



United States Department of the Interior



FISH AND WILDLIFE SERVICE
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In Reply Refer to:
08ESMF00-
2013-F-0401

JAN 15 2016

Ms. Tori White
Attn: Greg Brown
Department of the Army
San Francisco District, U.S. Army Corps of Engineers
1455 Market Street
San Francisco, California 94103-1398

Subject: Formal Consultation on the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, from San Francisco Bay to Highway 101, in the City of East Palo Alto, San Mateo County, and the City of Palo Alto, Santa Clara County, California (U.S. Army Corps of Engineers (Corps) file number 2013-00030S)

Dear Ms. White:

This letter is in response to the Corps' April 25, 2013, request for initiation of consultation for the San Francisquito Creek Joint Powers Authority's (SFCJPA) proposed San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project (proposed project), from San Francisco Bay to Highway 101, in the City of East Palo Alto, San Mateo County, and the City of Palo Alto, Santa Clara County, California (Corps file number 2013-00030S). Your request for consultation was received in our office on April 29, 2013. At issue are the proposed project's effects on the federally threatened California red-legged frog (*Rana draytonii*), endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), threatened Pacific Coast population of the western snowy plover (western snowy plover) (*Charadrius alexandrinus nivosus*), endangered California clapper rail (*Rallus longirostris obsoletus*), endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), endangered California least tern (*Sternula antillarum browni*), and endangered California seablite (*Suaeda californica*). Critical habitat has been designated for the California red-legged frog and western snowy plover but does not occur within the action area for the proposed project. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

Recent genetic analyses of rail species resulted in a change in the common name and taxonomy of the large, "clapper-type" rails (*Rallus longirostris*) of the west coast of North America to Ridgway's rail (*Rallus obsoletus*) (Maley and Brumfield 2013, Chesser *et al.* 2014). Thus the California clapper rail is now referred to in the scientific community as the California Ridgway's rail (*Rallus obsoletus obsoletus*). The change in the common name and taxonomy of the California clapper rail, however, does not change the listing status of the species.

The Federal action we are consulting on is the Corps' issuance of a permit to SFCJPA pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C Section 403) and Section 404 of the

Clean Water Act of 1973 (33 U.S.C. Section 1344) to reduce flooding risks and increase ecosystem functionality by widening the floodplain of San Francisquito Creek through levee de-construction and construction of floodwalls, degrading the Bay levee between Outer Faber Marsh and the creek's mouth, filling in low spots in portions of the unmaintained Faber Tract (Main Faber Marsh) southern levee, and sediment excavation of the creek channel. Pursuant to 50 CFR 402.12(j), you submitted a biological assessment for our review and requested concurrence with the findings presented therein. These findings conclude that the proposed project may affect, and is likely to adversely affect the salt marsh harvest mouse and California clapper rail. These findings conclude that the proposed project may affect, but is not likely to adversely affect the California red-legged frog, San Francisco garter snake, western snowy plover, California least tern, and California seablite.

In considering your request, we based our evaluation on the following: (1) your letter requesting consultation on the proposed project dated April 25, 2013; (2) the November 2012 *Draft Biological and Essential Fish Habitat Assessment for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project San Francisco Bay to Highway 101* (ICF International 2012); (3) the January 17, 2013 letter from ICF International responding to the Service's July 3, 2013, request for additional information (M. Jones, ICF International, *in litt.* 2013); (4) the August 27, 2014, *Amended Biological Assessment for the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, from San Francisco Bay to Highway 101 in the City of East Palo Alto, San Mateo County, and the City of Palo Alto, Santa Clara County, California* (L. Materman, SFCJPA, *in litt.* 2014); (5) the December 2015 *San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Mitigation and Monitoring Plan* (MMP) (SCVWD 2015); (6) protocol-level surveys for the California clapper rail (PRBO Conservation Science 2012; Point Blue Conservation Science 2014; Point Blue Conservation Science, *in litt.* 2014); (7) the March 5, 2015, memorandum from the Santa Clara Valley Water District (SCVWD) summarizing listed species habitat impacts (SCVWD, *in litt.* 2015); (8) the July 24, 2015, September 9, 2015, October 5, 2015, and October 26, 2015, memoranda from SFCJPA responding to the Service's requests for additional information (K. Murray, SFCJPA, *in litt.* 2015a, 2015b, 2015c, 2015d, 2015e); (9) the October 6, 2015, *San Francisquito Creek Flood Protection Project: Conceptual High-Tide Refuge Habitat Enhancement Plan* (H.T. Harvey & Associates 2015a); (10) electronic mail and conversations among the SFCJPA, ICF International, SCVWD, the Corps, California Department of Fish and Wildlife (CDFW), the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NMFS), the City of Palo Alto, the City of East Palo Alto, Bay Conservation and Development Commission (BCDC), H.T Harvey & Associates, U.S. Geological Survey, and the Service; (11) site visits conducted on February 28, 2013, April 16, 2013, and October 22, 2014; and (12) other information available to the Service.

The Service has determined that the proposed project is not likely to adversely affect the California red-legged frog and San Francisco garter snake because: (1) the portion of San Francisquito Creek within the action area is predominately tidally influenced and thus less suitable for the California red-legged frog and San Francisco garter snake; (2) the nearest known occurrences of the California red-legged frog and San Francisco garter snake are more than five miles upstream from the action area; (3) the potential for injuring or killing a California red-legged frog and San Francisco garter snake will be minimized by having a qualified biologist onsite during project construction; (4) all proposed project construction staff will be trained in identifying the California red-legged frog and San Francisco garter snake and their habitats and the avoidance and minimization measures; and (5) the potential for degrading aquatic habitat for the California red-legged frog and San Francisco garter

snake will be minimized by implementing water quality best management practices, a Storm Water Pollution Prevention Plan, and a hazardous material/spill prevention plan.

The Service has determined that the proposed project is not likely to adversely affect the western snowy plover and California least tern because: (1) the western snowy plover and California least tern are not known to breed within the action area; (2) the potential for injuring or killing a western snowy plover and California least tern will be minimized by having a qualified biologist onsite during project construction; (4) all proposed project construction staff will be trained in identifying the western snowy plover and California least tern; and (5) the potential for degrading foraging habitat for the western snowy plover and California least tern will be minimized by implementing water quality best management practices, a Storm Water Pollution Prevention Plan, and a hazardous material/spill prevention plan.

The Service has determined that the proposed project is not likely to adversely affect the California seablite because: (1) the listed plant is thought to have been extirpated from the action area; and (2) the California seablite was not seen during protocol-level surveys within the action area in August 2013.

The remainder of this document provides our biological opinion on the effects of the proposed project on the salt marsh harvest mouse and California clapper rail.

CONSULTATION HISTORY

- October 24, 2012: The Service participated in a conference call among staff from the Refuge, SFCJPA, and ICF International discussing the proposed project.
- February 28, 2013: The Service attended a site visit along with staff from SFCJPA, ICF International, SCVWD, CDFW, and SFRWQCB.
- April, 16, 2013: The Service attended a second site visit along with staff from SFCJPA, ICF International, and the Refuge.
- April 29, 2013: The Service received from the Corps the Biological Assessment (ICF International 2012) and the request for consultation on the proposed project.
- July 3, 2013: The Service sent a letter to the Corps commenting on the Biological Assessment and requesting additional information on the proposed project. The letter mentioned the Service's major concerns regarding the loss of high tide refugia habitat and increased flooding of tidal marsh habitat for the salt marsh harvest mouse and California clapper rail within Faber Marsh if the levee between San Francisquito Creek and Main Faber Marsh were degraded.
- September – December 2013: The Service attended multiple interagency meetings among staff from SFCJPA, ICF International, SCVWD, CDFW, SFRWQCB,

BCDC, NMFS, and the Refuge discussing the Service's concerns about the effects of the proposed project on the large population of California clapper rails within Faber Marsh due to the proposed lowering of the levee along the southern edge of Main Faber Marsh. At the December 12, 2013, meeting, ICF International and SFCJPA proposed revising the proposed project to avoid lowering the levee along Main Faber Marsh.

January 23, 2014:

The Service received the letter from ICF International responding to the Service's July 3, 2013, request for additional information on the proposed project.

February – July 2014:

The Service attended multiple interagency meetings for the proposed project among staff from the Refuge, the Corps, SCVWD, SFCJPA, CDFW, SFRWQCB, NMFS, and BCDC discussing the various alternatives for the proposed project including filling in low spots in the Main Faber Marsh levee, degrading the Bay levee adjacent to Outer Faber Marsh near the mouth of San Francisquito Creek, and further setting back the levee into the Palo Alto Municipal Golf Course.

August 28, 2014:

The Service received the amended Biological Assessment from the Corps and SFCJPA for the proposed project (L. Materman, SFCJPA, *in litt.* 2014).

September 3, 2014:

The Service responded via electronic email to the Corps and SFCJPA that the proposed project should include additional avoidance and minimization measures to address predation on salt marsh harvest mice and California clapper rails and the loss of high tide refugia cover (*e.g.*, avian and mammalian predator management, transition zone habitat enhancement, and installation of high-tide refuge islands in Faber Marsh).

October 20, 2014:

The Service submitted via electronic mail to SFCJPA and the Corps comments on the draft MMP (SCVWD 2014) and the Draft Operations and Maintenance (O&M) Plan (SFCJPA 2014) for the proposed project.

October 22, 2014:

The Service attended a site visit with staff from SFCJPA, the Refuge, CDFW, SFRWQCB, and U.S. Geological Survey to discuss measures to enhance habitat for salt marsh harvest mice and California clapper rails and minimize the levels of predation within Faber Marsh.

December 2, 2014:

The Service sent a letter to the Corps and SFCJPA commenting on the August 2014 amended Biological Assessment (L. Materman, SFCJPA, *in litt.* 2014), the draft MMP (SCVWD

2014), and the Draft O&M Plan (SFCJPA 2014) and requesting additional information on the proposed project.

April 15, 2015:

The Service received from SFCJPA and SCVWD the revised estimates of habitat disturbance (SCVWD *in litt.* 2015).

April 29, 2015:

The Service attended a meeting with staff from SFCJPA, the Corps, CDFW, and the Refuge to discuss avoidance and minimization measures.

July - December 2015:

The Service participated in biweekly conference calls with staff from SFCJPA, the Corps, the Refuge, NMFS, CDFW, and SCVWD to discuss the information needed to initiate formal consultation.

July 24, 2015:

The Service received via electronic mail from SFCJPA the memoranda responding to the Service's December 2, 2014, request for information on the proposed project (K. Murray, SFCJPA, *in litt.* 2015a, 2015b).

July 27, 2015:

The Service provided via electronic mail to SFCJPA and the Corps comments on the July 24, 2015, memoranda from SFCJPA.

August 20, 2015:

The Service attended a meeting with staff from H.T. Harvey & Associates, the Refuge, SFCJPA, CDFW, and the U.S. Geological Survey to discuss the restoration actions for the proposed project (*e.g.*, permanent high-tide refuge islands in Outer Faber Marsh, transition zone habitat enhancement along the Faber Marsh levees, invasive plant species control).

September 9, 2015:

The Service received via electronic mail from SFCJPA (K. Murray, SFCJPA, *in litt.* 2015c) the responses to the Service's comments on the July 24, 2015, memoranda from SFCJPA (*e.g.*, revised estimates of habitat disturbance and restoration; the predator management plan; the draft MMP; the revised Draft O&M Plan (SFCJPA 2015); the description of the proposed levee mowing activities for O&M; and the draft proposal for installation of high-tide refuge islands in Outer Faber Marsh).

September 15 and 24, 2015:

The Service provided via electronic mail to SFCJPA and the Corps comments on and requests for clarification of the information provided by SFCJPA on September 9, 2015 (*e.g.*, clarification of California clapper rail habitat disturbance estimates and habitat restoration/creation estimates within the widened San Francisquito Creek channel; clarification of proposed project levee mowing O&M activities; and a request for

information on the cumulative effects of other levee mowing O&M activities within the action area).

- October 5, 2015: The Service received via electronic mail from SFCJPA the responses to the Service's September 15 and 24, 2015, comments and request for clarification.
- October 7, 2015: The Service received via electronic mail from SFCJPA the *San Francisquito Creek Flood Protection Project: Conceptual High-Tide Refuge Habitat Enhancement Plan* (H.T. Harvey & Associates 2015a).
- October 26, 2015: The Service received via electronic mail from SFCJPA (K. Murray, SFCJPA, *in litt.* 2015e) responses to the Service's October 19, 2015, comments on the information provided by SFCJPA on October 5 and 7, 2015 (K. Murray, SFCJPA, *in litt.* 2015d; H.T. Harvey & Associates 2015a).
- November 18, 2015: The Service, the Refuge, and U.S. Geological Survey provided via electronic mail to SFCJPA, the Corps, SCVWD, NMFS, CDFW, H.T. Harvey & Associates, and SFRWQCB comments on the *San Francisquito Creek Flood Protection Project: Conceptual High-Tide Refuge Habitat Enhancement Plan* (H.T. Harvey & Associates 2015a).
- December 3, 2015: The Service received from SFCJPA the draft plan for the installation of steelhead passage features within the proposed project footprint in San Francisquito Creek.
- December 17, 2015: The Service received from SFCJPA the final project description and the revised MMP for proposed project revegetation and monitoring activities (SCVWD 2015).

BIOLOGICAL OPINION

Description of the Proposed Project

Location of the Proposed Project

The San Francisquito Creek watershed encompasses a 45-square-mile basin, extending from Skyline Boulevard to San Francisco Bay. San Francisquito Creek represents the boundary between San Mateo and Santa Clara counties, California, in the lower watershed. Figure 1 below shows the location of the proposed project. The proposed project area as a whole extends about 7,450 feet along San Francisquito Creek from San Francisco Bay upstream to the U.S. Highway 101/East Bayshore Road Bridge. The right bank refers to the San Mateo County (City of East Palo Alto) side of San Francisquito Creek, and the left bank refers to the Santa Clara County (City of Palo Alto) side of San Francisquito Creek. The lower reach of the proposed project extends about 2,850 feet from San Francisco Bay upstream to the Friendship Bridge; the tidal marshes of the Refuge-managed Main Faber Marsh and Outer Faber Marsh (the triangular-shaped tidal marsh downstream (east) of Main Faber Marsh) occur on the right bank, and the Palo Alto Municipal Golf Course and Palo Alto

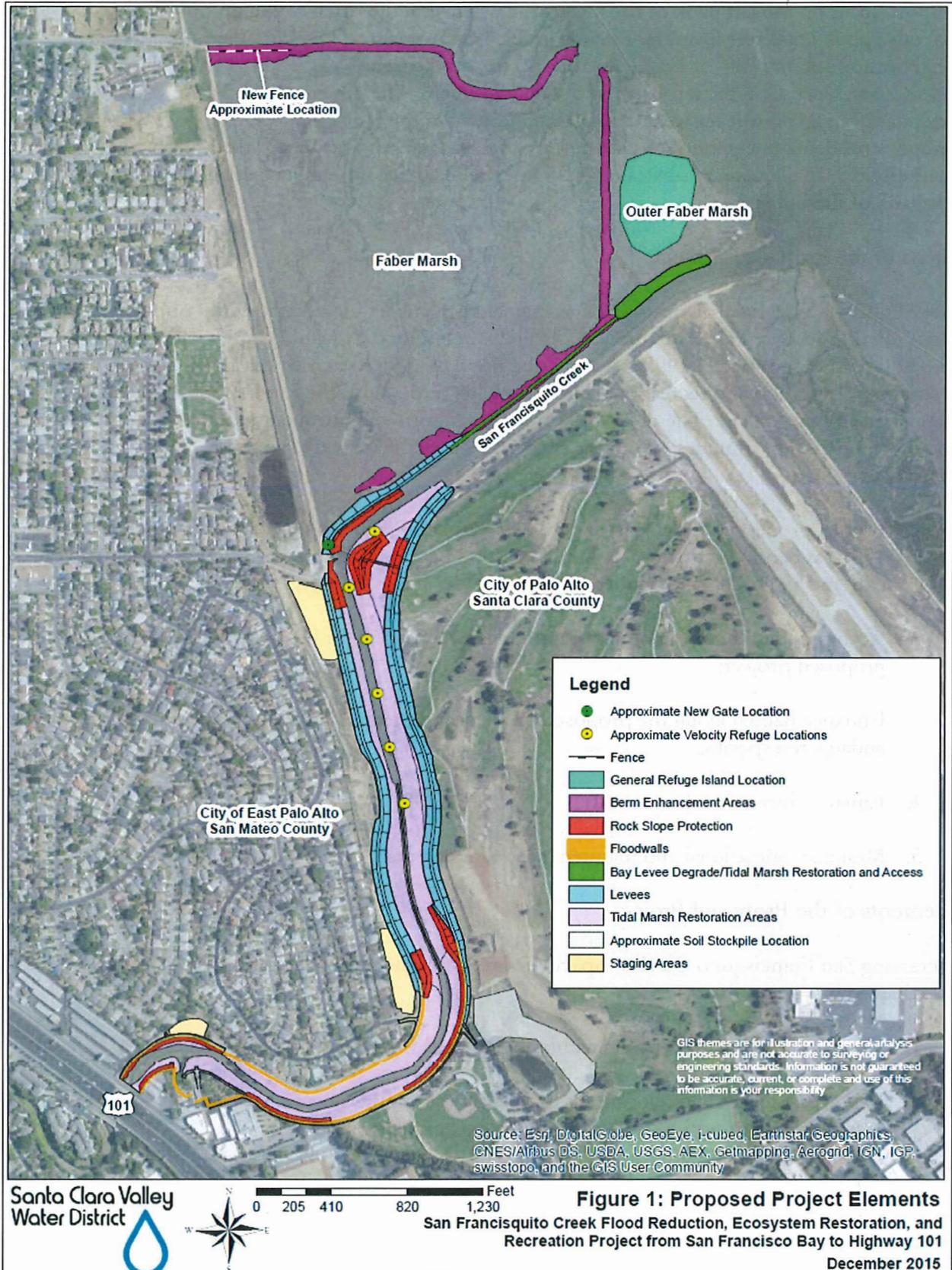


Figure 1. Action area and proposed project elements.

Airport occur on the left bank of the lower reach. The middle reach of the proposed project extends about 2,600 feet from the Friendship Bridge upstream to Daphne Way; a residential neighborhood of the City of East Palo Alto occurs on the right bank, and the Palo Alto Municipal Golf Course occurs on the left bank of the middle reach. The upper reach of the proposed project extends about 2,000 feet upstream from Daphne Way to the U.S. Highway 101/East Bayshore Road Bridge; a residential neighborhood of the City of East Palo Alto occurs on the right bank, and a baseball field, an elementary school, and commercial, Federal, and municipal buildings occur on the left bank of the upper reach.

Goals of the Proposed Project

The SFCJPA is a regional government agency whose members include the Cities of Palo Alto, Menlo Park, and East Palo Alto; the San Mateo County Flood Control District, and the SCVWD. The SFCJPA was formed in 1999 following the flood of 1998 to implement flood management, ecosystem restoration and recreational enhancements throughout the San Francisquito Creek watershed and floodplain. The proposed project's goals are to improve flood protection, habitat, and recreational opportunities within the proposed project reach with the following specific objectives:

1. Protect properties and infrastructure between San Francisco Bay and Highway 101 from a 100-year San Francisquito Creek fluvial flood flow occurring at the same time as a 10-year extreme high tide that includes projected sea level rise through 2065;
2. Accommodate future flood protection measures that might be constructed upstream of the proposed project;
3. Enhance habitat along the proposed project reach, particularly habitat for threatened and endangered species;
4. Enhance recreational uses; and
5. Minimize operational and maintenance requirements.

Elements of the Proposed Project

Increasing San Francisquito Creek's capacity from San Francisco Bay to East Bayshore Road would be achieved by:

1. Excavating sediment deposits within the channel to maximize conveyance;
2. Rebuilding levees and relocating a portion of the southern levee to widen the channel to reduce influence of tides and increase channel capacity; and
3. Constructing floodwalls in the upper reach to increase capacity and maintain consistency with the California Department of Transportation's (Caltrans) enlargement of the U.S. Highway 101/East Bayshore Road Bridge over San Francisquito Creek (Caltrans facility).

Major proposed project elements include:

1. Levee setback and improvements to widen the channel and increase levee height and stability between the City of East Palo Alto and the Palo Alto Municipal Golf Course;
2. Floodwalls in the upper reach downstream of East Bayshore Road;
3. Extension of Friendship Bridge via a boardwalk across new marshland within the widened channel;
4. Improving the stability of the Main Faber Marsh levee;
5. Degrading the Bay levee (levee on the right (north) bank of San Francisquito Creek along the southern edge Outer Faber Marsh near the creek's mouth); and
6. Rock-slope protection.

The majority of the proposed project elements would occur on properties in the cities of Palo Alto and East Palo Alto and owned by the City of Palo Alto or within SCVWD or City of East Palo Alto rights-of-way. The project elements proposed to improve management of flood flows along San Francisquito Creek from East Bayshore Road to San Francisco Bay include reconfiguring levees, creating a marsh plain terrace to convey high flows, installing floodwalls, widening of the creek channel, and constructing access roads for maintenance purposes. Proposed project levee and flood wall construction elements are summarized below in Table 1. Marshplain restoration elements are summarized in Table 2. A detailed overview of each project component is provided in the sections that follow.

The proposed project includes:

1. Excavation. Excavating about 106,000 cubic yards of sediment deposits within the channel to maximize conveyance including about 29,800 cubic yards of stripping, 18,700 cubic yards of rubble mound excavation, 11,600 cubic yards of off-haul material, and 46,600 cubic yards of material re-used from excavation.
2. Fill. Total fill of about 185,300 cubic yards consisting of about 46,600 cubic yards of material re-used from excavation and importing about 138,700 cubic yards from Stevens Creek Quarry.
3. Rebuilding and Setting Back Levees. Rebuilding levees and setting back a portion of the levee adjacent to the Palo Alto Municipal Golf Course by 50-100 feet to widen the channel, increase levee height and stability, reduce influence of tides, increase channel capacity, and restore tidal marsh along San Francisquito Creek.
4. Floodwalls. Constructing floodwalls in the upper reach downstream of East Bayshore Road to increase capacity.

Table 1. Summary of proposed levee and floodwall construction elements.

