume coverage of all replanted areas. Assume monitoring for percent cover of natives and non-natives, survival of plantings, and observations of damage to habitat would be recorded.	Annually for 7 years or until success has been achieved	Two biologists a week in the field and a week writing a report for 7 years	$242,000
Fish Access	Upstream and downstream openings of culverts will be measured manually to ensure sufficient access is available.	Annually for 7 years	Included in above	
TOTAL MONITORING				**$295,000**

*Costs include annual COLAs for labor each subsequent year and standard contingency.

Table 6. Adaptive Management Costs for Watsonville Slough CAP 1135 Recommended Plan.

Restoration Feature	Adaptive Management Measures	Assumed Tasks for Adaptive Management	Cost Assumptions	Total Cost for Monitoring Period
Hydrology	Review breaching program with County	Meet with County to discuss breaching if heightened water levels are not seen	Coordination involving multiple meetings and documentation	$20,000
	Breach berms adjacent to slough	If monitoring shows the existing berms are preventing water from reaching the marsh plain	1 time cost of $10,000	$10,000
Vegetation Measures	Detailed survey for invasive plants	2 biologists	2 time cost of $20,000	$40,000
	Non-native plant removal	Regimes of cutting and spraying. May include spot replanting to out-compete non-native vegetation	Assume 1 acre of eradication per event & 2 events over the monitoring period. $27,000 per event	$54,000
	Install additional marsh vegetation	Assume 1 attempt to replant original species to address survivorship rates if marsh is not naturally infilling	1 time cost	$70,000
	Develop new planting regime	Use of different species in subsequent years	1 time cost	$70,000
Fish Access	Clear culverts	Mechanical clearing of blockage	2 time cost of $15,000	$30,000
TOTAL ADAPTIVE MANAGEMENT				**$ 294,000**
TOTAL MONITORING AND ADAPTIVE MANAGEMENT				**$ 589,000**

References:

California Department of Fish and Game. 2001. Culvert Criteria for Fish Passage.

National Marine Fisheries Service (NMFS). 2023. NOAA Restoration Center's Programmatic Approach to ESA/EFH Consultation Streamlining for Fisheries Habitat Restoration Projects (NMFS Santa Rosa, CA office).

Whipple, A. and Grossinger, R. 2008. An Introduction to the Historical Ecology of the Watsonville Sloughs Watershed: A tool for developing an action plan for the Critical Coastal Areas program. Available online: HE_Watsonville_Sloughs_CCA.pdf. Accessed 2/20/2024.

Environmental Appendix A-4

Watsonville Slough Ecosystem Restoration Project

Continuing Authorities Program Section 1135

DRAFT

Greenhouse Gas Emission Analysis

July 2025

US Army Corps
of Engineers ®
San Francisco District

Pajaro Storm Drain Maintenance District
Within Santa Cruz County

1. Greenhouse Gas (GHG) Emissions

This Appendix provides details for how both direct and indirect greenhouse gas (GHG) emissions and reductions from the final array of alternatives, quantifying the baseline (no-action) emissions, and the effects of GHG on its environmental impacts. This GHG emission analysis provides the gross and net emissions for each chemical compound (i.e., methane, nitrous oxide, etc.) and summarized as carbon dioxide equivalent (CO2e).

2. Baseline Conditions for GHG Emissions

Increasing GHG concentrations in the atmosphere is resulting from human activity since the 19th century, such as fossil fuel combustion, deforestation, and other activities, are believed to be a major factor in climate and weather events. GHGs in the atmosphere trap heat by impeding the exit of solar derived radiation that is otherwise reflected or re-radiated back into space—a phenomenon referred to as the "greenhouse effect." Some GHGs occur naturally and are necessary for keeping the earth's surface habitable, such as water vapor. However, increases in the concentrations of other greenhouse gases in the atmosphere during the last 100 years such as methane and nitrous oxide have trapped additional solar radiation, intensifying the natural greenhouse effect and resulting in an increase in global average temperature at an average rate of 0.17 ºF per decade since 1901 (USEPA 2022).

Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are the principal GHGs emitted which contribute to global warming. When concentrations of these gases exceed historical concentrations in the atmosphere, the greenhouse effect is intensified. Carbon dioxide, methane, and nitrous oxide occur naturally and are also generated by human activity. Emissions of CO_2 are largely byproducts of fossil fuel combustion, while methane results from off-gassing, natural gas leaks from pipelines and industrial processes, and incomplete combustion associated with agricultural practices, landfills, energy providers, and other industrial facilities. Nitrous oxide emissions are also largely attributable to agricultural practices and soil management. CO_2 sinks (i.e., absorb more carbon from the atmosphere than they release) include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, and are two of the largest reservoirs of CO_2 sequestration. Other human-generated GHGs include fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which have much higher potential for heat absorption than CO_2 and are byproducts of certain industrial processes.

CO_2 is the reference gas as it is the GHG emitted in the highest volume. The effect of each GHG on global warming is the product of the mass of their emissions and their global warming potential (GWP). The GWP of a gas indicates how much the gas is predicted to contribute to global warming relative to the amount of warming that would be predicted to be caused by the same mass of CO_2. For example, methane and nitrous oxide are substantially more potent GHGs than CO_2, with GWPs of 25 and 298 times that of CO_2 respectively, which has a GWP of 1. To quantify these emissions as one quantity, they were converted to carbon dioxide equivalent units (CO_2e) using their global warming potential and then added together to get the total. Using the equation below and the global warming potential of each greenhouse gas per the Code of Federal Regulations

Title 40, Subpart A of Part 98 the total CO_2e from each project alternative were calculated. Please see Section 4.2.4 for the results of this calculation.

$$CO_2e = xCO_2 + yN_2O + zCh_4$$

Where:
x = 100-year global warming potential of carbon dioxide = 1
y = 100-year global warming potential of nitrous oxide = 298
z = 100-year global warming potential of methane = 25

3. Baseline Effects of Climate and Weather

Among the potential global warming impacts in California are loss of snowpack, sea level change (SLC), more extreme-heat days per year, an increase in the number of days with high ground-level ozone, larger forest fires, and increased drought in some parts of the state. Secondary effects are likely to include the displacement of thousands of coastal businesses and residences (as a result of SLC), impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity. The potential effects of climate and weather events due to SLC in the study area is described in the last paragraph of Section 2.7.1. Based on the predicted SLC in the Monterey region, the study area would experience moderate to permanent flooding by future tidal action over a 50-year planning horizon. The land use practices in the study area and its vicinity would slowly have to adapt to a rising sea water elevation.

Warming of the atmosphere would be expected to increase smog and particulate pollution, which could adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events would also be expected to occur with more frequency and could adversely affect the elderly, children, and people experiencing homelessness. Finally, the water supply impacts, and seasonal temperature variations expected as a result of climate and weather events could affect the viability of existing agricultural operations, making the food supply more vulnerable.

Green House Gases Emissions Inventory - Breaching O&M Emissions for No Action

GHG Emissions Inventory →

Emission Source Data						Emission Factors for Construction Equipment (lbs/Hp-hr) or (lbs/mile)[1,2,3]			Daily GHG Emissions from Construction Activities (lbs/day)			
Construction Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hrs per Day Or Miles Per Day (1)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_{2eq}
Worker vehicles	N/A	NA	10	NA	25	1.11010	0.00004	0.00038	277.524	0.011	0.094	305.923
Excavator	120	NA	1	NA	4	73.62307	0.00405	0.26376	294.492	0.016	1.055	609.301
Rubber Tired Loaders	120	NA	1	NA	4	58.91351	0.00358	0.24763	235.654	0.014	0.991	531.193
							Daily Total (Sum)		0.36635	0.00002	0.00097	0.65608
							Total (metric tons)		2.99860	0.00013	0.00271	3.80993

$CO_2eq = X*CO_2 + Y*N_2O + Z*CH_4$
Where X = 100 Year Global Warming Potential for Carbon Dioxide = 1
Where Y = 100 Year Global Warming Potential for Nitrous Oxide = 298
Where Z = 100 Year Global Warming Potential for Methane = 25

CFR Title 40 Chapter I Subchapter C Part 98: Table A-1 Global Warming Potentials

Green House Gases Emissions Inventory - Breaching O&M Emissions for Alternative 4 and Alternative 5

GHG Emissions Inventory →

Emission Source Data						Emission Factors for Construction Equipment (lbs/Hp-hr) or (lbs/mile)[1,2,3]			Daily GHG Emissions from Construction Activities (lbs/day)			
Construction Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hrs per Day Or Miles Per Day (1)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_{2eq}
Worker vehicles	N/A	NA	10	NA	25	1.11010	0.00004	0.00038	277.524	0.011	0.094	305.923
Excavator	120	NA	1	NA	4	73.62307	0.00405	0.26376	294.492	0.016	1.055	609.301
Rubber Tired Loaders	120	NA	1	NA	4	58.91351	0.00358	0.24763	235.654	0.014	0.991	531.193
							Daily Total (Sum)		0.36635	0.00002	0.00097	0.65608
							Total (metric tons)		1.49930	0.00006	0.00136	1.90497

$CO_2eq = X*CO_2 + Y*N_2O + Z*CH_4$
Where X = 100 Year Global Warming Potential for Carbon Dioxide = 1
Where Y = 100 Year Global Warming Potential for Nitrous Oxide = 298
Where Z = 100 Year Global Warming Potential for Methane = 25

CFR Title 40 Chapter I Subchapter C Part 98: Table A-1 Global Warming Potentials

Green House Gases Emissions Inventory - General O&M for No Action, Alternative 4, and Alternative 5

GHG Emissions Inventory →

Emission Source Data						Emission Factors for Construction Equipment (lbs/Hp-hr) or (lbs/mile)[1,2,3]			Daily GHG Emissions from Construction Activities (lbs/day)			
Construction Activity/Equipment Type	**Power Rating (Hp)**	**Load Factor**	**# Active**	**Hourly Hp-Hrs**	**Hrs per Day Or Miles Per Day (1)**	**CO_2**	**CH_4**	**N_2O**	**CO_2**	**CH_4**	**N_2O**	**CO_{2eq}**
Worker vehicles	N/A	NA	10	NA	25	1.1101	0.0000	0.0004	277.52390	0.01081	0.09439	305.92299
							Daily Total (Sum)		0.12588	0.00000	0.00004	0.13876
							Total (metric tons)		1.25883	0.00005	0.00043	**1.38764**

$CO_2eq = X*CO_2 + Y*N_2O + Z*CH_4$
Where X = 100 Year Global Warming Potential for Carbon Dioxide = 1
Where Y = 100 Year Global Warming Potential for Nitrous Oxide = 298
Where Z = 100 Year Global Warming Potential for Methane = 25

CFR Title 40 Chapter I Subchapter C Part 98: Table A-1 Global Warming Potentials

Green House Gases Emissions Inventory - Evacuations for No Action

GHG Emissions Inventory

Emission Source Data						Emission Factors for Construction Equipment (lbs/Hp-hr) or (lbs/mile)[1,2,3]			Daily GHG Emissions from Construction Activities (lbs/day)			
Construction Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hrs per Day Or Miles Per Day (1)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_{2eq}
Worker vehicles	N/A	NA	5	NA	15	1.11010	0.00004	0.00038	83.257	0.003	0.028	91.777
Passenger Vehicles	120	NA	230	NA	20	1.10496	0.00005	0.00044	5082.821	0.218	2.011	5687.530
							Daily Total (Sum)		2.34330	0.00010	0.00092	2.62145
							Total (metric tons)		9.37318	0.00040	0.00370	**10.48581**

$CO_2eq = X*CO_2 + Y*N_2O + Z*CH_4$
Where X = 100 Year Global Warming Potential for Carbon Dioxide = 1
Where Y = 100 Year Global Warming Potential for Nitrous Oxide = 298
Where Z = 100 Year Global Warming Potential for Methane = 25

CFR Title 40 Chapter I Subchapter C Part 98: Table A-1 Global Warming Potentials

Green House Gases Emissions Inventory - Evacuations for Alternative 4 and Alternative 5

GHG Emissions Inventory →

Emission Source Data						Emission Factors for Construction Equipment (lbs/Hp-hr) or (lbs/mile)[1,2,3]			Daily GHG Emissions from Construction Activities (lbs/day)			
Construction Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hrs per Day Or Miles Per Day (1)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_{2eq}
Worker vehicles	N/A	NA	5	NA	15	1.11010	0.00004	0.00038	83.257	0.003	0.028	91.777
Passenger Vehicles	120	NA	230	NA	20	1.10496	0.00005	0.00044	5082.821	0.218	2.011	5687.530
							Daily Total (Sum)		2.34330	0.00010	0.00092	2.62145
							Total (metric tons)		4.68659	0.00020	0.00185	**5.24291**

$CO_2eq = X*CO_2 + Y*N_2O + Z*CH_4$
Where X = 100 Year Global Warming Potential for Carbon Dioxide = 1
Where Y = 100 Year Global Warming Potential for Nitrous Oxide = 298
Where Z = 100 Year Global Warming Potential for Methane = 25

CFR Title 40 Chapter I Subchapter C Part 98: Table A-1 Global Warming Potentials

Green House Gases Emissions Inventory - Construction for Alternative 4 and 5

GHG Emissions Inventory →

Emission Source Data						Emission Factors for Construction Equipment (lbs/Hp-hr) or (lbs/mile)[1,2,3]			Daily GHG Emissions from Construction Activities (lbs/day)			
Construction Activity/Equipment Type	Power Rating (Hp)	Load Factor	# Active	Hourly Hp-Hrs	Hrs per Day Or Miles Per Day (1)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_{2eq}
Worker vehicles	N/A	NA	5	NA	40	1.11009559	0.00004322	0.00037757	222.019	0.009	0.076	244.738
Water Truck	N/A	NA	1	NA	15	4.21483461	0.00004176	0.01031407	63.223	0.001	0.155	109.342
Dump Trucks (10 CY)	N/A	NA	5	NA	10	4.19512979	0.00003697	0.00932573	209.756	0.002	0.466	348.756
Excavator	120	NA	2	NA	8	73.62306780	0.00404531	0.26376217	1177.969	0.065	4.220	2437.205
Concrete/Industrial Saws	30	NA	1	NA	8	20.00000000	0.00190000	0.14500000	160.000	0.015	1.160	506.060
Rubber Tired Loaders	120	NA	2	NA	8	58.91350855	0.00358381	0.24763471	942.616	0.057	3.962	2124.772
Dump Truck	N/A	NA	3	NA	40	4.21483461	0.00004176	0.01031407	505.780	0.005	1.238	874.736
Water Truck	N/A	NA	1	NA	40	4.21483461	0.00004176	0.01031407	168.593	0.002	0.413	291.579
Pile Driver	175	0.62	2	217	8	141	0.0029	0.00119849	111.090	0.002	0.001	111.429
Drag Tractor/ Skip Loader	200	NA	1	NA	1	50	0.0017	0.12400000	50.000	0.002	0.124	86.995
Bobcat- Steer Loader	200	NA	1	NA	1	50	0.0017	0.12400000	50.000	0.002	0.124	86.995
Bulldozer	250	NA	1	NA	8	159	0.0068	0.22220000	1272.000	0.054	1.778	1803.085
12 ft paving box (pump truck)	N/A	NA	1	NA	8	128	0.0081	0.52380000	1024.000	0.065	4.190	2274.359
Motor Grader	200	NA	1	NA	8	165	0.0067	0.35000000	1320.000	0.054	2.800	2155.740
Misc. Paving Equipment (trencher)	50	NA	1	NA	8	24	0.0042	0.17890000	191.200	0.034	1.431	618.538
Gater/ 4 wheel drive	N/A	NA	2	NA	8	1.11009559	0.00004322	0.00037757	17.762	0.001	0.006	19.579
Roller	120	NA	2	NA	8	58.98875264	0.00353881	0.26471585	943.820	0.057	4.235	2207.401
Tractor Trailor/End Dump	N/A	NA	1	NA	8	4.19512979	0.00003697	0.00932573	33.561	0.000	0.075	55.801
Crane, Hydraulic	N/A	NA	1	NA	4	112.00000000	0.00490000	0.27050000	448.000	0.020	1.082	770.926
Pile Hammer	N/A	NA	1	NA	2	141.00000000	0.00290000	0.00119849	282.000	0.006	0.002	282.859
							Daily Total (Sum)		4.170	0.000	0.012	7.897
							Total (metric tons)		246.73	0.01	0.80	**484.45**

$CO_2eq = X*CO_2 + Y*N_2O + Z*CH_4$
Where X = 100 Year Global Warming Potential for Carbon Dioxide = 1
Where Y = 100 Year Global Warming Potential for Nitrous Oxide = 298
Where Z = 100 Year Global Warming Potential for Methane = 25

CFR Title 40 Chapter I Subchapter C Part 98: Table A-1 Global Warming Potentials

	Gross Emissions			Net Emissions		
No Action Alternative	**Grams (g)**	**Pounds (lbs)**	**Metric Tons (Tons)**	**g**	**lbs**	**Tons**
Carbon Dioxide (CO_2)	-1,989,091,880	-4,385,201	-1,989	0	0	0
Methane (CH_4)	897,832	1,979	1	0	0	0
Nitrous Oxide (N_2O)	1,665,396	3,672	2	0	0	0
Carbon Dioxide Equivalents (CO_2e)	-1,470,358,142	-3,241,587	-1,470	0	0	0
Alternative 4	**g**	**lbs**	**Tons**	**g**	**lbs**	**Tons**
Carbon Dioxide (CO_2)	-3,024,393,309	-6,667,651	-3,024	-1,035,301,430	-2,282,451	-1,035
Methane (CH_4)	5,754,390	12,686	6	4,856,558	10,707	5
Nitrous Oxide (N_2O)	2,030,586	4,477	2	365,190 805	805	0
Carbon Dioxide Equivalents (CO_2e)	-2,275,418,862	-5,016,444	-2,275	-805,060,721 -1,774,857	-1,774,857	-805
Alternative 5	**g**	**lbs**	**Tons**	**g**	**lbs**	**Tons**
Carbon Dioxide (CO_2)	-3,455,863,902	-7,618,882	-3,456	-1,466,772,023	-3,233,681	-1,467
Methane (CH_4)	6,412,427	14,137	6	5,514,596	12,158	6
Nitrous Oxide (N_2O)	2,103,565	4,638	2	438,169	966	0
Carbon Dioxide Equivalents (CO_2e)	-2,668,690,956	-5,883,461	-2,669	-1,198,332,814	-2,641,874	-1,198

NEAT Model Step	Assumptions
Step 1: Project Data	
Step 2: Construction Emissions	138 days was used based on the construction window that was given for the equipment list until Bobcat Steel Loader and while from bulldozer to the end of the equipment list is noted for 7 days due to the nature of the equipment and how many days, they will be needed
Step 3: O&M Emissions	1 car per household, all evacuate each time (60 apartments and 170 houses)
	Breaching would take 10 days and occur twice for No Action and once for Alternatives per year
	General O&M is the same throughout all Actions and Alternatives that consistence of 10 days per year
	Evacuations emissions occur round trip for both Alternative 4 and 5, and 2 round trips for No Action per year
Step 4: Wetland and Aquatic Habitat Emissions	26 PPT average annual salinity for with action alternatives
	35 PPT average annual salinity (Sea water) for No Action
Step 5: Embodied Carbon in Materials	
Step 6: Net Emissions	Using 13.4 acres for Alternative 4 and 18.2 acres for Alternative 5

Wetland and aquatic ecosystem emissions and sinks are determined using the following equations: For wetland and aquatic habitat the sequestration or emissions are computed over a unit area per unit time:

$$Equation\ 4A:\ CO_{2seq} = -SR\ x\ A\ x\ T$$

Where:
CO_{2seq} = the quantity of carbon dioxide (CO_2) sequestered (grams, pounds, metric tons).
SR = CO_2sequestration rate, mass per unit area, per unit of time
A = area of wetland or aquatic habitat to be created
T = the unit of time over which benefits are calculated (50 years typically, though may be reduced with sea level rise)

Note- sequestration emissions have a negative value because sequestration removes carbon dioxide from the atmosphere and therefore the model subtracts the amount of CO_2 sequestered.

$$Equation\ 4B:\ CH_4 = MR\ x\ A\ x\ T$$

Where:
CH_4 = the quantity of methane (CH_4) emitted (grams, pounds, metric tons)
MR = methanogenesis rate in unit mass of CH_4 per unit area, per unit of time
A = area of wetland or aquatic habitat to be created
T = the unit of time over which the emissions are calculated (50 years typically, though may be reduced with sea level rise)

$$\text{Equation 4C: } N_2O = NR\ x\ A\ x\ T$$

Where:
N_2O= the quantity of nitrous oxide (N_2O) emitted (grams, pounds, metric tons)
NR = N_2O production rate in unit mass of N_2O per unit area, per unit of time
A = area of wetland or aquatic habitat to be created9
T = the unit of time over which the emissions are calculated (50 years typically, though may be reduced with sea level rise)

The area of the wetland or aquatic habitat can be obtained from a geographic information system (GIS) or calculated via the below calculation and substituted into the above equations:

The Net Emissions are calculated using the below equation. Note that the sum of each action alternatives emissions includes subtracting any sequestered CO_2 from wetlands or aquatic habitat if applicable.

$$Equation\ 4D:\ E_{NET} = \sum A_E - \sum NA_E$$

Where:
E_{Net} = net emissions for each action alternative (grams, pounds, metric tons)
A_E = total emissions for the action alternative (subtracting sequestered emissions)
NA_E = total emissions for the no-action alternative

Environmental Appendix A-5

Watsonville Slough Ecosystem Restoration Project

Continuing Authorities Program Section 1135

Proposed Project Description

Revised 3rd Draft

June 25, 2025

US Army Corps
of Engineers ®
San Francisco District

Pajaro Storm Drain Maintenance District
Within Santa Cruz County

Table of Content

1 Project Problem Statement 1
2 Project Purpose 1
3 Study Authority 2
4 Project Location in Watershed Context 2
5 Description of Existing Conditions 4
5.1 Hydrology 4
5.2 Water Quality 4
5.3 Biological Resources 6
6 Project Elements 8
7 Eligibility for Programmatic Approach 11
7.1 NOAA Restoration Center's Programmatic Approach 11
7.1.1 Instream Barrier Modification for Fish Passage Improvement 11
7.1.2 Stream Bank and Riparian Habitat Restoration 13
7.2 State Water Resources Control Board Order WQ 2022-0048-DWQ 14
7.2.1 Definition of Restoration Project 14
7.2.2 Categories of Eligible Project Types 15
7.3 U.S. Army Corps of Engineers' Nationwide Permit 27 15
8 Detailed Descriptions of Project Elements 16
8.1 Permanent Project Components 16
8.1.1 Culvert Replacement 16
8.1.2 Raise West Beach Road 17
8.1.3 Flapgate Installation on Adjacent Agricultural Ditch 18
8.1.4 Utility Relocation 18
8.1.5 Removal of Invasives and Planting of Native Plants 19
8.1.6 Parking Lot Raise 19
8.1.7 Install Interpretive Signage 20
8.2 Temporary Project Components 20
8.2.1 Staging Areas and Access 20
8.2.1 Dewatering 20
8.2.2 Cofferdam Installation 21
8.2.3 Temporary Water Diversion 23
8.2.4 Emergency Lagoon Breaching 23
9 Construction Plan 23
9.1 Construction Schedule 23
9.2 Construction Equipment 23
9.3 Materials to be used 24
9.4 Vegetation Removal 24
9.5 Construction Activities 26
9.6 Avoidance and Minimization Measures 28
9.6.1 Construction Best Management Practices 28
9.6.2 Temporary Impact Avoidance and Minimization Measures 29
10 Proposed Monitoring Plan 32
11 References 34

List of Figures

Figure 1. Historical Changes to Lower Watsonville Slough....2
Figure 2. Location of Project Area....3
Figure 3. Lower Watsonville Slough and Pajaro River Lagoon....4
Figure 4. Shell Road Culverts and Pump Station....7
Figure 5. Proposed Project Elements....10
Figure 6. Conceptual Design of Proposed Fish-friendly Culvert....12
Figure 7. Plan View of Culvert Replacement Work Area....17
Figure 8. Dewatering Schematic....21
Figure 9. Vegetation Observed in the Culvert Replacement Site....25

List of Tables

Table 1. Beneficial Uses of Watsonville Slough (Central Coast Basin Plan 2019)....5
Table 2. List of 303(d) Water Quality Impairments for Watsonville Slough....6
Table 3. Annual Average Habitat Units (in acres) in 1-50% Annualized Inundation over 50-year Project Life and Percent Change from Existing Condition....14
Table 4. Affected Known Utilities in Vicinity of Culvert Replacement Site....19
Table 5. List of Construction Equipment....23
Table 6. Temporary Impact Avoidance and Minimization Measures....29

1 PROJECT PROBLEM STATEMENT

Since the 1930s, most of the original Watsonville Slough channel and tidal marsh system had been reclaimed for agriculture and was further constrained by adjacent residential land use and USACE Federal levees. The total area of tidal marsh and coastal wetland habitat between the Watsonville Slough and the Pajaro River has decreased by approximately 80% (Whipple and Grossinger 2008). The levees have isolated the slough system from most fluvial processes and overflows. The remnant existing marsh plain has areas of robust native marsh, especially in low areas and immediately adjacent to the slough. Other areas exhibit stunted growth of native species and encroachment by upland non-native weeds, suggesting a truncation of marsh hydrology.

