United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846
SFWO_mail@fws.gov

In Reply Refer to:
2023-0050708-S7-001

June 4, 2024
Sent-Electronically

Regulatory Division Chief
Attn: Frances Malamud-Roam
Department of the Army
San Francisco District, Corps of Engineers
450 Golden Gate Avenue
San Francisco, California 94102
frances.p.malamud-roam@usace.army.mil

Subject: Reinitiation of Formal Consultation and Conference on the East Bay Regional Park District's Routine Maintenance Activities (U.S. Army Corps of Engineers File No. SPN-2003-289020) in Alameda and Contra Costa Counties, California.

Dear Regulatory Division Chief:

This letter is in response to the U.S. Army Corps of Engineers' (Corps) January 20, 2023, request to reinitiate formal consultation and conference with the U.S. Fish and Wildlife Service (Service) on the proposed East Bay Regional Park District's (District) Routine Maintenance Activities in Alameda and Contra Costa Counties, California. Your request was received by the Service on January 20, 2023. This reinitiation is needed to renew the routine maintenance program for another five years and update the list of species included in the analysis of effects. At issue are the proposed project's effects on the following federally listed as endangered and threatened species and their critical habitat, and species proposed for listing:

- endangered California Ridgway's rail (*Rallus obsoletus obsoletus*)
- endangered California least tern (*Sternula antillarum browni*)
- endangered salt marsh harvest mouse (*Reithrodontomys raviventris*)
- endangered San Joaquin kit fox (*Vulpes macrotis mutica*)
- endangered longhorn fairy shrimp (*Branchinecta longiantenna*) and its critical habitat
- endangered vernal pool fairy shrimp (*Branchinecta lynchi*) and its critical habitat
- endangered vernal pool tadpole shrimp (*Lepidurus packardi*)
- threatened Alameda whipsnake (*Masticophis lateralis*) and its critical habitat
- threatened California red-legged frog (*Rana draytonii*) and its critical habitat
- threatened Central California Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*)
- threatened delta smelt (*Hypomesus transpacificus*) and its critical habitat
- threatened foothill yellow legged frog (*Rana boylii*)
- threatened giant garter snake (*Thamnophis gigas*)

- threatened Pacific coast population of the western snowy plover (*Charadrius nivosus nivosus*) and its critical habitat
- threatened pallid manzanita (*Araostaphylos pallida*)
- proposed endangered San Francisco Bay-Delta Distinct Population Segment of the longfin smelt (*Spirinchus thaleichthys*)

Critical habitat has been designated for vernal pool tadpole shrimp and California tiger salamander, but none occurs in the action area. 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).

The federal action on which we are consulting is the Corps issuing a permit to the District pursuant to Section 404 of the Clean Water Act of 1972, as amended (33 U.S.C. § 1344 et seq.), for the proposed routine maintenance activities and restoration projects in Alameda and Contra Costa Counties, California. 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, California Ridgway's rail, California least tern, salt marsh harvest mouse, San Joaquin kit fox, longhorn fairy shrimp and its critical habitat, vernal pool fairy shrimp and its critical habitat, vernal pool tadpole shrimp, Alameda whipsnake and its critical habitat, California red-legged frog and its critical habitat, California tiger salamander, delta smelt and its critical habitat, foothill yellow-legged frog, giant garter snake, western snowy plover and its critical habitat, pallid manzanita, and longfin smelt.

In considering your request, we based our evaluation on the following:

1) The January 20, 2023, initiation letter from the Corps;

2) The May 23, 2017, Biological Assessment (District 2017);

3) The November 3, 2022, Supplement to East Bay Regional Park District Biological Assessment;

4) The January 24, 2024, Supplement to East Bay Regional Park District Biological Assessment;

5) Emails and exchanges between the Service and District biologists; and

6) Other information available to the Service.

The remainder of this document provides our biological opinion on the effects of the proposed project on the California Ridgway's rail, California least tern, salt marsh harvest mouse, San Joaquin kit fox, longhorn fairy shrimp and its critical habitat, vernal pool fairy shrimp and its critical habitat, vernal pool tadpole shrimp, Alameda whipsnake and its critical habitat, California red-legged frog and its critical habitat, California tiger salamander, delta smelt and its critical habitat, foothill yellow-legged frog, giant garter snake, western snowy plover and its critical habitat, and pallid manzanita. Additionally, this document provides a conference opinion on the longfin smelt.

ADMINISTRATION OF THE BIOLOGICAL AND CONFERENCE OPINION

Many of the proposed maintenance, restoration projects, and adaptive management conservation measures occur in waters regulated by the Corps require a Corps' permit, and potentially affect federally listed species and designated critical habitat. Many of these projects have a small, individual footprint and can be permitted under a Corps' Regional General Permit (RGP) or Nationwide Permit (NWP). Because of the small project size of the routine maintenance projects, the District requested a biological opinion that covers take authorization for five years for all these projects. By providing one comprehensive biological opinion for these projects, the Corps would not have to consult separately for each activity on District lands. The Service supported this approach because it allows for a more efficient workload and is more appropriate than consulting on individual projects, allowing the Service to evaluate the District activities at a larger scale. The Service worked with the Corps to help the District streamline the Clean Water Act/Endangered Species Act compliance for routine maintenance activities as well as certain restoration projects. The District worked with the Corps and the Service to define criteria for projects that would qualify for coverage under this comprehensive biological opinion, including qualifying criteria for applicable Corps RGPs/NWPs, Best Management Practices (BMPs), and conservation measures to avoid and minimize adverse effects to listed species. Development of these criteria allowed the Service to address the effects of a broad array of District routine maintenance and restoration activities in this comprehensive biological opinion.

The District will submit a detailed list of proposed maintenance, restoration projects, and adaptive management conservation measures for the upcoming year (the preconstruction project list) to the Corps, Service, and CDFW prior to June 1st each year for review. Only restoration projects and adaptive management conservation measure projects will require approval by the Service and CDFW. Upon receipt of the appropriate information as detailed in the *Description of the Proposed Action* and the *Terms and Conditions*, the Service will review the material and determine consistency with this biological opinion. Projects determined inconsistent with this biological opinion are those that exceed minimal effects to this species, including direct, indirect, and cumulative effects and these would require a separate consultation. At the Service's discretion, proposed actions that are not consistent with the covered activities as described in the *Description of the Proposed Action* may still be included, if the complete implementation of appropriate additional conservation measures sufficiently reduces the effects of the action or that the project has minimal effects that are consistent with the intent of this biological opinion and the Corps' permit. At the time of review of the June 1st project list, the Service can require species-specific conservation measures in the future in any parks covered under this biological opinion, if the species is found to inhabit parks or are reasonably certain to occur due to close proximity of future occurrences.

This biological opinion is effective for a period of five (5) calendar years from the date of its issuance and can be extended if deemed appropriate by both agencies. The Service will review this consultation, as appropriate, to ensure that its application is consistent with the intended criteria. If, at the time of the five-year review, the proposed affected acreage of species habitat by routine maintenance activities (Table 22) has not been reached, the Corps can continue to use this biological opinion for District routine maintenance activities, if acceptable to the Service. The Corps can then continue to use this biological opinion as long as the affected acreage of listed species habitat is consistent and does not exceed that which is detailed in Table 22.

Consultation History (since the issuance of the February 22, 2018 biological opinion)

February 19, 2021:	District staff requested to remove the requirements for Callippe silverspot butterfly given that the *Species Status Assessment for the Callippe Silverspot Butterfly* (Service 2020a) indicates that they are not present in the East Bay and the East Bay is no longer considered part of the species range.
March 2, 2021:	The Service approved the removal of requirements for Callippe silverspot butterfly.
January 20, 2023:	The Service received the reinitiation of consultation letter from the Corps.
April 3, 2023:	The Service, Corps, and District staff went on a site visit to see some of the standard project sites.
April 12, 2023:	The Service received an email from the Corps requesting to add foothill yellow-legged frog to the consultation.
July 21, 2023:	The Service requested an updated list of park unit acreages and environmental baseline.
August 21, 2023:	The Service received an updated version of Table 1 and environmental baseline.
September 27, 2023:	The District requested a meeting with the Service, Corps, and California Department of Fish and Wildlife (CDFW) to discuss possible changes to the biological opinion that would enable CDFW to issue a Consistency Determination.
October 13, 2023:	The Service, Corps, CDFW, and District met virtually to discuss a possible Consistency Determination.
December 4, 2023:	The Service, Corps, and District met virtually to discuss adding a conference opinion for western pond turtle and longfin smelt.
January 22, 2024:	The Service, CDFW, and District met virtually to further discuss a possible Consistency Determination.
March 7, 2024:	The Service notified the Corps and District that they would not be proceeding with a conference opinion for western pond turtle at this time.

BIOLOGICAL OPINION AND CONFERENCE OPINION

Description of the Proposed Action

Background

The District currently manages 66 regional parks, recreation areas, wilderness lands, shorelines, and preserves, as well as 43 distinct trail segments, which encompass approximately 122,206 acres in Alameda and Contra Costa Counties, California (Table 1). The District's mission is to

acquire, preserve, protect, and operate regional parklands in perpetuity for public use, while conserving these lands for natural resources. Over 90 percent of District lands are protected and operated as natural parklands. This includes parklands along the shorelines of San Francisco, San Pablo, Suisun Bays and the Delta Region, and inland areas of the coastal and transverse ranges of the East Bay.

Each year, the District performs routine maintenance activities designed to maintain existing facilities and structures the District also implements restoration projects to improve watersheds and coastal shoreline conditions. Activities included in this biological opinion are routine maintenance activities that will be conducted over a five-year period on District lands by the District (or their contractors) consistent with the Corps RGP-15 and restoration projects that will be covered under the Corps RGP-15 and Nationwide 27. Not all activities will be conducted annually and the number of projects conducted under RGP-15 or Nationwide may vary by year. Therefore, routine maintenance projects (defined in Table 2) and restoration projects to be conducted in any given year will vary by year over the five-year period and will be reviewed annually by the Service. District routine maintenance or restoration activities within East Contra Costa County Habitat Conservation Plan (ECCCHCP) Preserve Lands will not be covered in this biological opinion, as these activities will receive take authorization through the ECCCHP's incidental take permit (Fish and Wildlife Permit No. TE-160958-0). These parks are identified in Table 1.

The District will submit a detailed annual pre-construction project list for the upcoming year to the Corps and the Service by June 1 each year for approval. Additional projects may be reviewed by the Service after submittal deadline if information needed for projects was not available at the submittal deadline. The Service will inform the Corps and the District immediately if any routine maintenance projects are not consistent with this biological opinion. The Service and CDFW will respond with a letter approving that year's proposed restoration projects and adaptive management conservation measures (described in the Project Description section of this document) found to be consistent with this biological opinion. At a minimum, the annual pre-construction project list will include the following:

- A description of activities/projects proposed and their location
- Location and extent of habitat disturbance (temporary and permanent)
- Anticipated effects to listed species (restoration projects only)
- Conservation measures to be implemented during project work (restoration projects only)
- Any additional conservation measures the District deems necessary to minimize adverse effects to listed species (would require Service approval)

Covered Activities

Covered activities will include routine maintenance activities in streams, catch basins, seeps, springs, ponds, lakes, beaches, tidal marshes, and shoreline levees. The purpose of these activities is to maintain existing facilities, protect water quality, to reduce erosion, provide public and emergency access, and maintain natural resources that support a variety of listed, special status, and other native species. Routine maintenance activities will occur in the following watersheds: Alameda, Alhambra, Claremont, Garrity, Rheem, Kirker, Marsh, Mount Diablo, Pinole, San Pablo, San Leandro, San Lorenzo, Walnut and Wildcat Creeks, San Francisco Bay, San Pablo Bay, and Suisun Bay. Table 2 below describes covered routine maintenance activities.