Project Component	Description
Levee and floodwall construction	
Levee raising on right bank	From the O'Connor Pump Station tie-in near Friendship Bridge to the floodwall.
Floodwall on right bank	The right floodwall would extend from just downstream of Daphne Way to the end of the project reach where it would connect with the Caltrans U.S. Highway 101/East Bayshore Road facility (Caltrans facility).
Levee raising on left bank and levee relocation	Levee relocation of the middle reach and a small portion of the upper and lower reaches. The levee would be relocated inland (currently occupied by the Golf Course), creating space on the left bank for a marshplain terrace. Except for a section around the eastern footings of Friendship Bridge, the existing levee along this stretch would be removed.
Floodwall on left bank	The left floodwall would extend from the end of the left levee, along the streambed, around the Palo Alto Pump Station, to the end of the project reach where it would connect with the Caltrans facility.
Downstream access road on right bank	The right bank downstream access road would be approximately 16 feet wide and extend from the crown of the right levee to street level to just downstream of Daphne Way.
Upstream access road on right bank	The right bank upstream access road would be approximately 12 feet wide and would extend from just downstream of Verbena Drive to the Caltrans facility at East Bayshore Road.
Access road on left bank	The left bank access road would be generally 12 feet wide and would extend from a point downstream of the International School of the Peninsula to the Palo Alto Pump Station. The access road would also be used as a public trail within the City of Palo Alto and would connect to the Baylands Athletic Center.
Friendship Bridge	The existing Friendship Bridge would be retained and extended as a boardwalk from the retained eastern footing across the new marshplain terrace to the relocated left bank levee.
Stabilize Main Faber Marsh levee	Fill in a low spot along about 400 feet of the Main Faber Marsh levee by raising the lowest levee crest elevation downstream of Friendship Bridge from a minimum elevation of 11 feet to 13 feet, and incorporating a 6H:1V (horizontal : vertical) levee side slope into Main Faber Marsh.
Degrade Bay levee	Removing about 600 feet of the existing right bank levee (STA 3+50 to 9+50) along Outer Faber Marsh near the mouth of San Francisquito Creek.
Rock slope protection	Installation of about 3.71 acres of rock-slope levee protection.

Table 2. Summary of proposed marshplain restoration elements.

Marshplain restoration	
Downstream of Friendship Bridge on right bank	High-marsh and transitional vegetation will be planted from the edge of the San Francisquito Creek channel to the toe of the levee from just upstream of San Francisco Bay to just downstream of Friendship Bridge.
Upstream of Friendship Bridge on right bank	High-marsh and transitional vegetation will be planted from the edge of the San Francisquito Creek channel to the toe of the levee from just upstream of Friendship Bridge to East Bayshore Road.
Left bank	High-marsh and transitional vegetation will be planted from the edge of the San Francisquito Creek channel to the base of the floodwall or the toe of the levee. In this area the marsh will be planted adjacent to the toe of the cut-and-fill area. The marsh will extend from the point at which the new levee would diverge inland from the existing levee to East Bayshore Road.

5. Overflow Terrace and Tidal Marsh Creation. Creating/restoring a total of about 15.14 acres of riparian, tidal marsh, and transition zone habitat along San Francisquito Creek and revegetating with native high marsh plantings, high marsh/transition zone plantings, and high marsh/transition zone seed mix. This will create an overflow terrace at marsh elevation upstream and adjacent to Main Faber Marsh.
6. Extension of Friendship Bridge. Extension of the Friendship Bridge via a boardwalk across new marshland within the widened channel.
7. Relocating Utilities. Relocation of Pacific Gas and Electric Company (PG&E) electricity transmission lines and towers and gas transmission lines and the East Palo Alto Sanitary District sewer main.
8. Rodent Control. Controlling burrowing rodents on flood control levees within the proposed project area by use of rodenticides in areas outside of known and potential habitat for the salt marsh harvest mouse and California clapper rail. Only live trapping would be used to control burrowing rodents in areas near suitable habitat for the salt marsh harvest mouse and California clapper rail. The live traps will have openings measuring no smaller than two inches by one inch to allow any salt marsh harvest mouse that inadvertently enters the trap to easily escape. All traps will be placed outside of pickleweed areas and above the high tide line.
9. Stabilize Main Faber Marsh Levee. Add fill to the levee separating San Francisquito Creek from Main Faber Marsh in order to reduce concerns regarding levee erosion and the potential for substantial levee failure. Raising the lowest levee crest elevation downstream of Friendship Bridge from a minimum elevation of 11 feet to 13 feet and incorporating a 6 horizontal (H):1 vertical (V) levee side slope into Main Faber Marsh. The 6H:1V levee side slope will help protect the levee toe from erosion due to flow overtopping over a 400-foot distance as the levee transitions upstream to a higher elevation (as part of the Original Application) closer to the

bridge. About 0.30 acre of tidal marsh within Main Faber Marsh will be permanently lost with the installation of the wider levee toe slope. The stabilized levee will be planted with high marsh and transitional vegetation that is consistent with the levee's location adjacent to bayland marsh.

10. Bay Levee Degrade. Downstream of Main Faber Marsh, in a marsh area (Outer Faber Marsh) that is subject to daily tides from San Francisco Bay, a levee separating San Francisquito Creek from San Francisco Bay will be degraded, removing approximately 600 feet of the existing levee (STA 3+50 to 9+50). This will improve the connection between Outer Faber Marsh and San Francisquito Creek and decrease the water surface elevation during large flow events, allowing the channel to expand out over the marsh area at a point further upstream than under existing conditions.
11. Rock-Slope Protection. Installation of about 3.71 acres of rock-slope protection along the San Francisquito Creek channel.
12. Levee Mowing for O&M. SCVWD will mow approximately 6.49 acres of grassland habitat along the San Francisquito Creek levee slopes one to three times per year (see map in Figure 2 for areas that will be mowed by the proposed project). In order to maintain acceptable channel roughness and comply with "Guidelines for . . . Vegetation Management at Levees" and County of Santa Clara Fire Marshal requirements for preventing fire hazards, the SCVWD will mow plants to a height of 3 to 4 inches, one to three times per year. The levees will remain vegetated and plants will grow between mowing cycles. Mowing is rarely necessary or conducted during the wet season, so higher amounts of more suitable habitat will be available during those four to six months. Project O&M may be transferred to the SCVWD Stream Maintenance Program in the future depending on agreements for work in San Mateo County (Service file number 08ESMF00-2012-F-0398, Service 2014).
13. Steelhead Passage Features. SFCJPA will install six velocity refuge features within the proposed project footprint in the San Francisquito Creek channel to improve steelhead passage including five rock and rootwad structures (constructed features including wood logs with and without rootwads and large rocks for anchoring) in the middle reach (upstream of Friendship Bridge) and one rock spur (partial weir) in the lower reach (immediately downstream of Friendship Bridge).

San Francisquito Creek Marshplain Restoration

The proposed project will restore approximately 11.41 acres of tidal marsh/transition zone habitat along San Francisquito Creek, and adjacent areas, in areas that have been identified as potentially supporting salt marsh harvest mouse and/or California clapper rail, effectively restoring tidal influence in the proposed project reach. The proposed marshplain restoration and monitoring is described in more detail in the SCVWD's MMP (SCVWD 2015). Marshplain restoration will span the entire proposed project extent on both banks from East Bayshore Road to San Francisco Bay. Habitat for salt marsh harvest mouse will be restored downstream of a line approximately corresponding to the southwest border of the Palo Alto Golf Course and the end of Geng Road and Daphne Way. Habitat for California clapper rail will be restored downstream of Friendship Bridge. After levee construction is complete, the tidal marsh area will be terraced and revegetated with high-marsh plants appropriate to the elevation relative to tidal levels. The high-marsh planting area will include alkali weed, saltgrass, alkali heath, marsh jaumea, and perennial pickleweed. The high-marsh



Figure 2. San Francisquito Creek proposed areas of levee mowing for O&M (not including existing mowing for the San Francisco Bay Trail) (copied from K. Murray, SFCJPA, *in litt.* 2015c).

transition planting area will include fat hen, alkali weed, saltgrass, alkali heath, gumweed, marsh jaumea, and western marsh rosemary. The high marsh transition seed mix area will include fat hen, marsh baccharis, alkali weed, hybrid wheatgrass, alkali heath, gumweed, salt heliotrope, meadow barley, alkali barley, western marsh rosemary, and pickleweed. Native marsh plants will be used to revegetate the terraced land. Plants appropriate to the high marsh will be planted near the stream channel. Plants native to marsh transition areas will be planted in areas more distant from the creek channel and in the upper half of the proposed project area as elevation gains.

Approximately 19,500 high marsh and high marsh transition wetland plants and cuttings are planned for installation. Plants will be sourced from the San Francisquito Creek watershed and Baylands areas. A temporary irrigation system will be installed for use during the planting and three-year establishment phase, in order to provide a back-up water supply to the newly-installed vegetation in the event of a period of drought during the winter or spring rainy season, and for irrigation as needed during the summer. Irrigation frequency is expected to be reduced as the site develops during the establishment phase.

The successful implementation of the marshplain restoration will mitigate for permanent and temporary impacts to diked marsh, tidal salt marsh habitat, tidal channel and bay waters, and riparian habitat, and enhance the habitat surrounding the lower reach of San Francisquito Creek. To ensure these goals are met, annual monitoring will be conducted over a five-year period. Performance goals will aid in determining if the site is progressing incrementally toward meeting the Year 5 success criteria. Year 5 monitoring will determine if the success criteria have been achieved. Monitoring will be overseen or conducted by a qualified biologist with experience in mitigation monitoring. Final success will not be considered to have been achieved until temporary irrigation has been off for at least two years.

The performance criteria for restoration of the marshplain are:

1. Vegetative cover increases continuously throughout the period monitored for mitigation compliance;
2. Plant species composition consists of native tidal marsh species appropriate to the salinity regime; and
3. Net increase of waters and wetlands as shown in a Corps wetland delineation.

Qualitative monitoring will provide an opportunity to assess general site conditions and year to year trends based on reconnaissance-level field observations and photo-documentation. Qualitative monitoring will occur annually during the same time frame as specified for quantitative monitoring, and occur at low tide to enable the best viewing of the marsh vegetation. Observations will include impressions of overall plant health, apparent differences in conditions within and between planting zones, prevalence or particular locations of invasive weeds, any visible problems or damage to the site and potential causes. Photo-documentation of the site will be conducted annually from at least six fixed locations showing each planting zone and the overall site. Photo points and directions will be selected during the first year of monitoring and documented on a site planting plan. Observations from the qualitative monitoring will be presented in the form of a short narrative paragraph with photographs attached.

The success of the marsh vegetation mitigation will be quantitatively evaluated by measuring the following:

1. Final success criteria consist of achieving at least 13.67 acres of tidal marsh/transition zone habitat with at least 60 percent cover of wetland indicator species by Year 5; and
2. Invasive species shall not exceed a maximum of 5 percent cover.

A formal delineation of the created jurisdictional areas will be undertaken at the site five years following mitigation site construction. The mitigation will be considered a success if the wetland delineation reveals that at least 13.67 acres of tidal salt marsh, 0.80 acre of diked marsh, and 2.32 acres of tidal channel are restored. Percent cover will be used as the primary indicator of successful establishment of wetland habitat. The final goal is 60 percent cover of wetland indicator species by the end of the monitoring period (SCVWD 2014). Invasive species shall not exceed a maximum of 5 percent cover and shall be removed prior to going to seed. Weeds will be removed by hand tools, mechanical equipment, or herbicides that are approved by the U.S. Environmental Protection Agency for use in aquatic environments. Weed management activities will be conducted in accordance with the SCVWD's Stream Maintenance Program's current accepted practices at the time of the control work (Service file number 08ESMF00-2012-F-0398, Service 2014). Under the Stream Maintenance Program, use of herbicides is part of an integrated pest management approach targeting the use of proper tools to reach project objectives. The SFCJPA will be the permit holder and responsible for compliance monitoring.

Construction Schedule

Proposed project construction is expected to last two years with work estimated to begin in the spring of 2016. Post-construction monitoring will continue for at least five years.

Conservation Measures

As part of the proposed project, SFCJPA, SCVWD, and their contractors will implement the following conservation measures to avoid and minimize potential effects on the salt marsh harvest mouse and California clapper rail and their habitats.

General Construction Site Housekeeping

The work site, areas adjacent to the work site, and access roads will be maintained in an orderly condition, free and clear from debris and discarded materials. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust into storm drains or waterways. Upon completion of work, all building materials, debris, unused materials, concrete forms, and other construction-related materials will be removed from the work site. To prevent mosquito breeding on construction sites, the SFCJPA will require the construction contractor to ensure that surface water is gone within four days (96 hours). All outdoor grounds will be examined and unnecessary water that may stand longer than 96 hours will be drained. Construction personnel will properly dispose of unwanted or unused artificial containers and tires. If possible, any container or object that holds standing water that must remain outdoors will be covered, inverted, or have drainage holes drilled.

The following general construction site housekeeping measures will be implemented as necessary within staging areas.

1. Staging areas that are not already paved or covered with compacted aggregate base, and that are used for parking vehicles, trailers, workshops, maintenance areas, or equipment, piping, formwork, rebar, storing masonry on pallets, and metal product storage, will be graded as required, and surfaced with a minimum of three inches of compacted aggregate base rock over a high modulus, woven, and soil separation geo-textile. Areas storing aggregate base or other rock products will also be placed on this same geo-textile. The objective is to maintain separation between native and construction materials. Areas storing soils and sand are not required to be surfaced with aggregate base course.
2. Aggregate base will be removed from all staging areas prior to proposed project completion, and the surfaces will be re-graded to their original grades or matching surrounding conditions as directed by the Engineer.
3. Any soils contaminated with petroleum product or other hazardous materials by the contractor will be removed by the contractor and disposed of in accordance with local, State, and Federal laws.
4. The contractor is responsible for weed control in staging areas and material storage areas.

The spread of invasive nonnative plant species and plant pathogens will be avoided or minimized by implementing the following measures:

1. Construction equipment will arrive at the proposed project site clean and free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species.
2. Any imported fill material, soil amendments, gravel, etc., required for construction and/or restoration activities that will be placed within the upper 12 inches of the ground surface will be free of vegetation and plant material.
3. Certified weed-free imported erosion control materials (or rice straw in upland areas) will be used exclusively.
4. To reduce the movement of invasive weeds into uninfested areas, the contractor will stockpile topsoil removed during excavation and will subsequently reuse the stockpiled soil for re-establishment of disturbed project areas.

Water Quality Protection

1. The following measures will be implemented as necessary to reduce and minimize storm water pollution during ground disturbing maintenance activities:
 - a. Soils exposed due to maintenance activities will be seeded and stabilized using hydroseeding, straw placement, mulching, and/or erosion control fabric. These measures will be implemented such that the site is stabilized and water quality protected prior to significant rainfall.

- b. The preference for erosion control fabrics will be to consist of natural fibers. No plastic monofilament or similar material will be used.
 - c. Appropriate measures include, but are not limited to, the following: silt fences, straw bale barriers, brush or rock filters, storm drain inlet protection, sediment traps, sediment basins, erosion control blankets and mats, soil stabilization (*i.e.* tackified straw with seed, jute or geotextile blankets, etc.), wood chips, and straw mulch.
 2. All temporary construction-related erosion control methods will be removed at the completion of the proposed project (*e.g.*, silt fences).
 3. Sediments will be stored and transported in a manner that minimizes water quality effects.
 - a. Wet sediments may be stockpiled outside of a live stream or may be stockpiled within a dewatered stream so water can drain or evaporate before removal.
 - b. This measure applies to saturated, not damp, sediments and depends on the availability of a stockpile site.
 - c. For those stockpiles located outside the channel, water draining from them will not be allowed to flow back into the creek or into local storm drains that enter the creek, unless water quality protection measures recommended by SFRWQCB are implemented.
 - d. Trucks may be lined with an impervious material (*e.g.*, plastic), or the tailgate blocked with dry dirt or hay bales, for example, or trucks may drain excess water by slightly tilting their loads and allowing the water to drain out.
 - e. Water will not drain directly into channels (outside of the work area) or onto public streets without providing water quality control measures.
 - f. Streets and affected public parking lots will be cleared of mud and/or dirt by street sweeping (with a vacuum-powered street sweeper), as necessary, and not by hosing down the street.
 4. Oily, greasy, or sediment-laden substances or other material that originate from the proposed project operations and may degrade the quality of surface water or adversely affect aquatic life, fish, or wildlife will not be allowed to enter, or be placed where they may later enter, any waterway.
 5. The proposed project will not increase the turbidity of any watercourse flowing past the construction site by taking all necessary precautions to limit the increase in turbidity as follows.
 - a. Where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases will not exceed 5 percent.
 - b. Where natural turbidity is greater than 50 NTU, increases will not exceed 10 percent.

- c. Where the receiving water body is a dry creek bed or storm drain, waters in excess of 50 NTU will not be discharged from the proposed project.
 - d. Water turbidity changes will be monitored. The discharge water measurements will be made at the point where the discharge water exits the water control system for tidal sites and 100 feet downstream of the discharge point for non-tidal sites. Natural watercourse turbidity measurements will be made in the receiving water 100 feet upstream of the discharge site. Natural watercourse turbidity measurements will be made prior to initiation of proposed project discharges, preferably at least two days prior to commencement of operations.
6. No washing of vehicles will occur at job sites.
 7. No fueling will be done in a waterway or immediate floodplain, unless equipment stationed in these locations cannot be readily relocated (*i.e.*, pumps, generators).
 - a. For stationary equipment that must be fueled on the site, containment will be provided in such a manner that any accidental spill of fuel will not be able to enter the water or contaminate sediments that may come in contact with water.
 - b. Any equipment that is readily moved out of the waterway will not be fueled in the waterway or immediate floodplain.
 - c. All fueling done at the job site will provide containment to the degree that any spill will be unable to enter any waterway or damage riparian vegetation.
 8. No equipment servicing will be done in a stream channel or immediate floodplain, unless equipment stationed in these locations cannot be readily relocated (*i.e.*, pumps, generators).
 - a. Any equipment that can be readily moved out of the channel will not be serviced in the channel or immediate floodplain.
 - b. All servicing of equipment done at the job site will provide containment to the degree that any spill will be unable to enter any channel or damage stream vegetation.
 - c. If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location will be done in a channel or floodplain.
 - d. If emergency repairs are required, containment will be provided equivalent to that done for fueling or servicing.
 9. Measures will be implemented to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means.
 - a. Prior to entering the work site, all field personnel will know how to respond when toxic materials are discovered.
 - b. The discharge of any hazardous or nonhazardous waste as defined in Division 2,

Subdivision 1, Chapter 2 of the California Code of Regulations will be conducted in accordance with applicable State and Federal regulations.

- c. In the event of any hazardous material emergencies or spills, personnel will call the Chemical Emergencies/Spills Hotline at 1-800-510-5151.
10. Prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water.
 - a. Field personnel will be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills.
 - b. No fueling, repair, cleaning, maintenance, or vehicle washing will be performed in a creek channel or in areas at the top of a channel bank that may flow into a creek channel.
 11. Spill prevention kits appropriate to the hazard will always be in close proximity when using hazardous materials (*e.g.*, crew trucks and other logical locations).
 - a. Prior to entering the work site, all field personnel will know the location of spill kits on crew trucks and at other locations within SCVWD facilities.
 - b. All field personnel will be advised of these locations and trained in their appropriate use.
 12. Runoff from soil stockpiles will be avoided. If soil is to be stockpiled, no runoff will be allowed to flow to a creek.
 13. Cofferdams will be used for tidal work areas. For tidal areas, a downstream cofferdam will be constructed to prevent the work area from being inundated by tidal flows. By isolating the work area from tidal flows, water quality effects are minimized. Downstream flows will continue through the work area and through pipes within the cofferdam.
 - a. Installation of coffer dams will begin at low tide.
 - b. Waters discharged through tidal cofferdam bypass pipes will not exceed 50 NTU over the background levels of the tidal waters into which they are discharged.
 - c. Cofferdams shall not be constructed of earthen fill due to potential adverse water quality impacts in the event of a failure.
 - d. Cofferdams constructed of gravel shall be covered by a protective covering (*e.g.*, plastic or fabric) to prevent seepage.
 14. Groundwater will be managed at work sites. If high levels of groundwater in a work area are encountered, the water will be pumped out of the work site. If necessary to protect water quality, the water will be directed into specifically constructed infiltration basins, into holding ponds, or onto areas with vegetation to remove sediment prior to the water re-entering a

receiving water body. Water pumped into vegetated areas will be pumped in a manner that will not create erosion around vegetation.

15. Sanitary/septic waste will be managed. Temporary sanitary facilities will be located on jobs that last multiple days in compliance with California Division of Occupational Safety and Health regulation 8 California Code of Regulations 1526. All temporary sanitary facilities will be placed outside of the creek channel and floodplain and removed when no longer necessary.

In addition, as part of the Santa Clara Valley Urban Runoff Pollution Prevention Program and the San Mateo Countywide Stormwater Pollution Prevention Program, required under Waste Discharge Requirements and National Pollutant Discharge Elimination System permits for the discharge of storm water runoff from the municipal separate storm sewer systems (MS4s) overseen by the SFRWQCB, all construction sites are required to have site-specific and seasonally and phase-appropriate effective best management practices (BMPs) (SFRWQCB 2009). SFCJPA will be responsible for ensuring compliance with all local and State regulations, including the SFRWQCB National Pollutant Discharge Elimination System permits and local BMPs for jurisdictions adjoining the proposed project site. The proposed project specifications require that the proposed project construction contractor prepare a Storm Water Pollution Prevention Plan (SWPPP) and erosion control and sedimentation plan showing placement of BMPs at various stages of construction in conformance with requirements, and all SWPPP documents and plans will be stamped by a State-certified Qualified SWPPP Developer. The proposed project will implement measures to accomplish objectives specified in SFCJPA's *San Francisquito Creek Watershed Analysis and Sediment Reduction Plan*, which fulfills National Pollutant Discharge Elimination System permit provisions that require the co-permittees of the Santa Clara Valley Urban Runoff Pollution Prevention Program and San Mateo Countywide Stormwater Pollution Prevention Program within the San Francisquito Creek watershed to assess and implement sediment management measures in the watershed (SFCJPA 2004). Water quality protection standards during construction will comply with the most protective BMPs of the local jurisdictions and the State of California.

Safe Use of Herbicides and Pesticides

1. Pesticides products are to be used only after an assessment has been made regarding environmental, economical, and public health aspects of each of the alternatives. The following types of pesticides are used by the SCVWD.
 - a. Herbicides are used to: control algae, weeds, and undesirable vegetation; to minimize fire hazards; to maintain flood conveyance of waterways; and to maintain compliance with State and Federal requirements.
 - b. Insecticides are used only in and around SCVWD buildings, or in the case of a serious pest outbreak, on landscape and re-vegetation facilities; only after all other methods, such as prevention or natural nontoxic control methods, have proven ineffective; and where required, the lowest toxicity will be used in accordance with the label and the details of this policy.
 - c. No rodenticides or fumigants will be used within or near suitable habitat for the salt marsh harvest mouse or California clapper rail. Methods of rodent control within or

near salt marsh harvest mouse or California clapper rail habitat will be limited to live trapping. All live traps shall have openings measuring no smaller than two inches by one inch to allow any salt marsh harvest mouse that inadvertently enters the trap to easily escape. All traps will be placed outside of pickleweed areas and above the high tide line. In areas where rodenticides are used, carcass retrieval surveys will be conducted daily for acute toxins and weekly for anticoagulants to minimize secondary poisoning impacts during the use period. Any spilled bait will be cleaned up immediately. Alternatives such as trapping and smoke bombs are used wherever practical prior to rodenticide use.