Modeling has shown that while other anthropogenic stressors exist (i.e., the historic removal of side channels, sidecast berms between the slough and marsh plain in areas) the primary cause of truncated hydrology on the marsh plain is the mechanical breaching of the Pajaro River Lagoon. During lagoon closures in the wet season, generally from October through March, inundation of low Infrastructure, especially at Beach Road triggers manual breaching of the sand bar to drain the lagoon when the water surface level reaches at 8.0 feet NAVD88. This is necessary to preserve emergency access to the Pajaro Dunes community and Palm Beach State Park. With changing hydrologic conditions, higher areas of the marsh plain have become invaded by xeric, non-native species or exhibit stunted, stressed growth habits.

Additionally, the Watsonville Slough lacks resilience to sea level change. The current extent of existing coastal wetland habitat does not allow required space for the sea level change and associated saltwater intrusion. Existing culverts are undersized and constrained by the road elevation. During closed-lagoon conditions water levels in the slough overtop the road, which triggers the lagoon breaching, ultimately limiting the footprint of healthy wetland habitat. These existing culverts are also considered fish and wildlife passage barriers. Native, threatened and endangered species such as Steelhead Trout (*Oncorhynchus mykiss*) and Tidewater Goby (*Eucyclogobius newberryi*) have limited access to high-quality tidal marsh and coastal wetland habitat during natural flooding of the marsh.

2 PROJECT PURPOSE

The purpose of the proposed project is (1) to restore more natural lagoon hydrology and associated marsh vegetation, and (2) to remove a barrier to fish passage on the Beach Road crossing, allowing aquatic species to have better and more access to the marsh plain and foraging habitat when it's inundated. Modeling results showed that the proposed project would expand the marsh hydrology by 8.1 acres in County- and State-owned parcels combined, which is currently high and dry marsh plain and would be converted to healthy marsh over a 50-year project life based on the average annualized habitat unit. The County- and State-owned parcels in the project area currently has the estimated healthy marsh of 5.2 acres, and would increase to 13.4 acres.

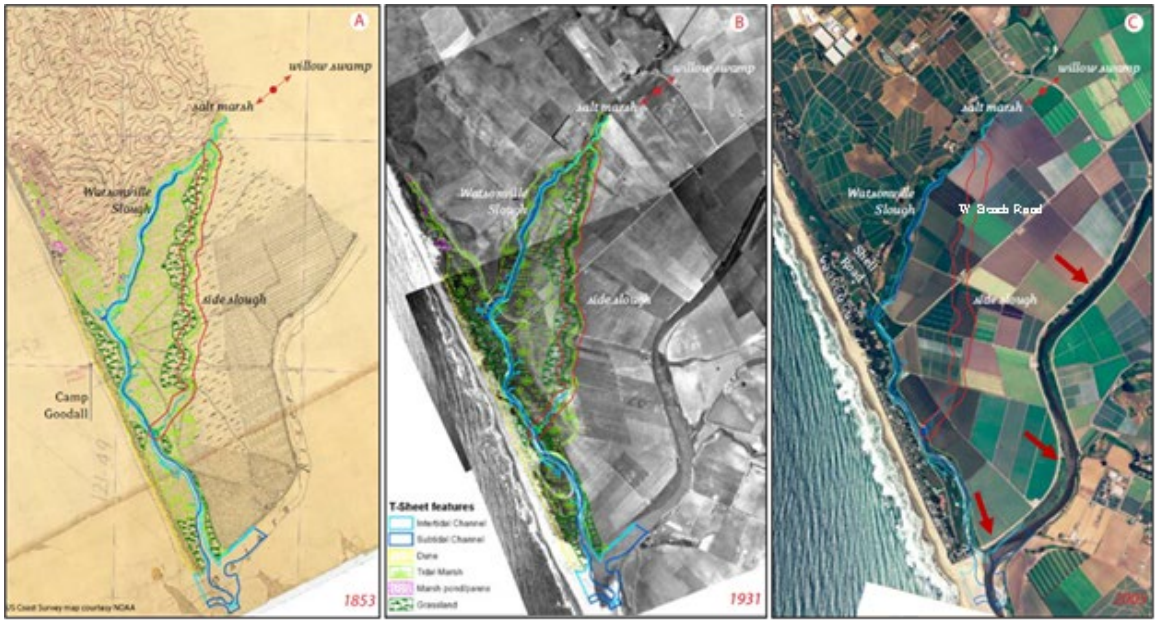
The expanded marsh area is approximately 45% of the total area of the County and State parcels. By retaining more natural and longer lagoon closure events, the proposed project would also reduce the extent of encroachment of salt water into the shallow aquafers.

3 STUDY AUTHORITY

This study is being conducted under Continuing Authorities Program (CAP) Section 1135 of Water Resources Development Act (WRDA) of 1986 (P.L. 99-662). The CAP Section 1135 allows the U.S. Army Corps of Engineers (USACE) to modify existing USACE projects to restore the environment and construct new projects to restore areas degraded by existing USACE projects when it is determined that such modifications are feasible, consistent with the authorized project purpose, and will improve the quality of the environment in the public interest. Work under this authority can include modification to the structures and operations of water resources project constructed by USACE or undertake restoration projects at locations where a USACE project has contributed to environmental degradation. The USACE San Francisco District is the federal agency in partnership with a local non-Federal sponsor (NFS), Pajaro Storm Drain Maintenance District (PSDMD) for this CAP Section 1135 study.

4 PROJECT LOCATION IN WATERSHED CONTEXT

The Pajaro River watershed encompasses approximately 1,300 square miles and the lower reach of the River forms the boundary between Santa Cruz and Monterey counties in California. The Watsonville Slough is a tributary to the Pajaro River's bar-built estuary. Historically, the marsh extended up into the area north of the bend near Camp Goodall (historical; see Panel A in Figure 1), but much of the marsh plain has been developed, and the historic "side slough" and tidal marsh between it and Watsonville Slough is currently used for agriculture (Figure 1).



Source: Adapted from Whipple, A. and Grossinger, R. 2008

Figure 1. Historical Changes to Lower Watsonville Slough

The project area is located in the lower Watsonville Slough in Santa Cruz County near the mouth of the Pajaro River, where the River discharges to the Pacific Ocean. The project area is adjacent to farmlands and the Pajaro Dunes Community at the coast of the Pacific Ocean (Figure 2).

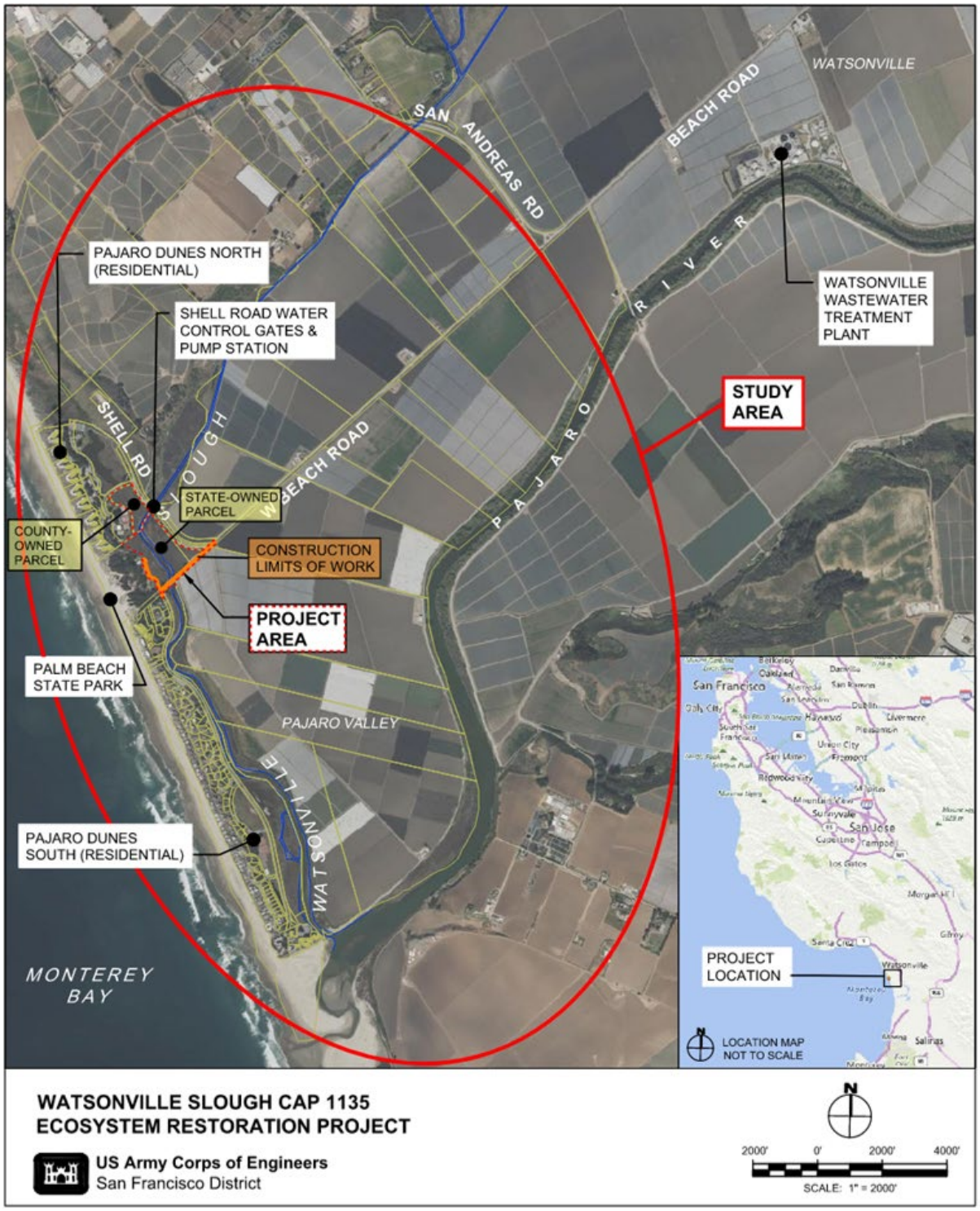


Figure 2. Location of Project Area

5 DESCRIPTION OF EXISTING CONDITIONS

5.1 Hydrology

The mouth of the Pajaro River Lagoon periodically closes, due to the formation of a barrier beach that is created by wave-driven sand transport during low river flows. When the lagoon is closed, the project area becomes disconnected from tidal forcing, and water levels in the lower Watsonville Slough are determined predominantly by upstream flow inputs, runoff flows from adjacent agricultural lands and losses due to evapotranspiration and seepage/infiltration. When the lagoon is open, both stream flow and tidal forcing play a role in water levels of the Slough, with tidal fluctuations having a more significant impact on the water levels. In general, these seasonal lagoon closures contribute significant hydrology and water availability to marsh plains adjacent to the sloughs and rivers associated with these lagoons, and the marsh plains are higher in elevation than those associated with strictly tidal, open estuaries. Therefore, much of the marsh plain in these systems is only inundated during lagoon closure events.

The land parcels immediately adjacent to the Watsonville Slough have been leveled in the past, are partially isolated from the Slough by berms, and are largely devoid of tidal channels or microtopographic heterogeneity. When the Pajaro River Lagoon is closed – which is a natural part of the hydrology in bar-built estuaries – water levels back up into the Slough. The water level at Beach Road crossing (Figure 3) periodically approaches 8.0 feet NAVD88, which is a threshold indicating street flooding on Beach Road and triggers the County of Santa Cruz to mechanically breach the lagoon to prevent flooding and loss of emergency access to the Pajaro Dunes Community. The mechanical breaching releases the water and drains the marsh plain artificially, truncating the natural hydrology in the perched marsh plain associated with bar-built estuaries.

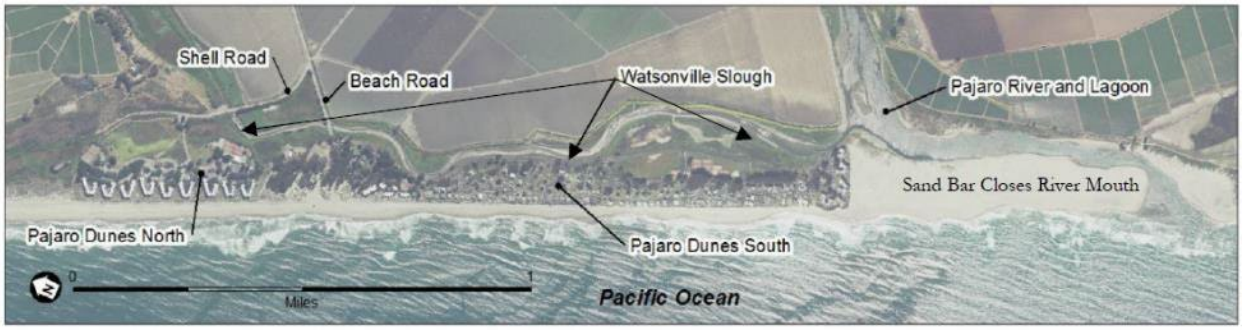


Figure 3. Lower Watsonville Slough and Pajaro River Lagoon

5.2 Water Quality

The Watsonville Slough and adjacent marsh plain have been modified for agriculture and urban development land uses. Two pump stations (Shell Road and Harkin Slough) manage flooding and saltwater intrusion in the lowlands. The water quality conditions of the Watsonville Slough are generally degraded. Degraded water quality in the Watsonville Slough is associated with

sedimentation (from soil erosion); nutrients (nitrate and phosphate, and pesticides); ammonia; pesticides; heavy metals (copper, nickel, lead, and zinc); localized algal blooms, and low dissolved oxygen; and pathogens. The lower Watsonville Slough receives all of the runoff from the entire Watsonville Slough watershed complex, including the untreated, concentrated agricultural drainage from the Beach Road Agricultural Ditch. The overall value to wildlife in the salt marsh of Watsonville Slough estuary is adversely affected by pesticide runoff from adjacent agricultural lands, reducing the invertebrate fauna on which many vertebrates forage (County of Santa Cruz 2003). Source control best management practices (BMPs) have been determined to be the best method to improve water quality in the Watsonville Slough.

The designated beneficial uses of Watsonville Slough as outlined in the Basin Plan for the Central Coast Region (1994) are presented in Table 1. The beneficial uses of water contact recreation (REC-1) and non-contact water recreation (REC-2) are not supported in the Watsonville Slough because fecal coliform concentrations exceed existing Basin Plan numeric water quality objectives.

Table 1. Beneficial Uses of Watsonville Slough (Central Coast Basin Plan 2019)

Water Contact Recreation	REC-1
Non-Contact Water Recreation	REC-2
Wildlife Habitat	WILD
Warm Fresh Water Habitat	WARM
Spawning, Reproduction, and/or Early Development	SPWM
Preservation of Biological Habitat of Special Significance	BIOL
Rare, Threatened, or Endangered Species	RARE
Estuarine Habitat	EST
Commercial and Sport Fishing	COMM
Source: Central Coast Regional Water Quality Control Board 2019	

State Water Resources Control Board (SWRCB), with the concurrence of the U.S. Environmental Protection Agency (USEPA) and Regional Water Quality Control Boards (RWCQB), establishes a list of all impaired water bodies within the State under Section 303(d) of the Clean Water Act (CWA), which requires the identification of water bodies that do not meet, or are not expected to meet water quality standards (i.e., impaired water bodies). The affected water body, and associated pollutant or stressor, is then prioritized in the 303(d) List. The Clean Water Act further requires the development of a Total Maximum Daily Load (TMDL) for each listing and the Watsonville Slough is listed on the 303(d) List for various pollutants (Table 2).

In terms of groundwater water quality in the region, higher total salt content in the groundwater of the Pajaro Valley Groundwater Basin is predominantly due to the seawater intrusion as the coastal area has the highest potential for salt loading. Approximately 92% of the water used in the Pajaro Valley is pumped groundwater (PV Water 2020), and the groundwater levels in the Basin have declined as a result of long-term groundwater overdraft. Nitrogen loading to the

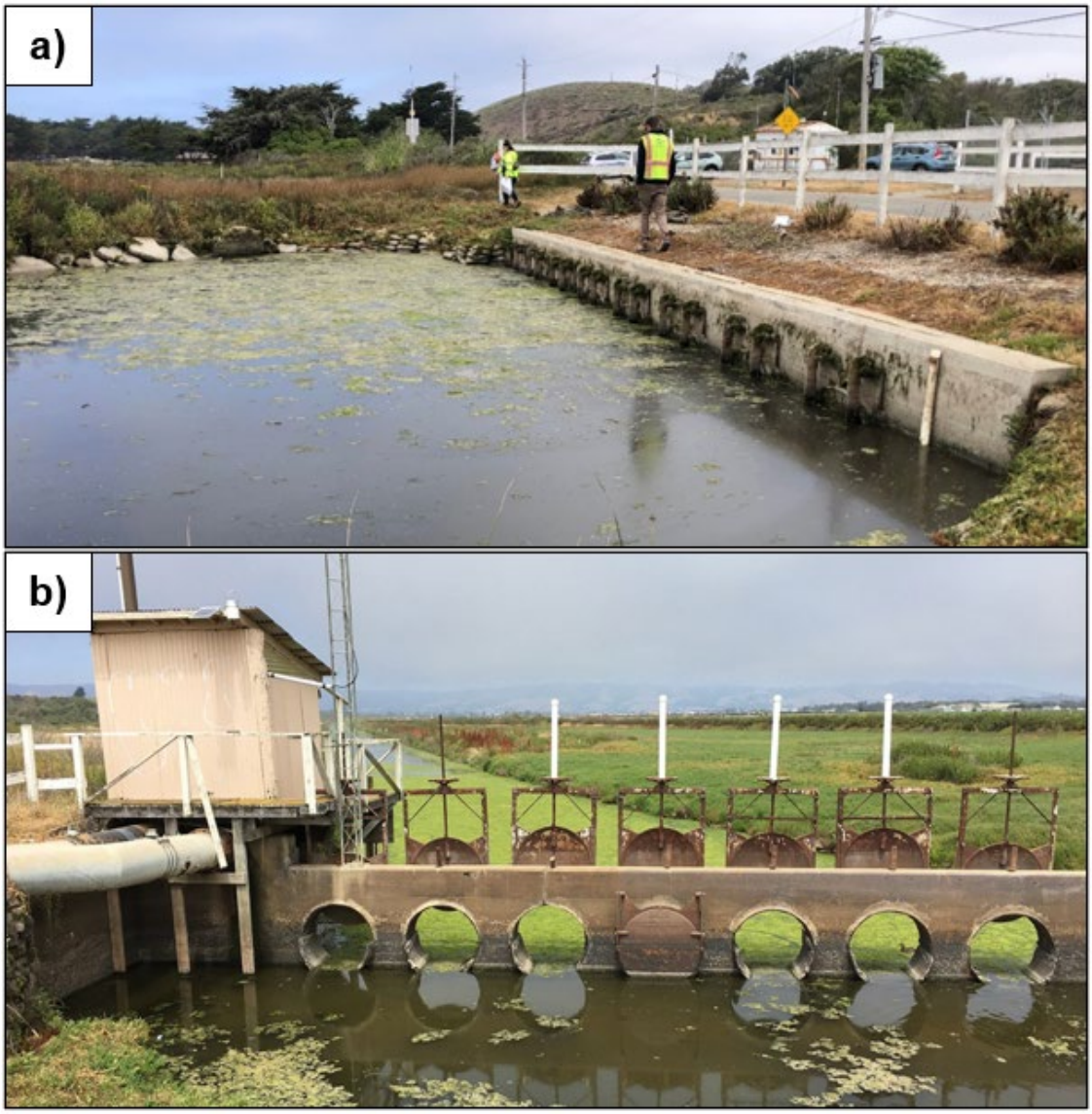
groundwater in the Pajaro Valley is primarily from agricultural fertilizer and irrigation runoff, streamflow recharge, and sewer and septic systems.

Table 2. List of 303(d) Water Quality Impairments for Watsonville Slough

Pollutant(s)	Potential Source	TMDL Schedule (Category 5 Criteria)*
Nitrate, Dissolved Oxygen	Agriculture, Domestic Animals/Livestock, Natural Sources, Urban Runoff/Storm Sewers	Required by 2018[a]
Toxicity, Turbidity	Unknown	Required by 2023[a]
DDE (Dichlorodiphenyldichloroethylene), Eshcherichia (E. Coli), Malathion		Required by 2027[a]
Fecal Coliform		Approved 2007[b]
Note: *Category 5 criteria: A water segment where standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed for this segment. TMDL requirement status definitions for listed pollutants are: a - TMDL still required, b - being addressed by USEPA approved TMDL.		
Data Source: California State Water Resources Control Board, 2018 California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report); available online: https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2018_integrated_report.html		

5.3 Biological Resources

Estuarine aquatic habitat is limited to the lower Watsonville Slough downstream of the Shell Road Pump Station (Figures 2 and 3). This reach is a tributary to the Pajaro River Lagoon and supports water quality conditions and fish populations typical of the larger lagoon environment. Smith (1993) found twenty-five fish species in the Pajaro River Lagoon of which nine were found in Watsonville Slough between Shell Road and the confluence with the lagoon. None of the species encountered by Smith are freshwater species. Threespine Stickleback (*Gasterosteus aculeatus*), Arrow Goby (*Clevelandia ios*), and Tidewater Goby (*Eucyclogobius newberryi*) are resident estuarine species. All others are marine species that use the lagoon and lower Watsonville Slough for spawning, juvenile rearing, and/or feeding. The Santa Cruz County has been conducting annual fish surveys in Pajaro Lagoon and Watsonville Slough at the confluence with Pajaro River since 2014, and Tidewater Goby have only been found in 2 years of the recent past 6 years. The reach is influenced by tidal circulation as well as freshwater inflows from upper watershed areas. Flap gates at Shell Road prevent upstream movement of estuarine fish (Figure 4).



Note: a) Photo of Shell Road crossing with culverts and vent array, looking upstream; b) Photo of Shell Road crossing pump station with old flow control weir, looking upstream

Figure 4. Shell Road Culverts and Pump Station

South-Central California Coast Steelhead (*Oncorhynchus mykiss*) have historically used and currently use the lower Watsonville Slough system for foraging - an extension of the Parajo River Lagoon - although there are no records of spawning habitat for this species prior to major land use conversion in the Watsonville Slough (both channel sediment and hydrology). Also, there are several federally managed fisheries that fall under Magnuson-Stevens Act: Pacific groundfish species and Coastal Pelagic species. These species would use the Parajo River Lagoon and lower Watsonville Slough system at least seasonally for foraging. The Lagoon and lower Slough system are Essential Fish Habitat for these federally managed fisheries (Casagrande 2024).

The Pacific Coast population of Western Snowy Plover (*Charadrius alexandrines*) is federally listed as threatened and nests near tidal waters along the coast. The nearest nesting sites to the project area are Sunset and Zmudowski State Beaches, including the sandbar at the mouth of the Pajaro River. The breeding season for the western snowy plover runs from March 1 through September 30. During surveys from 2010 through 2014, an average of 109 nests were laid and 31 chicks were fledged in the nesting areas adjacent to the Pajaro River Lagoon. A large flock of wintering western snowy plovers is also regularly found at the Pajaro River mouth (USFWS 2016).