Table 1. Acres[1] of Species Distributional Range on the District Parkland Units and East Contra Costa County Habitat Conservation Plan (ECCCHCP) Preserves District Lands

	Parkland Units	***Park Acres***			***Federally Listed (Endangered or Threatened) Species***															
			ECCC HCP	***Total Non-HCP***	Alameda Whipsnake	CA Red-Legged Frog	Central CA Tiger Salamander	Foothill Yellow-Legged Frog	San Joaquin Kit Fox	CA Ridgway's Rail	Salt Marsh Harvest Mouse	Longhorn Fairy Shrimp	Vernal Pool Fairy Shrimp	Vernal Pool Tadpole Shrimp	Giant Garter Snake	CA Least Tern	Western Snowy Plover	Delta Smelt	Longfin Smelt	Pallid Manzanita
1	ANTHONY CHABOT	3,314.26		3,314.26	3,314.26															
2	ANTIOCH/OAKLEY SHORE	6.32		6.32											6.32			6.32	6.32	
3	ARDENWOOD	208.00		208.00																
4	BAY POINT	149.70		149.70							149.70							149.70	149.70	
5	BIG BRK/DELTA REC	1,648.00		1,648.00							1,648.00				1,648.00			1,648.00	1,648.00	
6	BISHOP RANCH	806.13		806.13	806.13															
7	BLACK DIAMOND MINES	5,580.20	462.75	5,117.45	5,117.45	5,117.45	5,117.45		5,117.45											
8	BRIONES	6,255.18		6,255.18	6,255.18	6,255.18														
9	BROOKS ISLAND	372.82		372.82												372.82	372.82		372.82	
10	BROWN'S ISLAND	595.00		595.00							595.00				595.00			595.00	595.00	
11	BRUSHY PEAK	1,979.07		1,979.07	1,979.07	1,979.07	1,979.07		1,979.07			1,979.07	1,979.07	1,979.07						
12	BYRON VERNAL POOLS	1,472.45	1,472.45	0.00		0.00	0.00		0.00			0.00	0.00	0.00						
13	CARQUINEZ ST SHORE	1,568.27		1,568.27														1,568.27	1,568.27	
14	CLAREMONT CANYON	208.31		208.31	208.31															
15	CLAYTON RANCH	4,078.50	3,016.81	1,061.69	1,061.69	1,061.69	1,061.69													
16	CONTRA LOMA	779.35		779.35	779.35		779.35		779.35											
17	COYOTE HILLS	1,274.05		1,274.05							1,274.05									
18	CROCKETT HILLS	2,124.75		2,124.75																
19	CROWN BEACH SHORE	386.89		386.89						386.89							386.89		386.89	
20	CULL CANYON	360.00		360.00	360.00															
21	DEER VALLEY	3,076.58	3,076.58	0.00	0.00	0.00	0.00		0.00											
22	DEL VALLE	4,395.21		4,395.21	4,395.21	4,395.21	4,395.21	4,395.21												
23	DELTA ACCESS	1,011.95	640.16	371.79					371.79						371.79					
24	DIABLO FOOTHILLS	1,060.00		1,060.00	1,060.00	1,060.00														
25	DON CASTRO	101.00		101.00	101.00															
26	DOOLAN CANYON	640.00		640.00		640.00	640.00		640.00											
27	DRY CREEK PIONEER	1,626.45		1,626.45	1,626.45	1,626.45	1,626.45													
28	DUBLIN HILLS	654.22		654.22	654.22	654.22														
29	GARIN	4,215.24		4,215.24	4,215.24	4,215.24	4,215.24													

	Parkland Units	***Park Acres***			***Federally Listed (Endangered or Threatened) Species***															
			ECCC HCP	***Total Non-HCP***	Alameda Whipsnake	CA Red-Legged Frog	Central CA Tiger Salamander	Foothill Yellow-Legged Frog	San Joaquin Kit Fox	CA Ridgway's Rail	Salt Marsh Harvest Mouse	Longhorn Fairy Shrimp	Vernal Pool Fairy Shrimp	Vernal Pool Tadpole Shrimp	Giant Garter Snake	CA Least Tern	Western Snowy Plover	Delta Smelt	Longfin Smelt	Pallid Manzanita
30	HAYWARD SHORELINE	1,815.05		1,815.05						1,815.05	1,815.05					1,815.05	1,815.05		1,815.05	
31	HUCKLEBERRY	240.33		240.33	240.33															240.33
32	KENNEDY GROVE	221.46		221.46	221.46															
33	LAKE CHABOT	1,755.22		1,755.22	1,755.22															
34	LAS TRAMPAS	5,657.43		5,657.43	5,657.43	5,657.43	5,657.43													
35	LEONA CANYON	289.64		289.64	289.64															
36	LITTLE HILLS RANCH	100.00		100.00	100.00															
37	M L KING, JR SHORE	748.52		748.52						748.52	748.52						748.52		748.52	
38	MARTINEZ SHORELINE	343.00		343.00						343.00	343.00							343.00	343.00	
39	MCLAUGHLIN EASTSHORE	1,849.51		1,849.51						1,849.51	1,849.51								1,849.51	
40	MILLER/KNOX SHORE	306.51		306.51															306.51	
41	MISSION PEAK	3,023.55		3,023.55	3,023.55	3,023.55	3,023.55													
42	MORGAN TERRITORY	5,320.65	604.84	4,715.81	4,715.81	4,715.81	4,715.81													
43	OHLONE	9,049.00		9,049.00	9, 049.00	9, 049.00	9, 049.00	9, 049.00												
44	OYSTER BAY SHORE	194.78		194.78						194.78	194.78								194.78	
45	PLEASANTON RIDGE	9,086.07		9,086.07	9,086.07	9,086.07	9,086.07													
46	PT ISABEL SHORE	22.70		22.70						22.70	22.70								22.70	
47	PT PINOLE SHORE	2,444.95		2,444.95						2,444.95	2,444.95								2,444.95	
48	QUARRY LAKES	471.25		471.25																
49	RANCHO PINOLE	1,053.00		1,053.00	1,053.00	1,053.00														
50	REDWOOD	1,831.59		1,831.59	1,831.59															1,831.59
51	ROBERTS	86.92		86.92	86.92															
52	ROUND VALLEY	1,910.42		1,910.42	1,910.42	1,910.42	1,910.42		1,910.42											
53	SAN PABLO BAY SHORE	321.81		321.81						321.81	321.81								321.81	
54	SHADOW CLIFFS	265.80		265.80																
55	SIBLEY	928.08		928.08	928.08															928.08
56	SOBRANTE RIDGE	277.02		277.02	277.02	277.02														277.02
57	SUNOL	6,858.42		6,858.42	6,858.42	6,858.42	6,858.42	6,858.42												

	Parkland Units	***Park Acres***			***Federally Listed (Endangered or Threatened) Species***															
			ECCC HCP	***Total Non-HCP***	Alameda Whipsnake	CA Red-Legged Frog	Central CA Tiger Salamander	Foothill Yellow-Legged Frog	San Joaquin Kit Fox	CA Ridgway's Rail	Salt Marsh Harvest Mouse	Longhorn Fairy Shrimp	Vernal Pool Fairy Shrimp	Vernal Pool Tadpole Shrimp	Giant Garter Snake	CA Least Tern	Western Snowy Plover	Delta Smelt	Longfin Smelt	Pallid Manzanita
58	SYCAMORE VALLEY	695.49		695.49		695.49														
59	TEMESCAL	49.92		49.92																
60	THURGOOD MARSHALL[2]	2,608.00	400.90	2,207.10	2,207.10	2,207.10	2,207.10													
61	TILDEN	2,078.79		2,078.79	2,078.79	2,078.79														2,078.75
62	VARGAS PLATEAU	1,249.02		1,249.02	1,249.02	1,249.02	1,249.02													
63	VASCO CAVES	719.84		719.84		719.84	719.84		719.84			719.84	719.84	719.84						
64	VASCO HILLS	3,662.14	3,499.38	162.76		162.76	162.76		162.76			162.76	162.76	162.76						
65	WATERBIRD	197.83		197.83							197.83									
66	WILDCAT CANYON	2,789.15		2,789.15	2,789.15															
	Parklands (Acres)	**120,471.08**	**13,173.86**	**107,297.22**	**87,341.90**	**75,748.56**	**64,454.21**	**20,302.63**	**11,680.68**	**8,127.21**	**11,604.90**	**2,861.67**	**2,861.67**	**2,861.67**	**2,621.11**	**2,187.87**	**3,323.28**	**4,310.29**	**12,773.83**	**5,355.77**
	Trails (Acres)	**1,735.31**	**0.00**	**1,735.31**	**1,441.72**	**1,116.66**	**55.42**	**0.00**	**55.42**	**64.48**	**0.03**	**0.00**	**0.00**	**0.00**	**15.48**	**0.00**	**0.00**	**83.23**	**89.78**	**0.00**
	Total Acres	**122,206.39**		**109,032.53**	**88,783.62**	**76,865.22**	**64,509.63**	**20,302.63**	**11,736.10**	**8,191.69**	**11,604.93**	**2,861.67**	**2,861.67**	**2,861.67**	**2,636.59**	**2,187.87**	**3,323.28**	**4,393.52**	**12,863.61**	**5,355.77**
	Percentage of Total Land				**81.43%**	**70.50%**	**54.70%**	**18.62%**	**10.70%**	**7.47%**	**10.58%**	**2.61%**	**2.61%**	**2.61%**	**2.40%**	**1.99%**	**2.70%**	**4.00%**	**11.80%**	**4.88%**

[1] These acreage are to indicate species range and potential presence only, because (1) the entire distributional range overestimates the actual extent of suitable habitat, (2) not all land cover types within the District are natural open space land, and (3) not all potentially suitable habitat is occupied by the covered species. For delta smelt and longfin smelt, "total acreage" is grossly overestimated because only shoreline/tidal areas within those parks provide suitable habitat; [2] Previously known as Concord Hills

NOTE: Park Acres subject to change based on acquisition of new lands and therefore may not be precise. Regional Trails/Interpark Trails not specifically addressed in Table 1.