2. All herbicide use will be consistent with approved product specifications and according to their labels. Applications will be made by, or under the direct supervision of, State-certified applicators under the direction of a licensed Pest Control Advisor.
3. Only herbicides and surfactants registered for aquatic use will be applied within the banks of channels within 20 feet of any water present. Aquatic herbicide use will be limited to July 1 through October 15. If rain is forecasted for the day, then application of aquatic herbicide will be rescheduled.

Construction Dust Control

1. Bay Area Air Quality Management District Basic Control Measures for construction emissions of particulate matter (PM₁₀) will be implemented at all construction sites. Current measures stipulated by the Bay Area Air Quality Management District California Environmental Quality Act Guidelines include the following (Bay Area Air Quality Management District 2010):
 - a. All exposed surfaces (*e.g.*, parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day under normal conditions. Watering periodicity can be increased or decreased as necessitated by site specific conditions as determined by the SFCJPA's designated construction manager and with the SFCJPA's approval.
 - b. All haul trucks transporting soil, sand, or other loose material off the site will be covered.
 - c. All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
 - d. All vehicle speeds on unpaved roads will be limited to 15 miles per hour.
 - e. All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.
 - f. Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California

airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage will be provided for construction workers at all access points.

- g. All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified mechanic and determined to be running in proper condition prior to operation.
2. A publicly visible sign will be posted with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person will respond and take corrective action as soon as is feasible and no later than 24 hours after the complaint is made. The Bay Area Air Quality Management District's phone number, as well as the contact numbers for the SFCJPA Project Manager, Designated Construction Manager, and a designated contact with the City of East Palo Alto will also be visible to ensure compliance with applicable regulations.

Biological Resources Protection

1. Prior to construction, worker awareness training must be conducted to inform proposed project construction workers of their responsibilities regarding sensitive environmental resources. The training will include environmental education about the salt marsh harvest mouse and California clapper rail and other special-status species and sensitive habitats (*e.g.*, in-stream habitat, riparian habitat, wetlands). The training will include visual aids to assist in identification of regulated biological resources, actions to take should protected wildlife be observed within the action area, and possible legal repercussions of affecting such regulated resources.
2. Existing access ramps and roads to waterways will be used where possible. If temporary access points are necessary, they will be constructed in a manner that minimizes effects on waterways:
 - a. Temporary proposed project access points will be created as close to the work area as possible to minimize running equipment in waterways and will be constructed so as to minimize adverse effects.
 - b. Any temporary fill used for access will be removed upon completion of the proposed project. Site topography and geometry will be restored to pre-project conditions to the extent possible.
3. Migratory bird nesting surveys will be performed prior to any proposed project-related activity that could pose the potential to affect migratory birds during the nesting season.
4. Nesting exclusion devices may be installed to prevent potential establishment or occurrence of nests in areas where construction activities would occur. All nesting exclusion devices will be maintained throughout the nesting season or until completion of work in an area makes the devices unnecessary. All exclusion devices will be removed and disposed of when work in the area is complete.

5. Effects on native aquatic vertebrates will be avoided or minimized. If native aquatic vertebrates are present when cofferdams, water bypass structures, and silt barriers are to be installed, an evaluation of the project site and the native aquatic vertebrates will be conducted by a qualified biologist. The qualified biologist will consider:
 - a. Native aquatic species present at the site.
 - b. The ability of the species to naturally recolonize the stream reach.
 - c. The life stages of the native aquatic vertebrates present.
 - d. The flow, depth, topography, substrate, chemistry, and temperature of the stream reach.
 - e. The feasibility of relocating the aquatic species present.
 - f. The likelihood the stream reach will naturally dry up during the work season. Based on consideration of these factors, the qualified biologist may make a decision to relocate native aquatic vertebrates. The qualified biologist will document in writing the reasons to relocate native aquatic species, or not to relocate native aquatic species, prior to installation of cofferdams, water bypass structures, or silt barriers. If the decision is made to relocate the native aquatic species, then the operation will be based on the SCVWD's Fish Relocation Guidelines.
6. Local ecotypes of native plants will be planted and appropriate erosion-control seed mixes will be chosen. Whenever native species are prescribed for installation on SCVWD fee properties or easements, the following steps will be taken by a qualified biologist or vegetation specialist:
 - a. Evaluate whether the plant species currently grows wild in Santa Clara County.
 - b. If the plant species currently grows wild in Santa Clara County, the qualified biologist or vegetation specialist will determine whether the plant installation must include local natives, *i.e.* grown from propagules collected in the same or adjacent watershed, and as close to the proposed project site as feasible.
 - c. A qualified biologist or vegetation specialist will be consulted to determine which seeding option is ecologically appropriate and effective. The following guidelines will inform the biologist or vegetation specialist's determination.
 - d. For areas that are disturbed, an erosion control seed mix may be used consistent with the SCVWD's Guidelines and Standards for Land Use Near Streams, Design Guide 5, "Temporary Erosion Control Options."
 - e. In areas with remnant native plants, the qualified biologist or vegetation specialist may choose an abiotic application instead, such as an erosion control blanket or seedless hydro-mulch and tackifier to facilitate passive revegetation of native species.

- f. Temporary earthen access roads may be seeded when site and horticultural conditions are suitable.
 - g. If a gravel or wood mulch has been used to prevent soil compaction, this material may be left in place (if ecologically appropriate) instead of seeding.
 - h. Seed selection will be ecologically appropriate as determined by a qualified biologist, per *Guidelines and Standards for Land Use Near Streams, Design Guide 2: Use of Local Native Species; and, Supplemental Landscaping/Revegetation Guidelines* (ISO document WQ71001).
7. Animal entry and entrapment will be avoided.
- a. All pipes, hoses, or similar structures less than 12 inches diameter will be closed or covered to prevent animal entry. All construction pipes, culverts, or similar structures, greater than 2 inches diameter, stored at a construction site overnight, will be inspected thoroughly for wildlife by a qualified biologist or properly trained construction personnel before the pipe is buried, capped, used, or moved.
 - b. If inspection indicates presence of sensitive or State- or federally-listed species inside stored materials or equipment, work on those materials will cease until a qualified biologist determines the appropriate course of action.
 - c. To prevent entrapment of animals, all excavations, steep-walled holes or trenches more than 6 inches deep will be secured against animal entry at the close of each day. Any of the following measures may be employed, depending on the size of the hole and method feasibility.
 - d. Holes will be securely covered (no gaps) with plywood or similar materials at the close of each working day, or any time the opening will be left unattended for more than one hour.
 - e. In the absence of covers, the excavation will be provided with escape ramps constructed of earth or untreated wood, sloped no steeper than 2:1, and located no farther than 15 feet apart.
 - f. In situations where escape ramps are infeasible, the hole or trench will be surrounded by filter fabric fencing or a similar barrier with the bottom edge buried to prevent entry.
8. Identify and protect riparian habitats. To avoid unnecessary damage to or removal of riparian habitat, the SFCJPA will retain a qualified biologist or ecologist to survey and demarcate riparian habitat on or adjacent to the proposed areas of construction in the upper reach of San Francisquito Creek. Riparian areas not slated for trimming or removal to accommodate proposed project construction will be protected from encroachment and damage during construction by installing temporary construction fencing to create a no-activity exclusion zone. Fencing will be brightly colored and highly visible, and installed under the supervision of a qualified biologist to prevent damage to riparian habitat during installation. The fencing will protect all potentially affected riparian habitat consistent with

International Society of Arboriculture tree protection zone recommendations and any additional requirements of the resource agencies with jurisdiction. Fencing will be installed before any site preparation or construction work begins and will remain in place for the duration of construction. Riparian vegetation that must be trimmed will be trimmed by an International Society of Arboriculture certified arborist who will minimize stress and potential damage to trees and shrubs. Construction personnel will be prohibited from entering the exclusion zone for the duration of proposed project construction. Access and surface-disturbing activities will be prohibited within the exclusion zone.

9. Replace riparian habitat. The SFCJPA will be responsible for replacing permanently affected riparian habitat at a mitigation-to-effect ratio of 2:1 and temporarily affected riparian habitat at a minimum mitigation-to-effect ratio of 1:1 through the restoration or creation of marsh habitats consistent with the historical ecology of the project area. The SFCJPA will develop a MMP that describes this habitat replacement. The MMP will be developed in the context of the Federal and State permitting processes under the Clean Water Act and California Department of Fish and Game Code, and will include success criteria as specified by the permitting agencies. The MMP will also include adaptive management guidelines for actions to be taken if the success criteria are not met.

California Clapper Rail Measures

1. Work activities within 50 feet of California clapper rail habitat will not occur within two hours before or after extreme high tides (6.5 feet or above measured at the Golden Gate Bridge adjusted to the timing of local high tides) or when the marsh plain is inundated, which could prevent individuals from reaching available cover.
2. If work is to be conducted during the California clapper rail's breeding season (February 1 – August 31) within 700 feet of suitable habitat, a permitted biologist will be retained to conduct California clapper rail protocol-level surveys at the proposed project site in appropriate habitat for the California clapper rail. The surveys will be conducted following the Service's June 2015 survey protocol during the appropriate protocol-level survey period (*i.e.*, late January – April) prior to commencement of construction and maintenance activities (http://www.fws.gov/sfbaydelta/documents/June_2015_Final_CCR_protocol.pdf). Proposed project activities occurring within 700 feet of California clapper rail activity centers will occur only between September 1 and January 31 outside of the California clapper rail's breeding season.
3. Outside of the California clapper rail breeding season, a permitted biologist will be retained to conduct surveys of appropriate habitat for California clapper rails within the work area, including all staging and access routes, no more than seven days prior to initiation of work within suitable habitat. If California clapper rails are observed during this survey, a biologist will conduct an additional survey immediately prior to initiation of construction activities. If California clapper rails are observed within or near the work area, a no-disturbance buffer (minimum 50 feet) will be implemented. If the daily work area is expanded, then a qualified biologist will survey the suitable habitat prior to initiation of work and movement of equipment that day. No work will occur within the buffer until the biologist verifies that California clapper rail individuals have left the area.

4. If California clapper rails are routinely observed in the work area, a species avoidance plan will be developed in coordination with the Service and CDFW. If no California clapper rails are observed in accordance with the survey protocols, no buffers will be required. All vegetation removal within suitable California clapper rail habitat, as determined by a biologist, will be done by hand to the extent possible. If movement of heavy equipment is necessary in suitable habitat or within 50 feet of habitat, then a Service-approved biological monitor will observe the area in front of the equipment from a safe vantage point. If California clapper rails are detected within the area in front of the equipment, then the equipment will stop and the biologist will direct the equipment on an alternative path. If this is not possible, then equipment will stop until a clear path can be identified.
5. Additional conservation measures during the construction period will include:
 - a. An annual search for and subsequent destruction of any cat feeding stations along public walkways shall be conducted.
 - b. Before the onset of winter high tides, an annual capture and removal effort of feral cats and rats in the surrounding disturbed areas shall be conducted.
6. The SFCJPA will conduct protocol-level surveys for California clapper rail where potential impacts to rail habitat occur along the Faber Marsh levee and in San Francisquito Creek for the duration of mitigation monitoring, which is a minimum of five years. The purpose of the surveys will be to evaluate the effectiveness of the measures to support the California clapper rail population.

Salt Marsh Harvest Mouse Measures

1. Since the salt marsh harvest mouse can breed year-round, a species avoidance plan will be developed in consultation with the Service and CDFW and implemented. The avoidance plan, at a minimum, will include the following.
 - a. Hand removal of vegetation shall start at the edge farthest from the largest contiguous salt marsh area and work its way towards the salt marsh, providing cover for salt marsh harvest mice and allowing them to move towards the salt marsh as vegetation is being removed.
 - b. In consultation with CDFW and the Service, salt marsh harvest mouse-proof exclusion fencing shall be placed around a defined work area immediately following vegetation removal and before proposed project activities begin. All supports for the exclusion fencing will be placed on the inside of the work area to prevent salt marsh harvest mice from climbing the stakes into the work area. The salt marsh harvest mouse-proof exclusion fencing shall be at least two feet high but no higher than four feet. The fencing will be made of a heavy plastic sheeting material that is too smooth for salt marsh harvest mice to climb. The toe of the fence will be buried approximately four inches in the ground to prevent salt marsh harvest mice from crawling or burrowing underneath it. A four-foot buffer will be maintained free of vegetation around the exclusion fencing and work areas. The final design and

proposed location of the fencing shall be reviewed and approved by CDFW and the Service prior to placement.

- c. Prior to initiation of work each day within 300 feet of tidal or pickleweed habitats, a qualified biologist shall thoroughly inspect the work area and adjacent habitat areas to determine if salt marsh harvest mice are present. The biologist shall ensure the exclusion fencing has no holes or rips, and the base remains buried. The fenced area will be inspected daily to ensure that no mice are trapped.
2. Prior to initiation of work within suitable habitat, a Service-approved biologist will be retained to monitor the hand removal of pickleweed to avoid the injury or mortality of the salt marsh harvest mouse. Monitoring will occur for the duration of all clearing work within suitable habitat. If a salt marsh harvest mouse is observed during clearing activities, clearing will cease and workers will move to a new area. Clearing work may begin in the area of the observation one day or more after the observation date.
3. During the survey, if salt marsh harvest mouse individuals are observed, or if active nests of this species are observed, proposed project activities within 100 feet of the observation will be postponed and a no-disturbance buffer will be established. The buffer will remain in place until the biologist determines that the individuals have left the area (or if an active nest is found that all the salt marsh harvest mice have weaned) and are not present in or near (100 feet) of the work area. If no individuals are observed in accordance with the survey protocols, no buffers will be required.
4. Work activities within 50 feet of salt marsh harvest mouse habitat will not occur within two hours before or after extreme high tides (6.5 feet or above measured at the Golden Gate Bridge adjusted to the timing of local high tides) or when the marsh plain is inundated, which could prevent individuals from reaching available cover.

Avoidance Measures during O&M Activities including Levee Mowing and Vegetation Management

The following avoidance measures will be implemented during O&M activities including vegetation management and annual levee mowing to avoid the potential for injury and mortality of salt marsh harvest mice and California clapper rails.

1. Within seven days prior to work within the range of salt marsh harvest mouse or California clapper rail habitat, the proposed project area will be surveyed by a qualified biologist to identify specific habitat areas. Surveyed areas will include work locations and access routes.
2. To minimize or avoid the loss of individuals, activities within or adjacent to salt marsh harvest mouse and California clapper rail habitat will not occur within two hours before or after extreme high tides (6.5 feet or above measured at the Golden Gate Bridge adjusted to the timing of local high tides) when the marsh plain is inundated, because protective cover for those species is limited and activities could prevent them from reaching available cover.
3. Mowing will not occur at night.

4. Specific habitat areas are vegetated areas of cordgrass, marsh gumplant, pickleweed, alkali heath, and other high marsh vegetation, brackish marsh reaches of creek with heavy accumulations of bulrush thatch (old stands), and high water refugia habitat that may include annual grasses, and shrubs immediately adjacent to channels. Within the identified specific habitat areas, vegetation will be removed by hand from areas to be directly impacted by the work activities if possible (hand removal of vegetation in some channels may not be possible). If within the mapped range of the salt marsh harvest mouse, but outside of areas identified as specific habitat areas, then other methods may be possible.
5. Prior to the initiation of work each day for all vegetation management work, ground or vegetation disturbance, operation of large equipment, grading, sediment removal, and bank stabilization work and prior to expanding the work area, if suitable habitat occurs within the immediate work area, a qualified biologist will conduct a preconstruction survey of all suitable habitat that may be directly or indirectly impacted by the day's activities (work area, access routes, staging areas).
 - a. If during the initial daily survey or during work activities a California clapper rail is observed within or immediately adjacent to the work area (50 feet), initiation of work will be delayed until the California clapper rail leaves the work area.
 - b. If during the initial daily survey or during work activities a salt marsh harvest mouse or similar rodent is observed within or immediately adjacent to the work area (50 feet), initiation of work will be delayed until a *Site Specific Species Protection Form* to protect the salt marsh harvest mouse or similar rodent is developed and implemented by the qualified biologist. Acceptable plan activities may include one or more of the following activities: (1) establishment of a buffer zone at least 50 feet in radius from the rodent; (2) ongoing active monitoring; and (3) delay of work activity until the qualified biologist can provide CDFW and the Service a suggested course of action and seek concurrence.
6. If mowing with hand equipment is necessary within 50 feet of habitat areas, an on-site monitor will observe the area in front of the mower from a safe vantage point while it is in operation. If salt marsh harvest mice are detected within the area to be mowed, no mowing will occur in that area. If a California clapper rail is detected within the area to be mowed, the mowing will stop until the individual(s) have left the work area.
7. If visual observation cannot confirm California clapper rails have left the work area, then it is assumed that the individual(s) remains in the work area and the work will not resume until the area has been thoroughly surveyed (and absence confirmed) or the Service has been contacted for guidance.
8. No rodenticides or fumigants will be used within the range of the salt marsh harvest mouse or California clapper rail as identified on SCVWD range maps. Methods of rodent control within salt marsh harvest mouse or California clapper rail habitat will be limited to live trapping. All live traps shall have openings measuring no smaller than 2 inches by 1 inch to allow any salt marsh harvest mouse that inadvertently enters the trap to easily escape. All traps will be placed outside of pickleweed areas and above the high tide line.

Predator Management

The SFCJPA will take the following actions to assist the Refuge and U.S. Department of Agriculture Wildlife Services in its efforts towards predator management at Faber Marsh and the adjacent Laumeister Marsh as follows:

1. Predator Trapping Assistance

- a. Financial contributions towards predator management activities. Since predation is believed to represent the greatest threat and in order to provide the maximum benefit possible to the salt marsh harvest mouse and California clapper rail, the SFCJPA will provide funding to augment current predator trapping activities, so that the desired activities in and around Faber and Laumeister Tract marshes are fully funded. The SFCJPA will enter in to a formal agreement with U.S. Department of Agriculture Wildlife Services for the provision of \$8,000 per year with a 5 percent annual increase, the first payment to be made within 30 days after a Clean Water Act Section 404 permit is issued for the proposed project, for a total of five years.
 - b. Install features to deter the public from entering trapping areas. Currently, trapping activities are limited along the levee that separates the Faber and Laumeister Tracts because of human activity. This levee is open to the public, and U.S. Department of Agriculture Wildlife Services is reluctant to place traps in areas where people may tamper with them, or be harmed by them. To provide for greater trapping opportunities, the SFCJPA will install a pole and cable feature, subject to municipal and regional access codes, to designate a trail location and alignment for the public. This will provide some “off-trail” space between the pole and cable in the Laumeister Tract marsh for trapping activities and reduce the likelihood of accidental human/trap interface. Installation will take place at the time of revegetation of the Main Faber Marsh northern perimeter levee.
 - c. Provide access to new areas for trapping activities. Currently, U.S. Department of Agriculture Wildlife Services is limited in its trapping activities to areas within the Refuge. Trapping would likely be more effective if these activities could also take place in known predator access areas to the Refuge, but lie outside of the Refuge. There are certain parcels along and adjacent to the levee separating the Faber and Laumeister Tract marshes from developed areas in East Palo Alto that are owned by the City of East Palo Alto or the City of Palo Alto. The SFCJPA will work with its municipal partners to provide access agreements between the Cities and U.S. Department of Agriculture Wildlife Services to allow for trapping activities in these areas. Discussions with the Cities will begin at the time that formal Section 7 consultation on the proposed project is initiated with the Service.
2. Exclusionary Fencing. The SFCJPA will install a chain-link fence and gate across the levee that separates San Francisquito Creek and Main Faber Marsh to inhibit predator and human access to the marsh. In addition to inhibiting predator access, the fence will allow for more aggressive trapping activities along this levee and the levee that separates Main Faber Marsh and Outer Faber Marsh. The fencing will be installed upon completion of construction of the project features along the southern Main Faber Marsh levee beyond the proposed fence

location. The fence and gate will have the following features: 1-inch mesh chain link; 8 feet tall; vehicular gate with chained lock to allow access to multiple agencies; anti-perching feature on top; the fence shall extend on the marsh (north) side to the outboard toe of the high marsh transition zone; and the fence shall connect on the creek (south) side to the rail structure of the Friendship Bridge.

3. Raptor Perching Deterrents. The SFCJPA will modify 12 bridge marker poles to deter raptor perching. A cone-shaped cap will be placed at the top of each pole, and the capped poles will be maintained in a condition that deters predator access and raptor perching. Caps will be placed on the poles at the time of construction of the boardwalk project feature.
4. Trail Signage. The SFCJPA will coordinate with staff from the Palo Alto Baylands Preserve to install signs informing the public of the need to keep dogs leashed, with applicable municipal code citations, and establish a local enforcement strategy. Signage will be installed upon completion of the proposed project.

High Tide Refuge Islands

The SFCJPA will install five high-tide refuge islands in Outer Faber Marsh near the San Francisco Bay. These islands will be similar to those installed as part of the Invasive Spartina Project effort, which have successfully provided refuge during king tides throughout San Francisco Bay (H.T. Harvey & Associates 2015b). Each island will have a footprint of 0.007 acre (300 square feet, 10 feet by 30 feet). The islands will be planted with marsh gumplant and/or other native marsh species, and placed at an elevation that retains wetlands in the marsh. The SFCJPA and its partners will develop final design and dimensions, and determine final location of these islands in coordination with the Service, the Refuge, and H.T. Harvey & Associates (the consultant for the Invasive Spartina Project). Further details on the high-tide refuge islands installation will be provided in the proposed project's MMP and are available in the *San Francisquito Creek Flood Protection Project: Conceptual High-Tide Refuge Habitat Enhancement Plan* (H.T. Harvey & Associates 2015a). An example plan view and cross-section of a high-tide refuge island installed for the Invasive Spartina Project is illustrated in Figures 3 and 4 below. The approximate locations of the five high tide refuge islands to be installed in Outer Faber Marsh are shown in Figure 5 below.

Each of the five high-tide refuge island sites proposed for construction in Outer Faber Marsh will consist of one excavation area (if necessary), one refuge island, and an elevation control stake. Prior to construction, a restoration ecologist will ground-truth the location of refuge islands selected during the stakeholder meeting. Refuge island sites will be accessed on foot outside of the California clapper rail's breeding season (*i.e.*, after September 1). The restoration ecologist may adjust the location of refuge island sites based on field conditions in order to maximize the benefit of island sites for California clapper rail and facilitate construction.