The Pajaro River and Watsonville Slough system are occupied by federally threatened California Red-legged Frog (*Rana draytonii*). However, this species has not been observed at the Pajaro Lagoon and extensive surveys have not revealed breeding within the lower Pajaro River or lower Watsonville Slough. The closest known breeding site is off-channel on the Monterey County side of the Pajaro River and approximately 0.75 mile upstream from the Lagoon (USFWS 2016).

The tidally influenced portion of the Slough and its associated marshes could potentially provide habitats for these critically endangered species as well as several federally listed plant and bird species. There is a great deal of interest on the local and national level in restoring coastal marsh habitat in sloughs with the goal of ensuring survival and encouraging stable populations of these ESA-listed species. Given that the coastal marshes of California are the only habitat that supports those imperiled species, the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) have concluded that their survival rests in large part on restoring and maintaining this critical resource. Additionally, other species will benefit from the ecosystem restoration, not just threatened and endangered ones.

6 PROJECT ELEMENTS

Through the extensive plan evaluations using existing data, ecosystem benefit modeling, collective expertise, and professional judgement, the USACE San Francisco District determined a proposed plan to increase a lagoon breach threshold that the County of Santa Cruz uses in its manual breaching program from the existing threshold +8.0 feet to +9.2 feet NAVD88 by replacing the existing, closed culverts at W. Beach Road, which cannot accommodate the closed-lagoon hydrology due to their low elevation, with a higher-capacity, open-bottom culvert and consequently raising the W. Beach Road elevation. The purpose of the proposed project is to allow the naturally formed sandbar creating Pajaro River Lagoon to remain in place for longer periods of time by reducing the need for mechanical breaching. This will more closely mimic natural hydrology of the marsh and promote healthy marsh vegetation. The following project elements will be implemented (Figure 5):

1. Improve crossing at W. Beach Road on Watsonville Slough, which will support higher-capacity, fish-friendly culvert(s) that will accommodate the closed-lagoon water levels compared with the existing series of closed conduit culverts;

2. Raise an approximately 1,300 linear feet (LF) of W. Beach Road from the existing elevation to accommodate the new culvert(s) with a higher crown elevation;
3. Implement restoration measures such as invasive plant removal and native planting on both County- and State-owned land parcels;
4. Install a new flap gate on the adjacent Beach Road Agricultural Ditch to prevent the higher lagoon levels from moving upstream;
5. Raise surface elevation of a parking lot at Palm Beach State Park to prevent nuisance flooding; and
6. Install interpretive signage both in English and Spanish to inform locals and visitors to the Palm Beach State Park of the benefits of the wetland restoration.

Figure 5. Proposed Project Elements

7 ELIGIBILITY FOR PROGRAMMATIC APPROACH

7.1 NOAA Restoration Center's Programmatic Approach

The restoration projects that are located within the National Marine Fisheries Service (NMFS)'s North-Central Coast Office (NCCO, located in Santa Rosa, CA) jurisdictional area are eligible for NOAA Restoration Center's Programmatic Approach. Proposed restoration projects are categorized as follows: instream habitat improvements, instream barrier modification for fish passage improvement, streambank and riparian habitat restoration, upslope watershed restoration, removal of small dams (permanent, flashboard and other seasonal), creation of off-channel/side-channel habitat features and water conservation projects (developing alternative off-stream water supply, water storage tanks and water measuring devices). The Watsonville Slough CAP 1135 project would be eligible for the following categories: (1) instream barrier modification for fish passage improvement, and (2) streambank and riparian habitat restoration.

7.1.1 Instream Barrier Modification for Fish Passage Improvement

The guidance document of NOAA Restoration Center's Programmatic Approach (NMFS 2023) states the following:

> The *instream barrier modification projects are intended to improve anadromous salmonid passage and increase access to currently inaccessible or difficult-to-access salmonid habitat. Projects may include those designed to improve fish passage at existing culverts, bridges, small dams, flood control structures, and paved and unpaved fords, or Arizona crossings, through replacement, removal, or retrofitting of these existing structures*.

The proposed project will replace existing six 48-inch closed culverts with one fish-friendly culvert which will be designed according to *NOAA Fisheries Guidelines for Salmonid Passage at Stream Crossings in California (2023).* The guidelines are also adapted from culvert design criteria published by many federal and state organizations including the California Department of Fish and Game (CDFG 2001). The conceptual design of the proposed fish-friendly culvert (Figure 6) meets the requirements for Hydraulic Design method based on the NOAA Fisheries Guidelines as follows:

Culvert Width – The minimum culvert width shall be 3 feet.

Satisfied. The design calls for a 32-foot wide culvert.

Culvert Slope – Culvert slope shall not exceed slope of the stream.

Satisfied. The culvert will be embedded, and therefore the culvert bottom will match the adjacent stream slope.

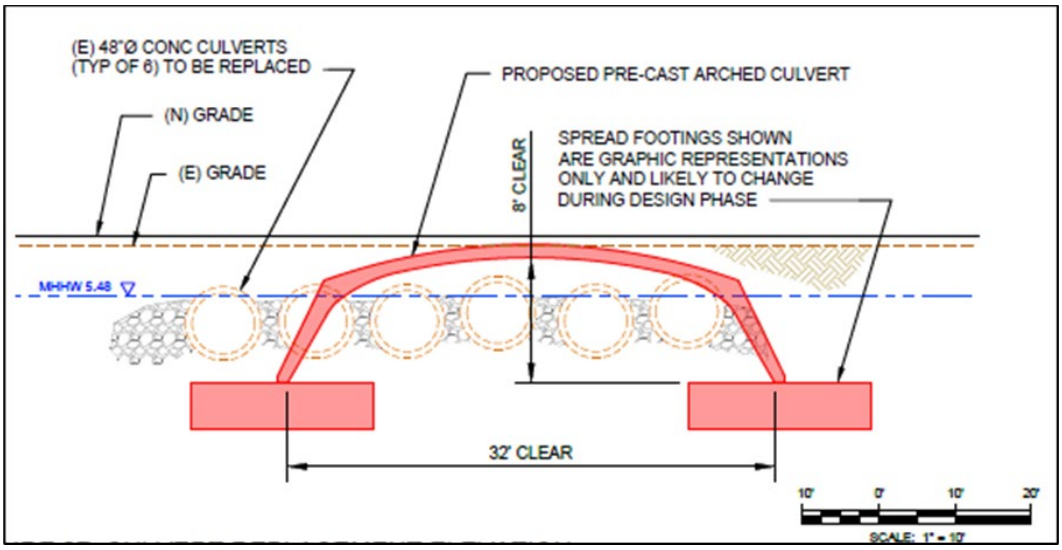


Figure 6. Conceptual Design of Proposed Fish-friendly Culvert

Embedment – The bottom of the culvert shall be buried into the streambed a minimum of 20% of the height of the culvert below the elevation of the tailwater control point downstream of the culvert.

Satisfied. The culvert will be embedded approximately 2 feet into the streambed. The culvert height is 8 feet. 2/8 > 20%.

Maximum Average Water Velocities in the Culvert at the High Fish Passage Design Flow – For adults, the maximum average velocity in the culvert depends on the length of the culvert. In the case of our project, the culvert length is less than 60 feet, so the maximum velocity is 6 fps. The High Fish Passage Design Flow that is used for this velocity analysis the 1% annual exceedance flow.

Satisfied. Using the flow duration analysis, the 1% annual exceedance flow in Watsonville Slough is estimated at 44 cfs, based on hydrologic (HEC-HMS) and hydraulic (HEC-RAS) modeling for the period of 2002 to 2018. The maximum average velocity through the proposed culvert for a flow of 44 cfs is estimated at 2 to 2.5 fps using HEC-RAS, which is less than the 6 fps threshold.

Minimum Water Depth at the Low Fish Passage Design Flow – For non-embedded culverts, minimum water depth shall be 12 inches for adult steelhead and salmon, and six inches for juvenile salmon.

Satisfied. The culverts are embedded.

Juvenile Upstream Passage – The design flow for this criterion is the 10% annual exceedance flow. This criterion states that the maximum average water velocity for this flow rate should not exceed 1 fps. In some cases over short distances, 2 fps may be allowed.

Satisfied. The 10% annual exceedance flow in Watsonville Slough is estimated at 13.9 cfs. For this flow, the maximum average velocity through the culvert is estimated at 1 to 1.5 fps using HEC-RAS, which is less than the 2 fps threshold.

Maximum Hydraulic Drop – Hydraulic drops between the water surface in the culvert and in the adjacent channel should be avoided for all cases.

Satisfied. The culverts are embedded.

Conveyance Area Calculations

Existing Conditions

6x 48" diameter concrete culverts: $Area = 6 * (\pi r^2) = 6 * (\pi * (2)^2) = 75\ ft^2$

Proposed Conditions

32' span x 8' rise arch culvert. Per Con/span spec sheets for the O-series arch culvert*, the equivalent rise for calculating conveyance area as a rectangle is 6.47 ft. Bottom elevation of culvert opening = 0' NAVD88. Slough bathymetry at culvert = 1.5 to 2.2' NAVD88. Conservatively, Conservatively, we approximate the culvert opening as follows:* $Area = 32 * (6.47 - 2) = 143\ ft^2$

Structural Design and Flood Capacity – The conceptual design is not designed to pass the 100-year flow; however, the culvert design will be further refined during Design and Implementation (D&I) phase based on geotechnical survey data so that it is structurally sound with consideration of the debris loading that is likely to be encountered during flooding.

7.1.2 Stream Bank and Riparian Habitat Restoration

The guidance document of NOAA Restoration Center's Programmatic Approach (NMFS 2023) states the following:

> *Riparian habitat restoration projects will aid in the restoration of riparian habitat by increasing the number of plants and plant groupings, and could include the following types of projects: natural native plant regeneration, bank laybacks, inset floodplains, livestock exclusionary fencing, bioengineering, removal of non-native trees (e.g., eucalyptus trees) and revegetation projects. Reducing excessive fine instream sediment will improve fish habitat and fish survival by increasing fish embryo and alevin survival in spawning gravels, reducing injury to juvenile steelhead from high concentrations of suspended sediment, and minimizing the loss, or reduction in size, of pools from excess sediment deposition. Improved instream habitat complexity will help to ensure that failing stream banks do not result in continued loss of the in-channel habitat complexity needed by salmonids…*

The proposed project will remove exotic and xeric species and implement planting the formerly high and dry areas with native marsh species, which will help reduce soil erosion and suspended sediment concentration in the Slough. Amah Mutsun Tribal Band[1] are interested in

[1] The Amah Mutsun is recognized by the State of California as a Tribal Government but lacks federal recognition. Consequently, the Tribe holds no tribal lands, nor does it receive financial assistance from either the Federal or State governments.

collaborating on the project so that indigenous knowledge can be used in selecting several traditional plants for the ecological restoration in the project area.

7.2 State Water Resources Control Board Order WQ 2022-0048-DWQ

7.2.1 Definition of Restoration Project

The *Clean Water Act Section 401 Water Quality Certification and Waste Discharge Requirements for Restoration Projects Statewide* document states the following:

> *A "restoration project" is defined as one that would result in a net increase in aquatic or riparian resource area functions and/or services through implementation of the eligible project types, relevant general protection measures (GPMs), and consideration of design guidelines…*

During the extensive ecosystem modeling exercise, the project defined goals for ecological benefits from the restoration measures as “marsh hydrology” with 1-50% annualized inundation because the existing condition indicated those areas were generally healthy pickleweed middle marsh and low to middle marsh areas. The annualized inundation range of 0-1% was excluded because significant portions of this range included stressed vegetation or were co-dominant with xeric non-native and invasive species, indicating that those are the “high and dry” areas affected by the truncated hydrology.

The model runs were set up for three time steps at Year 0 (existing condition), 25, and 50 for each of the ecosystem modeling scenarios. Table 3 presents the annual average areas in 1-50% annualized inundation over the 50-year project life, and percent changes from the existing condition (i.e., Year 0) for No Action alternative and Proposed Plan by parcel. Negative percent values denote decrease in 1-50% annualized inundation areas compared to the existing condition.

Table 3. Annual Average Habitat Units (in acres) in 1-50% Annualized Inundation over 50-year Project Life and Percent Change from Existing Condition

Parcel	Annual Average Area (in acres) in 1-50% Annualized Inundation over 50-year Project Life		Percent (%) Change of Annual Average Area (in acres) in 1-50% Annualized Inundation over 50-year Project Life from Existing Condition	
	No Action Alternative	Proposed Plan	No Action Alternative	Proposed Plan
County	0.69	3.41	-2.8	380.3
State	4.58	10.03	-9.3	98.6

As shown in Table 3, the proposed project would expand marsh hydrology (defined as 1-50% annualized inundation) to a net increase of 8.2 acres (i.e., 13.44 - 5.27 = 8.17 acres) total of formerly high and dry marsh plain, or approximately 45% of the County and State parcels over the No Action alternative.

7.2.2 Categories of Eligible Project Types

The proposed project will satisfy the following categories of restoration project types that are eligible for enrollment under the Order:

1. **Improvements to Stream Crossings and Fish Passage** — the proposed project would improve upstream and downstream movement by fish and other species, and functions of streams (see Section 7.1.1 for more detail).

8. **Removal of Nonnative Terrestrial and Aquatic Invasive Species and Revegetation with Native Plants** — the proposed project would improve watershed functions, such as aquatic and riparian habitat for fish and wildlife (see Section 7.1.2 for more detail).

9. **Establishment, Restoration, and Enhancement of Tidal, Subtidal, and Freshwater Wetlands** — the proposed project would improve wetland ecological functions and restore more natural hydrology within the Slough by raising the lagoon breach threshold that the County of Santa Cruz uses in its manual breaching program from the existing threshold +8.0 feet to +9.2 feet NAVD88. This project would allow a longer closure of the naturally formed sandbar lagoon, which would more closely mimic natural hydrology of the wetland habitat and promote healthy marsh vegetation with an increased area of 1-50% annualized inundation as shown in Table 3 in Section 7.3.1.

7.3 U.S. Army Corps of Engineers' Nationwide Permit 27

The Nationwide Permit (NWP) 27 (NWP Final Notice, 82 FR 4) for Aquatic Habitat Restoration, Enhancement, and Establishment Activities authorizes activities in waters of the United States associated with the restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters, and the rehabilitation or enhancement of tidal streams, tidal wetlands, and tidal open waters, provided those activities result in net increases in aquatic resource functions and services. Among other authorized activities by the NWP 27, the proposed project specifically includes the following activities:

1) Removal of stream barriers, such as undersized culverts;

2) Re-establishment of tidal wetlands in tidal waters where those wetlands previously existed;

3) Activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; and

4) Mechanized land clearing to remove non-native, invasive, exotic, or nuisance vegetation

The proposed project will be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent

practicable at the project area and include avoidance and minimization measures (see Section 9.6) to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal. Additionally, the proposed project would provide a benefit of removing approximately 240 cubic yards (CY) of permanent fill material below the high tide line (i.e., MHHW) compared to the existing condition.

For projects undertaken by the USACE, the USACE does not issue itself a permit. However, we have determined that this project is consistent with the NWP 27 (Aquatic Habitat Restoration, Establishment, and Enhancement Activities). As mentioned above in Sections 7.1 and 7.2, this proposed project will also be designed to meet the requirements of the NOAA Restoration Center's Programmatic Approach administered by the NMFS as well as Statewide Order WQ 2022-0048-DWQ by State Water Resources Control Board. As a federal agency, the USACE does not seek approval on the fish passage design from the California Department of Fish and Wildlife but instead seeks input through coordination with the NMFS.

8 DETAILED DESCRIPTIONS OF PROJECT ELEMENTS

8.1 Permanent Project Components

8.1.1 Culvert Replacement

The proposed project will replace the existing six 48-inch diameter closed culverts, which currently are a barrier to fish passage, with one 32-foot wide, 8-foot high, fish-friendly culvert at the Beach Road crossing. Because W. Beach Road is the primary access route in and out of the Pajaro Dunes Community and Palm Beach State Park, the proposed project will construct a temporary road to maintain regular traffic and emergency access through W. Beach Road at all times prior to construction for the culvert replacement. Safety barriers will be used to keep local traffic separated from work zones with additional crew for traffic control as needed for safety.

A temporary (single-lane) roadway will be built (north or south of W. Beach Road) from the existing roadway into the marsh then return traffic back onto W. Beach Road just east of Sunset Beach entrance. The temporary road would need to accommodate emergency vehicles and large trucks (e.g., fire, garbage trucks) so the roadway design would need to be reviewed by local agencies. It is assumed that a temporary earthen-type roadway can be built (with all environmental compliance) and acceptable to highway and safety reviews. Figure 7 shows the temporary roadway on the north side of the existing roadway; however, it may pose some challenge due to the overhead power lines. Therefore, the contractor may prefer building the temporary roadway on the south side of West Beach Road. These are considerations that may be further evaluated during the D&I phase.

After the temporary roadway is constructed, the existing grade (and compaction) and culverts will be excavated to desired elevation, and new culvert footings, culvert sections, and head or tail wall will be installed. A cast-in-place concrete beam would be cast at the outside edge of the

culvert to provide a foundation for the future guardrail to keep the guardrail support independent of the head and tail walls of the culvert.

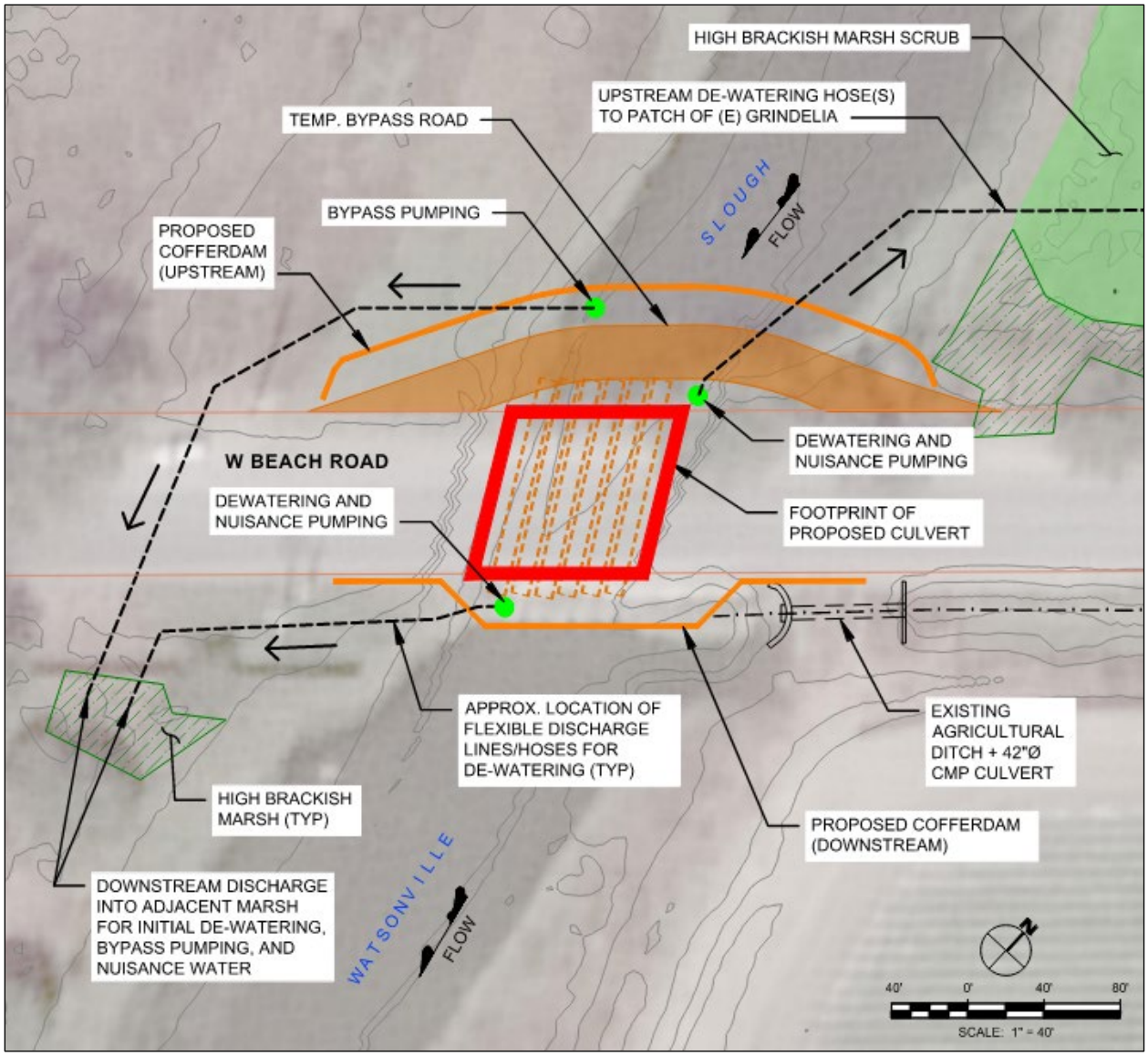


Figure 7. Plan View of Culvert Replacement Work Area

8.1.2 Raise West Beach Road

To avoid flooding impacts to the roadway from an increased culvert elevation and lagoon breach threshold, an estimated 1,300 LF of W. Beach Road will be raised from existing elevations of about 8.0-8.2 feet NAVD88 to a new surface elevation of 9.2 feet NAVD88. This road modification will occur from the Shell Road intersection to just east of the entrance to Palm Beach State Park. The existing roadway material will be removed, taken off-site and recycled. The road will be re-built with new base material, and new bituminous paving (about 24 feet in width) will be installed at a higher elevation with new gravel shoulders.

The construction sequence to raise the roadbed would be as follows:

- Provide traffic control as needed to maintain local traffic through West Beach Road;
- Remove 1 lane (about ½) of the existing asphalt concrete (or AC) paving, stockpile on site, haul later for recycling
- If desired by contractor, strip, and stockpile on site, existing road base (gravel) for reuse removing or screening any deleterious materials.
- Compact and build up road prism using former road base if acceptable.
- Add new fill and grade onto bank as required.
- Install new AC paving for 1 lane. Install crushed rock at shoulder and extend native material down slopes as required.
- Transfer traffic onto newly paved single lane and repeat for second half of the road.
- Once the second half of the road is raised and repaved complete shoulder and bank improvements. Note: USACE follow the Water Board's requirements for materials and porosity of new shoulders on W Beach Road.
- Install erosion control on banks and hydro-seed with native mix and/or plant approved vegetation.
- Remove traffic control.

8.1.3 Flapgate Installation on Adjacent Agricultural Ditch

Currently, there is a 42-inch pipe culvert in the Beach Road Agricultural Ditch immediately east of the existing (6) pipe culverts which discharges agricultural runoff into the Slough. The pipe will be replaced with an outlet with a removable flap valve, duck-bill valve, or similar to prevent the higher lagoon water levels from moving upstream. Similar to the main culvert replacement work, the work at this single culvert will need to be isolated by a temporary cofferdam, use of bladders, or similar.

8.1.4 Utility Relocation

During the feasibility study, several utilities have been identified in the project area that may need to be relocated. A water main and sewer line, owned by the City of Watsonville, run below/underneath the W. Beach Road crossing. Pacific Gas & Electric (PG&E) owned utilities and a low-voltage pressure transducer (which Santa Cruz County owns and maintains to monitor water levels for the Pajaro River Sandbar Mechanical Breaching Program) are in the immediate vicinity of the culvert replacement. Gas lines and overhead high-voltage electrical power lines run parallel to W. Beach Road. Existing utilities may impact the options for installation of temporary cofferdams and daily operations, and will need to be further investigated during the D&I phase.