Table 2. Covered Maintenance Activities

Routine Maintenance Activity	Description	Frequency of Activity/ Duration	Predicted Maximum Annual Extent of Impacts	Best Management Practices (BMPs)
1. Culvert repair, replacement, and maintenance	Existing degraded culverts will be replaced with same-size culverts, or if existing culverts are inadequate to convey peak flows, with culverts of a larger size (diameter and/or length). Culverts will be installed at existing channel grade. Mechanized equipment, including excavator, backhoe, ten-wheel dump truck, water truck, and soil compactors, will access the project sites and operate mostly on existing roads, trails, or levees and will avoid wetted channels/waterbodies.	1- 7 days per culvert 4 - 5 culverts per year	Temporary = 0.09 acre to uplands, riparian, and wetlands Permanent = None Removal of vegetation will be minimized; work typically only requires removal of lateral limbs to allow access.	1. When feasible, the District will replace old metal-galvanized culverts with modern plastic culverts. 2. When feasible, the District will install replacement culverts large enough to accommodate anticipated 25-year frequency storm events. 3. Replacement culverts will be installed at the existing grade to maintain natural stream gradient and minimize under cutting and erosion. 4. When feasible, the District will remove culverts to restore and enhance the natural stream corridor and riparian vegetation. 5. When feasible, the District will remove culverts and replace them with clear-span bridges or armored articulated fords. 6. The District will construct headwalls or discharge end splash pads, and will install armoring with porous materials or use other techniques that allow plant growth and avoid the permanent elimination of stream habitat.
2. Replacement and upgrade of existing culverts with installation of new head or tail walls	Existing degraded culverts will be replaced with same-or larger- size culverts and will include the installation of new rock head and/or tail walls to stabilize the streambank and prevent head cutting and/or down cutting of stream channels. Culverts will be installed at existing channel grade. Mechanized equipment, including excavator, backhoe, ten-wheel dump truck, water truck, and soil compactors, will access the project sites and operate mostly on existing roads, trails, or levees and will avoid wetted channels/waterbodies.	1- 7 days per culvert 8 - 10 culverts per year	Temporary = 0.18 acre to uplands, riparian, and wetlands Permanent =0 .18 acre to uplands, riparian, and wetlands Removal of vegetation will be minimized; work typically only requires removal of lateral limbs to allow access.	
3. Installation of new culverts	When no other alternative channel crossing is feasible, new culverts will be installed in manmade or natural drainages, ephemeral, intermittent, and perennial streams, or utilized as outflow discharge structures in man-made ponds or wetlands. Mechanized equipment, including excavator, backhoe, ten-wheel dump truck, water truck, and soil compactors, will access the project sites and operate mostly on existing roads and levees and will avoid wetted channels or waterbodies.	1- 7 days per culvert 2 - 3 culverts per year	Temporary = 0.05 acre to uplands, riparian, and wetlands Permanent =0 .06 acre to uplands, riparian, and wetlands Removal of vegetation will be minimized; work typically only requires removal of lateral limbs to allow access.	

Routine Maintenance Activity	Description	Frequency of Activity/ Duration	Predicted Maximum Annual Extent of Impacts	Best Management Practices (BMPs)
4. Maintenance of sediment-debris from culverts	During and/or prior to high winter flows, accumulated sediment and debris will be removed from culverts using equipment operated from the top of bank**s** and levees, or by hand crews to maintain flow and prevent flooding. Woody debris that does not block flow will be left in place to provide habitat for fish and wildlife. Some mechanized equipment may be required, and could include backhoe, ten-wheel dump truck, or four-wheel drive truck. This equipment will access the project sites and operate mostly on existing roads, trails, or levees and completely avoid wetted channels or other waterbodies.	0.5-1 day 4 – 5 culverts per year	Temporary = 0.22 acre to uplands, riparian, and wetlands Permanent = None Removal of vegetation will be minimized; work typically only requires removal of lateral limbs to allow access.	None
5. Installation of new culvert head- and tail-walls	New rock head and/or tail walls will be installed at locations with existing culverts to stabilize the streambank and prevent head and/or down cutting. These rock structures will be installed in the channel bed and bank. Mechanized equipment, including excavator, backhoe, ten-wheel dump truck, water truck, and soil compactors, will access the project sites and operate mostly on existing roads and levees and will avoid wetted channels or waterbodies.	1-4 days 2 - 3 head and/or tail walls per year	Temporary = 0.015 acre to uplands, riparian, and wetlands Permanent = 0.015 acre to uplands, riparian, and wetlands Removal of vegetation will be minimized; work typically only requires removal of lateral limbs to allow access.	None
6. Installation of energy dissipaters	Energy dissipaters will be installed to prevent erosion associated with flow discharge from existing culverts. These structures consist of drain to rip-rap size rock and are similar to or an extension of a culvert tail-wall structure. Energy dissipaters are effective in reducing channel erosion and down cutting. Mechanized equipment, including excavator, backhoe and ten-wheel dump truck, will access the project sites and operate mostly on existing roads and levees and will avoid wetted channels or waterbodies.	1-3 days 1 - 2 energy dissipaters per year	Temporary = 0.02 acre to uplands, riparian, and wetlands Permanent = 0.02 acre to uplands, riparian, and wetlands Removal of vegetation will be minimized; work typically only requires removal of	None

Routine Maintenance Activity	Description	Frequency of Activity/ Duration	Predicted Maximum Annual Extent of Impacts	Best Management Practices (BMPs)
			lateral limbs to allow access.	
7. Installation of armored or natural rock ford-stream crossings	Armored concrete pre-cast, open-cell, interlocking blocks will be laid within road crossings and/or trails and on top of the streambed and drainages. These fords will be installed in select locations to replace existing culverts and at natural drainage crossings to provide stability and minimize channel bed erosion. Ford crossings will be installed at the ground surface of the channel banks and bed. The armored crossings are designed and installed to maintain or improve flow and reduce erosion. Ford crossings are approximately 10 to 12 feet wide and equivalent to the width of the corresponding road or trail crossing. The length of the crossing from bank to bank and the total area of the crossing vary based on the width of the channel. Hand tools are used for most of these construction activities. Some mechanized equipment may be required and could include the use of an excavator, backhoe, ten-wheel dump truck, water truck, and soil compactors. This equipment will access the project sites and operate mostly on existing roads, trails, or levees and completely avoid wetted channels or other waterbodies.	2-5 days 2 - 3 crossings per year	Temporary = 0.027 acre to uplands, riparian, and wetlands Permanent = 0.027 acre to uplands, riparian, and wetlands	1. The District will conduct a District-wide annual evaluation of natural stream crossings to determine the need for maintenance. 2. Minimal grading or debris removal will be performed to make the crossing passable. 3. Stream gravel and sediments will be left within the dry portion of the stream channel rather than moved to upland areas. 4. Natural crossings (which require less intensive maintenance) rather than culverts, will be used and used where feasible.
8. Maintenance of existing ford crossings	Repairs will be made to existing armored or natural rock fords to help maintain road and/or trail crossings within streambed and drainages. Hand tools are used for most of the construction activities. Some mechanized equipment may be required and could include the use of an excavator, backhoe, ten-wheel dump truck, water truck, and soil compactors. This equipment will access the project sites and operate mostly on existing roads, trails, or levees and completely avoid wetted channels or other waterbodies.	2-5 days 1 crossing per year	Temporary = 0.01 acre to uplands, riparian, and wetlands Permanent = None	

Routine Maintenance Activity	Description	Frequency of Activity/ Duration	Predicted Maximum Annual Extent of Impacts	Best Management Practices (BMPs)
9. Maintenance and installation of clear span bridges	Clear-span bridges will be installed to replace existing culverts, natural (unarmored) stream crossings, concrete fords, and failing non-clear span bridges. Bridge concrete footings and abutments will be poured in place from above the top of the bank and will not have contact with channel flow. Each bridge span will be lowered into place by a crane operated from above the bank or tidal channel or other appropriate methods. While only clear span bridges will be installed, existing bridges (clear span and non-clear span) can be repaired/maintained. Other mechanized equipment, including excavator, backhoe, and ten-wheel dump truck, will access the project sites and operate mostly on existing roads and levees avoiding wetted channels or waterbodies. Maintenance of existing bridges consists of protection and stabilization of bank erosion around bridge abutments (detailed methods are described below).	1-20 days 1 bridge per year	Temporary = 0.01 acre to uplands, riparian, and wetlands Permanent = None	None
10. Streambank, shoreline, and levee stabilization	Bank and levee stabilization will be conducted in locations where bank or shoreline erosion has resulted in: (1) the release of sediment exceeding that generated by natural processes; (2) unstable road, trail, pathway, or levee structures; (3) erosion around a culvert or bridge abutments; and (4) major environmental or structural damage. Stabilization methods include the installation of log crib walls, replacing existing rip-rap, extending rip-rap sections, new rip-rap, upland and riparian vegetation planting, and other bio-engineering techniques. Mechanized equipment, including excavator, backhoe, ten-wheel dump truck, and soil compactors, will	1-8 days 3 - 4 stabilizations per year	Temporary = 0.36 acre to uplands, riparian, and wetlands Permanent = 0.36 acre to uplands, riparian, and wetlands	1. When feasible, the District will use bio-engineering techniques, such as planting riparian woody vegetation and installing willow waddles and mattresses, log crib-walls, log and stump deflectors, or vortex weirs to stabilize banks and reduce erosion. 2. Where appropriate jute netting, or other erosion control fabrics will be used to provide protection until adequate plant growth

Routine Maintenance Activity	Description	Frequency of Activity/ Duration	Predicted Maximum Annual Extent of Impacts	Best Management Practices (BMPs)
	operate mostly on existing roads and levees avoiding wetted channels or waterbodies.			can provide permanent protection. 3. Where appropriate broadcast and/or hydro-seeding (native mix) and planting of willow, maple, alder, and other native riparian woody vegetation will be carried out to stabilize banks and prevent erosion.
11. Maintenance and installation of spring boxes	Includes the maintenance of existing wood, metal, and slotted vertically placed collector pipe located to collect water in a seep or spring. The placement of new spring boxes mostly consists of installing slotted vertical collector pipe within a seep or spring. Spring box maintenance and development may also include the installation or repair of above or underground pipelines for conveying water from these water sources to alternative locations, including water tanks or troughs. Whenever possible, pipelines will be installed in existing roads and trails. All troughs will have escape ramps for wildlife. Mechanized equipment, including excavator, backhoe, ten-wheel dump truck, and small trucks, will operate mostly on existing roads, trails, levees, and disturbed areas. Cross country access will be minimized to avoid sensitive habitats and will be mostly restricted to open grasslands.	1-7 days 4-5 spring boxes per year	Temporary = 0.008 acre to uplands, riparian, and wetlands Permanent = 0.05 acre to uplands, riparian, and wetlands	1. Installation will include materials such as sand and/or gravel and non-woven geotextile fabric filter to prevent sediment from entering the system. 2. Sufficient spring flow will remain in the wetland area to maintain wetland functions and values. 3. Overflow from the development will be directed back into the wetland area. All spring developments will be designed to have a no net loss of wetlands.
12. Maintenance dredging of silt basins, ponds, lakes, and muted tidal wetlands	Maintenance dredging will occur in silt basins, ponds, lakes, and muted tidal wetlands to restore silt capacity and open water habitat for listed and/or aquatic species. Sediment removal may also incorporate design features to improve flow to and from receiving waters. Mechanized equipment including excavator, backhoe, ten-wheel dump truck, and small trucks, will operate mostly on existing roads, trails,	1-7 days 8-10 dredging projects per year	Temporary = 0.3 acre to uplands, riparian, and wetlands Permanent = None	1. When feasible, work will be performed in dry conditions and above water level. Otherwise, floating open water turbidity curtains will be used to contain sediment. 2. Other erosion, sediment, and turbidity control measures will be implemented as needed to contain