During pre-construction ground-truthing, a white polyvinyl chloride (PVC) pipe will be installed at each island site so that the top of the PVC pipe is at Mean Higher High Water (MHHW). During refuge island construction, the elevation of each island and the maximum depth of the excavation area will be determined via measurement (with a laser level) to the elevation control stake. The refuge islands will be built to be approximately 25-foot long by 10-foot wide with island tops approximately 2-3 feet above the marsh plain and located adjacent to a tidal marsh slough channel.

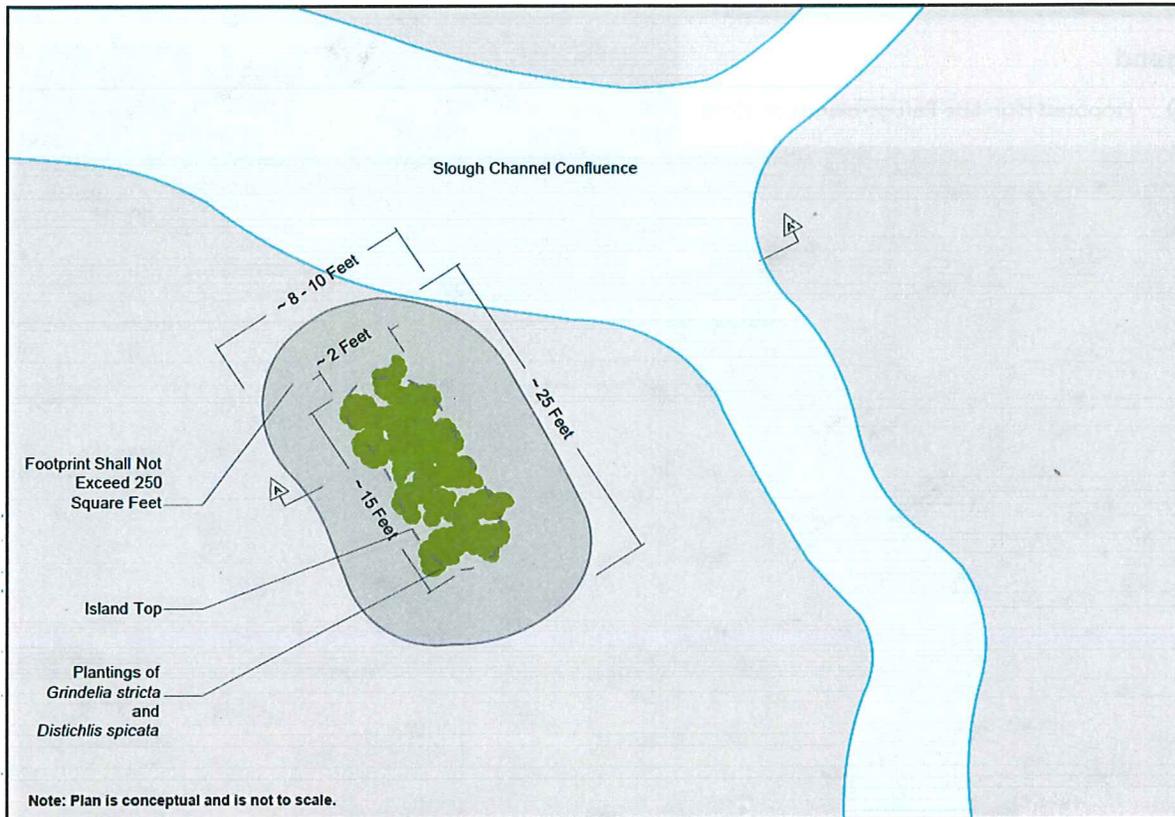


Figure 3. Typical plan view of a high-tide refuge island (copied from Figure 7 in H.T. Harvey & Associates (2015a)).

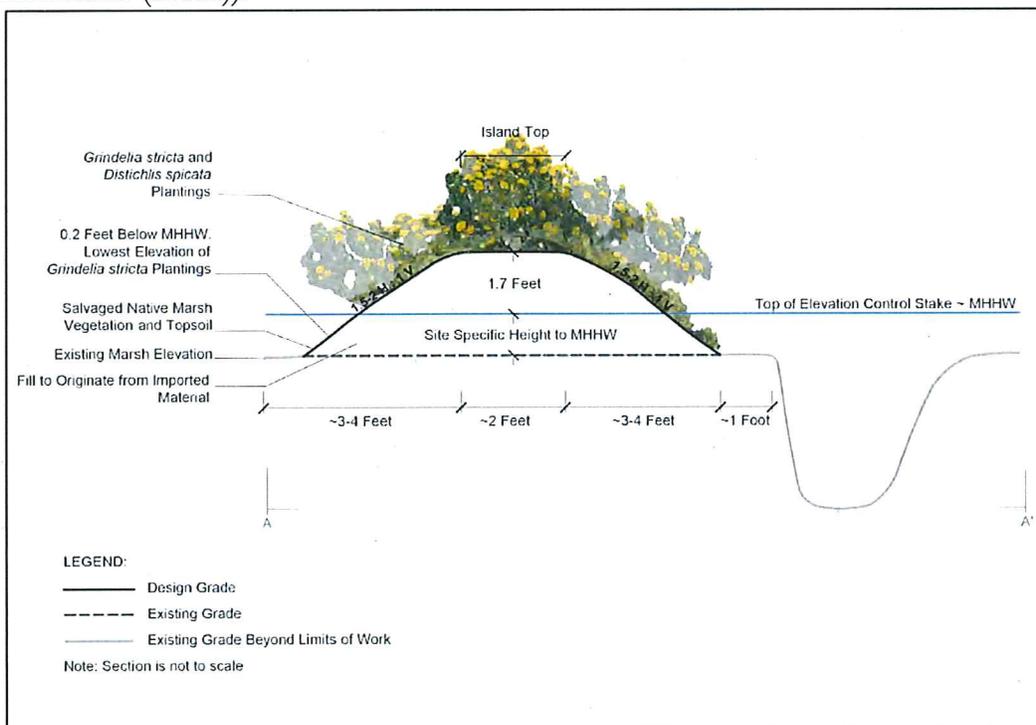


Figure 4. Typical cross-section of a high-tide refuge island (copied from Figure 8 in H.T. Harvey & Associates (2015a)).



Figure 5. Approximate locations where high-tide refuge islands will be installed in Outer Faber Marsh (copied from Figure 6 in H.T. Harvey & Associates (2015a)).

There are two general methods that may be used for refuge island construction: the use of in-situ bay mud collected from the marsh or via the import of terrestrial soil. The construction methods will be determined based on soil conditions (particularly moisture content) and logistical considerations. If it is infeasible to use bay mud, clean terrestrial soil will be imported to each island site using hand-tools. The fill may be transported to the marsh by dump truck to the nearest feasible access point, but no vehicles will enter marsh habitats. The contractor may also use boats (e.g., airboats) to import soil to Outer Faber Marsh, if that method is more logistically suitable. Ecologists for H.T. Harvey & Associates found that marsh mud in the footprint of the proposed refuge island locations in Outer Faber Marsh is too saturated and unconsolidated and therefore, not recommended for refuge island construction (H.T. Harvey & Associates 2015a). Instead, the ecologists for H.T. Harvey & Associates recommend that refuge islands be constructed using imported terrestrial fill. Use of terrestrial fill for construction will also reduce temporary impacts to Outer Faber Marsh which would have been caused by excavating in-situ marsh mud (H.T. Harvey & Associates 2015a).

Crews of approximately five to eight people will access and construct each refuge island over a one to two day period, during low tides. Refuge islands will be constructed by hand using shovels and other hand tools, from approximately 11 to 22 cubic yards of imported clean terrestrial fill meeting the specifications provided in Table 4 of H.T. Harvey & Associates (2015a). Terrestrial fill will be transported to island sites across the marsh from an adjacent berm using wheelbarrows (either hand operated or gas powered). A temporary plywood path will be laid down on the day of construction from the berm to the island site to protect marsh vegetation during transport of fill material. The surface area of fill at each refuge island site will be a maximum of 250 square feet (see Figures 4 and 5 for typical dimensions).

Prior to construction, approximately 4-6 vertical inches of the existing marsh vegetation, root structure, and sediment (hereafter, marsh sod) will be salvaged from the surface of the refuge island construction footprint. Following marsh sod removal, terrestrial fill will be placed in the island footprint, elevating an area of approximately 12 square feet (the island crest) to an elevation of approximately 1.7 feet above MHHW. Island tops will settle to approximately 1.3 feet above MHHW over a five-year period. Island tops will be flooded periodically during spring tides. Crews will make an effort to complete excavation and construction of each island during one low-tide cycle. However, if refuge island construction is not completed before the tide rises, measures such as tarping the excavated and salvaged materials will be employed to protect water quality until construction is completed during the following low-tide cycle. A total of about 8,250 square feet (0.19 acre) of tidal marsh habitat will be temporarily disturbed during construction of the five high-tide refuge islands in Outer Faber Marsh.

After the refuge island substrate is manually constructed and graded, salvaged marsh sod will then be placed on the top and side slopes of the constructed island to facilitate habitat establishment and erosion control. Moreover, the upper portion of each island will be densely planted with gumplant and saltgrass from container stock to facilitate establishment of refuge habitat. Marsh gumplant container stock (50, 1 gallon container plants per island) will be installed on 2-foot centers. Saltgrass will also be installed from container stock at all islands, next to each of the marsh gumplant plantings (50 saltgrass treeband container plants per island). Container plants will be purchased from a qualified plant nursery and collected from source populations located around the margins of southern San Francisco Bay (South Bay) (south of the San Mateo Bridge). An 8-12 month lead time prior to plant installation is typically necessary to contract grow the plants. Saltgrass planting is

intended to facilitate establishment of increased cover for refugia because saltgrass grows vertically into marsh gumplant canopies. Once mature, the planted marsh gumplant will provide high-tide refuge canopy extending approximately 2-3 feet above the highest predicted spring tides.

A qualified biologist will work with the contractor to reduce and minimize the impacts on wetlands from island construction access. Access to and from all refuge island sites will be conducted by foot from the nearest levee access point. During island construction, marsh vegetation roots and substrate will be thoroughly protected from damage. Protective materials such as plywood sheets (or equivalent) will be temporarily installed (for a maximum of two to three days) to completely cover all vegetated marsh areas that will be regularly accessed by workers and biologists during island construction, including the access pathways to construction sites and vegetation immediately surrounding the refuge island construction sites.

All dead marsh gumplant individuals will be replaced during the first two years of the plant establishment period. Additional plant replacement may occur in the third year if the Year 3 marsh gumplant performance criteria are not met. During the three year plant establishment period trash deposited within the planting areas will be removed when maintenance activities are performed.

The high-tide refuge islands will be monitored annually for five years. Monitoring will occur between September 1 and December 1 so that monitoring falls outside of the California clapper rail's breeding season (February 1 – August 31) and before mid-winter when high marsh vegetation has typically senesced. The first annual monitoring event will occur at the end of the first growing season following plant installation. High quality high-tide refuge habitat for California clapper rail and salt marsh harvest mouse should be at an appropriate elevation and sufficiently covered by native salt marsh vegetation to provide protection from flooding and predators during extreme high-tide events. Therefore, the final success criteria among high-tide refuge islands after five growing seasons will be as follows:

1. The average foliar cover among the refuge islands will be at least 70 percent provided by native plant species.
2. The average marsh gumplant canopy cover among the refuge islands will be at least 30 percent.
3. The average marsh gumplant height among the refuge islands will be at least 1.5 feet.
4. The average invasive plant foliar cover on each island will be less than 5 percent.
5. The average crest elevation of the ground surface among the refuge islands will be at least +0.8 feet above MHHW.

An Annual Monitoring Report will be submitted to the permitting agencies by February 1 following each monitoring year. Monitoring Reports will present the findings of the annual field surveys relative to the performance standards in the monitoring plan described above.

Transition Zone Habitat Enhancement along Faber Marsh Levees and Berms

The SFCJPA will remove invasive species from the levees and berms surrounding and within Main Faber Marsh and Outer Faber Marsh (with the exception of the western levee of Main Faber Marsh, which is being enhanced by the City of East Palo Alto as part of the habitat compensation requirements in the Runnymede Storm Drainage Improvements Phase II and O'Connor Pump Station Outfall Structure Repair Project (Service file number 81420-2011-F-0103-2, Service 2013b)) and revegetate them with appropriate marsh transition zone vegetation. The planting plan and plant palette will be designed to restore vegetation structure and composition that will provide high tide refuge habitat for the California clapper rail and salt marsh harvest mouse and will be subject to review and approval by the Service and the Refuge. The approximate areas and lengths of Faber Marsh levees where transition zone habitat will be enhanced are: northern levee 2.44 acres, 2,210 linear feet; southern levee 1.87 acres, 1,530 linear feet; and eastern levee 1.35 acres, 1,380 linear feet (Figure 6) (note the original estimate of 2.77 acres of north levee enhancement shown in Figure 6 has been revised by SFCJPA to 2.44 acres based on recent field data provided by H.T. Harvey & Associates) (K. Murray, SFCJPA, *in litt.* 2015e). The 1,530 linear feet of south levee enhancement is parallel to construction impacts on top of the levee as shown in Figure 6. The total amount of high tide refuge habitat enhancement on the Faber Marsh levees proposed by the proposed project is about 5.66 acres and approximately 5,120 linear feet. Functions and values of the native plant patches existing on the levees and the adjacent tidal marsh will be enhanced by habitat connectivity. More details on the transition zone habitat enhancement are available in the *San Francisquito Creek Flood Protection Project: Conceptual High-Tide Refuge Habitat Enhancement Plan* (H.T. Harvey & Associates 2015a).

The three plant palettes for transition zone habitat enhancement are Upland Plant Palette, Ecotone Plant Palette, and High Marsh Plant Palette and are described below and in H.T. Harvey & Associates (2015a):

1. Upland Plant Palette. These species will be installed in the Upland Planting Zone. This zone is commonly located on the tops of berms beyond the reach of tides. The graminoid and shrub species selected are either salt-sensitive or moderately salt tolerant. The soils in this zone are generally non-saline. Forb and grass species to be planted in the Upland Plant Palette include western ragweed, saltgrass, creeping wild rye, western goldenrod, bee-plant, and Pacific aster. Shrub species to be planted in the Upland Plant Palette include California sagebrush, marsh baccharis, lizard tail, and marsh gumplant.
2. Ecotone Plant Palette. These species will be installed in the Ecotone Planting Zone. This zone is located above the pickleweed-dominated high marsh and below the Upland Planting Zone and is occasionally inundated by the tides. These species consist of tidal salt marsh upland ecotone specialists such as saltgrass and marsh gumplant but also include high marsh and upland plants. The soils in this zone are moderately saline. Forb and grass species to be planted in the Ecotone Plant Palette include western ragweed, saltgrass, creeping wild rye, alkali heath, and perennial pickleweed. Shrub species to be planted in the Upland Plant Palette include California sagebrush, marsh baccharis, lizard tail, and marsh gumplant.
3. High Marsh Plant Palette. These species will be installed in the High Marsh Planting Zone. This planting palette consists of marsh gumplant interplanted into the existing native

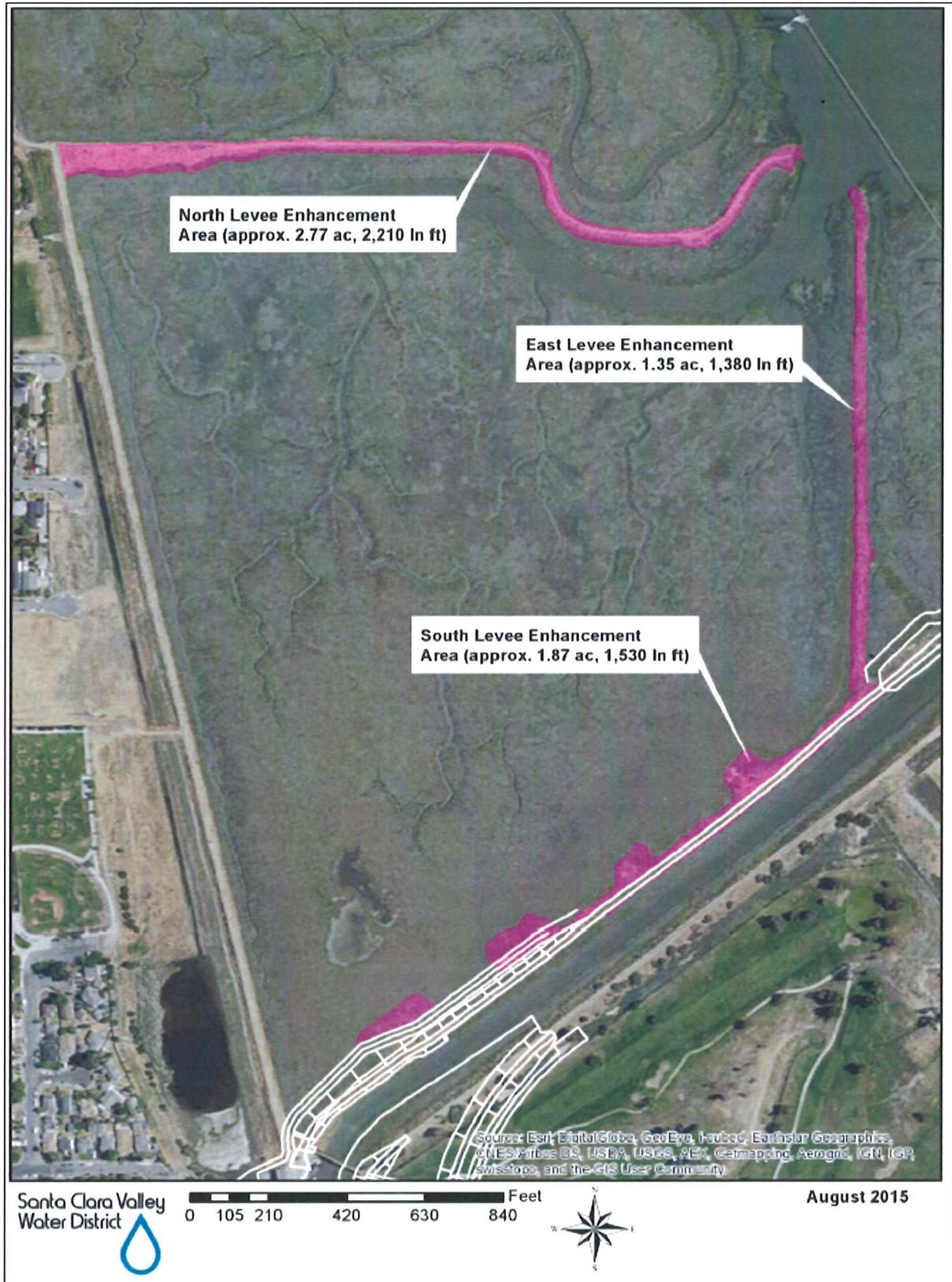


Figure 6. Proposed transition zone habitat enhancement areas along Faber Marsh levees (copied from Figure 1 in K. Murray, SFCJPA, *in litt.* 2015c).

pickleweed marsh to enhance high-tide refuge habitat. The soils in this zone are highly saline.

Plants will be installed between November 1 and January 31, during the rainy season and outside of the California clapper rail's breeding season. Plantings will require initial maintenance during a three-year plant establishment period following installation to become self-sustaining. The goal of habitat enhancement site maintenance is to facilitate the establishment of the target vegetation in the planting areas. Planting area maintenance during the three-year period will include dead plant replacement, irrigation, weed control, and trash removal. Irrigation will be placed that minimizes the access required to water the plants. A Service-approved biologist will be present if access is required during the California clapper rail's breeding season to the eastern berm of Main Faber Marsh.

In addition to this maintenance plan, annual site observations and data collected by a qualified restoration ecologist may be used to further specify maintenance actions necessary to establish the planting areas. All dead woody plants will be replaced during the first two years of the plant establishment period. Additional plant replacement may occur in the third year if the Year 3 percent shrub cover criterion is not met. Berm revegetation areas will require invasive plant control during the three-year plant establishment period. Potential weed removal treatments include hand-pulling and herbicide use. All herbicides used will be approved by the U.S. Environmental Protection Agency and the Refuge (*i.e.*, through a Refuge-approved Pesticide Use Proposal). Herbicide application will be guided by the Refuge's Comprehensive Conservation Plan for weed management (Service 2012c; Service, in prep.). Herbicides approved by the Refuge for terrestrial use include: Round-up, Glypro Plus, Roundup Pro, KleenUp Pro, Aquamaster and Rodeo (glyphosate), Garlon 4 Ultra (triclopyr), Habitat and Polaris (imazapyr), Milestone VM Plus and Capstone (aminopyralid and triclopyr), Telar (chlorsulfuron) and Transline (clopyralid). Herbicides approved by the Refuge for aquatic use include Habitat and Polaris (imazapyr) and Aquamaster, Roundup Custom, and Rodeo (glyphosate). The application of any pesticide, including herbicides, will be conducted in accordance with a Refuge-approved Pesticide Use Proposal. An annual pesticide use report will be completed for every Pesticide Use Proposal by January 31 each year for the previous year's activities. A qualified biologist will assess the type, distribution, and abundance of invasive plant species during annual monitoring and, when warranted, recommend effective control measures.

Non-native plant removal in breeding habitat during the California clapper rail's breeding season will be minimized to the maximum extent feasible. The eastern berm of Main Faber Marsh will not be accessed during the California clapper rail's breeding season unless a Service-approved biologist is present. Access to northern and southern berms of Main Faber Marsh during the California clapper rail's breeding season will be limited to the trail on the northern berm and the middle seeded area on the southern berm.