Table 4. Affected Known Utilities in Vicinity of Culvert Replacement Site

Item	Known Utility	Location	Owner
1	12-inch D Water Main line buried in roadway	At the box culvert, W. Beach Road	City of Watsonville
2	6-inch D Sewer (forced) line, buried in roadway	At the box culvert, W. Beach Road	City of Watsonville
3	Natural gas line(s), buried	In W. Beach Road and in slough south? of (E) culverts	PG&E
4	Power lines, overhead and buried	Along W. Beach and Shell Road	PG&E
5	Communication: fiber optics cable TV? Ask fire department if they have any info.	Overhead (on PG&E poles) + buried	Unknown
6	Low voltage pressure transducer for water level monitoring, buried and above grade	Downstream of (6) culverts, right bank and pole mounted	Santa Cruz County

8.1.5 Removal of Invasives and Planting of Native Plants

Mapping of vegetation was conducted by Watsonville Wetland Watch (WWW)[2] within the marsh and surrounding areas from the mouth of Watsonville Slough at the Pajaro River at the southern end of the project area, to the north encompassing the lagoon within the Pajaro Dunes North property and to the north-east where Watsonville Slough is crossed by San Andreas Road. Vegetation mapping efforts included a combination of field data collection and interpretation of aerial photography along with field reconnaissance and verification. Field surveys were conducted in June, July, and August of 2022. A planting plan will be prepared in coordination with WWW and Amah Mutsun Tribal Band so that the project can leverage local and indigenous knowledge in selection and long-term management of native plants. The proposed project will include invasive vegetation removal within the project area, and implementation of the planting plan prior to project completion.

8.1.6 Parking Lot Raise

During the feasibility study, modeling results showed a nuisance ponding impact (1-3 inch water depth) on the inboard side of the parking lot and picnic areas in the Palm Beach State Park, which are low grading areas. The USACE informed California State Parks about the potential nuisance flooding and coordinated with them to address their concerns. The proposed project includes a measure to raise some parts of the parking lot surface and re-paving the low areas to maintain runoff towards the channel. The project team assumed the overall parking lot gradient would continue to be gently sloped towards the channel, so the direction of runoff over the impervious surface would not change. However, USACE will refine this measure to reduce nuisance flooding on state park property during the D&I phase of the project.

[2] Watsonville Wetland Watch is a local non-profit whose mission is to protect, restore, and foster the appreciation of the wetlands of the Pajaro Valley. See https://www.watsonvillewetlandswatch.org/ for more information.

8.1.7 Install Interpretive Signage

During the D&I phase of the project, a recreation plan will be prepared, and identify the location of interpretive signage both in English and Spanish. The interpretive signage will facilitate the use of recreational area and inform locals and visitors to the Palm Beach State Park about the benefits of the restoration to the marsh and the interplay between infrastructure, natural lagoon closures, and marsh health.

8.2 Temporary Project Components

This section describes the temporary project components general means and methods of construction for the proposed project.

8.2.1 Staging Areas and Access

The primary construction zone will be around the area of crossing improvement/ roadway raise along W. Beach Road. Trucking access to the project area will be from Beach Road (coming from City of Watsonville) and Shell Road. The project needs to maintain emergency access through W. Beach Road because it is a primary access route to/from the Pajaro Dunes Community and Palm Beach State Park. Access will be maintained at all times by constructing a temporary road so that emergency and service vehicles (e.g., fire and garbage trucks) will be able to service the area. The USACE will further consult with Santa Cruz County and local fire and safety departments on access needs during D&I.

The USACE has identified a potential staging area (approx. 56,800 sq. ft.) south of the W. Beach Road crossing (Figure 2) to store equipment and stockpile materials, debris, etc. as a primary staging area. The haul route will pass through agricultural fields, approximately 0.35 miles from staging area to the culvert replacement site. Dust control will be required by the contractor to limit impacts to adjacent agricultural, waterways, and residential areas. The USACE has also initiated discussions with California State Parks, which operates Sunset Beach and Palm Beach state parks, and Pajaro Dunes Community on use of a portion of the parking lot next to the intersection of W. Beach Road and Rio Boca Road for contractor use (e.g., rest area, eye wash station, etc.).

8.2.1 Dewatering

The culvert replacement work area will be dewatered and initially pumped dry using a 4 or 6-inch diameter diesel pump. It is anticipated that the contractor will pump the water into the marsh plain (upstream, downstream, or both). The pump outlet discharge momentum will likely be reduced by using a perforated pipe diffuser or sprinklers to disperse with initial flow into vegetated areas before allowing water to flow back into the Slough (Figure 8). Once pumped, the work area around the existing culverts will need to be dried out (by time and wind) and then periodically maintained by pumping out nuisance water. The exact layout and configuration of the dewatering system will be further refined during the D&I Phase.

Nuisance water pumping will be required because of leakage from the cofferdams. Typically, 2-inch gas-powered pumps (or smaller electric pumps) are suitable for this task. The water leakage will be monitored, and the pumps will be run on an as-needed basis. In addition to the nuisance water pumping, a Slough bypass pumping system will be needed to transfer Slough water from the upstream (i.e., the north side cofferdam) to downstream of the south cofferdam during construction. Similarly, there may be bypass pumping required to transfer water from the agricultural/tidal ditch at south bank around the south cofferdam.

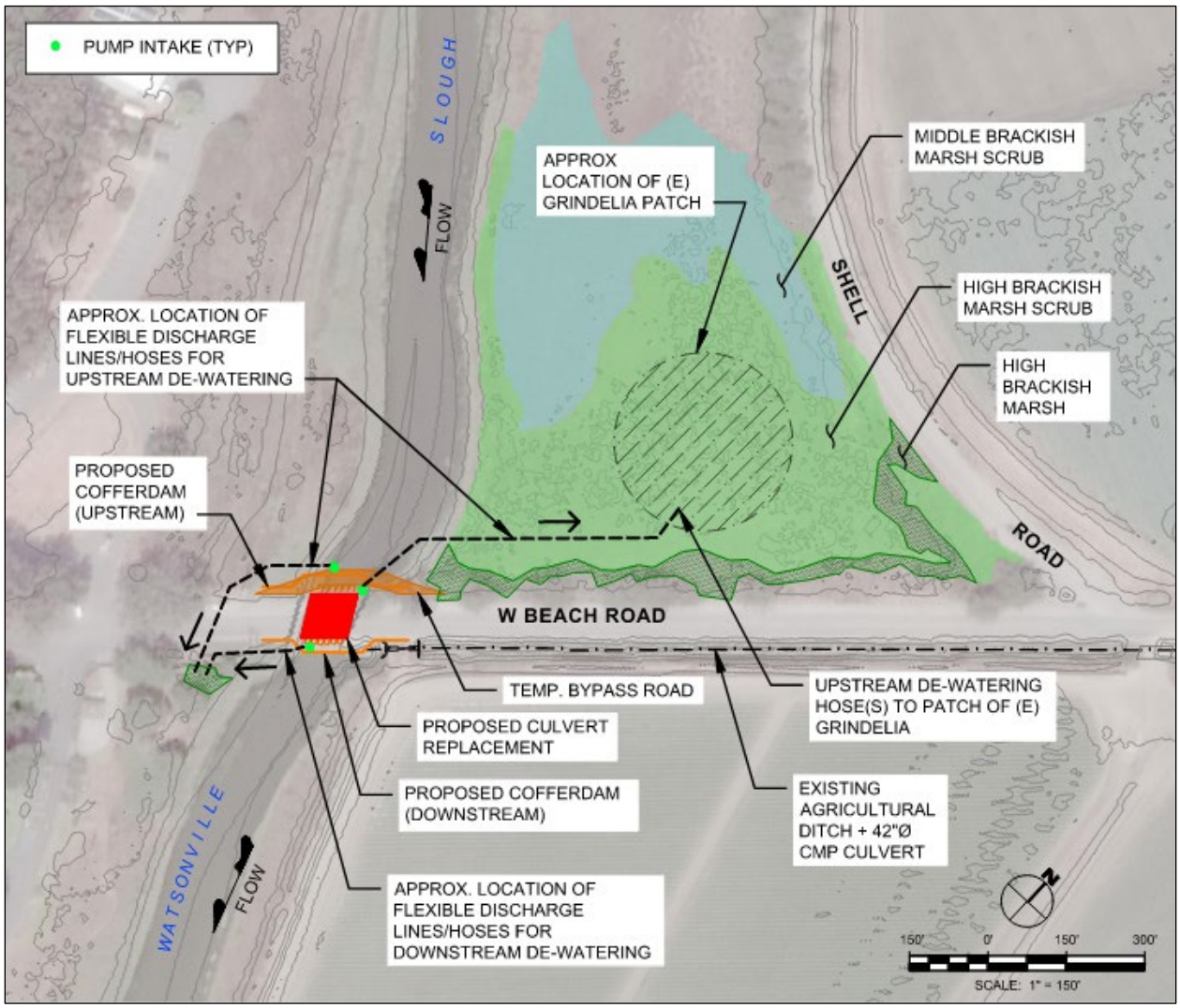


Figure 8. Dewatering Schematic

8.2.2 Cofferdam Installation

Installation of the new culvert at the W. Beach Road crossing will require establishing and maintaining a dry working area in the Slough. This will be accomplished by the installation of cofferdams and dewatering of an approximately 100-foot section of the Slough for construction. The cofferdam installation will also be required for dewatering to replace a pipe and flapgate on the Beach Road Agricultural Ditch, which runs parallel to W. Beach Road near the toe of the south bank.

Cofferdams will be installed both upstream and downstream, and along portions of the cross section of Watsonville Slough in the project area to isolate the extent of the work areas. The construction of cofferdams will begin in the upstream area and continue in a downstream direction, allowing water to drain and allowing fish and aquatic wildlife species to leave (under their own volition), from the area being isolated by the cofferdam, prior to closure. The flow will then be diverted only when construction of the upstream dam is completed and the work area has been naturally drained of flow, at this point, the downstream dam, if necessary, will be completed and then flow will be diverted around the work area. Cofferdams and stream diversion systems will remain in place and fully functional throughout the construction period. In order to minimize adverse effects to aquatic species, stream diversions will be limited to the shortest duration necessary to complete in-water work.

In-water cofferdams will only be built from materials such as sandbags, plastic, clean gravel (possibly wrapped in impermeable material), rubber bladders, vinyl, steel, or earthen fill, in a manner that minimizes siltation and/or turbidity. Sandbags may only be used to build cofferdams upstream of spawning gravels when filled with clean gravel (or other material acceptable to the approving Water Board). Where possible, cofferdams will be pushed into place. If pile driving (sheet piles) is required, vibratory hammers will be used and impact hammer will be avoided. If necessary, the footing of the cofferdam will be keyed into the channel bed at an appropriate depth to capture the majority of subsurface flow needed to dewater the streambed.

When cofferdams with bypass pipes are installed, debris racks will be placed at the bypass pipe inlet in a manner that minimizes the potential for fish impingement and/or entrapment. As needed and where feasible, bypass pipes will be monitored for accumulation of debris. All accumulated debris will be removed. When appropriate, cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour. Cofferdams in tidal waters should be removed during the lowest possible tide and in slack water to the extent feasible to minimize disturbance and turbidity. This will minimize the probability of fish and other aquatic species stranding as the area upstream becomes dewatered. All dewatering/diversion facilities will be installed such that natural flow is maintained upstream and downstream of project areas. An area may need to be dewatered for long enough to allow special-status species to leave on their own before final clearance surveys and construction can begin.

The in-water work window would be between June 15 and September 30 (i.e., during the dry season) when Slough flow is low, i.e., approximately 1-2 cfs. Slough flow upstream of W. Beach Road is influenced by Shell Road Pump Station, which is located approximately 1,200 feet north of the project area. Flows and releases from this pump station may need to be adjusted and scheduled for safe water handling around the project area in addition to the flow in the Slough. The expected volume of agricultural runoff in the ditch during the construction season will be further investigated during D&I and incorporated appropriately into the design of the cofferdams and water bypass system.

As shown in Figure 7 in Section 8.1.1, there will be two cofferdams (water barriers), an upstream and downstream of the existing culverts. The distance between two cofferdams will be less than 100 feet. The area of temporary impacts is conservatively estimated less than 1 acre as calculated approximately 160' times 100' = 16,000 sq. feet, say 20,000 sq. feet (i.e., 0.5 acres) assuming the area outside the cofferdams that contractors will have to access and work around.

8.2.3 Temporary Water Diversion

The in-water work for the proposed project will occur between June 15 and September 30 (dry season), when the flow of the Slough is low and the lagoon mouth is typically open, which will reduce the risk of backwatering event. Flows and releases from the Shell Road Pump Station may need to be scheduled and noted to potential bidders to provide safe water handling around the project site in addition to the watershed flows. The upstream cofferdam will be designed to accommodate all possible flows during construction. Fish barriers will be installed outside of the limits of the cofferdams.

Although the construction window for the project will likely be in dry season when flows to the Slough are low and the lagoon mouth is typically open, the County will maintain an excavator stationed at the beach in case there is a need for emergency breaching of the sandbar.

8.2.4 Emergency Lagoon Breaching

If the Pajaro Lagoon mouth is closed or closes during construction, the Santa Cruz County will mechanically breach the sandbar to reduce overtopping of the downstream cofferdam, and implement the best management practices (BMPs) in the existing sandbar breaching protocol using County's breaching permit.

9 CONSTRUCTION PLAN

9.1 Construction Schedule

Construction is anticipated to begin in June 2028 and would take approximately 5 months including preconstruction site preparation, out-of-water work cleanup, restoration of ground disturbance areas, and invasive plant removal and planting of native plants; however, in-water work would only occur between June 15 and September 30.

9.2 Construction Equipment

Table 5. List of Construction Equipment

Construction Activity/Equipment Type	Power Rating (Hp)	# of Units	Hourly Hp-Hrs	Hrs per Day Or Miles Per Day	Notes
Worker Vehicles	N/A	5	NA	40	miles per day
Water Truck	N/A	1	NA	15	miles per day
Dump Trucks (10 CY)	400	5	NA	10	hrs per day

Excavator	120	2	NA	8	hrs per day
Concrete/Industrial Saws	30	1	NA	8	hrs per day
Rubber Tired Loaders	120	2	NA	8	hrs per day
Dump Truck	NA	3	NA	40	miles per day
Pile Driver	175	2	217	8	hrs per day
Water Truck	NA	1	NA	40	miles per day
Roller	120	2	NA	8	hrs per day
Tractor Trailor/End Dump	NA	1	NA	8	miles per day
Crane, Hydraulic	NA	1	NA	4	hrs per day
Pile Hammer	NA	1	NA	2	miles per day
Drag Tractor/Skip Loader	200	1	NA	1	hrs per day
Bobcat-Street Loader	200	1	NA	1	hrs per day
Bulldozer	250	1	NA	8	hrs per day
12 ft Paving Box (Pump Truck)	NA	1	NA	8	hrs per day
Motor Grader	200	1	NA	8	hrs per day
Misc. Paving Equipment (Trencher)	50	1	NA	8	hrs per day
Gater/ 4 Wheel Drive	NA	2	NA	8	hrs per day

9.3 Materials to be used

Based on the conceptual design, the proposed project is expected to use two precast concrete converts; however, it is subject to change after further evaluation of the culvert design based on the NOAA Fisheries' fish passage design guidelines and geotechnical survey results during the D&I phase. Other construction materials would be selected in accordance with specific requirements under the programmatic permits for fish passage, dewatering, water diversion, borrow materials for the temporary roadway, etc.

9.4 Vegetation Removal

Trees and shrubs that were observed in the immediate vicinity of the project area during a site visit on February 6, 2024 include Monterey Cypress, Eucalyptus, gumweed, ice plants, red valerian, Marsh Rosemary, Watercress, etc. (Figure 9). Tree removal may be needed at the culvert replacement site and elsewhere once contractor's footprint is estimated for the access to marsh and cofferdam installations. All applicable mitigation measures of Vegetation/Habitat Disturbance and Revegetation would be incorporated into project design to minimize to the greatest extent feasible, the amount of soil, terrestrial vegetation and emergent native vegetation disturbed during project construction and completion.

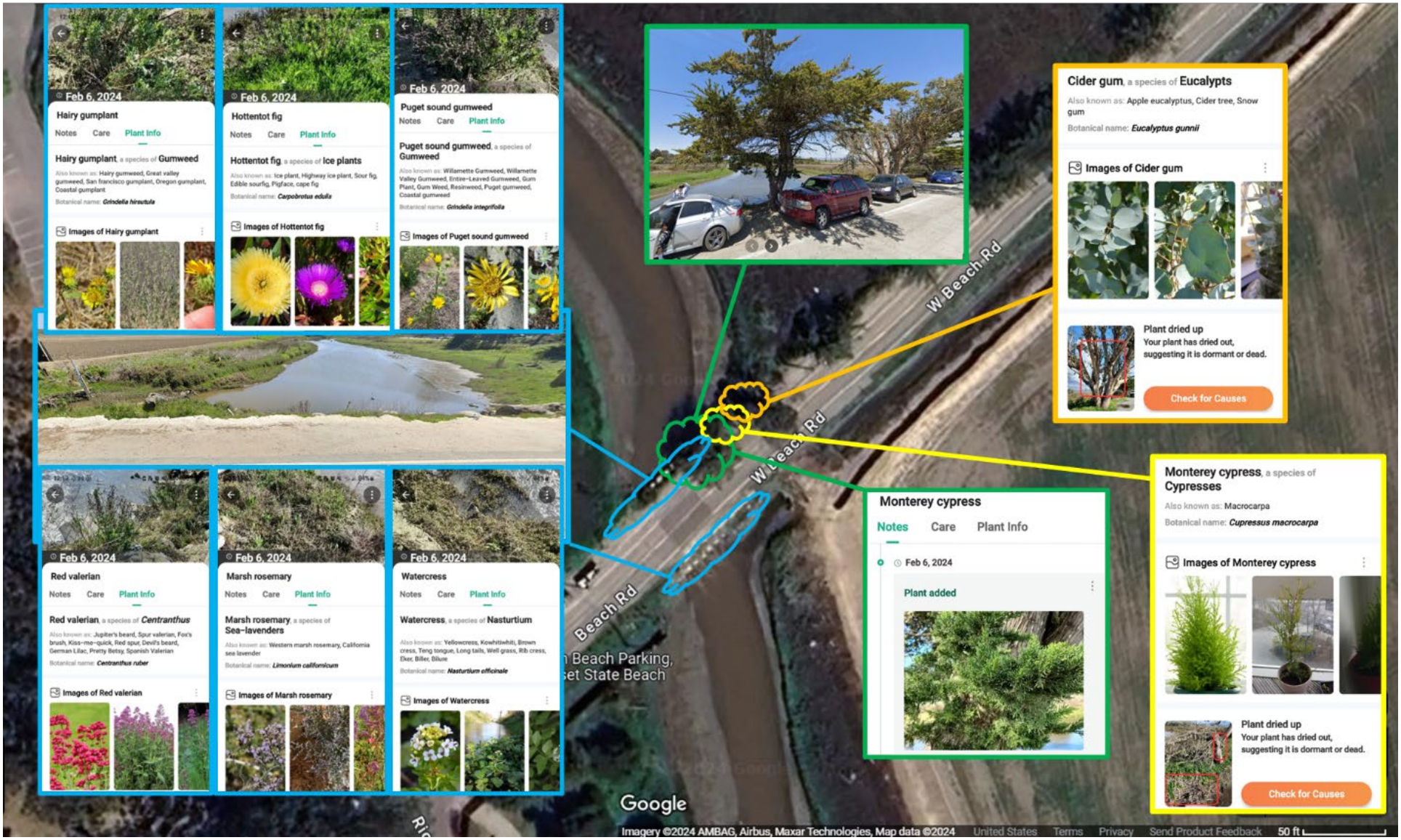


Figure 9. Vegetation Observed in the Culvert Replacement Site

9.5 Construction Activities

This section describes preliminary construction means, methods and considerations for implementing the proposed project. All information below should be considered feasibility-level determination and will be refined by the USACE and local sponsor as the project design progresses.

The expected sequencing of the contractor to initiate the early work is:

1. Notify Underground Services Alert (USA) and perform buried utility locations with pot-holing as required.
2. Mobilize to site.
3. Establish Staging area(s) with installation of exclusion and safety fencing.
4. Install exclusion fencing for protected species (at direction of biological monitors) as required at staging area; haul routes; West Beach Road; and future culvert replacement site.
5. Delivery of fuel tanks to primary staging area and set up with spill containment.
6. Install Erosion control and BMPs.
7. Establish traffic cones along West Beach Road (from Shell Road junction approximately to State Park entrance), but do not yet close down 2-way road traffic.
8. Install temporary traffic lights on both ends of West Beach Road for future use.
9. Install upstream and downstream fish exclusion screens with fisheries biologists.
10. Perform fish/aquatic species removal in accordance with permit conditions.
11. Install traffic control and safety barriers where needed along West Beach Road.
12. If required, trim and/or remove trees at north shoulder to allow heavy equipment access.
13. Install cofferdam and siphon / sump system upstream and downstream of West Beach Road culverts. Note: Agricultural ditch culvert will not be isolated and de-watered at this time.
14. De-watering of cofferdam site: Pump out standing water in cofferdam area. Pump all water to state park parcel and discharge onto marsh using manifold/diffuser/ stormwater BMPs like straw wattles.
15. Install bypass pumping system as main site: Ensure siphon/sump system is maintaining downstream flow of Watsonville Slough
16. Remove and store existing low-voltage (County-owned) transducer that records downstream water level
17. Remove existing concrete slabs in slough channel, dispose at landfill.
18. Perform nuisance pumping of water as needed and throughout all in-slough work.

19. Install bypass road on north side of existing culverts. Material of temporary roadway may vary and to be determined at a later date.
20. Install full-time traffic control (with automated traffic signals) on about ¼ mile of West Beach Road including intersection of Shell Road.
21. Perform site access clearing near existing culverts with removal of vegetation at construction access footprint (around culverts and into slough, both sides of road. Note: Native vegetation may need to be transported to an on-site nursery and maintained if required at a permit(s) condition. Stockpile vegetation/revetment/debris in staging area for future reuse (rock revetment, only if viable quantity) at site.
22. Provide for temporary utilities – 12" water, 6" sewer, gas (potential leave gas line undisturbed, contact PG&E),with a temporary alignment through work zone. Work around overhead electrical and communication lines as needed.
23. Demolish existing road and culverts, haul to landfill. Include potential for special handling requirements for Transit
24. pipes (only if existing RCP culverts are found to contain asbestos concrete).
25. Prepare subgrade for culvert installation (bedding material, foundation, etc.). Culvert bottom would be at 0' NAVD88 (or lower to ensure proper embedment), assume shallow foundation with geogrid, overlain by 1' granular material and 6" clean sand, however future culvert(s) foundation may also need to be a deep foundation.
26. Deliver and install culvert footings with possible hybrid precast sections with some cast-in-place concrete to complete.
27. Deliver and install precast open-bottom culverts. May assume open-bottom culverts with foundation type to be determined at a later date. Embed culverts in slough channel bed.
28. Install precast concrete head/tail walls and wing walls
29. Install structural fill at the culvert area only.
30. Install cast-in-place grade beams for future guardrails at culvert.
31. Relocate existing water and sewer pipelines with connections to outside face of culvert head and tail walls.
32. Install guardrail posts into grade beams near both ends of culvert.
33. Install base road fill at culvert area only.
34. Install Caltrans galvanized metal guard rails (about 50 LF each).
35. Remove existing pavement for the remainder of West Beach Road, probably in phases to allow 1-lane road traffic.
36. Remove temporary access road on Slough and restore slough bottom to final condition.
37. Remove primary cofferdams and fish screening.
38. Subgrade and pave up to design elevation.
39. Install BMPs and fish screens on agricultural ditch

40. Install coffer dams on agricultural ditch
41. Pump out agricultural ditch culvert and install pump for bypass flows
42. Excavate soil cover and remove 42-inch CMP culvert, timber head wall, and masonry tail wall on agricultural ditch.
43. Install new culvert at agricultural ditch with flap gate and raise grade to at least 9.2 feet NAVD88.
44. Install permanent utilities along W Beach Rd.
45. Re-install County's transducer for slough level data
46. Perform work at State Beach roadway and Rio Boca Road entrance, similar to work at West Beach Road, to summarize: Install traffic control then BMPs; Remove existing pavement and dispose of off-site for recycling; add new road raise material including base gravel and compact; install new paving; prepare and install new shoulders
47. Install new road base and prepare for new paving of West Beach Road
48. Remove invasive vegetation, install plantings
49. Paint road surfaces, clean-up site and restore existing surfaces as needed including adding jute matting and seeding as needed.
50. Install interpretive park signage
51. Demobilize from staging area and remove BMPs and related from work areas
52. Monitoring and adaptive management as required by regulatory compliance.