Routine Maintenance Activity	Description	Frequency of Activity/ Duration	Predicted Maximum Annual Extent of Impacts	Best Management Practices (BMPs)
	levees, and disturbed areas. Cross country access will be minimized to avoid sensitive habitats and will be mostly restricted to open grasslands.			sediments, minimize siltation, and prevent downstream turbidity. 3. Whenever feasible, dredging will be done with an excavator from the top of bank. 4. Based on permits conditions, sediment removed during pond and/or stream project activities will be placed at appropriate upland locations as designated by the Service-approved biologist. Removed sediment will not be placed where it can enter into aquatic habitat, and to the maximum extent possible not be placed in areas with ground squirrel burrows. 5. Removal of riparian vegetation will be minimized during dredging operations. 6. When feasible, dredged ponds and earthen dams will be reconfigured to enhance the habitat for aquatic species (i.e. deepening pond or pond section to increase inundation period, removing dense emergent vegetation.
13. Maintenance of existing recreational shoreline facilities.	Maintenance will include repairs and/or replacement of docks, fishing piers, boat launches, marsh board walks and overlooks. The maintenance and replacement of these structures will preserve public access and ensure public safety. Non-toxic materials will be used in all repairs and replacement structures. Mechanized equipment, including excavator, backhoe, crane, and ten-wheel dump truck, will access the	5-20 days 1 - 2 maintenance projects per year	Temporary = 0.04 acre to uplands, riparian, and wetlands Permanent = 0.04 acre to uplands, riparian, and wetlands	1. Anti-perching devices that are not in conflict with recreational uses will be installed to deter avian predators. As determined by a Service-approved biologist, the anti-perching devices will be installed at appropriate locations and on suitable structures (i.e. tall light

Routine Maintenance Activity	Description	Frequency of Activity/ Duration	Predicted Maximum Annual Extent of Impacts	Best Management Practices (BMPs)
	project sites and operate mostly on existing roads and levees avoiding wetted channels or waterbodies. Small water craft could also be used in open water to provide access and conduct repairs.			posts, utility poles, fencing, recreational signage).
14. Removal of hazardous man-made structures from waterbodies	Abandoned structures acting as a barrier to fish and wildlife movements or hazards to public safety will be removed from various waterbodies including streams, ponds, lakes, tidal channels estuaries, and bay waters. If possible, structures will be removed in their entirety. Excavated and disturbed areas will be restored following removal of objects. Mechanized equipment, including excavator, backhoe, crane, ten-wheel dump truck, four wheel drive trucks, and all-terrain vehicles (ATV's), will access the project sites and operate mostly on existing roads and levees avoiding wetted channels or waterbodies. Various water craft could also be used in open water to provide access and remove objects.	0.5-10 days As needed	Temporary and permanent impacts will be minimal	1. To the extent possible, no heavy equipment will be operated in standing or flowing water and disturbance to waterbodies will be minimized. 2. Any toxic or hazardous materials that could be deleterious to aquatic will be contained and prevented from re-contaminating the substrate and/or entering the waterbody.
15. Removal of vessels	Abandoned vessels acting as a barrier to fish and wildlife movements or hazards to navigation or public safety will be removed from various waterbodies including streams, ponds, lakes, tidal channels, estuaries, and bay waters. If possible, structures will be removed in their entirety. Excavated and disturbed areas will be restored following removal of objects	0.5-10 days As needed	Temporary and permanent impacts will be minimal	1. To the extent possible, no heavy equipment will operated in standing or flowing water and disturbance to waterbodies will be minimized. 2. Any toxic or hazardous materials that could be deleterious to aquatic will be contained and prevented from re-contaminating the substrate and/or entering the waterbody.

Adaptive Management Conservation Measures

While conducting routine maintenance, the District will incorporate an adaptive management strategy to improve existing conditions. Overall, implementation of adaptive management conservation measures reduces adverse effects to District lands and nearby waterbodies during implementation of routine maintenance projects. Adaptive management conservation measures will include but are not limited to:

- Planting native riparian and wetland vegetation to improve water quality
- Controlling and removing non-native invasive species (i.e., bullfrogs, exotic fish, Chinese mitten crab, etc.)
- Installing nest boxes for riparian bird species (i.e., wood ducks, tree swallows, and flycatchers)
- Removing non-native invasive vegetation to improve riparian habitat conditions
- Implementing streambank bioengineering techniques to reduce erosion and stabilize streambanks

Restoration Projects

Restoration projects to be implemented by the District will include revegetating disturbed sites, new grazing management practices benefiting listed/sensitive species, enhancing habitat conditions (aquatic, grasslands, and upland), reducing fuel loads, removing invasive aquatic and terrestrial plants (including reduction and cover of annual exotic grasses), developing spring boxes, and restoring existing levees. Additional Conservation Measures to those described below may be required by the Service and CDFW for restoration projects when projects are submitted for Service and CDFW approval.

Pond (Lentic Waterbody) Restoration Projects

Pond restoration projects will include the creation, repair, enhancement, and restoration of man-made lentic waterbodies. These ponds provide water for livestock and support a variety of taxa including California tiger salamander and California red-legged frog. The ponds also support western pond turtle, as well as various common amphibian species. Projects will be designed to enhance aquatic habitat for wildlife, reduce erosion and sedimentation to receiving waters, improve hydro-periods for breeding amphibians, and improve livestock water availability and grazing distribution. Projects could include but are not limited to: the re-construction of failed ponds; removal of sediments or de-siltation; and modifications of existing ponds to restore the original capacity and inundation period; repair and/or replacement of structural components such as spillways overflow discharge pipes or channels; and earthen dam and embankment repair and stabilization. Maintenance project (Table 2) activities may also include controlling noxious weeds, managing emergent vegetation when appropriate to improve habitat conditions, establishing native vegetation, and controlling non-native predators such as bullfrogs, predatory centrarchids, catfish, and *Gambusia spp*. Pond restoration projects may require the temporary dewatering or draining of the pond. It is anticipated that between six and twenty pond restoration projects will be conducted during a five-year period.

Mechanized equipment, including excavator, backhoe, ten-wheel dump truck, four wheel drive trucks, soil compacters, and ATV's, will access the project sites and typically operate on existing roads and earthen dam levees avoiding wetted channels. The implementation of these projects

will mostly cause temporary effects to upland, riparian, wetland vegetation, but overall will have neutral or beneficial permanent impacts. The size of these waterbodies is highly variable. Project duration will range from four to twenty days.

Stream (Lotic Waterbody) Restoration Projects

Stream restoration projects will involve the enhancement or restoration of ephemeral, intermittent, or perennial streams and riparian corridors to improve habitat characteristics for listed and other native species. Restoration projects will incorporate hydrologic, hydraulic, biological, and geomorphic process and will be designed to enhance stream function, promote dynamic equilibrium, reduce erosion, improve water quality to receiving waters, and improve aquatic habitat characteristics and/or riparian vegetative structure within the restored stream reach sites. Restoration projects may include removing instream man-made structures or instream barriers (when the project size exceeds the routine maintenance specifications) to fish and other aquatic species to restore the natural stream condition or installing instream structures to stabilize and protect degraded streambanks when the project size exceeds the routine maintenance specifications. Instream structures could include boulder riprap, boulder wing deflectors, rock weirs, root wad deflectors, log cribbing, live vegetated crib walls, tree or native material revetment, brush mattresses, and native re-vegetation. Other modifications could include changes in gradient, sinuosity, channel slope and type, cross-section and flood plain profile, and bankside vegetation. To the extent practicable, invasive noxious weeds will be controlled or removed during restoration activities. Appropriate native vegetation will be used for riparian restoration and for replanting exposed banks in a way that will replicate the existing biological conditions to stream reach corridor sites that support listed species.

Mechanized equipment, including excavator, backhoe, crane, ten-wheel dump truck, four wheel drive trucks, soil compactors, and ATV's, will access the project sites and operate mostly on existing roads, trails, and levees avoiding wetted channels or waterbodies. The implementation of these projects will mostly be temporary effects to upland, riparian, wetland vegetation, stream substrate and bank, but overall will have neutral or beneficial permanent impacts. The size of these waterbodies is highly variable and project duration will range from four to sixty days. It is anticipated that lotic restoration projects will be conducted in four to six stream reach sites within a five-year period.

Tidal Emergent Wetland Restoration Projects

Efforts to improve the habitat quality of tidal emergent wetlands or shorelines may include various restoration projects in tidal flats, tidal wetlands, diked baylands, and adjacent transitional upland habitats. Modifications could result in changes in tidal action, flood plain profile, and vegetation types in degraded wetland areas. Projects may include the removal of non-native vegetation, the removal of man-made debris or hazardous materials, and the re-establishment of native tidal and high marsh vegetation to enhance habitat conditions for giant garter snake, Ridgway's rail, and the salt marsh harvest mouse.

To the extent practicable, restoration projects will include the control of non-native species and predators in tidal wetlands and/or adjacent transitional upland habitats. Invasive noxious plant species will be controlled or removed. Target species will include, but not be limited to, iceplant and its hybrids, birdsfoot trefoil, broadleaf pepperweed, and Mediterranean saltwort. Exposed wetland areas will be replanted with the appropriate native vegetation and species composition

and density will be determined using reference sites of other functional wetlands with similar profiles dominated by native vegetation types. Non-native predator management will mostly focus on feral cats, non-native red fox, Norway rat, and black rat removal and control to reduce predation events to giant garter snake, Ridgway's rail, and salt marsh harvest mouse.

Mechanized equipment, including excavator, backhoe, crane, ten-wheel dump truck, four wheel drive trucks, soil compactors, and ATV's, will access the project sites and operate mostly on existing roads and levees avoiding wetted channels or waterbodies. The implementation of these projects will result in mostly temporary effects to upland and wetland vegetation, or tidal substrate, but overall will have neutral or beneficial permanent impacts. The size of these waterbodies is highly variable and project duration can range from a few days to several weeks. It is anticipated that tidal emergent restoration projects will be conducted at two to four sites within a five-year period.

Conservation Measures

General Measures

1. *Biologist Approval*. The District will submit the names and credentials of biologists that will conduct the activities specified in the following measures to the Service for approval along with the preconstruction project list. All monitors must be approved in writing by the Service prior to conducting monitoring activities. For restoration projects, the District will also submit the names and credentials of biologists to CDFW for approval.

2. *Trash Removal*. All trash and debris within the work area will be placed in containers with secure lids before the end of each work day in order to reduce the likelihood of predators being attracted to the site by discarded food wrappers and other rubbish that may be left on-site. Containers will be emptied as necessary to prevent trash overflow onto the site and all trash will be disposed of at an appropriate off-site location.

3. *Work Areas*. Project activities will be restricted to the minimum area necessary. Prior to start of work, project boundaries and access routes will be clearly demarcated to prevent work vehicles from straying into adjacent habitat. To the extent feasible, maintenance and construction activities will avoid small mammal and ground squirrel burrows and potential dens that may be used by listed species for shelter.

4. *Equipment.* The District will implement the following measures:
    a. The District will avoid using heavy equipment in areas where hand tools or light equipment are capable of performing the task.
    b. When feasible, The District will use rubber-tired vehicles as opposed to track mounted equipment to avoid soil compaction and disturbance.
    c. Prior to work, all equipment will be inspected for fuel, oil, and hydraulic leaks and will be repaired if necessary.
    d. At the work site, fueling of equipment and vehicles will only occur in upland areas and at a minimum of 100 feet from open water.
    e. Vehicles will be parked on pavement, existing roads, and previously disturbed areas to the maximum extent feasible.