The transition zone habitat enhancement areas will be monitored for at least five years to ensure success criteria are met for the establishment of suitable native transition zone vegetation and the removal of invasive plant species. The forthcoming levee revegetation plan (to be included in the MMP) will be subject to the review and approval of the Service and the Refuge and will include the following vegetation success criteria to determine whether the revegetated levee(s) are on a trajectory to successfully establish high tide refuge habitat for California clapper rail and salt marsh harvest mice. The berm enhancement area should be sufficiently covered by a scattered patchwork of dense native shrubs within a matrix of non-invasive forb/grass-dominated vegetation to provide protection from flooding and predators for the California clapper rail and salt marsh harvest mouse

during extreme high-tide events. The shrub patches are intended to provide escape cover for California clapper rails and the intervening forb/grass vegetation between the shrub patches is intended to provide escape cover for salt marsh harvest mice. The shrub patches are also intended to remain discrete patches (rather than long, contiguous shrub habitat) to minimize use by mammalian predators. Therefore, the final success criteria among the upland, ecotone, and high marsh planting zones after five growing seasons will be as follows (H.T. Harvey & Associates 2015a; K. Murray, SFCJPA, *in litt.* 2015c):

1. Native shrub patches will be 20-80 feet long, at least 4 feet wide (as measured from the widest portions of the plant canopies), and have a minimum of 60 percent average canopy cover provided by native shrubs. Canopy cover includes the area within the general perimeter of the shrub canopy.
2. The distance between the outer boundaries of native shrub patches (with the characteristics described above) will be 25-200 feet; 200 feet is selected as a maximum as it equals the approximate radius of the California clapper rail's home range.
3. The forb/grass revegetation areas (located between the native shrub patches) will have at least 60 percent average foliar cover (all forb/grass areas combined) provided by non-invasive, herbaceous vegetation; non-invasive herbaceous species are those that are not listed as "high" negative ecological impact by the California Invasive Plant Council (Cal-IPC) (Cal-IPC 2015) and are also not listed as weed species with "highest priority" and "high priority" rankings for control by the Service's *South San Francisco Bay Weed Management Plan* (Marriott *et al.* 2013). Foliar cover is the absolute area of ground covered by plant species.
4. The berm enhancement area (shrub patches and forb/grass areas) will have less than 5 percent average foliar cover of invasive plant species. Invasive species are those that have "high" negative ecological impact as rated by Cal-IPC (Cal-IPC 2015) and weed species with "highest priority" and "high priority" rankings for control by the *South San Francisco Bay Weed Management Plan* (Marriott *et al.* 2013).

An Annual Monitoring Report will be submitted to the permitting agencies by February 1 following each monitoring year. Monitoring Reports will present the findings of the annual field surveys relative to the performance standards in the monitoring plan described above.

Revegetation and Monitoring and Invasive Plant Species Control

The SFCJPA will monitor the re-vegetation in the channel and on levees for a minimum of five years to ensure they are successfully established with suitable native plant species and meet the success criteria under a Service-approved MMP. Monitoring will include the removal of any invasive plants.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed project, the action area encompasses all suitable tidal marsh, transition zone, and upland refugia habitat for the salt marsh harvest mouse and California clapper rail along the 7,450-foot length of San

Francisquito Creek between San Francisco Bay and the East Bayshore Road/Highway 101 Bridge. The action area also includes all suitable upland foraging/dispersal habitat and diked marsh habitat for the salt marsh harvest mouse contiguous with and within 328 feet of suitable tidal marsh habitat along San Francisquito Creek between San Francisco Bay and the East Bayshore Road/Highway 101 Bridge. The action area also includes all suitable tidal marsh, transition zone, and upland refugia habitat within the approximately 81.5-acre Refuge-managed Main Faber Marsh and the adjacent approximately 13.8-acre Outer Faber Marsh (*i.e.*, the triangle-shaped marsh between Main Faber Marsh and San Francisco Bay) that would be indirectly affected by altered hydrology and predator management. The action area also includes the adjacent 91-acre Refuge-managed Laumeister Marsh where predator management would be implemented for the benefit of the salt marsh harvest mouse and California clapper rail.

Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analyses in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the salt marsh harvest mouse's and California clapper rail's range-wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the salt marsh harvest mouse and California clapper rail in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the salt marsh harvest mouse and California clapper rail; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the salt marsh harvest mouse and California clapper rail; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the salt marsh harvest mouse and California clapper rail.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the salt marsh harvest mouse's and California clapper rail's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the salt marsh harvest mouse and California clapper rail and the role of the action area in the survival and recovery of salt marsh harvest mouse and California clapper rail as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Status of the Species

Salt Marsh Harvest Mouse

There are two subspecies of the salt marsh harvest mouse: the northern subspecies (*R. r. halicoetes*) and the southern subspecies (*R. r. raviventris*). Both subspecies are listed as endangered. The status of the salt marsh harvest mouse and information about its biology, ecology, distribution, and current threats is available in the *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Recovery Plan) (http://ecos.fws.gov/docs/recovery_plan/TMRP_Final.pdf; Service 2013a). Critical habitat has not been designated for this species. No change in the species' listing status was

recommended in the February 2010 5-year review (Service 2010). Threats evaluated during that review and discussed in the Recovery Plan have continued to act on the species since the February 2010 5-year review and the August 27, 2013 Recovery Plan were finalized, with loss of habitat being the most significant effect. While there have been continued losses of salt marsh harvest mouse habitat throughout the various recovery units, including the Central/South San Francisco Bay Recovery Unit where the proposed project is located, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. The Service is in the process of finalizing its most current 5-year review for the species.

California Clapper Rail

The status of the California clapper rail and information about its biology, ecology, distribution, and current threats is available in the Recovery Plan (http://ecos.fws.gov/docs/recovery_plan/TMRP_Final.pdf; Service 2013a). Critical habitat has not been designated for this species. Threats evaluated in the Recovery Plan have continued to act on the species since the August 27, 2013 Recovery Plan was finalized, with loss of habitat and predation being the most significant effects. While there have been continued losses of California clapper rail habitat throughout the various recovery units, including the Central/South San Francisco Bay Recovery Unit where the proposed project is located, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. The Service is in the process of finalizing its most current 5-year review for the species.

Environmental Baseline

San Francisquito Creek

San Francisquito Creek is a perennial stream that drains a 45-square-mile basin. There are about 7,450 linear feet of San Francisquito Creek within the action area for the proposed project between San Francisco Bay and the East Bayshore Road/Highway 101 Bridge. The 2,850-foot-long lower reach of San Francisquito Creek (San Francisco Bay to Friendship Bridge) is located between the tidal marshes of Main Faber Marsh and Outer Faber Marsh to the north (right bank) and the Palo Alto Municipal Golf Course to the south (left bank) (Figure 1). The lower reach of San Francisquito Creek contains tidal marsh dominated by tule, marsh gumplant, alkali heath, and saltgrass and provides suitable breeding, foraging, and dispersal habitat for salt marsh harvest mice and California clapper rails. The middle and upper reaches of San Francisquito Creek (upstream of Friendship Bridge) within the action area are less tidally influenced and transition from brackish to freshwater riparian habitat; the middle and upper reaches are less suitable for salt marsh harvest mouse and California clapper rail foraging and dispersal. The quality of the tidal and brackish marsh within the middle and upper reaches of the creek is degraded due to the relatively sparse vegetative cover, frequent inundation during winter storms, the marsh is highly fragmented and located within a highly urbanized environment, and the presence of ruderal and invasive plant species (*e.g.*, perennial pepperweed) and avian and mammal predators (*e.g.*, raptors, feral cats, skunks, red foxes, opossums, crows, and western scrub-jays).

Main Faber Marsh

Main Faber Marsh is a very high quality approximately 81.5-acre restored tidal marsh managed by the Refuge that supports one of the highest density populations of the California clapper rail range-

wide (Liu *et al.* 2012; L. Liu, Point Blue Conservation Science, pers. comm. 2014) and a population of the salt marsh harvest mouse. Main Faber Marsh is located immediately north of the lower reach of San Francisquito Creek, east of a residential neighborhood of the City of East Palo Alto, south of the Refuge-managed native tidal marsh of Laumeister Marsh, and west of Outer Faber Marsh and San Francisco Bay. The tidal marsh of Main Faber Marsh is dominated by pickleweed, cordgrass, and salt grass.

Levees and berms surrounding the majority of Main Faber Marsh reduce the frequency of fluvial and tidal flooding of the tidal marsh which benefits the salt marsh harvest mouse and California clapper rail. Salt marsh harvest mice and California clapper rails are more vulnerable to predation during flooding events when suitable unsubmerged cover is limited (Albertson 1995, Overton *et al.* 2014, Service 2013a). Salt marsh harvest mouse nests may be inundated during flooding events resulting in the loss of all mice within the nest (R. Perrera, Huffman-Broadway Group, Inc., pers. comm. 2012). Therefore, the levees and berms around Main Faber Marsh provide some benefit to the salt marsh harvest mouse and California clapper rail by reducing the frequency of flooding of the tidal marsh. However, the levees and berms also provide pathways for mammal predators into the marsh which increases the risk of predation on salt marsh harvest mice and California clapper rails in Main Faber Marsh.

Vegetation within the transition zone habitat along the levees and berms of Main Faber Marsh also provides important upland refugia cover for salt marsh harvest mice and California clapper rails during extreme high tide and flooding events by providing shelter for the mice and the rails from avian and mammalian predators. However, the quality of the vegetation along the levees and berms around Main Faber Marsh is degraded due to the presence of invasive plant species like perennial pepperweed and mustard that provide poor quality high-tide refugia cover because these plants are leafless in the winter when the salt marsh harvest mouse and California clapper rail are in most need of suitable high-tide refugia cover during the more frequent storm and extreme high tide events. The existing berms provide poor quality high tide refuge habitat for salt marsh harvest mouse and California clapper rail due to a lack of suitable canopy structure because the existing vegetation is dominated by low-growing perennials, frequent bare patches, and monotypic patches of annual plants (*e.g.*, black mustard) (H.T. Harvey & Associates 2015a). Pickleweed cover on berm side slopes provides good cover for the salt marsh harvest mouse, but does not provide sufficient escape cover from predators for California clapper rail during extreme high-tides (H.T. Harvey & Associates 2015a). H.T. Harvey & Associates (2015a) reports that refuge habitat for the California clapper rail could be substantially improved on berm side-slopes at Main Faber Marsh if native shrub patches were planted.

Without suitable high-tide refugia cover, the salt marsh harvest mouse and California clapper rail are vulnerable to predation during extreme high tide and flooding events when suitable unsubmerged cover is limited. The tops of the north and east berms of Main Faber Marsh are largely dominated by low growing non-native plants such as slenderleaf iceplant, riggut brome, and highway iceplant, monotypic stands of annual black mustard, and small isolated patches of perennial pepperweed (H.T. Harvey & Associates 2015a). Low-growing native plants such as alkali heath and saltgrass also occur at relatively low abundance compared to non-native species (H.T. Harvey & Associates 2015a). Along the tops of the southern berm and the western end of the northern berm of Main Faber Marsh (where soils are non-saline), annual non-native plants such as wild oats, black mustard, and riggut brome are dominant (H.T. Harvey & Associates 2015a). Berm side-slopes are primarily

covered with native perennial pickleweed with scattered patches of marsh gumplant and other high marsh vegetation.

A levee on the western side of Main Faber Marsh contains a pedestrian trail (the San Francisco Bay Trail) which separates the tidal marsh of Main Faber Marsh from the residential neighborhood of the City of East Palo Alto to the west. The City of East Palo Alto is currently enhancing transition zone habitat for the salt marsh harvest mouse and California clapper rail along about 2,100 linear feet (0.58 acre) of the outboard (Main Faber Marsh) side of this levee between Runnymede Street and San Francisquito Creek (WRA Environmental Consultants 2013). The transition zone habitat enhancement being conducted by the City of East Palo Alto is compensation for the effects of the temporary disturbance of about 3.6 acres of salt marsh harvest mouse and California clapper rail habitat along the inboard (City of East Palo Alto) side of this levee in the Runnymede Storm Drainage Improvements Phase II and O'Connor Pump Station Outfall Structure Repair Project (Service file number 81420-2011-F-0103-2, Service 2013b).

A berm along the southern edge of Main Faber Marsh separates the tidal marsh of Main Faber Marsh from the San Francisquito Creek channel. The quality of transition zone habitat along the southern berm of Main Faber Marsh is also low due to dominance of invasive mustard. An approximately 400-foot-long low spot in this berm downstream of the Friendship Bridge allows the five-year flood event to overtop the berm and flood Main Faber Marsh (20 percent chance of happening once in any given year) during average tidal conditions. The potential for flood flows spilling from San Francisquito Creek into Main Faber Marsh are currently limited by flow constrictions upstream (such as the Pope-Chaucer Bridge, Highway 101, and the channel near Highway 101) that reduce the amount of flows able to reach the lower reach of San Francisquito Creek and spill over into Main Faber Marsh. However, in 2015, Caltrans initiated construction of the enlargement of the U.S. Highway 101/East Bayshore Road Bridge (Caltrans facility) over San Francisquito Creek to increase the channel capacity to 9,400 cubic feet per second (cfs), the 100-year flood event for San Francisquito Creek. Once the enlargement of the Caltrans facility is completed, the maximum fluvial flood flow that could reach the lower reach of San Francisquito Creek adjacent to Main Faber Marsh will increase to 7,400 cfs. A 7,400 cfs fluvial flood flow in the lower reach of San Francisquito Creek would result in about 1,025 cfs of flow spilling into Main Faber Marsh during the 100-year flood event under average high tide conditions (an increase of 715 cfs over the 310 cfs of flow spilling into Main Faber Marsh during the 100-year flood flow under existing conditions) (M. Jones, ICF International, *in litt.* 2014). Flow constrictions further upstream (*e.g.*, Middlefield Road Bridge) will still limit the ability of the San Francisquito Creek channel to pass the 9,400 cfs 100-year flood event. The flow constriction at the Middlefield Road Bridge only allows 6,700 cfs to pass through the San Francisquito Creek channel. Pump stations downstream of Middlefield Road Bridge contribute an additional 700 cfs of flood flows to the San Francisquito Creek channel resulting in a total maximum flood flow of 7,400 cfs that could pass through the lower reach of San Francisquito Creek and the spilling of 1,025 cfs of flows into Main Faber Marsh once construction of the Caltrans facility is completed. Thus, once construction of the Caltrans facility is completed, the volume and frequency of flood flows entering Main Faber Marsh will increase resulting in an increased risk of predation on California clapper rails and salt marsh harvest mice and the flooding of salt marsh harvest mouse nests.

Outer Faber Marsh

Outer Faber Marsh is an approximately 13.8-acre triangle-shaped, low-elevation tidal marsh area located between Main Faber Marsh to the west, San Francisco Bay to the east, and immediately north of the mouth of San Francisquito Creek. Outer Faber Marsh is at a lower elevation than Main Faber Marsh and is dominated primarily by Pacific cordgrass with perennial pickleweed primarily located adjacent to the eastern and southern perimeter berms and along some channel edges (H.T. Harvey & Associates 2015a). Marsh gumplant grows in small patches along some of the tidal channels in Outer Faber Marsh. Overall, the marsh lacks sufficient high-tide refuge cover for the California clapper rail (H.T. Harvey & Associates 2015a). Additionally, the majority of the marsh also lacks high quality refuge cover for the salt marsh harvest mouse due to the relatively low elevations of the marsh plain (H.T. Harvey & Associates 2015a).

The levees and berms around Outer Faber Marsh are dominated by invasive plant species (about 58 percent cover) comprised mostly of invasive mustard and ice plant; however, the southern levee (Bay levee) contains more suitable native transition zone habitat (*e.g.*, marsh gumplant) than the western levee. The marsh is surrounded by PG&E towers and boardwalks and levees that increase predation risk on salt marsh harvest mice and California clapper rails in Outer Faber Marsh; the boardwalks and levees provide access for mammal predators while the PG&E towers provide perch and nest sites for raptors they may prey upon salt marsh harvest mice and California clapper rails in Outer Faber Marsh and the adjacent Main Faber Marsh. Due to the marsh's exposed location along San Francisco Bay and its lower elevation, Outer Faber Marsh is subject to more frequent tidal flooding and wave fetch than the more protected tidal marsh of Main Faber Marsh to the west. A north-south levee separates Outer Faber Marsh from Main Faber Marsh, while an east-west levee (the Bay levee) separates Outer Faber Marsh from the lower reach of San Francisquito Creek. Outer Faber Marsh provides lower quality breeding, foraging and dispersal habitat for salt marsh harvest mice and California clapper rails due to its exposure to more frequent tidal flooding and wave fetch from the Bay. Vegetation along the Bay levee and the berm separating Outer Faber Marsh from Main Faber Marsh provide transition zone habitat for salt marsh harvest mice and California clapper rails which shelter the mice and the rails from predation during extreme high tide and flooding events when the marsh plain is flooded; however, the quality of the transition zone habitat is low due to the dominance of invasive plant species which are leafless in the winter when the salt marsh harvest mouse and California clapper rail are in most need of suitable cover during the more frequent extreme high tide and winter storm events.

Laumeister Marsh

The Refuge-managed Laumeister Marsh is an approximately 91-acre high quality native tidal marsh located immediately north of Main Faber Marsh. Laumeister Marsh is bounded by the San Francisco Bay Trail levee and a residential neighborhood of the City of East Palo Alto to the west and the Cooley Landing public park to the north. The City of East Palo Alto is currently making improvements to Cooley Landing Park to increase public access and recreational opportunities (Cooley Landing Project). The Service issued a biological opinion for the indirect effects of increased public access at Cooley Landing Park on salt marsh harvest mice and California clapper rails in Laumeister Marsh (Service file number 81420-2011-F-0552-1; Service 2011). The City of East Palo Alto will minimize the indirect effects of increased public access at Cooley Landing Park by implementing a five-year adaptive mammal predator management plan beginning in October 2014 (Huffman-Broadway Group, Inc. 2011).

Diked Marsh Habitat at Palo Alto Municipal Golf Course

There about 2.7 acres of diked marsh habitat within the action area at the Palo Alto Municipal Golf Course adjacent to San Francisquito Creek. The diked marsh habitat within the action area is dominated by pickleweed and Mediterranean barley. The diked marsh habitat and adjacent ruderal grasslands at the Palo Alto Municipal Golf Course provide lower quality breeding, dispersal, and foraging habitat for salt marsh harvest mice. The managed turf of the golf course is not suitable habitat for the salt marsh harvest mouse because the turf grass is actively managed and maintained at a low height unsuitable for providing cover for the salt marsh harvest mouse. The diked marsh habitat within the action area is not suitable habitat for the California clapper rail because it is not tidally influenced.

Ruderal Annual Grassland

There are about 17.5 acres of ruderal annual grassland habitat within the action area along the middle reach of the San Francisquito Creek corridor. The ruderal annual grassland within the action area is dominated by wild oat and ripgut brome. The ruderal annual grassland habitat within the action area that is contiguous with and within 328 feet of suitable tidal salt or brackish marsh habitat along San Francisquito Creek provides suitable foraging and dispersal habitat for the salt marsh harvest mouse (Service 2010). The quality of the ruderal grassland within the action area is degraded by the presence of heavily used trails, abundance of predators in a highly urbanized environment, and frequent mowing.

Salt Marsh Harvest Mouse

Central/South San Francisco Bay Recovery Unit

The action area for the proposed project occurs within the Recovery Plan's Central/South San Francisco Bay Recovery Unit for the salt marsh harvest mouse (Service 2013a). The Central/South San Francisco Bay Recovery Unit is within the range of the southern subspecies of the salt marsh harvest mouse (*R. r. raviventris*) (Service 2013a). The population status of the southern subspecies is more precarious than that of the northern subspecies (*R. r. halicoetes*). Few major, resilient, or secure populations of the southern subspecies of the salt marsh harvest mouse persist within the Central/South San Francisco Bay Recovery Unit. The current populations within this recovery unit are very small and isolated compared with the historical pattern of distribution and abundance of the subspecies. All major population centers of the southern subspecies are remote from one another based on dispersal distances known for the species. Predation by mammalian and avian predators and spread of invasive plant species (*e.g.*, perennial pepperweed) are major threats to salt marsh harvest mice in the Central/South San Francisco Bay Recovery Unit (Albertson 1995, Service 2010, Service 2013a).

Levees adjacent to tidal marsh habitat and PG&E's numerous boardwalks provide access for mammalian predators that may prey on salt marsh harvest mice and California clapper rails in the adjacent marsh. PG&E's numerous transmission towers and transmission lines within tidal marsh habitat in the South Bay provide artificial perches and nesting platforms for raptors (*e.g.*, red-tailed hawks, crows, ravens, northern harriers, peregrine falcons, kestrels, white-tailed kites, gulls, great blue herons, barn owls, short-eared owls, great horned owls) that may prey on salt marsh harvest mice and California clapper rails in the adjacent marshes (Albertson 1995; Olofson Environmental,

Inc. 2011a; J. Albertson, Refuge, pers. comm. 2014). Raptors that nest and perch on PG&E's transmission towers and transmission lines in tidal marsh in the South Bay have been observed hunting in tidal marsh habitat known to be occupied by breeding salt marsh harvest mice and California clapper rails (Albertson 1995; Olofson Environmental, Inc. 2011a; J. Albertson, Refuge, pers. comm. 2014). Predation rates increase during extreme high tide events when cover is limited.

The Refuge annually funds the U.S. Department of Agriculture Wildlife Services to control mammalian predators that threaten the salt marsh harvest mouse and California clapper rail on Refuge lands in the South Bay. The priority areas for predator management at the Refuge are Ideal Marsh, Dumbarton Marsh, Mowry Marsh, Main Faber Marsh, and Laumeister Marsh (Refuge 2013). The Refuge, however, lacks the funding to adequately control all mammalian predators that threaten the salt marsh harvest mouse and California clapper rail on Refuge lands in the South Bay (J. Albertson, Refuge, pers. comm. 2014). In 2012, Cargill, Inc. (Cargill) restarted the annual funding of the U.S. Department of Agriculture Wildlife Services for mammalian predator management for the benefit of the salt marsh harvest mouse and California clapper rail for a 10-year period along Cargill's 44 miles of salt pond levees that are adjacent to tidal marsh habitat in the Newark, Mowry, and Redwood City salt pond complexes in the South Bay at the Refuge in Alameda and San Mateo counties. The annual funding of mammalian predator management by Cargill is a condition of the Service's biological opinion on the issuance of a 10-year Corps regional general permit for Cargill's salt pond levee operation and maintenance work in the South Bay (Service file number 81420-2010-F-0519; Service 2012a). The areas where Cargill will be funding mammalian predator management are outside of the action area for the proposed project. The City of East Palo Alto is contributing funding for a five-year mammalian predator management program at Cooley Landing beginning in 2015 adjacent to Laumeister Marsh about 0.5 mile north of Main Faber Marsh (Huffman-Broadway Group, Inc. 2011). The annual funding of mammalian predator management by the City of East Palo Alto is a condition of the Service's biological opinion on the Cooley Landing Project to minimize the effects of increased public use at Cooley Landing (81420-2011-F-0552-1; Service 2011).