9.6 Avoidance and Minimization Measures

9.6.1 Construction Best Management Practices

The following BMPs will be implemented to minimize construction impacts:

- Access roads and disturbed ground along construction routes will be wetted regularly to prevent dust from leaving the construction area.
- Stockpiles (e.g., debris, soil, sand, other materials) that can produce dust will be wetted or covered.
- All fill material, rubble, and spoils will be covered while in transport to/from the project site.
- All construction equipment would be cleaned before entering and upon leaving the study area to prevent introduction or spread of invasive species.
- Equipment previously used in a waterway or wetland will be disinfected to prevent spread of aquatic disease organisms.
- Construction mats will be placed at exits to public roads to limit mud from heavy equipment
- Implement additional mitigation measures as required by programmatic permits (see Section 9.6.2 below).

9.6.2 Temporary Impact Avoidance and Minimization Measures

To protect the existing sensitive resources and conservation values at the project area during construction activities, general protection measures and all applicable site-specific avoidance and minimization measures to avoid and/or minimize potential short-term, long-term and cumulative adverse effects. Table 6 presents a list of proposed avoidance and minimization measures while implementing the proposed project. These measures include the following:

- All applicable measures in the General Protection Measures (GPM-1 through 15) under the Order WQ 2022-0048-DWQ will be incorporated into project design;
- All applicable measures under General In-Water Measures (IWW-1 through 13) will be incorporated into project design for dewatering, in-water construction and water diversion activities;
- Avoidance and minimization measures to protect water quality of the Slough (WQHM-1 through 6);
- All applicable measures under Vegetation/Habitat Disturbance and Revegetation (VHDR-1 through 8) will be incorporated into project design to minimize to the greatest extent feasible, the amount of soil, terrestrial vegetation and emergent native vegetation disturbed during project construction and completion;
- All applicable measures of species-specific avoidance and minimization measures for ESA-listed species such as California Red-legged Frog and Western Snowy Plover (that may be present in the project area during construction activities. See SWRCB-SPM, USFWS-SPM-CRLF-CTS and USFWS-SPM-WSP in Table 6.
- Although the federally-listed Salmonids are not expected to occur in the project area, measures for Capture and Relocation of Salmonids Guidelines will be incorporated into the project design and implemented by a qualified biologist(s) if observed during preconstruction surveys and encountered during construction activities. See NMFS-CC-BO-IWW-15 through 18 in Table 6.
- Biological and cultural resource monitors on-site during earth-disturbing activities, as applicable; and
- Regular monitoring and reporting.

Table 6. Temporary Impact Avoidance and Minimization Measures

ID	Title	Targeted Resource to Protect:
General Protection Measures		
SWRCB-SRGO-GPM-01	Receipt and Copies of All Permits and Authorizations	Biological Resources
SWRCB-SRGO-GPM-02	Construction Work Windows	
SWRCB-SRGO-GPM-03	Construction Hours	Noise & Vibration; Biological Resources
SWRCB-SRGO-GPM-04	Environmental Awareness Training	Biological Resources
SWRCB-SRGO-GPM-05	Environmental Monitoring	Water Quality; Biological Resources

ID	Title	Targeted Resource to Protect:
SWRCB-SRGO-GPM-06	Work Area and Speed Limits	Air Quality; Traffic and Transportation; Water Quality
SWRCB-SRGO-GPM-07	Environmentally Sensitive Areas	Biological Resources
SWRCB-SRGO-GPM-08	Prevent Spread of Invasive Species	Biological Resources; Invasive Species Management
SWRCB-SRGO-GPM-09	Practices to Prevent Pathogen Contamination	Water Quality; Biological Resources
SWRCB-SRGO-GPM-10	Equipment Maintenance and Materials Storage	Water Quality
SWRCB-SRGO-GPM-11	Material Disposal	
SWRCB-SRGO-GPM-12	Fugitive Dust Reduction	Air Quality
SWRCB-SRGO-GPM-13	Trash Containment and Removal	Water Quality; Biological Resources
SWRCB-SRGO-GPM-14	Project Cleanup after Completion	
SWRCB-SRGO-GPM-15	Revegetate Disturbed Areas	Biological Resources; Native Vegetation
General In-Water Measures		
SWRCB-SRGO-IWW-01	Appropriate In-Water Materials	Biological Resources
SWRCB-SRGO-IWW-02	In-Water Vehicle Selection and Work Access	
SWRCB-SRGO-IWW-03	In-Water Placement of Materials, Structures, and Operation of Equipment	Water Quality
SWRCB-SRGO-IWW-04	In-Water Staging Areas and Use of Barges	Not Applicable
SWRCB-SRGO-IWW-05	Cofferdam Construction	Water Quality; Biological Resources
SWRCB-SRGO-IWW-06	Dewatering/Diversion	
SWRCB-SRGO-IWW-07	Fish and Aquatic Species Exclusion While Installing Diversion Structures	Biological Resources
SWRCB-SRGO-IWW-08	Removal of Diversion and Barriers to Flow	Water Quality; Biological Resources
SWRCB-SRGO-IWW-09	In-Water Pile Driving Plan for Sound Exposure	Noise & Vibration; Special Status Species Protection
SWRCB-SRGO-IWW-10	In-Water Pile Driving Methods	Noise & Vibration
SWRCB-SRGO-IWW-11	Sediment Containment during In-Water Pile Driving	Water Quality; Biological Resources
SWRCB-SRGO-IWW-12	Pile-driving Monitoring	Biological Resources; Special-status Species Protection
SWRCB-SRGO-IWW-13	Dredging Operations and Dredging Materials Reuse Plan	Water Quality
Water Quality and Hazardous Materials		
SWRCB-SRGO-WQHM-01	Staging Areas and Stockpiling of Materials and Equipment	Water Quality; Biological Resources
SWRCB-SRGO-WQHM-02	Storm Water Pollution Prevention Plan	
SWRCB-SRGO-WQHM-03	Erosion and Sediment Control Measures	
SWRCB-SRGO-WQHM-04	Hazardous Materials Management and Spill Response Plan	
SWRCB-SRGO-WQHM-05	In-Water Concrete Use	
SWRCB-SRGO-WQHM-06	Accidental Discharge of Hazardous Materials	
Vegetation/Habitat Disturbance and Revegetation Measures		
SWRCB-SRGO-VHDR-01	Avoidance of Vegetation Disturbance	Biological Resources
SWRCB-SRGO-VHDR-02	Native and Invasive Vegetation Removal Materials and Methods	
SWRCB-SRGO-VHDR-03	Revegetation Materials and Methods	
SWRCB-SRGO-VHDR-04	Revegetation Erosion Control Materials and Methods	Biological Resources; Water Quality
SWRCB-SRGO-VHDR-05	Revegetation Monitoring and Reporting	Biological Resources
SWRCB-SRGO-VHDR-06	General Herbicide Use	Water Quality; Biological Resources
SWRCB-SRGO-VHDR-07	Herbicide Application Planning	

ID	Title	Targeted Resource to Protect:
SWRCB-SRGO-VHDR-08	Herbicide Application Reporting	
Capture and Relocation of Salmonids Guidelines		
NMFS-CC-BO-IWW-15	Capture and Relocation of Salmonids Guidelines for a Qualified Biologist	Biological Resources; Special-status Species Protection
NMFS-CC-BO-IWW-16	Fish Relocation using Electrofishing	
NMFS-CC-BO-IWW-17	Fish Relocation using Seines	
NMFS-CC-BO-IWW-18	Relocation of Salmonids using either Electrofishing or Seining	
Mitigation Measures for Special Status Species		
SWRCB-SPM-01	Preconstruction Surveys	Biological Resources; Special-status Species Protection
SWRCB-SPM-02	Environmentally Sensitive Areas and/or Wildlife Exclusion	
SWRCB-SPM-03	Species Protection Construction Work Windows	
SWRCB-SPM-04	Species Capture, Handling and Translocation	
SWRCB-SPM-05	Special-Status Species Entrapment Prevention	
SWRCB-SPM-06	Airborne Noise Reduction	
Mitigation Measures for California red-legged frog		
USFWS-SPM-CRLF-CTS-01	Work Windows	Biological Resources; Special-status Species Protection
USFWS-SPM-CRLF-CTS-02	Nonnative Animal Removals	
Date Source: Protection Measures Selection Tool – Find and filter protection measures (acceleratingrestoration.org)		

10 PROPOSED MONITORING PLAN

The feasibility-level monitoring plan is outlined below:

1. Functions of the water resources.

   The marsh plain of the Watsonville Slough represents some of the last remnant marsh associated with the Pajaro River lagoon, the majority of which has been converted to agriculture. It has been confined between levees and subject to artificial lagoon drainages, altering its hydrology and allowing non-native xeric weeds to encroach into the marsh plain. Though degraded through the altered hydrology, the marsh still supports healthy native marsh species in some areas and attracts foraging birds. Restoring a more natural hydrology that fully inundates the marsh plain for longer periods of time will not only improve hydrology for marsh vegetation, but improve fish access to the marsh plain during critical life stages.

2. Project purpose and goals
   i. Restore more natural hydrology by replacing existing undersized culverts and raising road, allowing a higher breach threshold to inundate an expanded marsh plain for a longer period of time.
   ii. Restore a more native vegetation community by removing patches of exotic species and planting any areas disturbed by construction or the removal of exotic weeds with native marsh species.
   iii. Improve fish passage through the Beach Road crossing to ensure fish have access to the marsh plain under the new hydrologic regime by increasing the cross-sectional area and the height of the culvert system.

3. Measurable performance standards and success criteria for each goal:
   i. Hydrology monitoring:
      - Periodic, seasonal water levels on marsh plain between 8.0 and 9.2 feet NAVD88.

   ii. Vegetation monitoring:
      - 60% survival rate for plantings
      - >90% relative cover native marsh species

   ii. Fish passage monitoring:
      - Inspect culverts annually before the wet season to ensure there are no major blockages or other barriers to fish usage.

4. Methods to determine whether performance standards have been met:
   i. Hydrology monitoring:
      - Existing pressure transducer located at Beach Road crossing and maintained by the County will be used to document higher water depths and longer duration data compared with those prior to implementation of the proposed project. Water depths will be used as a success criterion (all depths between

8.0 and 9.2 feet NAVD88). Durations will be noted but not used as a criterion, since natural breaching also occurs in these dynamic systems.

ii. Vegetation monitoring:

- Vegetation in replanted marsh areas will be surveyed annually in the spring during peak growing season to establish survival rate for plantings and percent of native and non-native species.

iii. Fish passage monitoring:

- Upstream and downstream openings will be measured manually to ensure sufficient access is available.
- Observed fish behavior will be noted but not used for a success criteria, since water clarity can impede fish observations.

5. The timeframe and responsible party for achieving performance standards
   - Monitoring would occur for 5 years, or until success has been achieved. The USACE will contract the monitoring and it will be cost-shared with the non-federal sponsor.
6. The monitoring schedule
   - Hydrologic monitoring will be based on an existing pressure transducer that creates a continuous record of water levels over the course of the year.
   - Vegetation monitoring will occur annually in the spring or early summer, during peak vegetative growth.
   - Fish passage will be measured annually at the same time as vegetation monitoring.
7. Long-term management and maintenance practices and responsible party.
   - Adaptive management of the marsh vegetation if success criteria are not met within 3 years will include additional plantings to replace any dead plants, unless natural recruitment has filled gaps left by dead plantings. If deemed necessary by the Lead Biologist, a temporary irrigation system or similar watering plan may be added as adaptive management if the plants are not establishing without it.
   - Adaptive management of the fish passage may include scouring of the culverts or removal of blockages.
   - Monitoring and adaptive management prior to the determination of success are the responsibility of USACE and cost shared with the NFS. Once success has been determined, long-term management of the site will be transferred to the NFS.
8. The reporting schedule
   - Reports will be submitted annually.

11 REFERENCES

California Department of Fish and Game. 2001. Culvert Criteria for Fish Passage.

Casagrande, J. 2024. Fisheries Biologist, California Coastal Office. NOAA Fisheries. Electronic mail to Jamie You, U.S. Army Corps of Engineers, dated May 13, 2024. Subject: Re: Watsonville Slough CAP 1135 Study - Draft Project Description.

Central Coast Regional Water Quality Control Board. 2019. Water Quality Control Plan for the Central Coastal Basin, June 2019 Edition. California Environmental Protection Agency.

County of Santa Cruz. 2003. Watsonville Sloughs Watershed Resource Conservation & Enhancement Plan. Prepared for County of Santa Cruz Planning Department. Prepared by Swanson Hydrology & Geomorphology. January 2003. Available online: WSCEPTechnicalAppendices.pdf. Accessed 2/20/2024.

National Marine Fisheries Service (NMFS). 2023. NOAA Restoration Center's Programmatic Approach to ESA/EFH Consultation Streamlining for Fisheries Habitat Restoration Projects (NMFS Santa Rosa, CA office).

Smith, J.J. and The Habitat Restoration Group. 1993. Technical Appendix A: Aquatic Habitat and Fisheries. In: Pajaro River Lagoon Management Plan, Mitchell Swanson & Associates. 1993.

U.S. Fish and Wildlife Service (USFWS). 2016. Biological Opinion for Sandbar Breaching at the Mouth of the Pajaro River, Santa Cruz County, California. Date: January 6, 2016. 08EVEN00-2016-F-0101

Whipple, A. and Grossinger, R. 2008. An Introduction to the Historical Ecology of the Watsonville Sloughs Watershed: A tool for developing an action plan for the Critical Coastal Areas program. Available online: HE_Watsonville_Sloughs_CCA.pdf. Accessed 2/20/2024.

Environmental Appendix A-6

Watsonville Slough Ecosystem Restoration Project

Continuing Authorities Program Section 1135

Coastal Zone Management Act

NEGATIVE DETERMINATION

June 2025

US Army Corps of Engineers ®
San Francisco District

Pajaro Storm Drain Maintenance District Within Santa Cruz County

Table of Content

1 Authority....1
2 Determination....1
3 PROject Areas and Activities subject to Consistency Determination....1
4 Project Purpose....3
5 Project Description....3
5.1 Permanent Project Components....5
5.1.1 Culvert Replacement....5
5.1.2 Raise West Beach Road....5
5.1.3 Flapgate Installation on Adjacent Agricultural Ditch....6
5.1.4 Utility Relocation....6
5.1.5 Removal of Invasives and Planting of Native Plants....7
5.1.6 Parking Lot Raise....7
5.1.7 Install Interpretive Signage....7
5.2 Temporary Project Components....7
5.2.1 Temporary Road, Staging Areas and Access....8
5.2.2 Dewatering....8
5.2.1 Cofferdam Installation....9
5.2.2 Temporary Water Diversion....11
5.2.3 Emergency Lagoon Breaching....11
5.3 Mitigation Measures....11
5.3.1 BMPs....11
5.3.2 AMMs....12
6 Consistency with Provisions of the California Coastal Act....13
6.1 Article 2, Public Access (Section 30210 thru 30214)....13
6.2 Article 3, Recreation (Sections 30220 thru 30224)....14
6.3 Article 4, Marine Environment (Sections 30230 thru 30237)....15
6.3.1 Effects on S-CCC Steelhead and EFH....17
6.3.2 Effects on Tidewater Goby....17
6.3.3 Effects on CRLF....18
6.4 Article 5, Land Resources....19
6.5 Article 6, Development (Sections 30250 thru 30255)....20
6.6 Article 7, Industrial Development (Sections 30260 thru 30265.5)....20
6.7 Article 8, Seal Level Rise (Section 30270)....20
7 References....21

Attachment

Mitigation Measures for Watsonville Slough Continuing Authorities Program Section 1135 Ecosystem Restoration Project

List of Figures

Figure 1. Location of Project Area....2
Figure 2. Proposed Project Elements....4
Figure 3. Conceptual Design of Proposed Fish-Friendly Culvert....5
Figure 4. Plan View of Culvert Replacement Work Area....6
Figure 5. Dewatering Schematic....9

List of Tables

Table 1. Cofferdam (Barrier) Types....10

1 AUTHORITY

The United States Army Corps of Engineers (USACE), San Francisco District, is submitting this Negative Determination for Watsonville Slough Continuing Authorities Program (CAP) Section 1135 Ecosystem Restoration Project in accordance with the federal Coastal Zone Management Act (CZMA) of 1972, 16 U.S.C. § 1456, as amended, section 307c(1).

2 DETERMINATION

Pursuant to the CZMA of 1972, as amended, the USACE has evaluated the Watsonville Slough CAP Section 1135 Ecosystem Restoration project and determined that the project is consistent to the maximum extent possible with the California Coastal Management Program (CCMP), pursuant to the requirements of the CZMA and the California Coastal Act (CCA) of 1976, as amended. The Environmental Assessment, included with this Negative Determination, provides the basis for the USACE's findings.

3 PROJECT AREAS AND ACTIVITIES SUBJECT TO CONSISTENCY DETERMINATION

Section 304(1) CZMA defines the coastal zone as "the coastal waters (including lands therein and there under), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches."

The coastal zone is further defined by Section 30103(a) of the CCA as ". . . land and water area of the State of California from the Oregon border to the border of the Republic of Mexico. . . tending seaward to the state's outer limit of jurisdiction, including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas it extends inland to the first major ridgeline paralleling the sea or five miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards."

The Watsonville Slough which is a tributary to the Pajaro River is part of the Central Coast Area Land Coastal Program (LCP), which includes coastal areas along Santa Cruz County, Monterey County, and San Luis Obispo County.

The study area of the Watsonville Slough CAP 1135 Ecosystem Restoration project encompasses the lower Watsonville Slough and Pajaro River Lagoon, including extensive farmlands below San Andreas Road on its inland side, and extending to the Pajaro Dunes Community, the sandy beach between the Lagoon and the Pacific Ocean, and the surf zone where the Pajaro River meets the Pacific Ocean on the seaward side. The proposed project area includes the area from W. Beach Road crossing on the lower Watsonville Slough to the intersection of W. Beach Road and Shell Road, and State-and County-owned parcels (Figure 1).

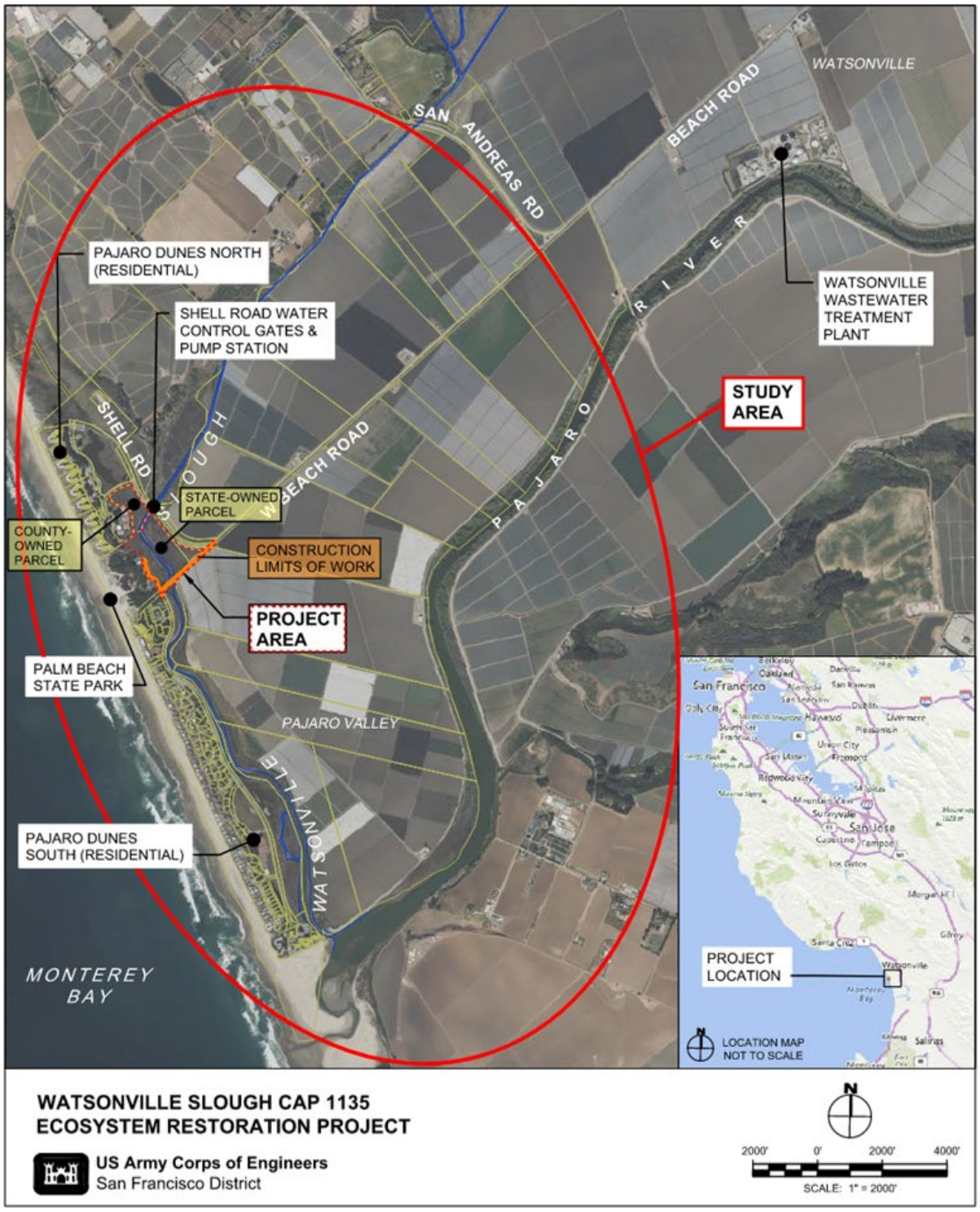


Figure 1. Location of Project Area

Therefore, the proposed project will be located within areas defined as Coastal Zone by Section 304(1) of the CZMA and Section 30103(a) of the CCA.

4 PROJECT PURPOSE

The purpose of the CAP Section 1135 Watsonville Slough Ecosystem Restoration project is to restore the Watsonville Slough and its marsh, countering historic degradation caused by the USACE flood control project and associated agricultural reclamation to a more natural, less degraded condition. The development along the lower Watsonville Slough created crossings at W. Beach Road and Shell Road. Historical development and land use conversion along the lower marsh and slough system also removed old tidal channels and created berms that impede flows between the slough and the marsh plain, further compromising marsh hydrology.

The constriction of the marsh plain and encroachment of development have proven incompatible with the natural lagoon closures. With the marsh floodplain confined by levees (both Federal and agricultural levees), lagoon closures have led to flooding of infrastructure. Santa Cruz County has been mechanically breaching the seasonal Pajaro River sandbar for flood control purposes since the 1950s. Flooding at the W. Beach Road crossing triggers the need for mechanical lagoon breaching to lower the water levels and preserve vehicle and emergency access to the adjacent Pajaro Dunes community and Palm Beach State Park. However, mechanically breaching of the lagoon has shortened an inundation period of marshes and resulted in degradation of the marsh plain due to encroachment of non-native and upland species to portions of the marsh.

5 PROJECT DESCRIPTION

The proposed project is to allow the naturally formed sandbar creating Pajaro River Lagoon to remain in place for longer periods of time by reducing the need for mechanical breaching. This will more closely mimic natural hydrology of the marsh and promote healthy marsh vegetation. The following project elements will be implemented (Figure 2):

1. Improve crossing at W. Beach Road on Watsonville Slough, which will support higher-capacity, fish-friendly culvert(s) that will accommodate the closed-lagoon water levels compared with the existing series of closed conduit culverts;
2. Raise an approximately 1,300 linear feet (LF) of W. Beach Road from the existing elevation to accommodate the new culvert(s) with a higher crown elevation;
3. Implement restoration measures such as invasive plant removal and native planting on both County- and State-owned land parcels;
4. Install a new flap gate on the adjacent Beach Road Agricultural Ditch to prevent the higher lagoon levels from moving upstream;
5. Raise surface elevation of a parking lot at Palm Beach State Park to prevent nuisance flooding; and
6. Install interpretive signage both in English and Spanish to inform locals and visitors to the Palm Beach State Park of the benefits of the wetland restoration.