5. *Entrapment Avoidance:* To prevent listed species and other animals from becoming entrapped in work areas, the District will implement the following measures:
    a. All excavated holes or trenches deeper than 12 inches will be covered at the end of each work day with plywood or similar materials. Foundation trenches or larger excavations that cannot easily be covered will be ramped at the end of the work day to allow trapped animals an escape method. Prior to the filling of such holes, these areas will be thoroughly inspected for listed species by a Service-approved biologist. In the event that a trapped animal is observed, construction will cease until the individual has been relocated by the Service-approved biologist according to the approved relocation plan (see Measure 14).
    b. Because listed species may take refuge in cavity-like and den-like structures such as pipes and may enter stored pipes and become trapped, all construction pipes, culverts, or similar structures that are stored at a construction site for one or more overnight periods will be either securely capped prior to storage or thoroughly inspected by a Service-approved biologist for these animals before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If any individuals have become trapped, the animal will be relocated according to the approved relocation plan (see Measure 14).

6. *Erosion Control*. Erosion control materials that use plastic or synthetic mono-filament netting will not be used within the action area in order to prevent listed species from becoming entangled, trapped or injured. This includes products that use photodegradable or biodegradable synthetic netting, which can take a full calendar year or more to decompose. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers.

7. *Invasive Plants*. The District will ensure that the spread or introduction of invasive exotic plant species will be avoided to the maximum extent possible. When feasible, invasive exotic plants within project areas will be removed. If herbicides are needed, they will be used according to their label instructions.

8. *Debris Removal*. The District will implement the following measures to minimize the effects of debris and woody vegetation removal activities:
    a. Debris removal during winter and spring to unclog culverts, etc. will be performed by hand crews to the maximum extent feasible. If hand removal is not feasible, debris will be removed using trucks with winches, and/or by backhoes operated from the top of bank.
    b. To the extent feasible, the District will avoid removal of large woody riparian vegetation and will remove only the minimum necessary to complete the project.
    c. Woody debris that does not cause bank instability, flooding, or culvert blockage will be left in place to provide in-stream cover and habitat for aquatic species.
    d. To the maximum extent feasible, the District will avoid the use of heavy mechanized equipment in waterways, streams, ponds, and lakes.

9. *Construction Schedule*. To minimize impacts to listed species the following construction timing measures will be followed:
    a. Within most habitats, grading and construction will be limited to the dry season, typically May-October. Exceptions would be in tidal emergent wetlands and in

the San Francisco Bay and Delta where activities would be conducted between September 1 and January 31 to avoid impacts to California Ridgway's rail, western snowy plover, California least tern, and between August 1 to November 30 to avoid potential impacts to delta smelt. See species specific measures.

b. All construction activities will cease one half hour before sunset and will not begin prior to one half hour after sunrise. There will be no night-time construction, except for emergency situations.

10. *Biological Awareness Training*. Prior to construction of a project, a Service-approved biologist will conduct a mandatory biological resources awareness training for all construction personnel on listed species that may occur on site. The training will include a description of these species and their habitat, the conservation measures in this biological opinion that are to be implemented as part of the project, and the penalties for not complying with these measures. Proof of personnel attendance will be kept on file by the District. Interpretation will be provided for non-English speaking workers. When new construction personnel are added to the project, the District will ensure that the new personnel receive the training before starting work. The subsequent training of personnel can include videotape of the initial training and/or the use of written materials rather than in-person training by a biologist.

11. *Construction Monitoring*. The District will implement the following measures:
    a. A Service-approved biologist will remain on-site during all construction activities that may result in take of federally listed species. The Service-approved biologist(s) will be given the authority to stop any work that may result in the take of listed species. If the Service-approved biologist(s) exercises this authority, the Service will be notified by telephone and electronic mail within one working day. The Service-approved biologist will be the contact for any employee or contractor who might inadvertently kill or injure a listed species or anyone who finds a dead, injured or entrapped individual. The Service-approved biologist will possess a working wireless/mobile phone whose number will be provided to the Service.
    b. Prior to the start of each work day, a Service-approved biologist will check under construction equipment, project vehicles, and their tires to ensure no listed species are utilizing the equipment as temporary shelter.

12. *Preconstruction Surveys*. The District will implement the following measures:
    a. Preconstruction surveys for listed species at proposed project sites covered in this biological opinion will be conducted by a Service-approved biologist(s) immediately prior to initial groundbreaking or vegetation clearing activities. All suitable habitat (upland and aquatic) within the work area will be thoroughly inspected. If any listed species are found, they will be relocated according to the approved relocation plan (See Measure 14). The Service-approved biologist will be allowed sufficient time to move all individuals from the work site before work activities begin.
    b. All vegetation that obscures the observation of listed species within affected areas that contain or are immediately adjacent to aquatic habitats will be removed by hand just prior to the initiation of grading in order to remove cover that might be used by listed species. A Service-approved biologist will be present during vegetation removal and will survey these areas immediately prior to and

following vegetation removal. If any listed species are found, they will be relocated according to the approved relocation plan (See Measure 14).

c. If at any point, construction activities cease for more than five consecutive days, additional preconstruction surveys will be conducted prior to the resumption of work.

13. *Wildlife Exclusion Fencing*. At all proposed activity sites, a Service-approved biologist will make the determination as to whether exclusion fencing is necessary or appropriate to minimize take of listed species**.**

14. *Listed Species Relocation Plan*. Listed species relocation will be approved on a project-specific basis. The District will prepare a listed species relocation plan for a proposed project to be reviewed and approved by the Service prior to project implementation. The plan will include trapping and relocation methods, relocation sites, and post-relocation monitoring. Only Service-approved biologists will handle or relocate listed species. All relocations of listed species will be conducted according to an approved relocation plan. For restoration projects, the District will also submit the listed species relocation plan to be reviewed and approved by CDFW.

15. *Construction Personnel Compliance.* The District will ensure that a readily available copy of this biological opinion is maintained by the construction foreman/manager on the project site whenever earthmoving and/or construction is taking place. The name and telephone number of the construction foreman/manager will be provided to the Service prior to ground-breaking.

16. *In-water or Dewatering Work.* The District will implement the following measures:
    a. No routine maintenance activity will be conducted that substantially disrupts the movements of aquatic indigenous life.
    b. To the maximum extent possible, no heavy mechanized equipment will operate in standing or flowing water and disturbance in stream channels will be minimized to the maximum extent possible.
    c. When necessary to avoid and minimize disturbance and maintain down stream flow, water will be temporarily diverted around the work area using sand bag coffer-dams, hoses, and pumps.
    d. If a work site is to be temporarily de-watered by pumping, intakes will be completely screened with wire mesh not larger than 2.5 millimeters or 0.10 inch. Water will be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Pumps will be placed in a perforated intake basin to allow water to be drawn into the pump to protect and ensure aquatic organisms are not pulled into the pump. Upon completion of construction activities, any barriers to flow will be removed in a manner that would allow flow to resume with the least disturbance to the substrate.
    e. The District will develop and implement a plan to relocate native fish and other native aquatic vertebrates during dewatering. Listed species in the dewatering area will be relocated according to the approved relocation plan (See Measure 14).
    f. A Service-approved biologist will permanently remove, from within the project area, any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid

fishes, to the maximum extent possible. The District will ensure that these activities are in compliance with the California Fish and Game Code.

g. New concrete will not be placed or poured on-site in a location that may come into contact with any natural waterbodies. Any concrete pouring will be isolated from all natural waterbodies through appropriate wrapping or water barrier implements.

17. *Project Site Revegetation*. Project sites determined to require revegetation by the Service-approved biologist will be replanted with an appropriate assemblage of native riparian, wetland, and upland vegetation suitable for the area. A species list and restoration and monitoring plan will be included with the preconstruction project list for review and approval. The plan will include the location of the restoration, the species to be used, the restoration methods to be employed, the time of year the work will be done, the identifiable success criteria for completion, and the remedial actions that will be taken if the success criteria are not achieved. To avoid and minimize disturbance, the District will plant riparian vegetation by hand or with a rubber-tired backhoe from above the top of bank.

18. *Measures for Restoration Projects and Adaptive Management Conservation Measures*. The District will implement the following measures for proposed restoration projects:
    a. The preconstruction project list submitted to the Service and CDFW by June 1st each year will include detailed descriptions and designs of proposed restoration projects for the upcoming year for Service and CDFW review and approval.
    b. All restoration projects and adaptive management conservation measures will have either: permanent beneficial effects to federally listed species analyzed in this biological opinion; or at most, no permanent adverse effects (e.g., permanent effects to hydrology, water quality, or temperature in listed species habitat will be neutral to the species) to federally listed species analyzed in this biological opinion.

19. *Reporting.* By February 15 of each year, the District will submit an annual report describing the activities performed the previous year and the resulting habitat disturbance. This report will include a description of the work performed, specifically noting any changes to proposed projects from what was outlined in the preconstruction project list. At a minimum, the annual report will include the following information for that year and in total for all years:
    a. A description of activities/projects completed and their location (only for that year);
    b. Location, amount, and extent of vegetation-type and listed species habitat-type disturbed;
    c. Amount or extent of take of listed species including a summary of listed species relocations;
    d. Conservation measures implemented that year;
    e. A description of the amount, type, and location of habitat restored or enhanced;
    f. Acreage of listed species habitat that was restored or enhanced and whether the permanent effects from the restoration projects to species habitat types will be beneficial or neutral; each listed species covered under this biological opinion will

be addressed to ensure that species habitat disturbance and habitat enhancement can be tracked over the 5-year period.

Species/Habitat Specific Measures

20. *Alameda Whipsnake.* The District will implement the following measures at parks listed in Table 1 as supporting or potentially supporting Alameda whipsnake:
    a. To the extent possible, all rock outcroppings will be avoided.
    b. Construction activities will occur between June 15 - October 31, when Alameda whipsnake are more active, capable of escaping, and less likely to be impacted.
    c. Ground disturbance and vegetation clearing in scrub/chaparral habitat will be avoided to the maximum extent possible. Where disturbance cannot be avoided in this habitat type, work will be limited to the fall season of September to November in order to allow the young of the year time to become sufficiently capable of escaping such activities.
    d. Work activities will be restricted to existing roads and trails to the maximum extent possible. When existing roads and trails cannot be followed, shrub vegetation will be removed by equipment operated by hand to prevent mortality associated with mowers or other large mechanical equipment. A Service-approved biologist experienced in identifying Alameda whipsnake will be present during vegetation removal.

21. *California Red-legged Frog and Foothill Yellow-legged Frog*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting California red-legged frog or foothill yellow-legged frog:
    a. Work within California red-legged frog or foothill yellow-legged frog aquatic habitat will be performed only between August 31 and October 31 or under dry site conditions and will minimize potential adverse impacts to aquatic habitats. If work must occur when water is present (after August 31) and the species is known to occur in the area, then a relocation plan will be provided to the Service for review and approval prior to the commencement of construction activities.
    b. An approved biologist will survey the work site immediately prior to construction activities. If adult, juvenile, or tadpole California red-legged frogs or foothill yellow-legged frogs are found, they will be provided the opportunity to leave the work area on their own, but if necessary, they will be relocated according to the approved relocation plan (measure 14). The approved biologist will be allowed sufficient time to move California red-legged frogs or foothill yellow-legged frogs from the work site before work activities begin.
    c. Only approved biologists will participate in activities associated with the capture, handling, and monitoring of California red-legged frogs or foothill yellow-legged frogs.
    d. Bare hands will be used to capture California red-legged frogs and foothill yellow-legged frogs. Approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating individuals. To avoid transferring diseases or pathogens while handling the amphibians, approved biologists will follow the Declining Amphibian Populations Task Force's "Code of Practice". These practices will be included in the relocation plan.