The Refuge finalized an avian predator management plan in 2012 for the benefit of the salt marsh harvest mouse, California clapper rail, western snowy plover, and other listed species on its Refuge lands in the South Bay (Refuge 2012). PG&E is currently working with the Refuge to assist in the implementation of the avian predator management plan by responding to the Refuge's requests to remove raptor nests from PG&E transmission towers within habitat for the salt marsh harvest mouse, California clapper rail, western snowy plover, and California least tern. PG&E's assistance with the avian predator management program is a requirement of the Refuge's Special Use Permit, which was renewed in 2013 (E. Mruz, Refuge, pers. comm. 2012; Service file number 81420-2011-F-0592-2; Service 2012b). At the request of the Refuge, PG&E removed 8-10 raptor nests (mostly raven nests and two red-tailed hawk nests) from listed species habitat in 2013 (C. Strong, Refuge, pers. comm. 2014; K. Sawyer, Refuge, *in litt.* 2013). However, the majority of the raptor nest removal conducted by PG&E in 2013 was for the benefit of the western snowy plover rather than the salt marsh harvest mouse and California clapper rail. PG&E removed a red-tailed hawk nest from a PG&E tower near the San Mateo Bridge toll plaza in Alameda County within salt marsh harvest mouse habitat west of Eden Landing Pond 10 in April 2013 (K. Sawyer, Refuge, *in litt.* 2013). No raptor nests were removed from California clapper rail habitat in 2013 (K. Sawyer, Refuge, *in litt.* 2013). Raptor nests (primarily ravens and red-tailed hawks) were removed from PG&E towers at 14 locations within or near tidal marsh habitat for the salt marsh harvest mouse and California clapper rail in the South Bay in 2014 outside of the action area (C. Strong, Refuge,

pers. comm.). PG&E removed several ravens' nests at the request of the Refuge from transmission towers near the action area near Faber Marsh in 2015 (R. Tertes, Refuge, 2015). However, the Refuge lacks the resources to adequately monitor all of PG&E's transmission towers for raptor nests (J. Albertson, Refuge, pers. comm. 2014). Therefore, raptor predation facilitated by PG&E transmission towers within tidal marsh habitat continues to be a major threat to salt marsh harvest mice and California clapper rails in the South Bay.

The Refuge finalized a weed management plan in 2013 to control invasive plant species (*e.g.*, perennial pepperweed) that threaten the tidal marsh and upland refugia habitat for the salt marsh harvest mouse and California clapper rail on Refuge lands in the South Bay (Marriott *et al.* 2013). The Refuge, however, lacks the resources to adequately implement its weed management plan (R. Tertes, Refuge, pers. comm. 2013). Cargill will implement the Refuge's weed management plan on the 12,100 acres of Cargill's property within the Newark, Mowry, and Redwood City salt pond complexes as a condition of the Service's biological opinion on the issuance of a 10-year Corps regional general permit for Cargill's salt pond levee operation and maintenance work in the South Bay (Service file number 81420-2010-F-0519; Service 2012a); the weed management that will be conducted by Cargill is outside of the action area for SFCJPA's proposed project.

Habitats within the Action Area

The expansive tidal marshes within the action area within Main Faber Marsh and the adjacent Laumeister Marsh provide high quality breeding, foraging, and dispersal habitat for salt marsh harvest mice. Outer Faber Marsh provides lower quality breeding habitat for the salt marsh harvest mouse since the tidal marsh is at a lower elevation and more exposed to tidal flooding and wave fetch due to its exposed location along San Francisco Bay. Potential breeding habitat for the salt marsh harvest mouse in Outer Faber Marsh is limited to the mid-elevation pickleweed marsh near the southern and western berms. Salt marsh harvest mice may also breed, forage, and disperse through the diked marsh habitat at the Palo Alto Municipal Golf Course near San Francisquito Creek. Salt marsh harvest mice are unlikely to utilize the managed turf of the adjacent golf course because it is actively managed, and the vegetation is maintained at a low height and thus does not provide suitable cover for the mouse.

The fringe of tidal marsh along the lower reach of San Francisquito Creek (downstream of Friendship Bridge) (Figure 1) provides moderate quality breeding, foraging, and dispersal habitat for salt marsh harvest mice; the suitability of this marsh for the salt marsh harvest mouse is reduced by frequent inundation of the marsh during winter storms. The fringe of tidal and brackish marsh along the middle reach of San Francisquito Creek (between Friendship Bridge and Daphne Way/Geng Road) (Figure 1) provides low quality breeding, foraging, and dispersal habitat for the salt marsh harvest mouse due to the marsh's sparse vegetative cover, frequent inundation during winter storms, the fragmented nature of the habitat, the presence of invasive plant species (*e.g.*, perennial pepperweed) and avian and mammal predators and frequent disturbance by trail users. The ruderal annual grassland habitat that is contiguous with and within 328 feet of the tidal and brackish marsh of the middle reach of San Francisquito Creek provides low quality foraging and dispersal habitat for the salt marsh harvest mouse. The marsh along the upper reach of San Francisquito Creek (Daphne Way/Geng Road to Highway 101) (Figure 1) is unsuitable for the salt marsh harvest mouse because it is less tidally influenced, has sparse vegetative cover, is frequently inundated during winter storms, highly fragmented, and located within a highly urbanized environment degraded by the presence of invasive plant species and avian and mammal predators.

Transition zone habitat along the levees and berms of Main Faber Marsh, Laumeister Marsh, San Francisquito Creek, and Outer Faber Marsh provide upland refugia cover for the salt marsh harvest mouse during extreme high tide and flooding events when the marsh plain is inundated. However, the quality of the transition zone habitat within the action area is low due to a lack of suitable canopy structure because the existing vegetation is dominated by invasive plant species, low-growing perennials, frequent bare patches, and monotypic patches of annual plants (*e.g.*, black mustard) (H.T. Harvey & Associates 2015a). Without suitable upland refugia cover, the salt marsh harvest mouse is more vulnerable to predation during extreme high tide and flooding events. Recent studies of the movement of the northern subspecies of salt marsh harvest mouse during extreme high tide events in tidal marsh in Suisun Bay found that the majority of the salt marsh harvest mice stayed in the marsh and climbed tall emergent vegetation to escape flood waters instead of moving horizontally into upland habitats along levees (Smith *et al.* 2014). Thus Smith *et al.* (2014) stressed the importance of tall emergent vegetation within the marsh to provide high tide refugia cover. However, the authors added that upland habitats along levees may be more important as high tide refugia cover to the southern subspecies of salt marsh harvest mouse in the South Bay due to the shorter heights of the marsh vegetation and the narrower widths of the marshes.

Occurrences near the Action Area

There are no known recent surveys of salt marsh harvest mouse that have been conducted within the action area. However, there are several reports of salt marsh harvest mice occurring near the action area. The San Francisco Estuary Institute (<http://www.sfei.org/content/salt-marsh-harvest-mouse-database-and-maps>) and California Natural Diversity Database (CNDDDB; CDFW 2015) report the following salt marsh harvest mouse survey data within 0.5 mile of the action area for the proposed project:

1. Two hundred forty salt marsh harvest mice captured in tidal marsh habitat of the Palo Alto Baylands about 0.25 mile southeast of the action area during 2,050 trapping nights in 1972 (capture efficiency (CE) = 9.56) (site number 240; Wondolleck, unpubl. data, 1972);
2. Five salt marsh harvest mice captured in tidal marsh habitat of the Palo Alto Baylands about 0.25 mile southeast of the action area during 480 trapping nights in 1993 (CE = 1.04) (site number 502; Steinberg, unpubl. data, 1993);
3. One salt marsh harvest mouse captured in tidal marsh habitat of the Palo Alto Baylands about 0.25 mile southeast of the action area during 200 trapping nights in 1980 (CE = 0.5) (site number 91; Service, unpubl. data, 1980);
4. One salt marsh harvest mouse captured in tidal marsh habitat at the northern edge of the Laumeister Tract of the Refuge about 0.5 mile north of the action area during 800 trapping nights in 1990 (CE = 0.13) (site number 232; H.T. Harvey and Associates, unpubl. data, 1990); and
5. Twelve adult salt marsh harvest mice found in the Laumeister Tract of the Refuge south of Bay Road about 0.5 mile north of the action area in January 1991 (CNDDDB occurrence number 131, CDFW 2015).

There is no recent survey data available for salt marsh harvest mice near the action area since 1993. However, a biological monitor for the City of East Palo Alto's Cooley Landing Project (Service file number 81420-2011-F-0552-1; Service 2011) reported the observation of a potential salt marsh harvest mouse nest during vegetation removal activities at Cooley Landing along the northern edge of Laumeister Marsh in November 2011. The biological monitor, however, could not find the nest during surveys of the area weeks later likely due to the nest being flooded during an extreme high tide event that month (R. Perrera, Huffman-Broadway Group, Inc., pers. comm. 2012). Mice were also observed recently during vegetation removal within diked brackish marsh habitat immediately west of Main Faber Marsh in October 2014 for the Runnymede Storm Drainage Improvements Phase II and O'Connor Pump Station Outfall Structure Repair Project (Service file number 81420-2011-F-0103-2); however, the biological monitor was not able to determine whether the mice were salt marsh harvest mice (K. Allan, WRA Environmental Consulting, pers. comm. 2014).

Based on the known occurrence of the salt marsh harvest mouse near the action area and the availability of suitable habitat, the Service believes the salt marsh harvest mouse is likely to be present within all suitable tidal marsh, brackish marsh, diked marsh, and adjacent upland habitats (within 328 feet of suitable marsh habitat) throughout the action area within Main Faber Marsh, Outer Faber Marsh, Laumeister Marsh, along the lower and middle reaches of San Francisquito Creek, and the diked marsh habitat at the Palo Alto Municipal Golf Course near San Francisquito Creek.

California Clapper Rail

Central/South San Francisco Bay Recovery Unit

The action area for the proposed project occurs within the Recovery Plan's Central/South San Francisco Bay Recovery Unit for the California clapper rail (Service 2013a). The Central/South San Francisco Bay Recovery Unit supports the majority of California clapper rail populations. Populations in this unit are widely separated from northern ones, but there may be occasional dispersal between these areas. Predation by mammalian and avian predators is one of the primary threats to California clapper rails in the Central/South San Francisco Bay Recovery Unit (Albertson 1995, Service 2013a, Overton *et al.* 2014).

Levees adjacent to tidal marsh habitat and PG&E's numerous boardwalks provide access for mammalian predators that may prey on California clapper rails in the adjacent marsh. PG&E's numerous transmission towers and transmission lines within tidal marsh habitat in the South Bay provide artificial perches and nesting platforms for raptors (*e.g.*, red-tailed hawks, crows, ravens, northern harriers, peregrine falcons, kestrels, white-tailed kites, gulls, great blue herons, barn owls, short-eared owls, great horned owls) that may prey on California clapper rails in the adjacent marshes (Albertson 1995; Olofson Environmental, Inc. 2011; Overton *et al.* 2014; J. Albertson, Refuge, pers. comm. 2012). Raptors that nest and perch on PG&E's transmission towers and transmission lines in tidal marsh in the South Bay have been observed hunting in tidal marsh habitat known to be occupied by breeding California clapper rails (Albertson 1995; Olofson Environmental, Inc. 2011; J. Albertson, Refuge, pers. comm. 2012). Predation rates increase during extreme high tide events when cover is limited.

Overton *et al.* (2014) tracked 108 radio-marked California clapper rails at four marshes within the Central/South San Francisco Bay Recovery Unit (*i.e.*, Colma Marsh, Arrowhead Marsh, Laumeister

Marsh, and Cogswell Marsh) and estimated survival rates over 166 weeks between 2007 and 2009. Overton *et al.* (2014) found that most of the California clapper rails (53 percent) died due to predation with raptors depredate 30 individual California clapper rails (28 percent) and mammals depredate 27 individual California clapper rails (25 percent). Seasonal risk of mortality was more than twice as great in the winter than in other seasons (Overton *et al.* 2014). The mortality rate of California clapper rails increased during periods of greater tidal inundation in all four marshes studied, but the impact of tide level was greatest in the winter when senesced vegetation reduced available refuge cover (Overton *et al.* 2014). The annual survival rate for California clapper rails at Laumeister Marsh was 0.227 (Overton *et al.* 2014). Preliminary data from the U.S. Geological Survey shows that predation by avian predators followed by feral cats are the primary causes of mortality of the California clapper rail within Main Faber Marsh (C. Overton, U.S. Geological Survey, pers. comm. 2015).

The Refuge's goal for predator management at the Refuge is to increase California clapper rail population densities to 2.96 rails per acre (Refuge 2013). However, the Refuge lacks the resources to adequately control all mammalian and avian predators that threaten the California clapper rail (J. Albertson, Refuge, pers. comm. 2014). See the discussion above for the salt marsh harvest mouse regarding the implementation of mammalian and avian predator control and a weed management plan at the Refuge and within the Central/South San Francisco Bay Recovery Unit. No raptor nests were removed from PG&E towers within California clapper rail habitat in 2013 (K. Sawyer, Refuge, *in litt.* 2013). Raptor nests (primarily ravens and red-tailed hawks) were removed from PG&E towers at 14 locations in the South Bay within or near tidal marsh habitat for the California clapper rail in 2014 (C. Strong, Refuge, pers. comm.); however, no raptor nest removal occurred within the action area in 2014. PG&E removed several ravens' nests at the request of the Refuge from transmission towers near the action area near Faber Marsh in 2015 (R. Tertes, Refuge, 2015). The Refuge lacks the resources to adequately monitor all of PG&E's transmission towers for raptor nests (J. Albertson, Refuge, pers. comm. 2014). Therefore, raptor predation facilitated by PG&E transmission towers within tidal marsh habitat continues to be a major threat to California clapper rails in the South Bay.

Occurrences within the Action Area

The Refuge-managed 81.5-acre Main Faber Marsh and adjacent Laumeister Marsh contain very high quality expansive tidal marsh habitat for the California clapper rail and support one of the largest populations of the California clapper rail range-wide. Main Faber Marsh and the adjacent Laumeister Marsh accounted for about 3.8 percent of the estimated total range-wide population of the California clapper rail in 2009-2011 (Liu *et al.* 2012; L. Liu, Point Blue Conservation Science, pers. comm. 2014). Main Faber Marsh also has one of the highest population densities of the California clapper rail range-wide (Liu *et al.* 2012; L. Liu, Point Blue Conservation Science, pers. comm. 2014). There were a total of about 91 California clapper rails detected in Main Faber Marsh and Laumeister Marsh in 2012 and 94 in 2011 during the highest minimum count (Point Blue Conservation Science 2014). However, the total number of California clapper rail detections within Main Faber Marsh and Laumeister Marsh significantly declined in 2013 with only 50 California clapper rails detected during the highest minimum count (Point Blue Conservation Science 2014). Main Faber Marsh had the most significant decline in California clapper rail detections with between 57 and 62 California clapper rails detected in 2010, between 64 and 85 California clapper rails detected in 2011, and only 25 California clapper rails detected in 2013 (PRBO Conservation Science 2012, Point Blue Conservation Science 2014). The number of California clapper rail detections

within the adjacent Laumeister Marsh was 30 in 2011, 22 in 2012, and 25 in 2013 (PRBO Conservation Science 2012, Point Blue Conservation Science 2014).

Two California clapper rails were detected during protocol-level surveys in Outer Faber Marsh in 2011, two in 2013, and three in 2013 (Point Blue Conservation Science, *in litt.* 2014). Outer Faber Marsh provides lower quality habitat for the California clapper rail than Main Faber Marsh because the marsh is more sparsely vegetated, at a lower and more exposed location along San Francisco Bay, and subject to more frequent inundation from daily tides and wave fetch from the Bay. Although a few California clapper rails have been observed during protocol-level surveys within Outer Faber Marsh, it is not known if the rails successfully breed within Outer Faber Marsh.

Protocol-level surveys conducted along San Francisquito Creek detected two California clapper rails along the lower reach of the creek in 2011 and one in 2013 (PRBO Conservation Science 2012; Point Blue Conservation Science, *in litt.* 2014). California clapper rails likely forage and disperse along lower San Francisquito Creek, but it is not known if they successfully breed in the fringe of tidal marsh along lower San Francisquito Creek.

It is not known with certainty why the number of California clapper rails in Main Faber Marsh declined in 2013, but the Service believes it may be due to high levels of predation (Overton *et al.* 2014; J. McBroom, Olofson Environmental, pers. comm. 2014; J. Albertson, Refuge, pers. comm. 2014; E. Mruz, Refuge, pers. comm. 2014). The Refuge through the U.S. Department of Agriculture Wildlife Services has implemented minimal amounts of mammalian predator management within Main Faber Marsh and Laumeister Marsh in recent years due to limited funding (E. Mruz, Refuge, pers. comm. 2014; J. Albertson, Refuge, pers. comm. 2014). Studies in 2007 through 2009 showed high rates of predation in the adjacent Laumeister Marsh by both avian and mammal predators with 53 percent of California clapper rails depredated during the 166-week study period (Overton *et al.* 2014). Studies of predation in Laumeister Marsh in the 1990s showed that Norway rats depredated about half of the California clapper rail nests (Albertson 1995). The Refuge believes that Norway rats are likely still a significant source of predation within Main Faber Marsh and Laumeister Marsh because the U.S. Department of Agriculture Wildlife Services is unable to control the rat populations coming from the nearby residential communities in the City of East Palo Alto (J. Albertson, Refuge, pers. comm. 2014). The City of East Palo Alto is required under the biological opinion for the Cooley Landing Project to fund five years of mammalian predator management within Laumeister Marsh (Service file number 81420-2011-F-0552-1, Service 2011); the five-year predator management program at Laumeister Marsh was initiated in October 2014 (B. Popper, U.S. Department of Agriculture Wildlife Services, pers. comm. 2015).

Raptor predation is also likely a significant source of mortality of California clapper rails within the Main Faber Marsh, Laumeister Marsh, and Outer Faber Marsh (C. Overton, U.S. Geological Survey, pers. comm. 2015). Northern harriers and red-tailed hawks have been observed nesting in Main Faber Marsh and Laumeister Marsh and are likely to prey on California clapper rails within the action area (J. Albertson, Refuge, pers. comm. 2014). Raptor predation within Main Faber Marsh, Laumeister Marsh, and Outer Faber Marsh is facilitated by PG&E transmission towers and transmission lines within the marshes that provide artificial perch and nest sites for raptors. Avian predator management had not been implemented within the action area until 2015 when several ravens' nests were removed from transmissions towers by PG&E at the request of the Refuge (R. Tertes, Refuge, pers. comm. 2015). As stated previously, recent studies of the sources of mortality of California clapper rails within Laumeister Marsh and other marshes of the Central/South San

Francisco Bay Recovery Unit found that 53 percent of California clapper rails died due to predation with raptors depredating 28 percent and mammals depredating 25 percent of California clapper rails (Overton *et al.* 2014). Thus predation by mammal and avian predators are likely significant contributors to the recent decline in the number of California clapper rails within Main Faber Marsh.

Based on the known occurrence of the California clapper rail within the action area in Main Faber Marsh, Laumeister Marsh, Outer Faber Marsh, and lower San Francisquito Creek and the availability of suitable habitat, the Service considers the California clapper rail to have a high potential to occur within all suitable tidal marsh habitat and adjacent transition zone habitat within the action area in Main Faber Marsh, Laumeister Marsh, Outer Faber Marsh, and the lower reach San Francisquito Creek (downstream of Friendship Bridge). Individual California clapper rails may infrequently forage and disperse within the middle reach of San Francisquito Creek immediately upstream of Friendship Bridge; however, no California clapper rails have been observed upstream of Friendship Bridge during protocol-level surveys. California clapper rails are unlikely to occur within the upper reach of San Francisquito Creek (upstream of Dahpne Way/Geng Road) because this portion of the creek is less tidally influenced, sparsely vegetated, the marsh is highly fragmented, and located within a highly urbanized environment with an abundance of mammal and avian predators. California clapper rails are unlikely to occur within the diked marsh habitat at the Palo Alto Golf Course because this marsh is not tidally influenced.

Effects of the Proposed Project

Salt Marsh Harvest Mouse and California Clapper Rail

Habitat Disturbance

Table 3 below summarizes for each habitat type the acres and linear extent of suitable habitat for the salt marsh harvest mouse and California clapper rail that will be temporarily disturbed or permanently lost due to construction of the proposed project. Table 4 below summarizes the changes in the areal extent of each habitat type for the salt marsh harvest mouse and California clapper rail within the action area post-construction of the proposed project. Table 5 below summarizes the amount of tidal marsh habitat that will be temporarily disturbed during the installation of the five high-tide refuge islands in Outer Faber Marsh.

Salt Marsh Harvest Mouse

The proposed project will result in the temporary disturbance of a total of about 3.83 acres of tidal marsh habitat, 1.89 acres of diked marsh habitat, 13.05 acres of ruderal grassland habitat, and 8.12 acres of upland refugia/transition zone habitat for the salt marsh harvest mouse (Table 3). The proposed project will result in the permanent loss of a total of about 0.82 acre of tidal marsh habitat, 0.79 acre of diked marsh habitat, 7.77 acres of ruderal grassland habitat, and 0.27 acre of upland refugia/transition zone habitat for the salt marsh harvest mouse (Table 3). The proposed project will result in a net gain of about 6.90 acres of suitable tidal marsh habitat for the salt marsh harvest mouse within the widened San Francisquito Creek floodplain channel (Table 3). The proposed project will result in a net loss of about 1.61 acres of lower quality diked marsh habitat adjacent to the golf course (Table 3). The proposed project will result in a net loss of about 6.12 acres of upland foraging/dispersal habitat for the salt marsh harvest mouse primarily due to ongoing mowing

Table 3. Habitat loss and disturbance.

Habitat Type	Temporary Disturbance		Permanent Loss	
	Acres	Linear Feet ¹	Acres	Linear Feet ¹
Salt Marsh Harvest Mouse Only				
Tidal Marsh	2.07	n/a	0.46	n/a
Diked Marsh	1.89	n/a	0.79	n/a
Ruderal Grassland				
Construction	13.05	n/a	1.28	n/a
Ongoing O&M (levee mowing) ²	0.00	n/a	6.49	n/a
Salt Marsh Harvest Mouse Only Subtotal	17.01	n/a	9.02	n/a
Salt Marsh Harvest Mouse and California Clapper Rail				
Tidal Salt Marsh				
Main Faber Marsh Southern Levee	0.32	475	0.30	598
Bay Levee	0.40	636	0.00	0
Bay Levee access	0.00	0	0.00	0
Outer Faber High-Tide Refugia Islands ³	0.19	n/a	0.00	n/a
All other construction (creek channel)	0.85	n/a	0.06	n/a
Tidal Salt Marsh Subtotal	1.76	n/a	0.36	n/a
Upland Refugia/Transition Zone				
Main Faber Marsh Southern Levee ⁴	1.03	1,018	0.27	488
Transition Zone Habitat Enhancement ⁴	5.66	5,120	0.00	n/a
Bay Levee	0.93	651	0.00	0
Bay Levee access ⁴	0.44	1,150	0.00	0
All other construction (creek channel)	0.06	n/a	0.00	n/a
Upland Refugia/Transition Zone Subtotal	8.12	n/a	0.27	n/a
Salt Marsh Harvest Mouse and California Clapper Rail Subtotal	9.88	n/a	0.63	n/a
GRAND TOTAL	26.89	n/a	9.65	n/a

¹ Linear footage of disturbance is only reported for effects incurred from construction of the Main Faber Marsh levee, Bay levee lowering, access, and levee habitat enhancement along the Main Faber Marsh and Outer Faber Marsh levees (n/a = not applicable).