Figure 2. Proposed Project Elements

5.1 Permanent Project Components

5.1.1 Culvert Replacement

The proposed project will replace the existing six 48-inch diameter closed culverts, which currently are a barrier to fish passage, with one 32-foot wide, 8-foot high, fish-friendly culvert at the W. Beach Road crossing (Figure 3).

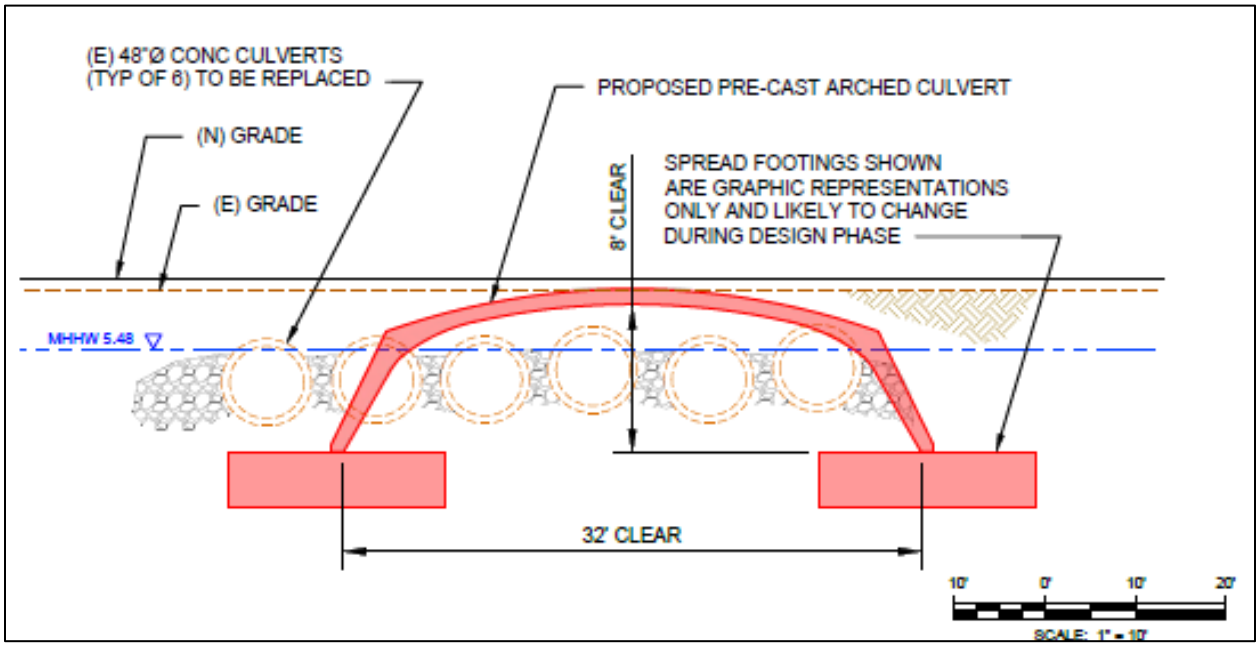


Figure 3. Conceptual Design of Proposed Fish-Friendly Culvert

Because W. Beach Road is the primary access route in and out of the Pajaro Dunes Community and Palm Beach State Park, the proposed project will construct a temporary road to maintain regular traffic and emergency access through W. Beach Road at all times prior to construction for the culvert replacement. Figure 4 shows the temporary bypass road on the north side of the existing roadway.

5.1.2 Raise West Beach Road

To avoid flooding impacts to the roadway from an increased culvert elevation and lagoon breach threshold, an estimated 1,300 LF of W. Beach Road will be raised from existing elevations of about 8.0-8.2 feet NAVD88 to a new surface elevation of 9.2 feet NAVD88. This road modification will occur from the Shell Road intersection to just east of the entrance to Palm Beach State Park (Figure 2). The existing roadway material will be removed, taken off-site and recycled. The road will be re-built with new base material, and new bituminous paving (about 24 feet in width) will be installed at a higher elevation with new gravel shoulders.

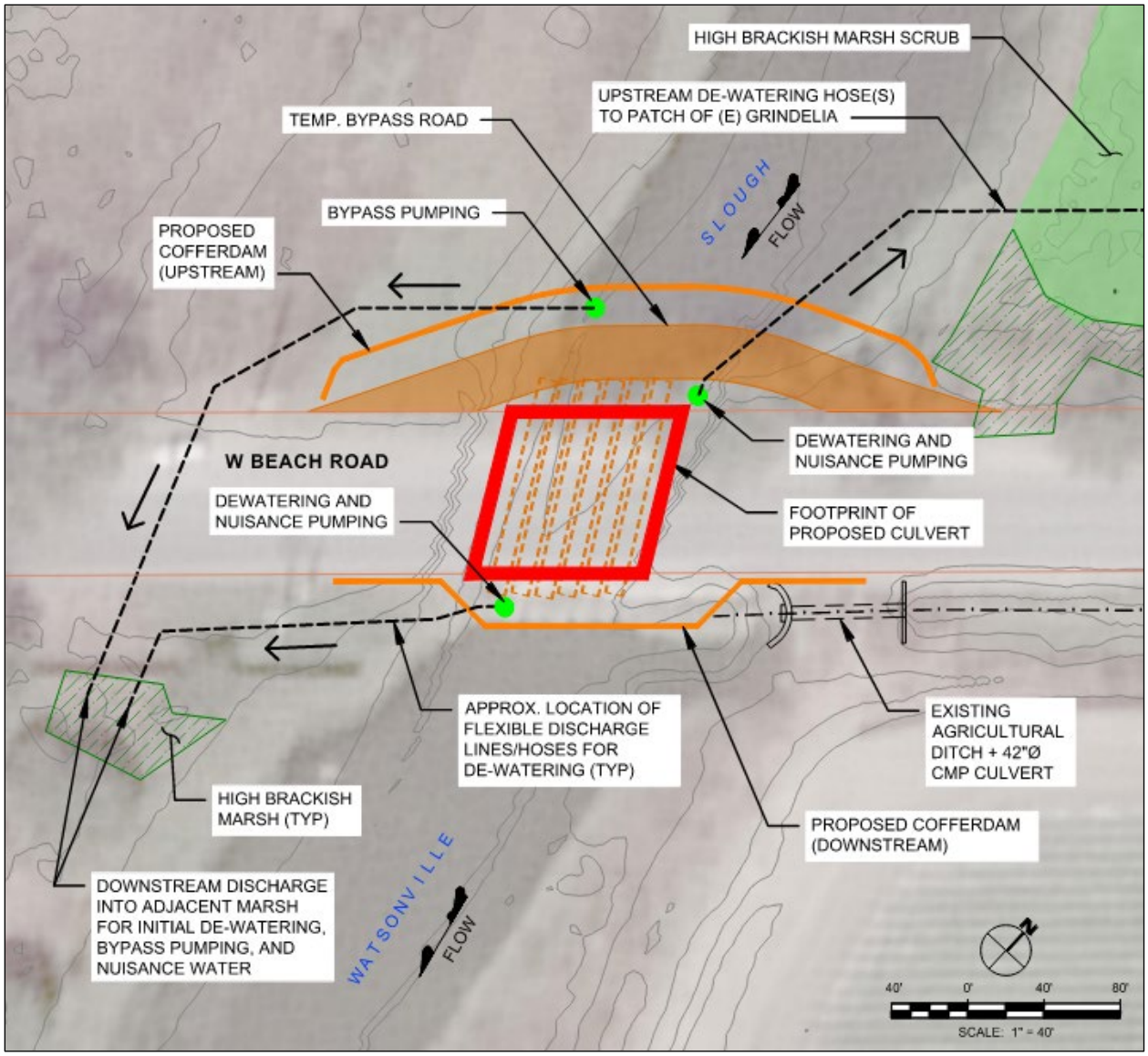


Figure 4. Plan View of Culvert Replacement Work Area

5.1.3 Flapgate Installation on Adjacent Agricultural Ditch

Currently, there is a 42-inch pipe culvert in the Beach Road Agricultural Ditch immediately east of the existing (6) pipe culverts which discharges agricultural runoff into the Slough (Figure 4). The pipe will be replaced with an outlet with a removable flap valve, duck-bill valve, or similar to prevent the higher lagoon water levels from moving upstream. Similar to the main culvert replacement work, the work at this single culvert will need to be isolated by a temporary cofferdam, use of bladders, or similar.

5.1.4 Utility Relocation

During the feasibility study, several utilities have been identified in the project area that may need to be relocated. A water main and sewer line, owned by the City of Watsonville, run

below/underneath the W. Beach Road crossing. Pacific Gas & Electric (PG&E) owned utilities and a low-voltage pressure transducer (which Santa Cruz County owns and maintains to monitor water levels for the Pajaro River Sandbar Mechanical Breaching Program are in the immediate vicinity of the culvert replacement. Gas lines and overhead high-voltage electrical power lines run parallel to W. Beach Road. Existing utilities may impact the options for installation of temporary cofferdams and daily operations, and will need to be further investigated during Design and Implementation (D&I) phase.

5.1.5 Removal of Invasives and Planting of Native Plants

The proposed project will remove exotics and xeric species from the formerly “high and dry” areas and plant native marsh species on both County- and State-owned land parcels. The proposed project will include invasive vegetation removal within the project area, and implementation of a planting plan prior to project completion. The planting plan will be prepared in coordination with Watsonville Wetlands Watch and Amah Mutsun Tribal Band so that the project can leverage local and indigenous knowledge in selection and long-term management of native plants.

5.1.6 Parking Lot Raise

During the feasibility study, the modeling results showed a nuisance ponding impact (1-3 inch water depth) on the inboard side of the parking lot and picnic areas in the Palm Beach State Park, which are low grading areas (Figure 2). The USACE informed California State Parks about the potential nuisance flooding and coordinated with them to address their concerns. The proposed project includes a measure to raise some parts of the parking lot surface and re-paving the low areas to maintain runoff towards the channel. The project team assumed the overall parking lot gradient would continue to be gently sloped towards the channel and so the direction of runoff over the impervious surface would not change. However, USACE will refine this measure to reduce nuisance flooding on state park property during the D&I phase of the project.

5.1.7 Install Interpretive Signage

During the D&I phase of the project, a recreation plan will be prepared, and identify the location of interpretive signage. both in English and Spanish. The interpretive signage will facilitate the use of recreational area and inform locals and visitors to the Palm Beach State Park about the benefits of the restoration to the marsh and the interplay between infrastructure, natural lagoon closures, and marsh health.

5.2 Temporary Project Components

This section describes the temporary project components and general means and methods of construction for the proposed project.

5.2.1 Temporary Road, Staging Areas and Access

The primary construction zone will be around the area of crossing improvement/ roadway raise along W. Beach Road. Trucking access to the project area will be from Beach Road (coming from City of Watsonville) and Shell Road. The project needs to maintain emergency access through W. Beach Road because it is a primary access route to/from the Pajaro Dunes Community and Palm Beach State Park. Access will be maintained at all times by constructing a temporary road so that emergency and service vehicles (e.g., fire and garbage trucks) will be able to service the area (Figure 4). The USACE will further consult with the County and local fire and safety departments on access needs during D&I.

The USACE has identified a potential staging area (approx. 56,800 sq. ft.) south of the W. Beach Road crossing (Figure 2) to store equipment and stockpile materials, debris, etc. as a primary staging area. The haul route will pass through agricultural fields, approximately 0.35 miles from staging area to the culvert replacement site. Dust control will be required by the contractor to limit impacts to adjacent agricultural, waterways, and residential areas. The USACE has also initiated coordination with California State Parks, which operates Sunset Beach and Palm Beach state parks, and Pajaro Dunes Community on use of a portion of the parking lot next to the intersection of W. Beach Road and Rio Boca Road for contractor use (e.g., rest area, eye wash station, etc.).

5.2.2 Dewatering

The culvert replacement work area will be dewatered and initially pumped dry using a 4 or 6-inch diameter diesel pump. It is anticipated that the contractor will pump the water into the marsh plain (upstream, downstream, or both). The pump outlet discharge momentum will likely be reduced by using a perforated pipe diffuser or sprinklers to disperse with initial flow into vegetated areas before allowing water to flow back into the Slough (Figure 5). Once pumped, the work area around the existing culverts will need to be dried out (by time and wind) and then periodically maintained by pumping out nuisance water. The exact layout and configuration of the dewatering system will be further refined during the D&I Phase.

Nuisance water pumping will be required because of leakage from the cofferdams. Typically, 2-inch gas-powered pumps (or smaller electric pumps) are suitable for this task. The water leakage will be monitored, and the pumps will be run on an as-needed basis. In addition to the nuisance water pumping, a Slough bypass pumping system will be needed to transfer Slough water from the upstream (i.e., the north side cofferdam) to downstream of the south cofferdam during construction. Similarly, there may be bypass pumping required to transfer water from the agricultural/tidal ditch at south bank around the south cofferdam.

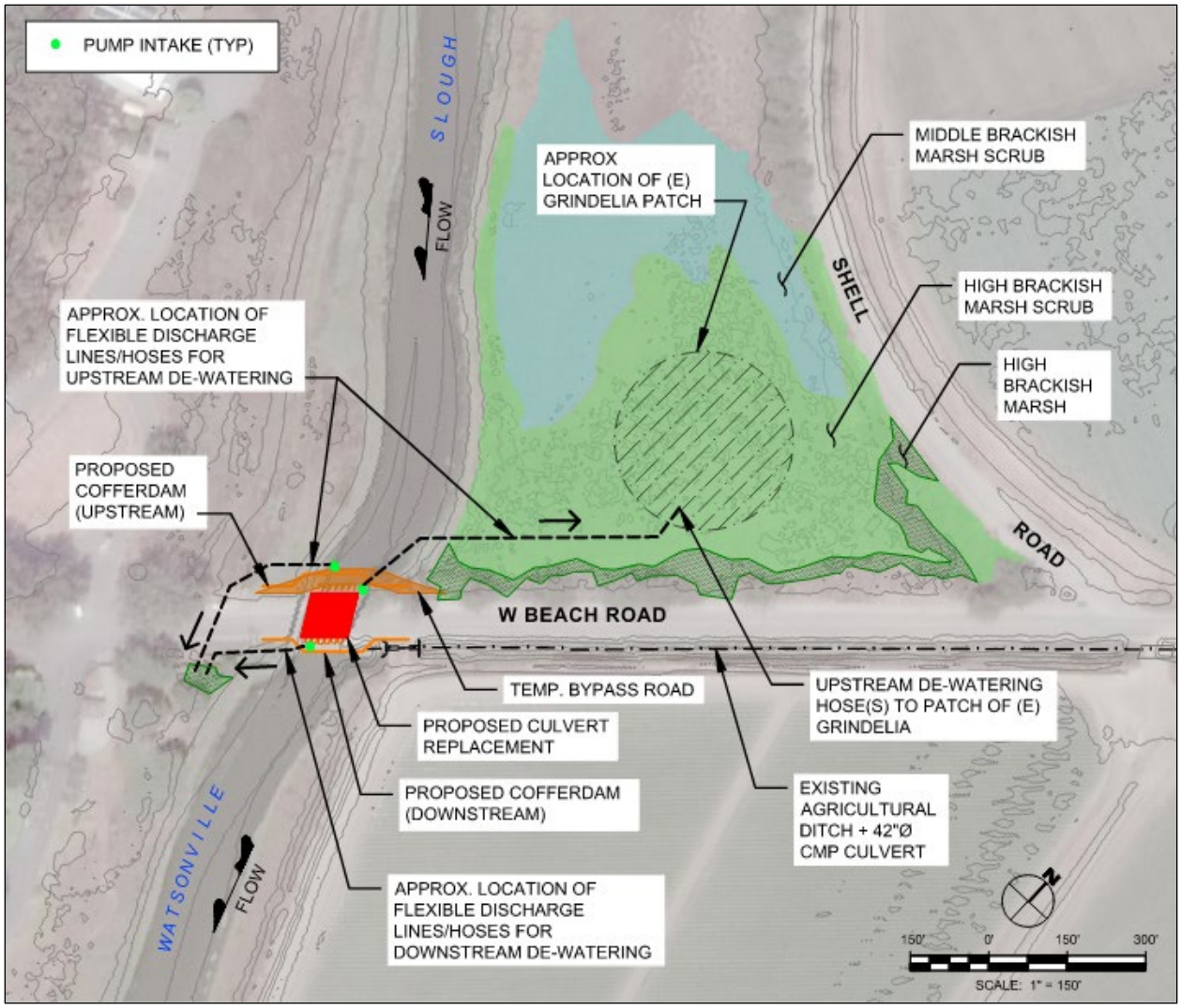


Figure 5. Dewatering Schematic

5.2.1 Cofferdam Installation

Installation of the new culvert at the W. Beach Road crossing will require establishing and maintaining a dry working area in the Slough. This will be accomplished by the installation of cofferdams and dewatering of an approximately 100-foot section of the Slough for construction. Water diversion will also be required at the Beach Road Agricultural Ditch that runs parallel to W. Beach Road near the toe of the south bank.

The in-water work window would be between June 15 and September 30 (i.e., during the dry season) when Slough flow is low, i.e., approximately 1-2 cfs. Slough flow upstream of W. Beach Road is influenced by Shell Road Pump Station, which is located approximately 1,200 feet north of the project area. Flows and releases from this pump station may need to be adjusted and scheduled for safe water handling around the project area in addition to the flow in the Slough. The expected volume of agricultural runoff in the ditch during the construction season will be

further investigated during D&I and incorporated appropriately into the design of the cofferdams and water bypass system.

Prior to cofferdam installation, fish barriers will be installed outside of the expected footprint of the cofferdams for fish capture and relocation (see Section 5.3 and Attachment for more detail on dewatering and fish capture/relocation methods). Cofferdams will be designed to exclude water under all possible flows (including daily tidal fluctuations) during construction. Potential cofferdam types that may be used are presented in Table 1. At this feasibility phase, it is preferred to include a variety of options for cofferdam types. The presence of existing utilities may eliminate some options due to cost and possible public safety. The desired cofferdam type also may vary by contractor.

Table 1. Cofferdam (Barrier) Types

Type	Description	Notes
Earthen Berm	A temporary berm or shallow ridge of compacted soil would be placed to form a barrier to prevent surface water access to the culvert work area. Potential for loss of berm material causing increases in turbidity would be balanced against design considerations, although the berm would be covered with poly sheeting (e.g., visqueen) to minimize this impact.	Loader and excavator to move soil (delivered by dump trucks and loaders) into the Slough.
Sand/Gravel Bag Berm	Reinforced fabric bags (super sacks) would be filled with sand or gravel, and laid end to end to form a barrier that prevents surface water from reaching a specific area (work area). Multiple levels of bags can be used and plastic sheeting incorporated into the barrier to help prevent water seepage through the barrier. Sand bags may be suitable at tidal ditch.	Fill 1 cubic yard (CY) supersacks and install with excavator; may access from slough shore then off of supersack base if needed for ground pressure.
Aqua-Barrier	Inflatable barriers made from laminated industrial grade vinyl coated polyester and available in a variety of sizes (lengths and heights) would be used to prevent surface water from reaching the work area.	Probably least amount of surface and aquatic impact; however, it may not be as reliable as other cofferdam types.
Sheet piles	Long structural sections with a vertical interlocking system, in various sizes, would be used to create a continuous wall to exclude water from work areas.	Sheet piles may be installed with a vibratory hammer mounted on excavator.

As shown in Figure 4, there will be two cofferdams (water barriers), upstream and downstream of the existing culverts. The distance between the two cofferdams will be less than 100 feet. The area of temporary impacts is conservatively estimated to be less than 1 acre as calculated approximately 160' times 100' = 16,000 sq. feet, say 20,000 sq. feet (i.e., 0.5 acres) assuming the area outside the cofferdams that contractors will have to access and work around. As soon as the culvert replacement work is completed, the cofferdams and associated water bypass system will be removed.

5.2.2 Temporary Water Diversion

The in-water work for the proposed project will occur between June 15 and September 30 (dry season), when the flow of the Slough is low and the lagoon mouth is typically open, which will reduce the risk of a backwatering event that could flood the work area. The upstream cofferdam will be designed to accommodate all possible flows during construction. Fish barriers will be installed outside of the limits of the cofferdams.

5.2.3 Emergency Lagoon Breaching

If the Pajaro Lagoon mouth is closed or closes during construction, the Santa Cruz County will mechanically breach the sandbar to reduce overtopping of the downstream cofferdam, and implement the Best Management Practices (BMPs) in the existing sandbar breaching protocol using County's breaching permit.

5.3 Mitigation Measures

This section describes proposed BMPs and Avoidance and Mitigation Measures (AMMs) that will be incorporated into the project design to minimize temporary impacts of the proposed project.

5.3.1 BMPs

The following BMPs will be implemented to minimize construction impacts:

- Access roads and disturbed ground along construction routes will be wetted regularly to prevent dust from leaving the construction area.
- Stockpiles (e.g., debris, soil, sand, other materials) that can produce dust will be wetted or covered.
- All fill material, rubble, and spoils will be covered while in transport to/from the project site.
- All construction equipment would be cleaned before entering and upon leaving the study area to prevent introduction or spread of invasive species.
- Equipment previously used in a waterway or wetland will be disinfected to prevent spread of aquatic disease organisms.
- Construction mats will be placed at exits to public roads to limit mud from heavy equipment

- Implement additional mitigation measures as required by programmatic permits (see Section 2.3.2 below).

5.3.2 AMMs

To protect the existing sensitive resources and conservation values in the project area during construction activities, general protection measures and applicable site-specific avoidance and minimization measures reduce adverse effects (see Attachment for more detail). Below are the descriptions of some AMMs that are designed to reduce impacts to special status species.

Staging areas will be established for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants in coordination with resource agencies. Staging areas will have a stabilized entrance and exit, and will be located at least 100 feet from bodies of water unless site-specific circumstances do not provide such a setback, in such cases the maximum setback possible will be used. If an off-road site is chosen and if special-status species are potentially present, a biological monitor will survey the selected site to verify that no special status species are present or that staging activities can be modified so that impacts can be avoided or minimized to acceptable levels.

All in-water work will occur between June 15 and September 30. For pile driving, USACE will develop a plan to minimize noise impacts to special-status species and submit it to relevant agencies for approval prior to the start of in-water construction. However, pile driving is expected to be conducted only with vibratory or low/nonimpact methods (i.e., hydraulic) that would result in sound pressures below threshold levels to the extent feasible.

For dewatering, cofferdams will be installed both upstream and downstream to isolate the extent of the work areas. The construction of cofferdams will begin in the upstream area and continue in a downstream direction, allowing water to drain and fish and aquatic wildlife species to leave (under their own volition), from the area being isolated by the cofferdam prior to closure. When construction of the upstream dam is completed and the work area has been naturally drained of flow, the downstream dam will be completed, and then flow will be diverted around the work area. Cofferdams and stream bypass systems will remain in place and fully functional throughout the construction period. In order to minimize adverse effects to aquatic species, stream bypass will be limited to the shortest duration necessary to perform the restoration activity and to allow special-status species time to leave on their own before final clearance surveys and construction can begin. Also, in-water cofferdams will be built with the intent of minimizing siltation and/or turbidity.

When bypass pipes are installed for water diversion, debris racks will be placed at the bypass pipe inlet in a manner that minimizes the potential for fish impingement and/or entrapment. Where feasible, bypass pipes will be monitored for accumulation of debris, and all accumulated debris will be removed. The pipe outlet energy dissipaters will be installed to prevent scour and turbidity at the discharge location. When water is pumped from within the construction area, it will be pumped to upland marsh areas and to a location where it can infiltrate without return

flows to the watercourse. A fish capture and relocation plan will be developed and implemented for review and approval by USFWS. Upon completion of construction activities, any diversions or barriers to flow will be removed in a manner that will allow flow to resume with the least disturbance to the substrate and consideration of turbidity levels.

6 CONSISTENCY WITH PROVISIONS OF THE CALIFORNIA COASTAL ACT

This section analyzes the consistency between the proposed project and the policies set forth in Chapter 3 (Coastal Resources Planning and Management Policies; Section 30200 et. seq.) of the California Coastal Act (Division 20, Cal. Pub. Resources Code Section 30000 et. seq.; California Code of Regulations, Title 14, Section 13000 et. seq.).