22. *California Tiger Salamander*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting California tiger salamander:
    a. Work within California tiger salamander aquatic habitat will be performed only between August 31 and October 31 or under dry site conditions and will minimize potential adverse impacts to aquatic habitats.
    b. An approved biologist will survey the work site immediately prior to construction activities. If adult, juvenile, or larvae California tiger salamanders are found, they will be relocated according to the approved relocation plan (measure 14). The approved biologist will be allowed sufficient time to relocate California tiger salamanders from the work site before work activities begin.
    c. Only approved biologists will participate in activities associated with the capture, handling, and monitoring of California tiger salamanders.
    d. Bare hands will be used to capture California tiger salamanders. Approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating individuals. To avoid transferring disease or pathogens while handling the amphibians, approved biologists will follow the Declining Amphibian Populations Task Force's "Code of Practice." These practices will be included in the relocation plan.

23. *San Joaquin Kit Fox*: The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting San Joaquin kit fox:
    a. Preconstruction surveys for San Joaquin kit fox will be conducted in work areas and all areas within 200 feet of work areas to identify potential San Joaquin kit fox dens or other refugia. Surveys will include den searches following methods outlined in the *U.S Fish and Wildlife Service San Joaquin Kit Fox Survey Protocol for the Northern Range* (Service 1999). A Service-approved biologist will conduct the den searches 14 to 30 days before initiation of ground-disturbing activity in each work area. Following den searches, all identified potential dens (as defined in Appendix II of *U.S. Fish and Wildlife Service Standardized Recommendations for the Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (Service 2011)) will be monitored for evidence of kit fox use by placing an inert tracking medium and/or a camera station at den entrances and monitoring for at least 3 consecutive nights. The results of the surveys will be provided to the Service within 1 week of completion. If ground disturbing activities cease for 28 consecutive calendar days, a Service-approved biologist will conduct a new survey for San Joaquin kit fox prior to re-initiation of ground-disturbing activities.
    b. If no activity is detected at potential den sites, potential den sites that will be collapsed by construction activities will be closed following guidance established in the *U.S. Fish and Wildlife Service Standardized Recommendations for the Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (Service 2011). If kit fox occupancy is determined during any of the surveys conducted, the Service will be notified within 24 hours and no work will occur within 200 feet of the den unless approved by the Service. Appropriate buffers and avoidance measures will be developed in consultation with the Service. Depending on the den type, measures to avoid effects to kit foxes could

include seasonal limitations on work in the area (i.e., restricting the work period to avoid spring-summer pupping season), establishing a work exclusion zone around the identified site, or resurveying the den later to determine species presence or absence.

c. Vehicle traffic will be restricted to established roads, construction areas, and other designated areas.
d. Grading activities will be designed to minimize or eliminate effects to rodent burrows. Areas with high concentrations of burrows and large burrows suitable for San Joaquin kit fox dens will be avoided by grading activities to the maximum extent possible. In addition, when concentrations of burrows or large burrows are observed within the site these areas will be staked and flagged to ensure construction personnel are aware of their location and to facilitate avoidance of these areas.

24. *Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, and Vernal Pool Tadpole Shrimp*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting listed vernal pool branchiopods:
    a. Work within 250 feet of listed vernal pool branchiopod habitat will be performed only between August 1 and October 31 under dry site conditions and will minimize potential adverse impacts to aquatic habitats.
    b. A Service-approved biologist will monitor all construction activities within 250 feet of suitable habitat for listed vernal pool branchiopods to ensure that no unnecessary take or destruction of habitat occurs.
    c. The District or its contractors will implement dust control measures necessary to prevent the transport of soil from exposed surfaces to vernal pool, swale, and rock pool habitat. Sprinkling with water will not be done in excess to minimize the potential for non-storm water discharge.
    d. Routine maintenance activities within 250 feet of vernal pool and swale habitat will be avoided to the maximum extent possible.
    e. If work within 250 feet of suitable habitat for listed vernal pool branchiopods cannot be avoided, the District will conduct protocol-level surveys according to the Service's 2015 *Survey Guidelines for Listed Vernal Pool Branchiopods* and provide the results of the surveys to the Service along with the preconstruction project list. If listed vernal pool branchiopods are found to be present in features within 250 feet of proposed activities (or if surveys are not conducted and presence of listed branchiopods is assumed), the District will design the project so that no permanent adverse effects to hydrology to the vernal pool or vernal pool complex will result from the project. The District will then contact the Service for site specific approval and the Service will help to develop appropriate site specific conservation measures to avoid any permanent adverse effects to the hydrology of the pools. If avoidance of permanent adverse effects to hydrology is not feasible for the project, the District will contact the Corps and request initiation of a separate consultation for that project.

25. *Tidal Habitat*. The District will implement the following measures in tidal habitat and areas adjacent to tidal habitat:
    a. Work vehicles driving on levees adjacent to tidal habitat will travel at speeds no greater than 10 miles per hour to minimize noise and dust disturbance.

b. Construction, maintenance, and management activities (including mowing) will not occur within two hours before or after extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge and adjusted to the timing of local high tides), when the marsh plain is inundated.
c. On appropriate structures (i.e. tall light poles, utility poles, fencing, etc.) not in conflict with recreational uses (recreational signage, boardwalk fencing, etc.) that are installed, replaced, or repaired near habitat for the salt marsh harvest mouse, California Ridgway's rail, California least tern, or western snowy plover, anti – perching devices will be installed, as determined by a service approved biologist, to deter avian predators.
d. All equipment that may have come in contact with invasive plants (including perennial pepperweed, smooth cordgrass or its hybrids, or the seeds of these plants) will be carefully cleaned before arriving on site.

26. *California Ridgway's Rail*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting California Ridgway's rail:
    a. To avoid causing the abandonment of an active California Ridgway's rail nest, activities (including construction and maintenance activities) within 700 feet of vegetated tidal marsh providing suitable breeding habitat for California Ridgway's rails will be avoided during the rail's breeding season from February 1 through August 31.
    b. If a rail of any species is observed in or adjacent to a work area, work will be stopped immediately. If the rail is either identified as a California Ridgway's rail by a Service-approved biologist or cannot be positively identified, work will be stopped until the rail leaves the work area of its own volition and the Service will be notified. If the rail does not leave the work area, work will not be reinitiated until after the Service is consulted regarding appropriate avoidance measures and permission is granted by the Service to commence work.

27. *Salt Marsh Harvest Mouse.* The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting salt marsh harvest mouse:
    a. Impacts to pickleweed will be avoided to the maximum extent feasible. Excluding outboard wave exposed levees, any vegetation clearing to be conducted in areas containing pickleweed habitat or areas within 50 feet from the edge of pickleweed habitat will be conducted only with non-mechanized hand tools (i.e. trowel, hoe, rake, and shovel). No motorized equipment, including weed whackers or lawn mowers, will be used to remove this vegetation. Vegetation will be cleared to bare ground and removal will start at the edge farthest from the salt marsh and work towards the marsh. If a mouse of any species is observed within the areas being removed of vegetation work will cease until the mouse has left the area of its own volition.
    b. During mowing of vegetation along levees adjacent to pickleweed habitat in site preparation for covered maintenance activities, mowing will start from the top (the area of least suitable habitat) and proceed downslope toward more suitable habitat so any salt marsh harvest mice present in the area to be mown can move away from the disturbance of the mower and out of the mowing area. If mowing needs to occur within 50-feet of pickleweed habitat, Conservation Measure 27a will be implemented prior to mowing. Immediately prior to start of mowing (even

after hand-removal), a Service-approved biologist will walk the area to be mowed to look for salt marsh harvest mice and to encourage them to move out of the area. If a salt marsh harvest mouse (or mouse that could be a salt marsh harvest mouse) is detected within the area to be mowed, no mowing will occur in that area.

c. For ground-disturbing activities in or within 50 feet of pickleweed habitat, construction boundaries will be well marked with flagging or stakes as per General Conservation Measure 3. The final design and proposed location of the marking will be determined by a Service-approved biologist. The site will be surveyed throughout the day for any salt marsh harvest mouse individuals. Boundary flagging/staking will be removed immediately following work completion.
d. If an active nest is observed within work or access areas during the pre-construction surveillance or any activity, a wooden coverboard will be placed over the suspected rodent nest during trimming activities and activities will be halted and a 100-foot no disturbance buffer area implemented until the Service-approved biologist has determined that all salt marsh harvest mice have weaned or are not present within 100 feet of the work area.

28. *Western Snowy Plover*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting snowy plover:
    a. Shoreline protection and dredging activities in or within 600 feet of known or potential Western snowy plover habitat (dunes and beach) will be performed only during the non-nesting season between September 1 and January 31.
    b. Should a Western snowy plover be observed within or adjacent to a project area, work activities within a 50-foot radius of the bird will be suspended until the bird leaves the site voluntarily.

29. *California Least Tern.* The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting California least tern:
    a. Maintenance activities in or within 600 feet of known or potential California least tern nesting habitat will be performed only during the non-nesting season between September 1 and January 31.
    b. To minimize open water turbidity during the California least tern breeding season, no dredging activities will occur in California least tern foraging habitat from April 1 to August 15.
    c. Should a California least tern be observed within or adjacent to a project area, work activities within a 50-foot radius of the bird will be suspended until the bird leaves the site voluntarily.

30. *Giant Garter Snake*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting giant garter snake:
    a. Disturbance activities in known or potential giant garter snake aquatic or within 200 feet of habitat will be performed only between May 1 and October 1 to avoid potential impacts to this species.
    b. Work activities will be restricted to existing roads and trails to the maximum extent possible. When existing roads and trails cannot be followed, and disturbance is in known or potential giant garter snake habitat, vegetation will be

removed by hand to prevent mortality associated with mowers and other landscaping equipment.

31. *Plant Surveys*. A Service-approved botanist will conduct pre-construction field surveys to identify any threatened, endangered, rare, and other special-status plants located within or adjacent (within 300 feet) of proposed work areas. Surveys will be conducted prior to the initiation of work activities and coincide with the appropriate flowering period of the special-status plant species with the potential to occur in the project area. Survey results will be provided to the Service prior to the start of project work. If any listed plants are found during the surveys the project will be re-designed to avoid the plant/population. A Service-approved botanist will delineate the locations of the plant or population and install protective fencing between the work area and the plant/population such that direct or indirect effects to the plants will be avoided. If avoidance of a federally-listed plant/population is not feasible, the District will contact the Corps and request initiation of a separate consultation for that project.

32. *Pallid Manzanita*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting pallid manzanita:

    a. All pallid manzanita populations will be mapped using GPS prior to any construction activities. Populations or individual plants will be flagged with high visibility flagging and avoided.

    b. Adjacent to or within pallid manzanita populations, encroaching brush or noxious weedy vegetation will be removed by hand to protect and prevent harm to the species.

    c. A specific ingress/ egress route that minimizes the potential spread of *Phytophthora cinnamomi*, will be identified by a Service-approved biologist when working in vicinity of extant populations of pallid manzanita. A wash station will be established at the ingress/ egress location. Prior to entering or exiting the ingress/ egress location, any potentially contaminated material will be removed from all boots, hand tools, clothing, and equipment, then these items will be disinfected using 70 percent isopropanol (rubbing alcohol) or another Service-approved substance known to disinfect *P. cinnamomi* contaminated equipment.

    d. Prior to conducting routine maintenance activities within the vicinity of known extant populations of pallid manzanitas, all personnel will attend an environmental awareness training session designed to inform all workers about the long-term effects of *P. cinnamomi*, how it is spread, and the measures to be taken to avoid spreading it.