² Ongoing O&M effects from annual mowing of grassland habitat along the levees is counted as a permanent effect. However, salt marsh harvest mouse forage and dispersal habitat will be present, especially seasonally between mowing events, when vegetation is taller.

³ High-tide refuge islands will likely establish as jurisdictional wetlands (*i.e.*, tidal marsh) with wetland plant palette and saturated subsoils. The 0.19 acre of marsh disturbance will be temporary.

⁴ A total of about 5,120 linear feet of habitat will be disturbed during transition zone enhancement along the northern, eastern, and southern Main Faber Marsh levees including 1,540 linear feet of the southern levee which partially overlaps with the 1,018 linear feet of disturbance from construction along the southern levee. However, the 5.66-acre estimate for transition zone enhancement does not include the impacts from construction activities along the southern levee.

Table 4. Post-construction changes in the areal extent of suitable habitat within the action area.

Habitat Type	Post-Construction Surface Area (acres)	Net Gain or Loss (acres)	Habitat Enhanced ² (acres)
California Clapper Rail and Salt Marsh Harvest Mouse			
Tidal Marsh ¹	3.07	+1.09	n/a
Upland Refugia/Transition Zone ²	7.83	+1.64	5.66 ²
Salt Marsh Harvest Mouse Only			
Tidal Marsh ¹	8.34	+5.81	n/a
Diked Marsh	1.06	-1.61	n/a
Upland Foraging/Dispersal ³ (Ruderal Grassland)	14.70	-6.12 ³	n/a

¹ Tidal marsh along the lower reach of San Francisquito Creek downstream of Friendship Bridge is counted as suitable habitat for both California clapper rail and salt marsh harvest mouse. Tidal marsh along the middle reach of San Francisquito Creek between Friendship Bridge and the ends of Geng Road and Daphne Way is counted as suitable habitat only for salt marsh harvest mouse (although there is the potential for California clapper rails to infrequently forage and disperse upstream of Friendship Bridge). Tidal marsh along the upper reach of San Francisquito Creek upstream of the ends of Geng Road and Daphne Way are not counted as suitable habitat for the California clapper rail or salt marsh harvest mouse.

² The enhancement of 5.66 acres of upland refugia/transition zone habitat along the southern, northern, and eastern levees of Main Faber Marsh and the western levee of Outer Faber Marsh through invasive plant control and planting suitable native transition zone plant species (n/a = not applicable).

³ The ongoing disturbance of 6.49 acres of grassland habitat from annual levee mowing is counted as a net loss of habitat; however, the grassland will be available as salt marsh harvest mouse foraging and dispersal habitat in between mowing events, especially during the wet season. Some potential upland foraging/dispersal habitat would be created on the new levee on the Palo Alto side due to the increase in surface area of the levee on the Palo Alto side post-construction.

Table 5. Total maximum amount of tidal marsh habitat temporarily disturbed during installation of five high tide refuge islands in Outer Faber Marsh (copied from Table 5 in H.T. Harvey & Associates (2015a)).

Cause of Disturbance	Total Maximum Disturbance for Five Refuge Islands (square feet (acres))	Expected Duration of Recovery
Place plywood pathway and transport crew and materials through marsh habitat to access refuge islands construction locations	5,000 square feet (0.11 acre)	Marsh vegetation will fully recover within a few days-weeks after plywood is removed
Place plywood in approximately a 10-foot radius surrounding refuge islands to protect the construction area	2,000 square feet (0.05 acre)	Marsh vegetation will fully recover within a few weeks after plywood is removed
Refuge island construction (sod removed and then placed on island)	1,250 square feet (0.03 acre)	Marsh vegetation will fully recover 6 months - 1 year after refuge island construction
TOTAL	8,250 square feet (0.19 acre)	

of 6.49 acres of grassland on the levee side slopes along the San Francisquito Creek channel for O&M; the Service considers the annual mowing (up to three times per year during the summer and fall) of the grassland habitat to 3 or 4 inches high along the levee side slopes for O&M a net loss of habitat although the grassland would provide foraging and dispersal cover for the salt marsh harvest mouse in between mowing events particularly during the wet season (Table 3). The proposed project will result in a net gain of about 1.64 acres of upland refugia/transition zone habitat primarily along the widened San Francisquito Creek channel. An additional 5.66 acres of low quality upland refugia/transition zone habitat for the salt marsh harvest mouse will be enhanced along a total of about 5,120 linear feet of the southern, northern, and eastern Main Faber Marsh perimeter levees and Outer Faber Marsh western perimeter levee through control of invasive plant species (*e.g.*, mustard, ice plant, and perennial pepperweed) and planting suitable native transition zone plant species (*e.g.*, marsh gumplant) (Figure 4 and Table 4). The proposed project will also create upland refugia/transition zone habitat for the salt marsh harvest mouse within Outer Faber Marsh through the installation of five 10-foot-wide by 30-foot-long high-tide refuge islands at the elevation of MHHW (Figures 3, 4, and 5).

Tidal salt marsh habitat will be disturbed during stabilizing and filling in low spots in the Main Faber Marsh levee, degrading the Bay levee, excavating and widening the lower and middle reaches of the San Francisquito Creek channel, constructing the floodwalls along the middle reach of San Francisquito Creek, and creation of the five high-tide refuge islands in Outer Faber Marsh (Tables 3 and 5). The stabilizing and filling in low spots in the Main Faber Marsh levee will temporarily disturb about 0.32 acre and permanently remove about 0.30 acre of high quality tidal marsh habitat the salt marsh harvest mouse utilizes for breeding, foraging, sheltering, and dispersal (Table 5).

However, the quality of the tidal marsh habitat that will be temporarily disturbed (2.92 acres) or permanently removed (0.52 acre) along the lower and middle reaches of San Francisquito Creek is low due to frequent inundation during high tides and winter storms, presence of invasive plant species and predators, and habitat fragmentation. The quality of the tidal marsh habitat that will be temporarily disturbed (0.59 acre) within Outer Faber Marsh during degrading the Bay levee and installation of the high tide refuge islands is low due to the marsh's lower elevation and exposure to frequent flooding and wave fetch from the adjacent San Francisco Bay.

The stabilizing and filling in low spots in the Main Faber Marsh levee and accessing and degrading the Bay levee will also temporarily disturb about 2.40 acres and permanently remove about 0.27 acre of low quality upland refugia/transition zone habitat the salt marsh harvest mouse primarily utilizes for sheltering during extreme high tide and flooding events when the adjacent marsh plain is flooded. The quality of the upland refugia/ transition zone habitat along the Main Faber Marsh levee and Bay levee that will be disturbed is low due to the dominance of invasive plant species like mustard and perennial pepperweed which provide poor quality high tide refugia cover because these invasive plants are leafless in the winter.

The widening of the San Francisquito Creek channel and construction of the floodwalls will temporarily disturb about 1.89 acres and permanently remove about 0.79 acre of low quality diked marsh habitat adjacent to the golf course the salt marsh harvest mouse utilizes primarily for foraging and dispersal. The annual mowing (up to three times per year) of 6.49 acres of grassland along the San Francisquito Creek levee side slopes to 3 or 4 inches high during the summer and fall will continue to remove low quality upland habitat the salt marsh harvest mouse utilizes for foraging and dispersal; however, the grassland would provide suitable foraging and dispersal habitat in between mowing events particularly during the wet season.

SFCJPA and SCVWD will minimize the potential for the contamination of suitable tidal marsh habitat during construction of the proposed project by implementing a SWPPP, water quality protection BMPs, and a hazardous spill prevention plan.

The proposed project will compensate for the disturbance of salt marsh harvest mouse habitat by creating an additional approximately 6.90 acres of suitable tidal marsh habitat and 1.64 acres of suitable upland refugia/transition zone habitat for the salt marsh harvest mouse within the widened San Francisquito Creek channel resulting in a total of about 11.41 acres of suitable restored tidal marsh habitat and 7.83 acres of suitable upland refugia/transition zone habitat within the widened creek channel (Table 4). The created and restored tidal marsh and transition zone habitat will be restored under a Service-approved revegetation and monitoring plan with success criteria and invasive plant species control to ensure the tidal marsh and transition zone habitat revegetate with suitable native tidal marsh and transition zone plant species. The created and restored tidal marsh habitat within the widened San Francisquito Creek channel will provide higher quality breeding, foraging, and dispersal habitat for the salt marsh harvest mouse than the narrow and fragmented tidal marsh habitat that currently occurs along the creek channel; however, salt marsh harvest mouse within the tidal marsh along the creek channel would continue to be subject to frequent inundation during high tide and winter storm events. The proposed project will minimize the effects of the net loss of 6.12 acres of upland foraging/dispersal habitat and 1.61 acres of diked marsh habitat for the salt marsh harvest mouse by enhancing a total of approximately 5.66 acres (5,120 linear feet) of upland refugia/transition zone habitat for the salt marsh harvest mouse along the southern, northern, and eastern perimeter levees of Main Faber Marsh and the western levee of Outer Faber

Marsh (Figure 6) under a Service-approved restoration plan. Salt marsh harvest mice within the adjacent Laumeister Marsh will also benefit from the upland refugia/transition zone habitat along the levee that divides northern Main Faber Marsh and southern Laumeister Marsh. All temporarily disturbed habitats within the action area will be restored under a five-year Service-approved revegetation and monitoring plan with invasive plant species control and success criteria.

California Clapper Rail

The proposed project will result in the temporary disturbance of a total of about 1.76 acres of tidal marsh habitat and 8.12 acres of upland refugia/transition zone habitat for the California clapper rail (Table 3). The proposed project will result in the permanent loss of a total of about 0.36 acre of tidal marsh habitat and 0.27 acre of upland refugia/transition zone habitat for the California clapper rail (Table 3). The proposed project will result in a net gain of about 1.09 acres of suitable tidal marsh habitat for the California clapper rail within the widened San Francisquito Creek floodplain channel immediately downstream of Friendship Bridge (Table 4). The proposed project will also result in a net gain of about 1.64 acres of upland refugia/transition zone habitat for the California clapper rail primarily along the widened San Francisquito Creek channel downstream of Friendship Bridge (Table 4). Although upland refugia cover will be removed from Outer Faber Marsh during the Bay levee degrade, the creation of five high-tide refuge islands within Outer Faber Marsh will minimize the effects of the loss of upland refugia in Outer Faber Marsh (Figures 3, 4, and 5).

Tidal salt marsh habitat will be disturbed during stabilizing and filling in low spots in the Main Faber Marsh levee, accessing and degrading the Bay levee, excavating and widening the lower reach of the San Francisquito Creek channel, and installation of the five high-tide refuge islands in Outer Faber Marsh. The stabilizing and filling in low spots in the Main Faber Marsh levee will temporarily disturb about 0.32 acre and permanently remove about 0.30 acre of high quality tidal marsh habitat the California clapper rail utilizes for breeding, foraging, sheltering, and dispersal. However, the quality of the tidal marsh habitat that will be temporarily disturbed (0.85 acres) or permanently removed (0.06 acre) along the lower reach of San Francisquito Creek and the Bay levee (0.40 acre temporarily disturbed) is low due to frequent inundation during high tides and winter storms, presence of invasive plant species and predators, and habitat fragmentation. The excavation of sediment from the lower and middle reaches of the San Francisquito Creek channel will temporarily remove benthic invertebrate prey species for the California clapper rail. However, the benthic invertebrate prey community is likely to recover within a few months to a few years of excavation. Additionally, the widening of the San Francisquito Creek channel will result in an increase in the availability of foraging habitat for the California clapper rail.

The stabilizing and filling in low spots in the Main Faber Marsh levee will also temporarily disturb about 1.03 acres (1,018 linear feet) and permanently remove about 0.27 acre (488 linear feet) of low quality upland refugia/transition zone habitat the California clapper rail primarily utilizes for sheltering during extreme high tide and flooding events when the adjacent marsh plain is flooded. The quality of the upland refugia/ transition zone habitat along the Main Faber Marsh levee that will be disturbed is low due to the dominance of invasive plant species like mustard and perennial pepperweed which provide poor quality high tide refugia cover because these invasive plants are leafless in the winter.

SFCJPA and SCVWD will minimize the potential for the contamination of suitable tidal marsh habitat during construction of the proposed project by implementing a SWPPP, water quality protection BMPs, and a hazardous spill prevention plan.

The proposed project will compensate for the disturbance of California clapper rail habitat by creating an additional approximately 1.09 acres of suitable tidal marsh habitat and 1.64 acres of suitable upland refugia/transition zone habitat for the California clapper rail within the widened San Francisquito Creek channel resulting in a total of about 3.07 acres of suitable restored tidal marsh habitat and 7.83 acres of suitable upland refugia/transition zone habitat within the widened creek channel downstream of Friendship Bridge (Table 4). The created and restored tidal marsh and upland refugia/transition zone habitat will be restored under a Service-approved revegetation and monitoring plan with success criteria and invasive plant species control to ensure the tidal marsh and transition zone habitat revegetate with suitable native tidal marsh and transition zone plant species. The created tidal marsh and upland refugia/transition zone habitat within the widened San Francisquito Creek channel will provide higher quality breeding, foraging, sheltering, and dispersal habitat for the California clapper rail than the fragmented tidal marsh and transition zone habitat that currently occurs along the creek channel; however, California clapper rails within the tidal marsh along the creek channel would continue to be subject to frequent inundation during high tide and winter storm events. The proposed project will minimize the effects of the temporary disturbance of 2.40 acres and permanent loss of 0.27 acre of upland refugia/transition zone habitat for the California clapper rail in Main Faber Marsh and Outer Faber Marsh by enhancing a total of approximately 5.66 acres (5,120 linear feet) of upland refugia/transition zone habitat for the California clapper rail along the southern, northern, and eastern levees of Main Faber Marsh and the western levee of Outer Faber Marsh (Figure 6) under a Service-approved restoration plan. California clapper rails within the adjacent Laumeister Marsh will also benefit from the upland refugia/transition zone habitat along the levee that divides northern Main Faber Marsh and southern Laumeister Marsh. All temporarily disturbed habitats within the action area will be restored under a five-year Service-approved revegetation and monitoring plan with invasive plant species control and success criteria.

Direct Effects to Individuals

Any salt marsh harvest mice occurring within the proposed project area during excavation and levee construction activities could be injured or killed by being crushed by the use heavy equipment within suitable wetland and grassland habitat. Any salt marsh harvest mice occurring within the grassland habitat on the levee side slopes during annual levee mowing (up to three times per year) along the San Francisquito Creek channel could be injured or killed by the mower. Individual salt marsh harvest mice and California clapper rails may be displaced by noise and vibrations associated with construction activities and the operation of heavy equipment within and adjacent to suitable marsh habitat. Displaced salt marsh harvest mice and California clapper rails may have to compete for resources in occupied habitat, and may be more vulnerable to predators. Disturbance to female salt marsh harvest mice may cause abandonment or failure of the current litter. Thus, displaced salt marsh harvest mice may suffer from increased predation, competition, mortality, and reduced reproductive success. SFCJPA and SCVWD will avoid construction activities within 700 feet of California clapper rails during the rail's breeding season; therefore, no breeding California clapper rails will be disturbed during the construction of the proposed project. All work will stop if a salt marsh harvest mouse or its nest is observed within the work area.

The level of disturbance of individual salt marsh harvest mice and California clapper rails may vary depending on the type of equipment being used; different pieces of equipment have different noise levels and, thus, cause more or less disturbance. Noise and vibrations may result in displacement of salt marsh harvest mice and California clapper rails from protective cover and their territories. These disturbances are likely to disrupt normal behavior patterns of breeding, foraging, sheltering, and dispersal. The level of disturbance of salt marsh harvest mice and California clapper rails would be exacerbated if construction activities near tidal areas occurred during an extreme high tide event when the mice and rails escape the flooded marsh to seek high tide refugia cover that is not submerged; this is when the salt marsh harvest mouse and California clapper rail are most vulnerable to predation.

SFCJPA and SCVWD will minimize the potential for injury and mortality of salt marsh harvest mice and reduce the level of harassment by removing vegetation within a 4-foot buffer around work areas using only non-mechanized hand tools and installing salt marsh harvest mouse-proof exclusion fencing around work areas prior to the initiation of work within suitable habitat. The hand removal of vegetation and installation of salt marsh harvest mouse-proof exclusion fencing will be supervised by a Service-approved biological monitor. A Service-approved biological monitor will be onsite during all construction activities within or adjacent to potential habitat for the salt marsh harvest mouse and California clapper rail. Prior to construction activities, environmentally sensitive areas will be flagged or fenced in order to clearly delineate the extent of the construction. A worker awareness program will be presented to all construction personnel before they start work on the proposed project; the program will summarize relevant laws and regulations that protect biological resources, discuss sensitive habitats and listed species with the potential to occur in the work zone, explain the role and authority of the biological monitors, and review applicable avoidance measures to protect listed species and habitats.

SFCJPA and SCVWD will minimize the level of harassment of salt marsh harvest mice and California clapper rails during extreme high tide events by avoiding work within 50 feet of suitable tidal marsh habitat within two hours before and after an extreme high tide event (6.5 feet or higher measured at the Golden Gate Bridge and adjusted to the timing of local high tides). All work will occur during the daylight hours to avoid disturbance of salt marsh harvest mice and California clapper rails at night. All foods and food-related trash items will be enclosed in sealed trash containers and removed from the site at the end of each workday to prevent attracting predators to the work site.

SFCJPA and SCVWD will minimize the potential for injury and mortality of salt marsh harvest mice and harassment of California clapper rails during annual mowing of the levee slopes by: having a qualified biologist survey the area to be mowed; avoiding mowing suitable wetland, marsh, and transition zone habitat; avoiding mowing during extreme high tide events when salt marsh harvest mice and California clapper rails are most likely to approach the upland areas along the levee slopes; avoiding mowing at night; and stopping mowing if any salt marsh harvest mice or California clapper rails are observed within 50 feet.

SFCJPA and SCVWD will minimize the potential for injury and mortality of salt marsh harvest mice and California clapper rails during rodent control within the action area by prohibiting the use of rodenticides and fumigants within suitable habitat for the salt marsh harvest mouse and California clapper rail. In areas where rodenticides are used, carcass retrieval surveys will be conducted daily for acute toxins and weekly for anticoagulants to minimize secondary poisoning impacts during the

use period. Methods of rodent control within salt marsh harvest mouse or California clapper rail habitat will be limited to live trapping. All live traps will have openings measuring no smaller than 2 inches by 1 inch to allow any salt marsh harvest mouse that inadvertently enters the trap to easily escape. All traps will be placed outside of pickleweed areas and above the high tide line.

SFCJPA and SCVWD will minimize the potential for injury and mortality of salt marsh harvest mice and California clapper rails and reduce the level of harassment during installation of the high tide refuge islands in Outer Faber Marsh by avoiding work during the California clapper rail's breeding season; accessing the refuge island sites on foot or boat; a biological monitor will work with the contractor(s) to reduce and minimize the impacts on wetlands from construction access; protective materials such as plywood sheets over geotextile fabric (or equivalent) will be temporarily installed (for a maximum of 2-3 days) to cover all vegetated marsh areas that will be regularly accessed during island construction; using wheelbarrows to transport necessary materials over protective sheets; using skilled personnel and qualified biologists trained in working in sensitive wetland habitats; and utilizing hand tools and manual labor to construct the islands.

Invasive Plant Species

The proposed project has the potential to degrade salt marsh harvest mouse and California clapper rail habitat through the introduction of invasive weeds during proposed project construction. Invasive weeds, such as perennial pepperweed, could spread into marsh habitats when seeds are attached to vehicles, equipment, and clothing. The spread of perennial pepperweed and other invasive plants can displace native marsh vegetation and lower habitat quality for salt marsh harvest mice and California clapper rails by reducing the amount of plants they use for refugia, foraging, and nesting, such as marsh gumplant and pickleweed. Perennial pepperweed provides poor upland refugia cover because the plant is leafless in the winter when the salt marsh harvest mouse and California clapper rail are in most need of suitable upland refugia cover during the more frequent winter extreme high tides and storm events. Without suitable upland refugia cover, the salt marsh harvest mouse and California clapper rail are more vulnerable to predation during extreme high tide events. To minimize the potential for the spread of invasive plants during proposed project implementation, SFCJPA will clean all construction equipment of soil, seed, and plant parts prior to arriving onsite; utilize fill material that is free of vegetation and plant material; utilize certified weed-free erosion control materials; implement a Service-approved revegetation and monitoring plan to ensure all temporarily disturbed areas revegetate with suitable native plant species; and control invasive plant species.

Installation of Rock-Slope Protection

The installation of 3.71 acres of rock-slope protection within the San Francisquito Creek channel could provide denning areas for predators of the salt marsh harvest mouse and the California clapper rail (e.g., foxes, rats, raccoons) if installed in a manner that left voids in between the rocks. This would increase the risk of predation by mammal predators on the salt marsh harvest mouse and the California clapper rail within the action area. SFCJPA will fund the implementation of a five-year mammal predator control program within the action area which will reduce the potential for predation on salt marsh harvest mice and the California clapper rails during the five-year predator control period; however, predation by mammal predators is likely to increase within the action area once the five-year predator management program is terminated.

Altered Hydrology

Main Faber Marsh

Fluvial flood flows above the five-year event (20 percent chance of happening once in any given year) currently spill over from San Francisquito Creek into Main Faber Marsh under average tidal conditions due to an approximately 400-foot-long low spot in the Main Faber Marsh levee downstream of the Friendship Bridge. Once construction of the proposed project is completed, this frequency will decrease to roughly the 25-year event (4 percent chance of happening once in any given year) due to the SFCJPA filling in the low spot in the Main Faber Marsh levee. Hydraulic modeling for the proposed project indicates that there would not be discharge to the Main Faber Marsh from San Francisquito Creek post-project during a two-year, three-year, five-year or 10-year fluvial flood flow event occurring during MHHW. If occurring during a king tide of 10.5 feet, a 10-year flow event would result in a discharge of approximately 100 cfs into Main Faber Marsh, which is a reduction from the volume that would be discharged if these two conditions happened at the same time with the current channel and levee dimensions.