6.1 Article 2, Public Access (Section 30210 thru 30214)

Article 2 of the CCA requires that development shall not interfere with the public's right of access to the sea, public facilities including parking areas or facilities, and lower cost visitor and recreational facilities.

As mentioned in Section 5.1.1, the proposed project will replace existing culverts with one fish-friendly culvert at the W. Beach Road crossing. A temporary road will be constructed to maintain regular traffic and emergency access through W. Beach Road at all times during construction. Safety barriers will be used to keep local traffic separated from work zones with additional crew for traffic control as needed for safety. The temporary road will need to accommodate emergency vehicles and large trucks (e.g., fire, garbage trucks) so the roadway design will be reviewed by local agencies. It is assumed that a temporary earthen-type roadway can be built (with all environmental compliance) and acceptable to highway and safety reviews.

To avoid any adverse effects from the construction vehicle traffic that will be associated with the proposed project, the selected construction contractor will be required to prepare a Traffic Control Plan to ensure safe and efficient traffic movement throughout the project area. The Traffic Control Plan will identify access routes as well as alternative emergency routes, where necessary, to avoid areas most affected by construction-related traffic. The contractor will also be required to provide signage where appropriate to alert motorists, cyclists, and pedestrians of potential delays and alternative routes. Flagging for construction vehicles will be used if necessary to temporarily control traffic on roadways and protect public safety. Given these measures, the proposed project will not be expected to impact motorist, bicycle, or pedestrian safety.

Furthermore, construction traffic associated with the proposed project will not permanently degrade, damage, or wear down roadways used to access the project area. Public roadways in the project area are designed to accommodate the routine traffic of heavy vehicles associated

with the operation of large farmlands in the region and thus the minimal increase in construction-related traffic will not be expected to affect such roadways.

The existing recreational features in the vicinity of the project area are the access to Palm Beach State Park and its parking facility. The proposed project will ensure the access to Palm Beach State Park and its parking at all times during construction via construction of the temporary road at W. Beach Road although street parking access on the north shoulder of the W. Beach Road will be limited and all visitors to the Palm Beach State Park will have to park at the designated parking lot which will be open at all times during construction. To mitigate impacts to street parking for beach-goers and recreationists, signage alerting the public parking closures on W. Beach Road will be posted. The proposed construction period is from June 1 to October 31. Public use is relatively higher during June-August and lower in September and October. The impact of limited parking area will be temporary and less than significant as visitors will be provided with alternative parking at the State Park instead of the street parking. During invasive plant removal and native species planting activities on the State- and County-owned parcels, there will not be any adverse impact to recreation because the construction on W. Beach Road will have been completed and street parking and State Park parking facility will be open at all times.

6.2 Article 3, Recreation (Sections 30220 thru 30224)

Article 3 of the CCA requires that coastal areas suited for recreational activities shall be protected for such uses and places priorities on development of recreational or visitor serving uses rather than residential uses, that upland areas necessary to support coastal recreation uses shall be reserved for such uses, and that recreational boating use of coastal waters shall be encouraged.

The proposed project will not alter any existing recreational use and development in the vicinity of the project area. The existing recreational features in the study area are the access to Palm Beach State Park and its parking facility. The proposed project will ensure the access to Palm Beach State Park and its parking at all times during construction by constructing a temporary road at W. Beach Road although street parking access on the north shoulder of the W. Beach Road would be limited and all visitors to the Palm Beach State Park would have to park at the designated parking lot which will be open at all times during construction. To mitigate impacts to street parking for beach-goers and recreationists, signage alerting the public parking closures on W. Beach Road will be posted. Also, as mentioned in Section 5.1.6, the proposed project includes a measure to raise some parts of the parking lot surface and re-paving the low areas to prevent a nuisance ponding impact so that the public access to the parking area will be improved.

The proposed construction period is from June 1 to October 31. There are relatively higher visitors during June-August and lower in September and October. The impact of limited parking

area would be temporary and less than significant as alternative parking will be available at the State Park instead of the street parking.

During activities of implementing restoration measures on areas of invasive removal and native planting, there will not be any adverse impact to recreation because the construction on W. Beach Road will have been completed and street parking and State Park parking facility will be open at all times. The proposed project is expected to provide long-term benefits to recreational and environmentally sensitive areas because the restoration measures enhance the marsh plain by replacing invasives with native plants and wildlife; thus, wildlife-dependent recreational activities may increase in the future.

Therefore, the USACE believes that the proposed project is consistent with the provisions set forth in Chapter 3 Article 3 of the CCA.

6.3 Article 4, Marine Environment (Sections 30230 thru 30237)

Article 4 of the CCA requires that marine resources be maintained, enhanced, and, where feasible, restored and special protection given to areas and species of special biological or economic significance. It further requires that uses of marine environments be such that habitat function, biological productivity, healthy species populations, and fishing and recreational interests of coastal waters be maintained for long-term commercial, recreational, scientific, and educational purposes and that marine resources be protected against the spillage of crude oil, gas, petroleum products, or hazardous substances.

The proposed project will replace the existing culverts at W. Beach Road crossing with a higher flow capacity, fish friendly culvert that can accommodate the high water elevation during natural lagoon closure events. By replacing the culverts and raising the road at W. Beach Road, a more natural hydrologic regime and connectivity between the slough and the marsh plain will be maintained and improve ecosystem function. The inundation of the marsh plain during lagoon closures is primarily backwater flooding, which is typically less saline than the normal tidal flows. Native and non-native fish species are located above and below the W. Beach Road crossing and both will benefit from the removal of existing culverts (i.e., fish barrier), daylighting the slough bottom substrates, increasing the bottom habitat areas, and reconnecting aquatic habitat to the upstream of W. Beach Road crossing. Also, transitioning the stressed wetland environment back to a healthy marsh and riparian habitat will benefit native fish, especially protected fish species and amphibians. The proposed project will have long-term benefits on aquatic habitat by restoring the quality and removing the fish barrier at W. Beach Road. As mentioned in Section 5.3, the proposed project will implement BMPs and AMMs that will be incorporated into the project design to minimize temporary construction impacts (see Attachment).

During construction and maintenance activities, short-term sediment impacts downstream of the project area are expected, including temporary increased turbidity and suspended solid

concentrations during dewatering and stream diversion. The potential for adverse effects from turbidity and degraded water quality would be minimized to a less than significant level by implementing erosion control measures (see Attachment).

Staging areas will be established according to protocols required by resource agencies for maintaining of heavy equipment storage, and handling of construction materials, fuels, lubricants, solvents, and other possible contaminants. Staging areas will have a stabilized entrance/exit and will be located at least 100 feet from bodies of water unless site-specific circumstances do not provide such a setback. In such cases the maximum setback possible will be used. If an off-road site is chosen and if special-status species are potentially present, the Biological Monitor will survey the selected site to verify that no aquatic resources will be disturbed by staging activities. At the project site within the study area that experiences foot traffic, the USACE will post interpretive signs describing the presence of special-status species and/or critical habitat as well as highlighting their ecological and cultural value.

For pile driving, USACE will develop a plan to minimize noise impacts to special-status species and submit it to relevant agencies for approval prior to the start of in-water construction. However, pile driving is expected to be conducted only with vibratory or low/nonimpact methods (i.e., hydraulic) that would result in sound pressures below threshold levels to the extent feasible. Measures will be implemented to minimize underwater sound pressure to levels below fish thresholds for peak pressure and accumulated sound exposure levels. The plan will describe the least impactful method to aquatic organisms, and will identify the number, type, and size of piles, estimated sound levels caused by the driving, how many piles will be driven each day, qualifications of Biological Monitors, any other relevant details on the nature of the pile driving activity, and the actions that will be taken to ensure a project stays within the required sound exposure thresholds. Pile driving will occur during an approved in-water work window of June 15 to September 30 with reduced currents and only during daylight hours. Pile driving will be conducted with vibratory or low/non-impact methods (i.e., hydraulic) that result in sound pressures below threshold levels to the extent feasible. An agency-approved biologist will be on site during pile-driving activities to minimize effects to special-status species that could be present.

The proposed culvert replacement work may adversely affect South-Central California Coast (S-CCC) Steelhead (*Oncorhynchus mykiss*) and Tidewater Goby (*Eucyclogobius newberryi*) because of the proposed capture/relocation measures during dewatering although they have low potential to be present in the project area during construction. Implementation of other BMPs and AMMs including environmental work window will minimize adverse impacts to those protected species during construction activities. Therefore, the construction impacts to aquatic species will be short-term and temporary, and will not result in any significant adverse effects on aquatic habitat. Short-term adverse effects on aquatic habitat will be offset by long-term benefits to the function and value of the aquatic habitat.

There is moderate to low potential for three species protected under the Federal Endangered Species Act (ESA) to occur in the project area including two fish species (S-CCC Steelhead and Tidewater Goby) and one amphibian species (California Red-legged Frog [CRLF; *Rana draytonii*]). Also, the project area is located within designated Essential Fish Habitat (EFH) for groundfish and coastal pelagic species (market squid, finfish).

6.3.1 Effects on S-CCC Steelhead and EFH

S-CCC Steelhead currently use the study area for juvenile rearing and feeding through the Pajaro River Lagoon and Pajaro River mainstem as a migration corridor. Smolts pass through the Lagoon during their seaward migration, as do adults after they have spawned upstream in the Pajaro River. There is no data record for spawning habitat in Watsonville Slough (Personal communication with Casagrande 2024). Because of low and warm summer stream flows in the Slough, the Lagoon and lower Watsonville Slough provide almost no potential summer rearing habitat for steelhead. Construction activities for the proposed project will occur during summer season when the Slough flow is very low and water temperature is high; therefore, it is unlikely that juvenile steelhead are present during culvert replacement work. In the unlikely event that they observed during preconstruction survey, the Capture and Relocation of Salmonids Guidelines provided by NMFS will be followed by a qualified fisheries biologist to capture and relocate steelhead (and other native fish) prior to construction of the water bypass structures (e.g., cofferdams). The stream bypass would result in short-term loss of habitat space and short-term reductions in macroinvertebrates (food for EFH species).

As a result of informal consultation with NMFS under Section 7 of ESA and Magnuson–Stevens Fishery Conservation and Management Act, it was determined that the proposed action would fit under NOAA Restoration Center's Programmatic Biological Opinion (BO) through NOAA Restoration Center because it would benefit aquatic and wetland habitat by replacing existing culverts with fish passage and restoring wetland habitats. The application form for Inclusion in the NOAA Restoration Center Santa Rosa Office Programmatic Approach will be submitted.

6.3.2 Effects on Tidewater Goby

Tidewater Goby is Federally endangered species under Federal ESA and has the potential to occur in the study area. Tidewater gobies have been documented in the lowermost reach of Watsonville Slough, downstream of the Shell Road Pump Station and Pajaro River with the highest abundance observed at the most upstream site sampled in Pajaro River, which is approximately 2.9 miles above the confluence with Watsonville Slough (USFWS 2016). Santa Cruz County has been conducting annual fish surveys in Pajaro Lagoon and Watsonville Slough at the confluence with Pajaro River since 2014, and Tidewater Goby have only been found in 2 years of the recent past 6 years. In the event that they are observed during the preconstruction survey, should relocation of Tidewater Goby (and other native fish) be necessary, it would involve capturing and handling the species and follow NMFS' Capture and Relocation of Salmonids Guidelines (see Attachment) prior to construction of the water diversion structures

(e.g., cofferdams). This work will be conducted by qualified fisheries biologists, and a plan for conducting the capture and relocation will be submitted to USFWS prior to construction.

Potential adverse effects to Tidewater Goby would occur due to the proposed capture/handling/relocation measures (should they be necessary) prior to construction of the water diversion structures for dewatering. However, the species is considered to have low potential to be present in the project area because the construction will occur during a period of low flows (1 to 2 cfs) and water temperatures are expected to be high. Therefore, adverse effects to the species may not occur if no individuals are detected. Construction impacts are expected to be minor, temporary and localized and construction activities will include extensive BMPs and AMMs as described in Attachment. The USACE has determined that construction impacts are not likely to adversely affect Tidewater Goby and its designated critical habitat.

6.3.3 Effects on CRLF

The CRLF is a threatened species under Federal ESA, and is known to occur in the study area; however, the nearest recorded observation of this species occurred approximately 1.25 miles upstream from the project area. Therefore, the CRLF has low potential to be affected by the proposed project. In the rare event that the CRLF are observed during preconstruction survey, a USFWS-Approved biologist will coordinate with USFWS and will determine measures for avoiding or minimizing impacts to CRLF individuals.

Potential effects to CRLF are expected to be minimal because it is very unlikely that this species is present in the project area during construction. Additionally, the implementation of BMPs and AMMs (Attachment) including the environmental work window for in-water work between June 15 and September 30 is expected to avoid and minimize adverse impacts during construction activities. CRLF breeding season typically is from late November to late April, which is outside of the construction period. The sites used for rearing of larvae and metamorphs include streams with deep pools, backwater streams and creeks, natural and artificial ponds, and freshwater marshes and lagoons. The lower Watsonville Slough does not provide rearing habitat of deep pools and backwater for CRLF in the summer because the flow is very low and the Pajaro Lagoon is typically open.

Preconstruction surveys and monitoring will be conducted and ensure that young-of-year (recently metamorphosed) amphibians have dispersed from the breeding habitat. In a rare event that any CRLF are detected, adverse effects may occur because they likely will be captured and handled depending on the avoidance and minimization measures implemented. The USACE has determined that the proposed project may affect, but is not likely to adversely affect CRLF because the likelihood that the species will occur in project area during construction is discountable, and its designated critical habitat for CRLF does not occur in the action area.

6.4 Article 5, Land Resources

Article 5 focuses on land resources and their protection by emphasizing safeguarding environmentally sensitive habitats, agricultural lands, and other valuable natural resources along the California coast. The policies aim to ensure that development in these areas is carefully managed to avoid significant disruption to ecosystems and to maintain ecological balance. Additionally, the article highlights the importance of preserving the scenic and visual qualities of coastal areas for public enjoyment.

The California Department of Conservation designates the majority of land parcels in the study area as Prime Farmland with some areas designated as Farmland of Statewide Importance and Unique Farmland. The proposed project includes the crossing improvement and restoration features in the project area. The State- or County-owned parcels are not currently under agricultural production and are not designated as farmland under California's most recent Farmland Mapping Monitoring Program (FMMP) database (2024).

While the proposed construction areas are within the Slough channel, staging and access routes for the proposed project will occur on a vacant land in the vicinity of the property designated as Prime farmland under the FMMP. This area will be temporarily affected during construction, but given its current use as staging and stock-piling area for farming purposes, any impacts will be minimal and it could be returned to the agricultural use post construction. Therefore, no irreversible conversion of farmland will occur.

There will be temporary effects to the aesthetic environment in and around the project area because of the presence of construction equipment, however, no significant adverse impacts to aesthetics are expected. Much of the construction activity, such as the operation of heavy-duty equipment and hauling of materials, will be confined to the active construction site. Staging of construction equipment and materials will take place on land which is already used as a site for stock-piling and staging of soil and heavy farming equipment.

Visibility of construction and maintenance activities will be primarily limited to the project area, but they may be visible from nearby parking facilities at the Palm Beach State Park. Immediately following construction of the culvert replacement, there will be temporarily exposed soil, rocks, and other natural materials that could be visible to beach goers and residents. However, areas with exposed soil will be replanted with native vegetation after construction or major maintenance activities are completed. After vegetation has established, the appearance of the project area is expected to be visually blended in with existing healthy marsh, and the aesthetics of the project area will be improved over time with mature native plants.

Any aesthetic impacts from construction activities will be temporary during a 5-month construction period, construction equipment will be similar to agricultural machinery used in the vicinity, and post-construction revegetation will help restore the natural visual character near the

project area. Therefore, USACE believes that the proposed project is consistent with the provisions set forth in Chapter 3 Article 5 of the CCA.

6.5 Article 6, Development (Sections 30250 thru 30255)

Article 6 applies to new residential, commercial, or industrial development and requires that new development be contiguous with, or in close proximity to, existing developed areas. It requires that scenic and visual qualities of coastal areas be considered as a resource of public importance and protected during the process of development. Additionally, it maintains that new development shall not impede access to coastal resources, minimize risks to life and property, and be serviceable by public works.

The proposed project is not a development project and, therefore, does not apply to this project.

6.6 Article 7, Industrial Development (Sections 30260 thru 30265.5)

Article 7 states that the California Coastal Commission has permitting authority over all offshore oil and gas development within the 3-mile jurisdiction and onshore facilities within the coastal zone. Further, it encourages coastal-dependent industrial facilities to be located or expanded within existing sites.

The proposed project does not involve industrial development; as such, this article does not apply to this project.

6.7 Article 8, Seal Level Rise (Section 30270)

Article 8 takes into account the effects of sea level rise in coastal resources planning and management policies and activities in order to identify, assess, and, to the extent feasible, avoid and mitigate the adverse effects of sea level rise (SLR).

Projected estimates of relative sea level change from 1992 to 2125 were evaluated for the USACE Low, Intermediate and High curves from the USACE Sea-Level Change Curve Calculator (Version 2022.72). The observed relative sea level trend of +1.67 mm/year (entered as 0.005479 feet/year) was used. The USACE Intermediate values for 2050 and 2075, +0.57 ft and +1.02 feet respectively, track closely with the Monterey station (#9413450) which is the closest tide gauge to the study area (approx. 17.5 miles SSW). The SLR mapping for the Pajaro River/Watsonville Slough area show extensive flooding of low-lying agricultural land adjacent to the study area beginning with 2 to 3 feet of SLR. Under the High curve, the predicted permanent flooding of the lower Watsonville Slough by future tidal action will trigger shifts in system hydrology, adjacent land use and access to the study area.

SLR was incorporated into the planning process and the modeling results showed that the lagoon is expected to be permanently open with tidal connection and need for mechanical breaching will gradually decrease beyond SLR of +1.5 feet. The reduced frequency of the

County's mechanical breaching will provide beneficial effects to overall water quality in the study area during heavy rainfall events because the inundated marsh plain will allow infiltration of pollutants in the runoff from adjacent farmlands, vegetative uptake of nutrients in fertilizers, and soil contact of the runoff to decrease contaminant (i.e., pesticides) loading into the receiving water.

7 REFERENCES

Casagrande, J. 2024. Fisheries Biologist, California Coastal Office. NOAA Fisheries. Electronic mail to Jamie You, U.S. Army Corps of Engineers, dated May 13, 2024. Subject: Re: Watsonville Slough CAP 1135 Study - Draft Project Description.

USFWS. 2016. Biological Opinion for Sandbar Breaching at the Mouth of the Pajaro River, Santa Cruz County, California. Date: January 6, 2016. 08EVEN00-2016-F-0101.

Environmental Appendix A-7

Watsonville Slough Ecosystem Restoration Project

Continuing Authorities Program Section 1135

NOAA Restoration Center Santa Rosa Office Programmatic Approach Application Form and SPD Approval to Defer ESA/MSA Compliance to D&I Phase

July 2025

US Army Corps of Engineers ®
San Francisco District

Pajaro Storm Drain Maintenance District
Within Santa Cruz County

NOAA

APPLICATION CHECKLIST FOR INCLUSION IN THE NOAA RC SANTA ROSA OFFICE PROGRAMMATIC APPROACH

INSTRUCTIONS

- Read through the Programmatic Approach to determine if the project fits under the described activities.
- Fill out an online application from the U.S. Army Corps of Engineers, if necessary.
- Fill out the application below.
- Sign and date the application.
- Attach a map of the project site, project site photos, a dewatering plan, completed designs and any other needed documents as necessary, then submit the completed form to the NOAA Restoration Center by e-mailing it to joe.pecharich@noaa.gov.

General Information

Applicant Name	U.S. Army Corps of Engineers				
Landowner Name	Pajaro Storm Drain Maintenance District				
Project Name	CAP Section 1135 Watsonville Slough Ecosystem Restoration Project				
Project Location	Lower Watsonville Slough, CA				
Project Start Date	06/01/28	Stream	Watsonville Slough	Latitude	36.868286
Project End Date	10/31/28	Watershed	Pajaro River	Longitude	-121.817300

**Please note that in-water work will only occur between June 15 and September 30.

Project Description

How does the project fit under the Programmatic Approach?

- [ ] This project is applying for / has received funding from the NOAA Restoration Center.
- [x] This project is expected to require / has received a permit from the U.S. Army Corps of Engineers.

Which salmonid species are present at your project site?

- [ ] Central California Coast Coho Salmon
- [ ] Coastal California Chinook Salmon
- [ ] Central California Coast Steelhead Trout
- [ ] Northern California Steelhead Trout
- [x] South-Central California Coast Steelhead Trout

What is the current problem addressed by this project? What is the context of this issue in the watershed?

Since the 1930s, most of the original Watsonville Slough channel and tidal marsh system had been reclaimed for agriculture and was further constrained by adjacent residential land use and USACE Federal levees. The total area of tidal marsh and coastal wetland habitat between the Watsonville Slough and the Pajaro River has decreased by approximately 80% (Whipple and Grossinger 2008). The levees have isolated the slough system from most fluvial processes and overflows. The remnant existing marsh plain has areas of robust native marsh, especially in low areas and immediately adjacent to the slough. Other areas exhibit stunted growth of native species and encroachment by upland non-native weeds, suggesting a truncation of marsh hydrology.

What solution are you proposing? What are the goals, objectives, and proposed benefits of your project?

The proposed project is (1) to restore more natural lagoon hydrology and associated marsh vegetation, and (2) to remove a barrier to fish passage on the Beach Road crossing, allowing aquatic species to have better and more access to the marsh plain and foraging habitat when it's inundated.

The ecosystem modeling results showed that the proposed project would expand the marsh hydrology by 8.2 acres in County- and State-owned parcels, which is currently high and dry marsh plain and would be converted to healthy marsh over a 50-year project life based on the average annualized habitat unit. The County- and State-owned parcels in the project area currently has the estimated healthy marsh of 5.2 acres

PROJECT INFORMATION (continued)

Please indicate the type(s) of techniques your project is likely to involve.
Check all that apply.

- [ ] Instream Habitat Improvements
- [x] Instream Barrier Mod. for Fish Passage Improvements
- [x] Streambank and Riparian Habitat Restoration
- [ ] Upslope Watershed Restoration
- [ ] Removal of Small Dams
- [ ] Creation of Off-/Side-channel Habitat Features
- [ ] Water Conservation Project
- [ ] Developing of Alt. Off-stream Water Supply
- [ ] Water Storage Tanks
- [ ] Installation of Water Measuring Device(s)

Will construction occur between Jun 15 - Oct 31?	Yes
Will riparian vegetation (>2 inches dbh) removal exceed 1.0 acre?	No
Will native trees >16 inches dbh and 20 feet high with cavities, trees with nests, or trees > 48 inches dbh be removed ?	Yes
Will dewatering and/or fish relocation be required?	Yes
Will mechanized equipment be working in the stream channel or within 25 feet of a wetted channel?	Yes

Does the project involve additional activities not described in the Program Activities sections (2.2-2.3) in the PA?
If so, please explain.

Please describe the specific construction elements of your project, including dimensions, timing, equipment used, and any staging area / access roads needed.

(1) Improve crossing at W. Beach Road on Watsonville Slough, which will support higher-capacity, fish-friendly culvert(s) that will accommodate the closed-lagoon water levels compared with the existing series of closed conduit culverts;

(2) Raise an approximately 1,300 linear feet (LF) of W. Beach Road from the existing elevation to accommodate the new culvert(s) with a higher crown elevation;

(3) Implement restoration measures such as invasive plant removal and native planting on both County- and State-owned land parcels;

What minimization and avoidance measures are planned as a part of this project?

General Protection Measures
SWRCB-SRGO-GPM-01Receipt and Copies of All Permits and Authorizations
SWRCB-SRGO-GPM-02Construction Work Windows
SWRCB-SRGO-GPM-03Construction Hours
SWRCB-SRGO-GPM-04Environmental Awareness Training
SWRCB-SRGO-GPM-05Environmental Monitoring
SWRCB-SRGO-GPM-06Work Area and Speed Limits
SWRCB-SRGO-GPM-07Environmentally Sensitive Areas
SWRCB-SRGO-GPM-08Prevent Spread of Invasive Species
SWRCB-SRGO-GPM-09Practices to Prevent Pathogen Contamination

Please attach photos and a map of the project site.