33. *Delta Smelt*. The District will implement the following measures in parks listed in Table 1 as supporting or potentially supporting delta smelt.
    a. Disturbance activities in known or potential delta smelt habitat will be performed only between August 1 and November 30 to avoid potential impacts to this species.

34. *Longfin Smelt*. If dewatering is required in potential longfin or delta smelt habitat, a fish relocation plan will be prepared and submitted for Service approval prior to project commencement. All pump intakes will be screened per Service and National Marine Fisheries Service standards.

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 the approximately 122,206 acres of land owned or managed by the District displayed in Table 1 as well as the lands immediately adjacent that may have indirect effects.

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the current rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the current condition of the species in the action area without the consequences to the listed species caused by the proposed action, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines all consequences to listed species that are caused by the proposed federal action; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on the species. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and in light of the status of the species, the Service formulates its opinion as to whether the proposed action is likely to jeopardize the continued existence of the listed species.

Analytical Framework for the Adverse Modification Determination

Section 7(a)(2) of the Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. A final rule revising the regulatory definition of "destruction or adverse modification" (DAM) was published on August 27, 2019 (84 FR 44976). The final rule became effective on October 28, 2019. The revised definition states:

> "*Destruction or adverse modification* means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species."

The DAM analysis in this biological opinion relies on four components: (1) the *Status of Critical Habitat*, which describes the current rangewide condition of the critical habitat in terms of the key components (i.e., essential habitat features, primary constituent elements, or physical and biological features) that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the critical habitat overall for the conservation/recovery of the listed species; (2) the *Environmental Baseline*, which analyzes the current condition of the critical habitat in the action area without the consequences to designated critical habitat caused by the proposed action, the factors responsible for that condition, and the value of the critical habitat in the action area for the conservation/recovery of the listed species; (3) the *Effects of the Action*, which determines all consequences to designated critical habitat that are caused by the proposed federal action on the key components of critical habitat that provide for the conservation of the listed species, and how those impacts are likely to influence the conservation value of the affected critical habitat; and (4) *Cumulative Effects*, which evaluate the effects of future non-federal activities that are reasonably certain to occur in the action area on the key components of critical habitat that provide for the conservation of the listed species and how those impacts are likely to influence the conservation value of the affected critical habitat. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and in light of the status of critical habitat, the Service formulates its opinion as to whether the action is likely to destroy or adversely modify designated critical habitat. The Service's opinion evaluates whether the action is likely to impair or preclude the capacity of critical habitat in the action area to serve its intended conservation function to an extent that appreciably diminishes the rangewide value of critical habitat for the conservation of the listed species. The key to making that finding is understanding the value (i.e., the role) of the critical habitat in the action area for the conservation/recovery of the listed species based on the *Environmental Baseline* analysis.

Status of the Species

Alameda Whipsnake

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Alameda Whipsnake (Masticophis lateralis euryxanthus) 5-Year Review* (Service 2020b). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2020 5-year review was finalized, with loss of habitat being the most significant effect. Alameda whipsnake was included in the 2002 *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California* (Service 2002a)..

Within the action area, habitat fragmentation and loss through urban development and build-out of major transportation corridors represent major threats to the Alameda whipsnake (Service 2020b). The increasing urban development in the East Bay adjacent to protected properties has been shown to increase the number of feral cats and dogs that may affect Alameda whipsnake populations (District 2017). Although most major reservoirs and water projects in the East Bay were completed prior to the Alameda whipsnake listing, these projects have been responsible for loss and fragmentation of its habitat and represent continuing threats due to infrastructure build-out and reservoir expansion. New reservoir construction in the region remains a potential threat. Direct and indirect effects of off-highway vehicle use, such as what occurs at the Carnegie State Vehicular Recreation Area in Recovery Unit 5 in eastern Alameda and San Joaquin Counties,

and trail use by mountain bikers and other recreationists, may represent threats to the Alameda whipsnake (District 2017).

California Red-legged Frog

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *California Red-Legged Frog (Rana draytonii) 5-Year Review: Summary and Evaluation* (Service 2022a) and the *Recovery Plan for the California Red-legged Frog (Rana aurora draytonii)* (Service 2002b). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2022 5-year review was finalized, with loss of habitat being the most significant effect.

Within the action area, loss of habitat due to increased development poses the biggest threat to California red-legged frog populations in Alameda and Contra Costa Counties. Numerous recent developments have reduced habitat and known California red-legged frog populations. Other threats within the Action area include off-road vehicle use and various forms of recreation (Carnegie State Vehicular Recreation Area), inappropriate levels of grazing, agriculture, flood control maintenance, herbicide and pesticide use, and non-human activities, such as predation by introduced species, feral animals, and/or domestic animals, such as cats and dogs (District 2017).

Foothill Yellow-legged Frog

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Foothill Yellow-Legged Frog; Threatened Status with Section 4(d) Rule for Two Distinct Population Segments and Endangered Status for Two Distinct Population Segments; Final Rule* (Service 2023a) (Final Rule) and the *Species Status Assessment Report for the Foothill Yellow-legged Frog (Rana boylii)* (Service 2023b). The Service listed the Central Coast and North Feather distinct population segments as threatened and South Coast and South Sierra distinct population segments as endangered in the Final Rule. Threats evaluated and discussed in the Final Rule have continued to act on the species since the Service issued the document, with loss of habitat (altered hydrology), competition with nonnative species, and effects of climate change having the most significant effects.

California Tiger Salamander

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *California Tiger Salamander Central California Distinct Population Segment (Ambystoma californiense) 5-Year Review* (Service 2023c) and the Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (Service 2017a). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2023 5-year review was finalized, with loss of habitat being the most significant effect.

Within the action area, loss of habitat due to increased development poses the biggest threat to California tiger salamander populations in Alameda and Contra Costa Counties. Numerous recent developments have reduced habitat and known California tiger salamander populations. Numerous recent developments have reduced habitat and known California tiger salamander populations: Dublin Ranch and other developments along Tassajara Road; Positano, Jordan

Ranch, and East Ranch developments within the East Dublin Specific Plan; and Las Positas College build out, business parks, various road projects, and vineyards in North Livermore. Other threats to California tiger salamanders in the action area include habitat destruction, degradation, and fragmentation due to urban development and conversion to intensive agriculture, off-road vehicle use and various forms of recreation (such as the Carnegie State Vehicular Recreation Area), inappropriate levels of grazing, exposure to various contaminants, rodent population control efforts, mosquito control, hybridization with non-native tiger salamanders and predation by introduced species and/or feral animals (District 2017).

Longhorn Fairy Shrimp

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Longhorn Fairy Shrimp (Branchinecta longiantenna) 5-Year Review* (Service 2022b). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2022 5-year review was finalized, with loss of habitat being the most significant effect. Longhorn fairy shrimp was included in the 2005 *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005a).

Vernal Pool Fairy Shrimp

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Vernal Pool Fairy Shrimp (Branchinecta lynchi), Vernal Pool Tadpole Shrimp (Lepidurus packardi), Conservancy Fairy Shrimp (Branchinecta conservatio) 5-Year Review: Summary and Evaluation* (Service 2024). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2024 5-year review was finalized, with loss of habitat being the most significant effect. Vernal pool fairy shrimp was included in the 2005 *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005a).

Vernal Pool Tadpole Shrimp

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Vernal Pool Fairy Shrimp (Branchinecta lynchi), Vernal Pool Tadpole Shrimp (Lepidurus packardi), Conservancy Fairy Shrimp (Branchinecta conservatio) 5-Year Review: Summary and Evaluation* (Service 2024). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2024 5-year review was finalized, with loss of habitat being the most significant effect. Vernal pool tadpole shrimp was included in the 2005 *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005a).

San Joaquin Kit Fox

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *San Joaquin kit fox (Vulpes macrotis mutica) 5-Year Review* (Service 2020c). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2020 5-year review was finalized, with loss of habitat being the most significant effect. San Joaquin

kit fox was included in the 1998 *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Service 1998).

Threats to San Joaquin kit foxes in the action area include loss and modification of habitat due to agricultural conversion, infrastructure construction, and urban development, pesticides and rodenticides, road mortality and off-road vehicle use, competition, and predation (District 2017). Numerous developments and activities have reduced and/or fragmented habitat for the San Joaquin kit fox within Alameda County: Dublin Ranch and other developments along Tassajara Road; Positano, Jordan Ranch, and East Ranch developments within the East Dublin Specific Plan; and Las Positas College build out, business parks and vineyards in North Livermore, commercial and private racetracks and off-road vehicle parks, energy and water infrastructure projects, and agricultural conversions.

Pallid Manzanita

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Pallid Manzanita (Arctostaphylos pallida) 5-Year Review* (Service 2023d) and the *Recovery Plan for Arctostaphylos pallida (pallid manzanita)* (Service 2015). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2023 5-year review was finalized, with fire suppression and overshading by other plants, hybridization, and *Phytophthora cinnamomic* infection being the most significant effects.

Giant Garter Snake

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Giant Garter Snake (Thamnophis gigas) 5-Year Review: Summary and Evaluation* (Service 2020d) and the *Recovery Plan for the Giant Garter Snake (Thamnophis gigas)* (Service 2017b). No change in the species' listing status was recommended in this 5-year review. Ongoing threats to giant garter snake include habitat loss from urbanization, the resultant fragmentation and population isolation, flood channel maintenance, agricultural practices (e.g., rice fallowing due to drought conditions, habitat disturbance and loss from irrigation and drainage ditch maintenance), climate change, water transfers, and invasive species. Our review emphasizes urbanization as one of the greatest threats to the species, particularly where associated with rice agriculture.

According to Halstead et al. (2015a), habitat quality plays a central role in the population ecology of this species, depending on factors like refuge and prey availability, vegetation type and density, and scouring floods. Our recovery plan outlines actions needed to protect and enhance the species sufficiently to remove it from the list of endangered species (Service 2017). This includes but is not limited to, the protection, connection, and improvement of the quality and presence of habitat through various management actions aimed at water quality and presence of summer water.

More recent studies examining the use of uplands have bearing on the effects of the proposed project (Halstead et al. 2015b). It has been known for some time that the giant garter snake spends half of the year, roughly November through April, hibernating in uplands. However, it is now known that the snake also spends more than half the time in terrestrial environments during the active period during summer. While in such terrestrial habitats in summer, the snake is often underground, especially during extreme temperatures. Animal burrows are believed to be an

important component of upland refugia, although other elements such as brush piles and even riprap may be used (e.g., Wylie and Amarello 2008). Although snakes can venture as much as 500 feet or more from the water edge, the overwhelming majority of both the summer and winter upland captures are within the first 10 meters from the water edge.

California Ridgway's Rail

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *California clapper rail (Rallus longirostris obsoletus) 5-Year Review* (Service 2020e). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2020 5-year review was finalized, with loss of habitat being the most significant effect. California Ridgway's rail was included in the 2013 *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Service 2013)..

Salt Marsh Harvest Mouse

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Salt marsh harvest mouse (Reithrodontomys raviventris) 5-Year Review* (Service 2021). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2020 5-year review was finalized, with loss of habitat being the most significant effect. Salt marsh harvest mouse was included in the 2013 *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Service 2013).

California Least Tern

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *California Least Tern (Sternula antillarum browni) (= Sterna a. b.) 5-Year Review: Summary and Evaluation* (Service 2020f). No change in the species' listing status was recommended in this 5-year review. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2020 5-year review was finalized, with loss of habitat being the most significant effect. In 2009, the Service published a *Spotlight Species Action Plan for the California Least Tern* (Service 2009), which included the statement that nesting has occurred sporadically but increasingly at inland sites in the Bay-Delta and Central Valley.