Since salt marsh harvest mice and California clapper rails are most vulnerable to predation during flooding events when cover is limited (Albertson 1995, Service 2013a, Overton *et al.* 2014), any reductions in the frequency of flooding of Main Faber Marsh would likely benefit the mouse and rail by reducing the risk of predation. SFCJPA will further reduce the risk of predation on salt marsh harvest mice and California clapper rails within Main Faber Marsh by contributing funding to a Service- and Refuge-approved five-year predator management program; enhancing transition zone habitat for salt marsh harvest mice and California clapper rails along the southern, eastern, and northern levees of Main Faber Marsh under a Service-approved plan; and installing fencing at the entrance to the southern levee of Main Faber Marsh to deter people and mammal predators from accessing the southern levee. The salt marsh harvest mouse would also benefit from reductions in the frequency of flooding of salt marsh harvest mouse nests within Main Faber Marsh. Salt marsh harvest mice and California clapper rails within the adjacent Laumeister Marsh would also benefit from transition zone habitat enhancement along the northern Main Faber Marsh/southern Laumeister Marsh berm and the implementation of the five-year predator management program.

However, it is not known to what extent reductions in fluvial flooding may alter habitat quality within Main Faber Marsh. Fluvial floods may contribute sediment to Main Faber Marsh which is important for tidal marsh accretion and the ability of the marsh plain to keep up with sea level rise. Thus any decrease in the input of sediment from fluvial flood flows into Main Faber Marsh could decrease the rates of tidal marsh accretion and the ability of the tidal marsh to keep up with sea level rise.

High velocity fluvial flood flows may also scour marsh vegetation and thus reduce the availability of cover for the salt marsh harvest mouse and California clapper rail. Under existing conditions, fluvial flood flows spilling over a low spot in the Main Faber Marsh levee where San Francisquito Creek makes a sharp right turn creates a “fire hose” effect with a zone of concentrated high velocity flows spilling into the tidal marsh of the Main Faber Marsh (A. Riley, SFRWQCB, pers. comm. 2014). The proposed increase in channel capacity within the San Francisquito Creek channel could exacerbate the “fire hose” effect into Main Faber Marsh during flood events (A. Riley, SFRWQCB, pers. comm. 2014). SFCJPA will minimize the “fire hose” effect by filling in the low spot in the Main Faber Marsh levee downstream of the Friendship Bridge.

Fluvial flood flows may also alter vegetation communities within the tidal marsh of the Main Faber Marsh through the introduction of freshwater flows. For example, freshwater discharges from the San Jose/Santa Clara Water Pollution Control Plant since 1970 are thought to have contributed to a net conversion from tidal to brackish marsh and a reduction in habitat quality and population densities of the California clapper rail at the southern end of San Francisco Bay around Coyote Creek (H.T. Harvey and Associates 1989, Service 2013a). However, between 2006 and 2008, a decrease in freshwater outflow from the San Jose/Santa Clara Water Pollution Control Plant has resulted in a shift from brackish marsh to tidal marsh, in turn resulting in a net formation of 77 acres of tidal marsh at the southern end of San Francisco Bay since 1989 (H.T. Harvey Associates 2008, Service 2013a). Thus it is possible that decreases in freshwater flows into Main Faber Marsh could improve habitat quality for the California clapper rail. However, the tidal marsh of the Main Faber Marsh already supports one of the highest densities of California clapper rails range-wide; therefore, it is unlikely that further decreases in freshwater flows would significantly improve habitat quality for California clapper rails except for decreasing the risk of predation as described above.

Freshwater flows increase the biodiversity of the plant community within brackish marsh habitat around San Francisco, San Pablo, and Suisun bays. Thus it is possible that any reductions in freshwater flows may also decrease the biodiversity of plant species within Main Faber Marsh which could alter habitat quality for the salt marsh harvest mouse and California clapper rail. However, since the California clapper rail prefers more saline tidal marshes and the salt marsh harvest mouse occurs in both brackish and saline marsh habitats, it is unlikely that any decreases in freshwater flows into Main Faber Marsh would decrease habitat quality for the salt marsh harvest mouse and California clapper rail.

Outer Faber Marsh

The degrading of the Bay levee will result in an increase in the frequency of fluvial flooding of Outer Faber Marsh thus having the opposite effect described above for Main Faber Marsh. Increases in the frequency of flooding of Outer Faber Marsh may make the marsh less suitable for salt marsh harvest mice and California clapper rails. SFCJPA estimates that degrading the Bay levee will result in three to four additional flood events entering Outer Faber Marsh during large storm events over the 50-year life span of the proposed project.

Additionally, the removal of upland refugia/transition zone habitat along the Bay levee will make salt marsh harvest mice and California clapper rails within Outer Faber Marsh more vulnerable to predation during the more frequent flood events. Recent surveys of Outer Faber Marsh show only two or three California clapper rails occur within Outer Faber Marsh; therefore, the Service anticipates that no more than two or three California clapper rails will be harassed during each of the three to four additional flooding events in Outer Faber Marsh during the 50-year life span of the proposed project. Altered hydrology within Outer Faber Marsh may adversely affect breeding, foraging, and dispersing salt marsh harvest mice or result in the flooding of salt marsh harvest mouse nests; however, the number of breeding salt marsh harvest mice and their nests occurring within Outer Faber Marsh is likely to be low due to the marginal quality of the marsh for breeding salt marsh harvest mice. Degrading the Bay levee could result in an increase in the rate of sedimentation and tidal marsh accretion within Outer Faber Marsh which in the long-term could increase elevations within the marsh making the marsh more suitable for salt marsh harvest mice and California clapper rails.

SFCJPA will minimize the effects of increased flooding and loss of upland refugia/transition zone habitat on salt marsh harvest mice and California clapper rails within Outer Faber Marsh by creating five high-tide refuge islands in Outer Faber Marsh. The high-tide refuge islands will be planted with marsh gumplant and be constructed at high enough elevation to provide cover for salt marsh harvest mice and California clapper rails during most flooding events. The high-tide refuge islands are expected to provide suitable high-tide refuge habitat for the salt marsh harvest mouse and California clapper rail in Outer Faber Marsh within 3-5 years after installation (H.T. Harvey & Associates 2015a). SFCJPA will also minimize the effects of increased flooding and loss of upland refugia/transition zone habitat on salt marsh harvest mice and California clapper rails by enhancing transition zone habitat along the western Outer Faber Marsh levee. SFCJPA will also minimize the risk of predation on salt marsh harvest mice and California clapper rails within Outer Faber Marsh during flooding events by contributing to the Refuge's predator management program within the action area for five years.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions unrelated to the proposed project are not considered in this section, because they require separate consultation pursuant to section 7 of the Act.

City of Palo Alto Levee O&M Mowing

The City of Palo Alto conducts frequent mowing of the San Francisco Bay Trail levees within the action area along the lower reach of San Francisquito Creek adjacent to the Palo Alto Municipal Golf Course and Palo Alto Airport and along the western side of Main Faber Marsh (K. Murray, SFCJPA, *in litt.* 2015c, 2015d). Levee mowing may result in the harassment of salt marsh harvest mice and California clapper rails and the potential for injury and mortality of salt marsh harvest mice. The level of harassment of salt marsh harvest mice and California clapper rails and potential for injury and mortality of salt marsh harvest mice increases if the mowing is conducted during an extreme high tide or flooding event when the adjacent marsh plain is inundated because this is when the mouse and the rail are most likely to approach the levee to seek cover along the levee that is not submerged. The frequent mowing of the levees also increases the risk of predation on salt marsh harvest mice and California clapper rails within the action area by removing high tide refugia cover the mice and the rails utilize as shelter from predators when the adjacent marsh plain is flooded. Levee mowing during extreme high tide and flooding events may also increase the risk of predation on salt marsh harvest mice and California clapper rails within the action area by flushing the mice and rails from suitable cover or preventing the mice and rails from seeking available unsubmerged cover along the levees. Levee mowing may also introduce and spread invasive plant species which displace higher quality transition zone habitat plant species like marsh gumplant that provide suitable year-round cover for salt marsh harvest mice and California clapper rails during extreme high tide events. The displacement of suitable higher quality transition zone habitat plant species like marsh gumplant that provide year-round suitable cover increases the risk of predation on salt marsh harvest mice and California clapper rails especially during winter extreme high-tide and flooding events when suitable cover is limited.

California clapper rails are sensitive to noise disturbance during the breeding season. For example, Albertson (1995) documented a California clapper rail abandoning its territory in Laumeister Marsh

shortly after a repair crew worked on a nearby transmission tower. The California clapper rail did not establish a stable territory within the duration of the breeding season. As a result of this territorial abandonment, the opportunity for successful reproduction during the breeding season was eliminated. Thus noise from levee mowing adjacent to California clapper rail breeding habitat in Main Faber Marsh and along lower San Francisquito Creek during the rail's breeding season may result in the flushing of California clapper rails from their nests and the loss of breeding activity. The flushing of California clapper rails from their nests increases the risk of predation on the adult California clapper rail and its nest. However, it is possible that some California clapper rails may acclimate to noise from frequent levee mowing.

The City of Palo Alto mows about 0.32 acre of salt marsh harvest mouse grassland foraging/dispersal habitat to control ruderal grasses in an approximately 3-foot wide strip along the top of the levee along the left bank of the lower reach of San Francisquito Creek downstream of Friendship Bridge adjacent to the Palo Alto Municipal Golf Course and the Palo Alto Airport two or three times per year. The City of Palo Alto also mows annually about 0.29 acre of transition zone habitat for the salt marsh harvest mouse and California clapper rail and about 0.32 acre of grassland foraging/dispersal habitat for the salt marsh harvest mouse within an approximately 9-foot-wide by 2,830-foot-long strip along the western Main Faber Marsh levee. The strip of transition zone habitat mowed by the City of Palo Alto along the western Main Faber Marsh levee includes about 50 percent of the City of East Palo Alto's 0.58-acre transition zone habitat enhancement area which is required habitat compensation for the effects of the Runnymede Storm Drainage Improvements Phase II and O'Connor Pump Station Outfall Structure Repair Project on the salt marsh harvest mouse and California clapper rail (Service file number 81420-2011-F-0103-2, Service 2013b). The City of Palo Alto avoids the mowing of the City of East Palo Alto's transition zone shrub mitigation plantings (*e.g.*, marsh gumplant and salt marsh baccharis) during levee mowing within the 0.58-acre habitat compensation area along the western Main Faber Marsh levee; however, the mowing of the grassland vegetation in between the shrubs within the habitat compensation area reduces the ability of the habitat compensation area to provide suitable cover for salt marsh harvest mice during extreme high tide and flooding events and during seasonal foraging and dispersal.

Conclusion

After reviewing the current status of the salt marsh harvest mouse and California clapper rail, the environmental baseline for the action area, the effects of the proposed San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, and the cumulative effects, it is the Service's biological opinion that the San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, as proposed, is not likely to jeopardize the continued existence of the salt marsh harvest mouse and California clapper rail. The Service reached this conclusion because the project-related effects to these species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of these species based on the following: (1) successful implementation of the conservation measures described in this biological opinion will minimize the adverse effects on individual salt marsh harvest mice and California clapper rails; (2) the avoidance of construction activities within 700 feet of California clapper rail activity centers during the rail's breeding season; (3) the small amount of habitat within Main Faber Marsh that will be directly disturbed; (4) the reduction in the frequency of flood flows entering Main Faber Marsh due to filling in low spots in the levee along San Francisquito Creek will reduce the risk of predation on salt marsh harvest mice and California clapper rails and the potential for flooding of salt marsh harvest mouse

nests in Main Faber Marsh; (5) the creation of an additional approximately 6.90 acres of suitable tidal marsh habitat for the salt marsh harvest mouse and an additional approximately 1.09 acres of suitable tidal marsh habitat for the California clapper rail within the widened San Francisquito Creek channel; (6) the creation of an additional approximately 1.64 acres of suitable upland refugia/transition zone habitat for the salt marsh harvest mouse and California clapper rail along the widened San Francisquito Creek channel; and (7) the reduction in predation levels on the salt marsh harvest mouse and California clapper rail within Main Faber Marsh and Outer Faber Marsh due to SFCJPA's contribution to the Refuge's predator management program for at least five years, the enhancement of 5.66 acres of transition zone habitat along the Main Faber Marsh and Outer Faber Marsh perimeter levees, and the installation of fencing to deter people and mammal predators from accessing the southern Main Faber Marsh levee.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps or SFCJPA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

Salt Marsh Harvest Mouse

The Service anticipates incidental take of individual salt marsh harvest mice will be difficult to detect or quantify because of the variable, unknown size of any resident population over time, their elusive and cryptic behavior, and the difficulty of finding killed or injured animals. Due to the difficulty in quantifying the number of salt marsh harvest mice that will be taken as a result of the proposed project, the Service is quantifying take incidental to the proposed project as the following:

1. The harassment and non-lethal harm of all salt marsh harvest mice within the 3.64 acres of suitable tidal marsh habitat, 1.89 acres of suitable diked marsh habitat, 13.05 acres of suitable ruderal grassland foraging/dispersal habitat, and 2.46 acres of suitable upland refugia/transition zone habitat temporarily disturbed during construction of the proposed project (*i.e.*, construction of the San Francisquito Creek levees and widened channel, filling in low spots in the Main Faber Marsh levee, and accessing and degrading the Bay levee).
2. The harassment and harm of all salt marsh harvest mice within the 0.82 acre of suitable tidal marsh habitat, 0.79 acre of suitable diked marsh habitat, 1.28 acres of suitable ruderal grassland habitat, and 0.27 acre of suitable upland refugia/transition zone habitat permanently lost during construction of the proposed project (*i.e.*, construction of the San Francisquito Creek levees and widened channel, filling in low spots in the Main Faber Marsh levee, and accessing and degrading the Bay levee).
3. The harassment of all salt marsh harvest mice within the 5.66 acres of low quality transition zone habitat temporarily disturbed along a total of 5,120 linear feet of the southern, eastern, and northern Main Faber Marsh perimeter levees and the western Outer Faber Marsh perimeter levee during transition zone habitat enhancement.
4. The harassment of all salt marsh harvest mice within the 0.19 acre of suitable tidal marsh habitat temporarily disturbed during installation of five high tide refuge islands in Outer Faber Marsh.
5. The ongoing harassment and non-lethal harm of all salt marsh harvest mice within 6.49 acres of ruderal grassland foraging/dispersal habitat disturbed up to three times per year during annual levee mowing along the San Francisquito Creek levee slopes.
6. The harassment of all salt marsh harvest mice within the 13.8 acres of suitable tidal marsh and transition zone habitat in Outer Faber Marsh during four additional flooding events during the 50-year life span of the proposed project.
7. The injury or mortality of two adult salt marsh harvest mice and four juvenile salt marsh harvest mice.

California Clapper Rail

The Service anticipates incidental take of individual California clapper rails will be difficult to detect or quantify because of the variable, unknown size of any resident population over time, their elusive and cryptic behavior, and the difficulty of finding killed or injured animals. Due to the difficulty in quantifying the number of California clapper rails that will be taken as a result of the proposed project, the Service is quantifying take incidental to the proposed project as the following:

1. The harassment and non-lethal harm of all California clapper rails within the 1.57 acres of suitable tidal marsh habitat and 2.46 acres of suitable upland refugia/transition zone habitat temporarily disturbed during the construction of the proposed project (*i.e.*, construction of the San Francisquito Creek levees and widened channel, filling in low spots in the Main Faber Marsh levee, and accessing and degrading the Bay levee).

2. The harassment and non-lethal harm of all California clapper rails within the 0.36 acre of suitable tidal marsh habitat and 0.27 acre of suitable upland refugia/transition zone habitat permanently lost during the construction of the proposed project (*i.e.*, construction of the San Francisquito Creek levees and widened channel, filling in low spots in the Main Faber Marsh levee, and accessing and degrading the Bay levee).
3. The harassment of all California clapper rails within the 0.19 acre of tidal marsh disturbed during installation of up to five high-tide refuge islands within Outer Faber Marsh.
4. The harassment of all California clapper rails within the 5.66 acres of low quality transition zone habitat temporarily disturbed along 5,120 linear feet of the southern, eastern, and northern Main Faber Marsh levees and western Outer Faber Marsh levee during transition zone habitat enhancement.
5. The harassment of all California clapper rails within the 13.8 acres of suitable tidal marsh and transition zone habitat in Outer Faber Marsh during four additional flooding events during the 50-year life span of the proposed project.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the salt marsh harvest mouse and California clapper rail.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the salt marsh harvest mouse and California clapper rail resulting from implementation of the proposed project have been incorporated into the project's proposed conservation measures. Therefore, the Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the salt marsh harvest mouse and California clapper rail:

1. All conservation measures, as described in the biological assessment and restated here in the Description of the Proposed Project section of this biological opinion, shall be fully implemented and adhered to. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. The Corps shall include full implementation and adherence to the conservation measures as a condition of any permit or contract issued for the proposed project.
2. The Corps shall ensure that no rodenticides are used within 328 feet of suitable habitat for the salt marsh harvest mouse and California clapper rail.

3. The Corps shall ensure that any mammals trapped during rodent control that are potential predators of the California clapper rail or salt marsh harvest mouse (*e.g.*, Norway rats, feral cats, skunks, red foxes, raccoons, opossums) are dispatched and removed from the site.
4. The Corps shall ensure that SFCJPA has a plan for marsh ecotone/transition zone habitat enhancement along the Main Faber Marsh and Outer Faber Marsh levees and avian and mammal predator monitoring and management within the action area reviewed and approved by the Service prior to the initiation of construction of the proposed project. The marsh ecotone/transition zone habitat enhancement and the funding for predator management shall be initiated within one year of the initiation of construction of the proposed project.
5. The Corps shall ensure that SFCJPA has a plan for the installation of the permanent high-tide refuge islands in Outer Faber Marsh reviewed and approved by the Service within six months of the initiation of construction of the proposed project. The permanent high-tide refuge islands shall be installed within two years of the initiation of construction of the proposed project.
6. The Corps shall ensure that SFCJPA installs the rock-slope protection in a manner that minimizes voids in between the rocks that could provide denning areas for predators of the salt marsh harvest mouse and California clapper rail.

Monitoring

In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, the Corps shall adhere to the following reporting requirements. Should this anticipated amount or extent of incidental take be exceeded, the Corps must immediately reinstate formal consultation as per 50 CFR 402.16.

- a. For those components of the action that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated, the Corps shall provide bimonthly updates to the Service with a precise accounting of the total acreage of habitat impacted. Updates shall also include any information about changes in project implementation that result in habitat disturbance not described in the Description of the Proposed Project and not analyzed in this Biological Opinion.
- b. For those components of the action that may result in direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harassment, harm, injury, or death is anticipated, the Corps shall immediately contact the Service's Sacramento Fish and Wildlife Office (SFWO) at (916) 414-6623 to report the encounter. If encounter occurs after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day. When injured or killed individuals of the listed species are found, the Corps shall follow the steps outlined in the Salvage and Disposition of Individuals section below.
- c. The Corps shall ensure that SFCJPA or SCVWD provide annual reports to the Service during the five-year post-construction monitoring period on the status of revegetation and invasive plant species control of the temporarily disturbed areas, tidal marsh creation/

restoration within the widened San Francisquito Creek floodplain, transition zone habitat enhancement along the Main Faber Marsh and Outer Faber Marsh perimeter levees, and revegetation of the permanent high-tide refuge islands in Outer Faber Marsh.

- d. The Corps shall ensure that SFCJPA or the U.S. Department of Agriculture Wildlife Services provides annual reports to the Service on the implementation of the avian and mammalian predator monitoring and management program within the action area. The annual reports should include the number of each species of avian and mammal predator observed, the number of each species of predator removed, and the frequency of monitoring for predators.

Disposition of Individuals Taken

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact person is the Coast/Bay Division Chief of the Endangered Species Program at the SFWO at (916) 414-6623.

CONSERVATION RECOMMENDATIONS

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

1. Develop, fund, and annually implement a predator management program for controlling avian and mammal predators that threaten the salt marsh harvest mouse and California clapper rail, western snowy plover, and California least tern. Fund the monitoring of PG&E transmission towers for avian predators within suitable habitat for the salt marsh harvest mouse and California clapper rail and report any raptor nests to PG&E and the Refuge for removal. Work with PG&E to install raptor perch deterrents on their transmission towers within suitable habitat for the salt marsh harvest mouse and California clapper rail.
2. Control rat populations within the City of East Palo Alto near the Faber and Laumeister marshes.
3. Decommission trails or require that dogs be kept on a leash near breeding habitat for the California clapper rail. Avoid constructing trails near suitable habitat for the California clapper rail and salt marsh harvest mouse. Enforce dog leash laws along the San Francisco Bay Trail.
4. Remove raptor perches near suitable habitat for the salt marsh harvest mouse and California clapper rail.

5. Prohibit the feeding of wildlife near suitable habitat for the salt marsh harvest mouse and California clapper rail.
6. Control invasive perennial pepperweed within suitable upland transition zone and tidal marsh habitat for the salt marsh harvest mouse and California clapper rail and implement measures to minimize the introduction and spread of perennial pepperweed and other invasive plant species.
7. Restore tidal marsh habitat and marsh ecotone/transition zone habitat for the California clapper rail and salt marsh harvest mouse in priority areas identified in the Recovery Plan.
8. Report sightings of any listed or sensitive animal species to the CNDDDB of the CDFW. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

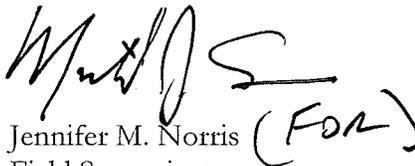
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project, from San Francisco Bay to Highway 101, in the City of East Palo Alto, San Mateo County, and the City of Palo Alto, Santa Clara County, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any additional take will not be exempt from the prohibitions of section 9 of the Act, pending reinitiation.

If you have any questions regarding this biological opinion on the proposed San Francisquito Creek Flood Reduction, Ecosystem Restoration, and Recreation Project please contact Joseph Terry, Senior Biologist, or Ryan Olah, Coast/Bay Division Chief, at the letterhead address, electronic mail (Joseph_Terry@fws.gov; Ryan_Olah@fws.gov), or at telephone (916) 943-6721.

Sincerely,


Jennifer M. Norris (FOR)
Field Supervisor

cc:

Anne Morkill, San Francisco Bay National Wildlife Refuge Complex, Fremont, California

Kim Squires, Bay/Delta Fish and Wildlife Office, Sacramento, California

Tami Schane, California Department of Fish and Wildlife, Napa, California

Susan Glendening, San Francisco Bay Regional Water Quality Control Board, Oakland, California

Len Materman, San Francisquito Creek Joint Powers Authority, Menlo Park, California

Amanda Morrison, National Oceanic and Atmospheric Administration/National Marine Fisheries Service, Santa Rosa, California

Brenda Goeden, San Francisco Bay Conservation and Development Commission, San Francisco, California

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