Attach photos separately. Pre-project photos should be taken from the four cardinal directions and from established locations for comparison to post-project photos. Post-project photo documentation will be required of all approved projects.

Additional Information Required for Specific Project Activities

Upslope Restoration

- Will all stream crossing removals in fish bearing streams be more than 1500 feet (stream distance) apart, or removals in a non-fish-bearing more than 100 feet apart? ..... No

Dewatering / Fish Relocation

- Will more than 1000 feet of stream need to be dewatered? ..... No
- Please describe your planned methods for temporarily dewatering the stream, and how they will meet the Guidelines for Dewatering [Section 2.4.1.a.] in the Programmatic Approach.

The proposed project will follow Capture and Relocation of Salmonids Guidelines. Please see attached Project Description for details and schematics of water bypass system.

- Will fish relocation likely be necessary? ..... Yes
- If so, please describe your fish removal and relocation plan and how it will meet the *General Conditions for Fish Capture and Relocation Activities, Electrofishing Guidelines, Seining Guidelines*, and *Guidelines for Relocation of Salmonids* [Sections 2.4.1, b-e.] in the Programmatic Approach.

Please see Section 9.6.2 and Attachment of the Proposed Project Description for details of fish capture and relocation methods.

Off-Channel and/or Side-Channel Habitat

- Will the project involve a flashboard dam, a head gate, or other mechanical structure? ..... No
- Will the resulting ponds be used as a point of water diversion? ..... No
- Please attach descriptions of the following as separate files:
  - How the project will consider water supply, including channel / overland flow, and groundwater;
  - Water quantity and reliability, risk of channel change, and channel and hydraulic grade.
- Please explain how your project will meet the protection measures for off-channel /side-channel projects as identified in the Programmatic Approach (Sections 2.4 and 2.5).

N/A

Barrier Modification for Fish Passage Improvement

- Does the proposed project meet NMFS and CDFW fish passage criteria? ..... Yes
- Please explain.

The proposed project will replace existing six 48-inch closed culverts with one fish-friendly culvert which will be designed according to NOAA Fisheries Guidelines for Salmonid Passage at Stream Crossings in California (2023). The guidelines are also adapted from culvert design criteria published by many federal and state organizations including the California Department of Fish and Game (CDFG, 2001). The conceptual design of the proposed fish-friendly culverts meets the requirements for Hydraulic Design method based on the NOAA Fisheries Guidelines. Please see attached Proposed Project Description.

- Please attach your project designs as a separate file.

ADDITIONAL INFORMATION REQUIRED FOR SPECIFIC PROJECT ACTIVITIES (continued)

Removal of Small Dams

- Does the proposed project meet NMFS & CDFW fish passage criteria? ..... No
- Please explain.

N/A

- Is the structure less than 25 feet in height from the natural bed of the stream or watercourse at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier to the maximum possible water storage elevation? .....
- Was the structure designed to have an impounding capacity of less than 50 acre-feet? .....
- Will the project form a natural grade/shape upstream, naturally or with excavation? .....
- Is the project site located downstream of potential contamination sources such as current or historical lumber or paper mills, industrial sites, or intensive agricultural production? .....
- Is there risk of significant loss or degradation of downstream spawning or rearing areas from potential sediment deposition resulting from the project? .....
- Please explain how your project will meet the protection measures for small dam removal projects as identified in the Programmatic Approach (Section 2.4.6).

N/A

- Please attach your project designs as a separate file.

Water Conservation

- To aid us in verifying compliance with applicable water rights, please attach the following as separate files:
  - A copy of the small domestic use or livestock stockpond registration, appropriative water right, or a statement of riparian water use registered with the State Water Resources Control Board.
  - Any additional associated permitting that may have been required (e.g. Lake or Streambed Alteration Agreement, CA Environmental Quality [CEQA] analysis, etc.).
  - Diversion records (riparian and appropriative) both upstream and downstream of the project site.
  - The household / property water conservation plan (low flow shower heads, toilets, etc.).
  - A document detailing the estimated stream gradient and substrate, as well as what method(s) will be used to accurately measure the diversion rate.
- What are the proposed dates of diversion? ..... From to
- What is the proposed rate of diversion (in cfs)? .....
- What is the estimated water use / storage needed for this project (in gallons/year)? .....

ADDITIONAL INFORMATION REQUIRED FOR SPECIFIC PROJECT ACTIVITIES (continued)

Development of Off-stream Water Supply

- Please explain how your project will meet the general protection measures as identified in the Programmatic Approach (Section 2.4).

N/A

Installation of Water Measuring Devices

Please explain how your project will meet the general protection measures indentified in the Programmatic Approach (Section 2.4).

N/A

Construction/ Use of Water Storage Tanks

- Is the landowner / water rights holder willing to enter into a forbearance agreement for at least 10 years .....
- What are the proposed dates of forbearance? ..... From to
- What is the estimated water need for the forbearance period (in gallons/year)? .....
- Please explain how your project will meet the protection measures for projects that construct or use water storage tanks, as identified in the Programmatic Approach (Sections 2.3.3.b and 2.4).

N/A

Signature

YOU.JAMIE.KO.1383039610 Digitally signed by YOU.JAMIE.KO.1383039610
Date: 2025.06.25 15:02:54 -07'00'

By signing below, the applicant agrees to implement the restoration project described here, contingent on obtaining all permits and funding. In addition, the applicant agrees to inform the Corps and the NOAA Restoration Center of any changes in a timely manner before implementing changes.

You, Jamie K CIV USARMY CESPN (USA)

From: Joe Pecharich - NOAA Federal <joe.pecharich@noaa.gov>
Sent: Thursday, July 10, 2025 12:15 PM
To: You, Jamie K CIV USARMY CESPN (USA)
Cc: Joel Casagrande; Flannery, Joel R CIV USARMY CESPN (USA); Murray, Elizabeth O CIV USARMY CESPN (USA); Rodney Trujillo; Antonella Gentile
Subject: Re: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO

Follow Up Flag: Follow up
Flag Status: Flagged

Jamie,
We have received and accepted all project documents produced so far and this project should absolutely fit under the NOAA RC/Corps programmatic BO for restoration projects. I can send the official coverage once 65% designs are finished. Joel Casagrande and I look forward to working with the Corps during the design development and look forward to helping the Corps on this important project.
Thanks,
Joe

Joe Pecharich
Fish Biologist/Habitat Specialist
NOAA Restoration Center
777 Sonoma Ave., Suite 325
Santa Rosa, CA 95404-6515
(707) 575-6095 - office
(707) 583-3189 - cell

On Thu, Jul 10, 2025 at 11:05 AM You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil> wrote:

> Hi Joe,
>
> Thanks for reaching out!
>
> Yes, this is the Corps project in partnership with Pajaro Storm Drain Maintenance District (PSDMD) within Santa Cruz County.
>
> I am not sure what the Corps file number is for the project. Are you referring to a Corps project number? If not, we don't have anything called "Corps file number" for any projects under Civil Works mission. Our regulatory division may issue it to keep track of their projects, but the planning division doesn't and keeps track of projects by project numbers.

Joel Casagrande has reviewed our project description which included design parameters and went through fish passage criteria based on NOAA Fisheries Guidelines for Salmonid Passage at Stream Crossings in California (2023).

We will further refine the culvert design during our design & implementation phase, which will occur after the feasibility study is completed.

Yes, I am the POC for any coordination with you at NOAA RC.

Please let me know if you have any further questions.

Jamie

Jamie You, PMP, ENV SP

Environmental Manager

Regional CAP Production Center

San Francisco District

U.S. Army Corps of Engineers

Desk: 415-503-2906

From: Joe Pecharich - NOAA Federal <joe.pecharich@noaa.gov>
Sent: Thursday, July 10, 2025 10:39 AM
To: You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil>
Cc: Joel Casagrande <joel.casagrande@noaa.gov>
Subject: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO

Jamie,

Also, have there been any engineering reviews of the designs by NMFS or CDFW?

Thanks,

Joe

Joe Pecharich
Fish Biologist/Habitat Specialist
NOAA Restoration Center
777 Sonoma Ave., Suite 325
Santa Rosa, CA 95404-6515
(707) 575-6095 - office
(707) 583-3189 - cell

On Thu, Jul 10, 2025 at 10:32 AM Joe Pecharich - NOAA Federal <joe.pecharich@noaa.gov> wrote:

> Jamie,
>
> I'm looking to send the confirmation email of coverage under the NOAA RC programmatic BO for this project. Is there a Corps file number for the project? Not sure since it's a Corps project. Also, are you the Corps contact for this project?
>
> Thanks,
>
> Joe
>
> **Joe Pecharich**
> **Fish Biologist/Habitat Specialist**
> **NOAA Restoration Center**
> **777 Sonoma Ave., Suite 325**
> **Santa Rosa, CA 95404-6515**
> **(707) 575-6095 - office**
> **(707) 583-3189 - cell**

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
SOUTH PACIFIC DIVISION
450 GOLDEN GATE AVENUE
SAN FRANCISCO CALIFORNIA 94102-3661

CESPD-PDP 23 July 2025

MEMORANDUM FOR RECORD

SUBJECT: Approval to defer federal Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat compliance for species managed by the National Oceanic and Atmospheric Administration (NOAA) – National Marine Fisheries Service (NMFS) to the design and implementation phase to include the project in the NOAA Restoration Center's programmatic biological opinion.

1. References.

a. National Oceanic and Atmospheric Administration Restoration Center, West Coast Region. Subject: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Program for restoration projects within NOAA Restoration Center's Central Coast California Office jurisdictional area in California (WCR-2015-3755), dated 14 June 2016 (available at: https://safe.menlosecurity.com/doc/docview/viewer/docNF6BD9CE6825Fdba715c0a2dbd35fd77aa7a8dc127f2534480082b85f0da298f3fa2ee286bdc9)

b. EP 1105-2-58, Continuing Authorities Program, dated 1 March 2019.

c. Email, subject: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's Programmatic BO, dated 23 July 2025 (encl).

2. On 15 July 2025, the San Francisco District requested from the South Pacific Division approval to defer Watsonville Slough Ecosystem Restoration Project compliance with the Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act to the design and implementation phase to include the project in NOAA's Restoration Center's programmatic biological opinion and essential fish habitat conservation recommendations. The district's request included confirmation that NOAA would "approve this project when it gets to having 65% plans done" (ref. 1.a and 1.c).

3. The South Pacific Division, including the Office of Counsel (see ref. 1.c), reviewed the district's request and approves deferring full compliance with the Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat for NOAA-NMFS managed species to the design and implementation phase to include the project in NOAA Restoration Center's programmatic biological opinion and essential fish

habitat conservation recommendations. This approval does not change the requirement to demonstrate full compliance with Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act prior to construction.

4. The point of contact for this action is Ms. Cynthia Jo Fowler, Environmental Program Lead, 415-638-1869, or cynthia.j.fowler@usace.army.mil.

FOWLER.CYNTHIA.JO.1270956854
FOWLER.CYNTHIA.JO.1270956854
2025.07.23 13:55:32 -07'00'

Ms. Cynthia Jo Fowler
Environmental Program Lead
South Pacific Division

AXT MULLINS.JOSEPHINE.RUSSELL.1239584663
Digitally signed by AXT MULLINS.JOSEPHINE.RUSSELL.1239584663
Date: 2025.07.23 13:47:15 -07'00'

Dr. Josephine Axt
Chief, Planning and Policy
South Pacific Division

Encl.

1. Email dated 23 July 2025

From:	Merchant, Randall C CIV USARMY CESPD (USA)
To:	Fowler, Cynthia Jo CIV USARMY CESPD (USA)
Subject:	RE: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project"s coverage under the NOAA RC"s programmatic BO
Date:	Wednesday, July 23, 2025 7:32:12 AM
Attachments:	image001.png image002.png

Cynthia, based on our conversation yesterday, in reviewing the situation, SPN is working to get the project included within a programmatic biological opinion that was issued by NMFS that covers restoration project. You sent me an email from NOAA/Santa Rosa, CA wherein the NOAA specialist indicated that the proposed Watsonville 1135 project should fit within the Programmatic BO and that "official coverage" would be confirmed once 65% designs are complete. Design efforts on the project would not begin until after the Division Commander approves the Project Report currently in draft form. In my view, I don't see the "delay" in gaining coverage by the programmatic BO as something that should hinder approval of the project. Final determination relative to the programmatic BO would come during design and before construction was to begin, and any changes in this could be incorporated prior to initiation of any construction. The Report should specify the current status of compliance with the NOAA programmatic BO. CAP project PPA's have what I term a cooling off period between design and construction Article I A, wherein parties can mutually agree not to proceed to construction. In this instance, so long as the ESA process/inclusion within the programmatic BO is concluded at the end of design, and before any contract for construction is solicited/executed, then I don't have issues with proceeding with this matter, while favorable for the project, unresolved.

Hope this is good for you.

Randall Merchant
Assistant Division Counsel
South Pacific Division
Work Cell (202) 394-7697

From: Fowler, Cynthia Jo CIV USARMY CESPD (USA) <Cynthia.J.Fowler@usace.army.mil>
Sent: Tuesday, July 22, 2025 1:27 PM
To: Merchant, Randall C CIV USARMY CESPD (USA) <Randall.C.Merchant@usace.army.mil>
Subject: FW: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO
Importance: High

Hi Randy. Could you respond to this email with your recommendation to allow deferring the NMFS ESA compliance to PED so it can be included under the programmatic BiOp – with the caveat that before construction, the project must have full ESA compliance?

Cynthia Jo Fowler
Environmental Program Lead
South Pacific Division
U.S. Army Corps of Engineers

o: 415-503-6858
c: 415-638-1869
p: 415-238-6906

From: Fowler, Cynthia Jo CIV USARMY CESPD (USA)
Sent: Wednesday, July 16, 2025 3:36 PM
To: Hansberry, Alarice R CIV USARMY CESPD (USA) <Alarice.R.Hansberry@usace.army.mil>
Subject: FW: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO
Importance: High

Hi Alarice. Emailing you about the Watsonville Slough issue I mentioned earlier today. This is what I plan to discuss with you tomorrow – but giving you a heads up.

State and federal agencies have worked together to develop streamlined permitting for small restoration projects, particularly if the benefit salmonids. Part of the streamlined permitting is compliance with the federal ESA. NMFS has a programmatic biological opinion / essential fish habitat conservation recommendations for small ecosystem restoration projects that benefit salmonids. SPN has applied for the Watsonville Slough (a small ecosystem restoration project benefitting salmonids) to be included in the BiOp / EFH conservation recommendations. As discussed in the email below – NMFS said “We “

The *final* Watsonville Slough DPR/EA is being circulated now for P&LC review. The concern is that the district will not have 65 percent design completed for the feasiblity study and, therefore, ESA and EFH will not be fully complied with. As shown below (CAP guidance – EP 1105-2-58)

regarding compliance with federal environmental laws) typically ESA and EFH needs to be complied with prior to approving the CAP feasiblity study.

I spoke with Josephine and she asked me to coordinate a recommendation through OC. We have two COAs (I prefer COA 1):

1. Based on NMFS agreeing that this project would be included in the programmatic BiOp / EFH CR, have the district prepare a memo citing the appropriate coordination and providing that coordination to the MSC asking for a waiver to defer ESA / EFH to PED and leverage the programmatic BiOp / EFH (it would be nice if this study could leverage already approved env. compliance permits). Note that for GI feasibility study, these waivers are rare, but the ASA(CW) has approved them for various reasons.
2. Require that the district consult with NMFS and obtain ESA / EFH approvals before approving the final report.

(2) Decision Document Requirements. The decision document and supporting documentation requirements will be scalable to the size and complexity of the proposed project and at a minimum contain the following: a clear description of the recommended plan; demonstration of the project justification based on standard Corps project justification criteria for the particular project purpose consistent with the general guidance applicable to the project purpose(s); documentation of the results of any request for a waiver of policy under paragraph 14.f.(4) below; documentation of compliance with appropriate Federal, State, and local environmental and regulatory requirements such as NEPA, etc. (see Appendix C of ER 1105-2-100), normally included in a feasibility study specifically authorized by the Congress; a completed Real Estate Plan consistent with the requirements of Chapter 12, ER 405-1-12; the non-Federal sponsor's Self-Certification of Financial Capability for Decision Documents and Letter of Intent; District Real Estate certification that the non-Federal sponsor has the capability to acquire and provide the required real estate interests; a detailed description of the non-Federal sponsor's local cooperation requirements; identification of the anticipated operation, maintenance, repair, replacement, and rehabilitation activities, including estimated costs; the feasibility level ATR certification; and the District Counsel statement of legal sufficiency for the decision documentation and NEPA process.

Thanks,
Cynthia

Cynthia Jo Fowler
Environmental Program Lead
South Pacific Division
U.S. Army Corps of Engineers

o: 415-503-6858
c: 415-638-1869
p: 415-238-6906

From: You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil>
Sent: Tuesday, July 15, 2025 1:51 PM
To: Fowler, Cynthia Jo CIV USARMY CESPD (USA) <Cynthia.J.Fowler@usace.army.mil>
Cc: Flannery, Joel R CIV USARMY CESPN (USA) <Joel.R.Flannery@usace.army.mil>; Murray, Elizabeth O CIV USARMY CESPN (USA) <Elizabeth.O.Murray@usace.army.mil>; Baker, Anne CIV USARMY CESPN (USA) <Anne.E.Baker@usace.army.mil>
Subject: FW: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO
Importance: High

Hi Cynthia,

I submitted the application for Watsonville to be include in the NOAA RC's programmatic BO for ESA/MSA compliance, but Joe Pecharich from NOAA RC said he won't be able to provide coverage until we reach 65% design – please see below for the email thread. I asked him to send me an email acknowledging the receipt of our application and stating that he will work with us during design. Please see attached for the email from him. Is it sufficient to document our compliance with ESA/MSA during feasibility? Please let me know what you think.

Thanks.

Jamie

From: Joe Pecharich - NOAA Federal <joe.pecharich@noaa.gov>
Sent: Thursday, July 10, 2025 12:13 PM
To: You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil>
Cc: Joel Casagrande <joel.casagrande@noaa.gov>; Flannery, Joel R CIV USARMY CESPN (USA) <Joel.R.Flannery@usace.army.mil>; Murray, Elizabeth O CIV USARMY CESPN (USA) <Elizabeth.O.Murray@usace.army.mil>; Rodney Trujillo <rodney.trujillo@santacruzcountyca.gov>; Antonella Gentile <antonella.gentile@santacruzcountyca.gov>
Subject: Re: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO

Jamie,
I'll send you that email in just a moment. We absolutely will approve this project when it gets to having 65% plans done. And please just send Joel Casagrande and I any further designs and documents (including dewatering/fish relocation plan) when they become available. When CDFW reviews the further designs, they most likely will have someone from their engineering branch sign off on the plans and then if you could just let me know their name, that will suffice.
Cheers,
Joe

Joe Pecharich
Fish Biologist/Habitat Specialist
NOAA Restoration Center
777 Sonoma Ave., Suite 325
Santa Rosa, CA 95404-6515
(707) 575-6095 - office
(707) 583-3189 - cell

On Thu, Jul 10, 2025 at 11:55 AM You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil> wrote:

> Joe,
>
> Thanks for letting me know that you won't be able to process the application until 65% design maturity. I was not aware of that.
>
> We don't typically coordinate with CDFW, but our project sponsor has engaged with CDFW for their CEQA compliance. In fact, Santa Cruz County is in the process of obtaining CEQA Statutory Exemption for Restoration Project (SERP) and submitted the application material and concurrence request. CDFW has reviewed our project and design and provided their comments on the application material. They expressed their support for the project and there is high likelihood of this project being exempt from CEQA because it is an ecosystem restoration project and will be part of their cutting green tape initiatives. Antonella and/or Rodney can provide some more detail on the status of their SERP process.
>
> USACE policy requires we comply with federal laws and regulations including ESA during feasibility and obtain all necessary permits and concurrences from other federal agencies, although the permits such as CWA 401 Water Quality Certification and CZMA that are delegated to the state may get deferred to the design phase because the state agencies typically require more details that we could not provide during feasibility phase. It sounds like NOAA RC is in the same boat as those cases with Water Board and/or CCC.
>
> As part of our decision document (which is an integrated feasibility and NEPA document), I need to include compliance status of ESA/MSA for this project. For that purpose, would you please be able to send me an email stating that you received our application for inclusion of this project to NOAA RC's programmatic BO, support for this project and intend to work with USACE during design. I don't want to put words in your mouth , but it would be great if you can send me something to that effect by email.
>
> Please let me know if you have any further questions.

Thanks again!

Jamie

From: Joe Pecharich - NOAA Federal <joe.pecharich@noaa.gov>
Sent: Thursday, July 10, 2025 11:10 AM
To: You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil>
Cc: Joel Casagrande <joel.casagrande@noaa.gov>; Flannery, Joel R CIV USARMY CESPN (USA) <Joel.R.Flannery@usace.army.mil>; Murray, Elizabeth O CIV USARMY CESPN (USA) <Elizabeth.O.Murray@usace.army.mil>; Rodney Trujillo <rodney.trujillo@santacruzcountyca.gov>; Antonella Gentile <antonella.gentile@santacruzcountyca.gov>
Subject: Re: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO

Jamie,
Thanks for the quick response. I guess I'm used to getting projects through your regulatory division. It's fine with no Corps file number. I will not be able to process the application until intermediate (~65%) designs are finished. Do you anticipate a CDFW engineer reviewing designs?
Thanks,
Joe

Joe Pecharich
Fish Biologist/Habitat Specialist
NOAA Restoration Center
777 Sonoma Ave., Suite 325
Santa Rosa, CA 95404-6515
(707) 575-6095 - office
(707) 583-3189 - cell

On Thu, Jul 10, 2025 at 11:05 AM You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil> wrote:

> Hi Joe,
>
> Thanks for reaching out!
>
> Yes, this is the Corps project in partnership with Pajaro Storm Drain Maintenance District (PSDMD) within Santa Cruz County.

I am not sure what the Corps file number is for the project. Are you referring to a Corps project number? If not, we don't have anything called "Corps file number" for any projects under Civil Works mission. Our regulatory division may issue it to keep track of their projects, but the planning division doesn't and keeps track of projects by project numbers.

Joel Casagrande has reviewed our project description which included design parameters and went through fish passage criteria based on NOAA Fisheries Guidelines for Salmonid Passage at Stream Crossings in California (2023).

We will further refine the culvert design during our design & implementation phase, which will occur after the feasibility study is completed.

Yes, I am the POC for any coordination with you at NOAA RC.

Please let me know if you have any further questions.

Jamie

Jamie You, PMP, ENV SP
Environmental Manager
Regional CAP Production Center
San Francisco District
U.S. Army Corps of Engineers
Desk: 415-503-2906

From: Joe Pecharich - NOAA Federal <joe.pecharich@noaa.gov>
Sent: Thursday, July 10, 2025 10:39 AM
To: You, Jamie K CIV USARMY CESPN (USA) <Jamie.You@usace.army.mil>
Cc: Joel Casagrande <joel.casagrande@noaa.gov>
Subject: [Non-DoD Source] Re: CAP Section 1135 Watsonville Slough Ecosystem Restoration Project's coverage under the NOAA RC's programmatic BO

Jamie,
Also, have there been any engineering reviews of the designs by NMFS or CDFW?
Thanks,
Joe

Joe Pecharich
Fish Biologist/Habitat Specialist
NOAA Restoration Center
777 Sonoma Ave., Suite 325
Santa Rosa, CA 95404-6515
(707) 575-6095 - office
(707) 583-3189 - cell

On Thu, Jul 10, 2025 at 10:32 AM Joe Pecharich - NOAA Federal <joe.pecharich@noaa.gov> wrote:

> Jamie,
> I'm looking to send the confirmation email of coverage under the NOAA RC programmatic BO for this project. Is there a Corps file number for the project? Not sure since it's a Corps project. Also, are you the Corps contact for this project?
> Thanks,
> Joe
>
> **Joe Pecharich**
> **Fish Biologist/Habitat Specialist**
> **NOAA Restoration Center**
> **777 Sonoma Ave., Suite 325**
> **Santa Rosa, CA 95404-6515**
> **(707) 575-6095 - office**
> **(707) 583-3189 - cell**