Western Snowy Plover

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Western Snowy Plover [Pacific Coast population Distinct Population Segment] (Charadrius nivosus nivosus) 5-Year Review* (Service 2019) and the *Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (Charadrius alexandrinus nivosus)* (Service 2007). No change in the species' listing status was recommended in this 5-year review.. Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2019 5-year review was finalized, with predation and disturbance and loss of habitat being the most significant effects.

Delta Smelt

For the most recent comprehensive assessment of the species' rangewide status, please refer to the *Hypomesus transpacificus (delta smelt) 5-Year Review* (Service 2010b) and page 41560 of the 2023 Candidate Notice of Review for the status of the species. The Service found that the status of the species warrants reclassification from threatened to endangered, but that this reclassification is precluded by higher priority actions. The Service is in the process of finalizing its most current 5-year review for the species.

The CDFW's Fall Midwater Trawl (FMWT) Survey is one of the longest running indicators of the delta smelt's abundance trend. Indices of delta smelt relative abundance from this survey date to 1967. The FMWT index has traditionally been the primary indicator of delta smelt trend because it samples later in the life cycle, providing an indicator of annual recruitment. The FMWT deploys more than 400 net tows per year over its four-month sampling season (September through December). The highest FMWT index for delta smelt (1,673) was recorded in 1970 and a comparably high index (1,654) was reported in 1980. The last FMWT index exceeding 1,000 was reported in 1993. The last FMWT indices exceeding 100 were reported in 2003 and 2011. In 2018, the FMWT index was zero for the first time, and the FMWT index has been zero every year from 2018 through 2023. Thus, the FMWT has recorded a 40-50 year decline in which delta smelt went from a minor (but common) species to essentially undetectable by this long-term survey.

In December 2021, the Service, along with CDFW, California Department of Water Resources, and U.S. Bureau of Reclamation, began experimentally releasing captively produced delta smelt into the Sacramento-San Joaquin River Delta in an experiment intended to help inform future supplementation of the species in the wild. A total of 5 releases were completed, totaling 55,733 brood year 2021 marked (adipose fin clip or Visible Implant Elastomer) delta smelt from UC Davis' Fish Conservation and Culture Laboratory. The releases occurred in various locations including Rio Vista, the Sacramento Deep Water Ship Channel, and Suisun Marsh. A subsample of those marked fish were recaptured in the Deep Water Ship Channel, central Delta, south Delta, and Suisun Marsh by the Service's Enhanced Delta Smelt Monitoring, Chipps Island Trawl, CDFW's Spring Kodiak Trawl, Bay Study, and in the Central Valley Project salvage facility.

Experimental release of captively produced, marked delta smelt continued for a second year in November 2022 through January 2023. These releases occurred at both Rio Vista and the Sacramento Deep Water Ship Channel. A total of 43,705 delta smelt were released. A small subsample of those marked fish have also been recaptured. A third year of experimental release has started with releases starting in November 2023, with approximately 90,000 cultured delta smelt slated for release.

Longfin Smelt

The Service proposed to list the San Francisco Bay-Delta DPS of the longfin smelt as endangered on October 7, 2022 (Service 2022c). For the comprehensive assessment of the longfin smelt DPS, please refer to the proposed listing rule at https://www.govinfo.gov/content/pkg/FR-2022-10-07/pdf/2022-21605.pdf#page=1 and the *Species Status Assessment for the San Francisco Bay-Delta Distinct Population Segment of the Longfin Smelt* at https://ecos.fws.gov/ServCat/DownloadFile/223002 (Service 2022d).

Status of Critical Habitat

Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.12(b)). The Service is required to list the known primary constituent elements (PCEs) together with the critical habitat description. Such physical and biological features include, but are not limited to, the following:

1. Space for individual and population growth, and for normal behavior;
2. Food, water, air, light, minerals, or other nutritional or physiological requirements;
3. Cover or shelter;
4. Sites for breeding, reproduction, rearing of offspring, or dispersal; and
5. Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

With the designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species through the identification of the appropriate quantity and spatial arrangement of the PCEs sufficient to support the life-history functions of the species. Not all life-history functions require all the PCEs, therefore, not all areas designated as critical habitat will contain all the PCEs.

Alameda Whipsnake Critical Habitat

On October 2, 2006, the final rule determining critical habitat for the Alameda whipsnake was published in the Federal Register (Service 2006c). The rule identifies approximately 154,834 acres within six critical habitat units in Alameda, Contra Costa, Santa Clara, and San Joaquin counties, California.

Based on our current knowledge of the life history, biology, and ecology of the Alameda whipsnake and the requirements of the habitat necessary to sustain the essential life history functions of the subspecies, the Service has determined that the PCEs for the Alameda whipsnake are:

> PCE 1: Scrub/shrub communities with a mosaic of open and closed canopy. Scrub/shrub vegetation dominated by low-to medium-stature woody shrubs with a mosaic of open and closed canopy as characterized by the chamise, chamise-eastwood manzanita, chaparral whitethorn, and interior live oak shrub vegetation series (as identified in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), A Guide to Wildlife Habitats of California ((Mayer and Laudenslayer 1988), and California Wildlife Habitat Relationship System (CDFG 1998)), occurring at elevations from sea level to approximately 3,850 feet. Such scrub/shrub vegetation within these series forms a pattern of open and closed canopy used by the Alameda whipsnake for shelter from predators; temperature

regulation because it provides sunny and shady locations; prey-viewing opportunities; and nesting habitat and substrate. These features contribute to support a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds;

PCE 2: Woodland or annual grassland plant communities contiguous to lands containing PCE 1. Woodland or annual grassland vegetation series comprised of one or more of the following: blue oak, coast live oak, California bay, California buckeye, and California annual grassland vegetation series (as identified in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), A Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988), and California Wildlife Habitat Relationship System (CDFG 1998)) are PCE 2. This mosaic of vegetation is essential to the conservation of the Alameda whipsnake because it supports a prey base, consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds. This provides opportunities for foraging by allowing snakes to come in contact with and visualize, track, and capture prey (especially western fence lizards along with other prey such as skinks, frogs, birds); short and long distance dispersal within, between, or to adjacent areas containing essential features (i.e., PCE 1 or PCE 3); and contact with other Alameda whipsnakes for mating and reproduction;

PCE 3: Lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PCE 1 and or PCE 2. These areas are essential to the conservation of the Alameda whipsnake because they are used for retreats (shelter), hibernacula, foraging, and dispersal, and provide additional prey population support functions. Refer to the final designation of critical habitat for additional information.

California Red-legged Frog Critical Habitat

The Service designated critical habitat for the California red-legged frog on April 13, 2006 (71 FR 19244) (Service 2006a) and a revised designation to the critical habitat was published on March 17, 2010 (75 FR 12816) (Service 2010a). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer et al. 2010).

The PCEs defined for the California red-legged frog was derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for breeding and non-breeding activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The PCEs and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California red-legged frog ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PCEs essential to the conservation of the California red-legged frog are:

PCE 1: Aquatic Breeding Habitat Standing bodies of fresh water (with salinities less than 7.0 parts per thousand), including: natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years;

> PCE 2: Non-Breeding Aquatic Habitat Freshwater and wetted riparian habitats, as described above, that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period.
>
> PCE 3: Upland Habitat Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile in most cases and comprised of various vegetational series such as grasslands, woodlands, wetland, or riparian plant species that provide the frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter; and
>
> PCE 4: Dispersal Habitat: Accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other that allow for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified in PCEs 1, 2, or 3 as essential to the conservation of the subspecies.

Longhorn Fairy Shrimp Critical Habitat

A final rule designated approximately 858,846 acres of critical habitat collectively for four vernal pool crustaceans and 11 vernal pool plants in 34 counties in California and one county in southern Oregon on August 11, 2005 (Service 2005c). On February 10, 2006, a final rule describing species-specific unit descriptions and maps identifying the critical habitat for each individual species was published (Service 2006b). The rule identifies approximately 13,557 acres within three critical habitat units in Alameda, Contra Costa, Merced, and San Luis Obispo counties, California.

The PCEs of critical habitat for longhorn fairy shrimp are the habitat components that provide:

> PCE 1: Topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools and providing for dispersal and promoting hydroperiods of adequate length in the pools;

PCE 2: Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 23 days, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands;

PCE 3: Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding;

PCE 4: Structure within the pools consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

Vernal Pool Fairy Shrimp Critical Habitat

The Service designated approximately 858,846 acres of critical habitat collectively for four vernal pool crustaceans and 11 vernal pool plants in 34 counties in California and one county in southern Oregon on August 11, 2005 (Service 2005c). On February 10, 2006, a final rule describing species-specific unit descriptions and maps identifying the critical habitat for each individual species was published (Service 2006b). The rule identifies approximately 597,821 acres within 32 critical habitat units in Jackson County, Oregon, and Alameda, Amador, Contra Costa, Fresno, Kings, Mariposa, Monterey, Napa, Placer, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Shasta, Stanislaus, Tehama, Tulare, Ventura, and Yuba counties, California.

The PCEs of critical habitat for vernal pool fairy shrimp are the habitat components that provide:

PCE 1: Topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools and providing for dispersal and promoting hydroperiods of adequate length in the pools;

PCE 2: Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands;

PCE 3: Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding;

> PCE 4: Structure within the pools consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

Western Snowy Plover Critical Habitat

On June 19, 2012, the final rule determining critical habitat for the western snowy plover was published in the Federal Register (Service 2012). The rule identifies approximately 24,527 acres of critical habitat units in Washington, Oregon, and California. In California, a total of 47 units on 16,337 acres throughout northern and southern California coastal areas were designated.

The PCEs essential to the conservation of the western snowy plover are sandy beaches, dune systems immediately inland of an active beach face, salt flats, mud flats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with:

> PCE 1: Areas that are below heavily vegetated areas or developed areas and above the daily high tide;
>
> PCE 2: Shoreline habitat areas for feeding with no or very sparse vegetation that are between the annual low tide or low-water flow and annual high tide or high-water flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources;
>
> PCE 3: Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports small invertebrates as described in PCE 2 for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults;
>
> PCE 4: Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.

Delta Smelt Critical Habitat

The Service designated critical habitat for the delta smelt on December 19, 1994 (Service 1994). The geographic area encompassed by the designation includes all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker Bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the existing contiguous waters contained within the legal Delta (as defined in section 12220 of the California Water Code). The Primary Constituent Elements (PCEs) designated by the Service are physical habitat (PCE 1), water (PCE 2), and river flow (PCE 3).

In designating critical habitat for the delta smelt, the Service identified the following primary constituent elements essential to the conservation of the species: physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and

juvenile transport, rearing, and adult migration. The elements required for suitable spawning, larval and juvenile transport, rearing, and adult migration are:

- Spawning. Delta smelt adults seek hallow, fresh or slightly brackish backwater sloughs and edgewaters for spawning. To ensure egg hatching and larval viability, spawning areas also must provide suitable water quality (i.e. low concentrations of pollutants) and substrates for egg attachment (e.g. submerged tree roots and branches and emergent vegetation). Specific areas that have been identified as important delta smelt spawning habitat include Barker, Lindsey, Cache, Prospect, Georgiana, Beaver, Hog, and Sycamore sloughs and the Sacramento River in the Delta, and tributaries of northern Suisun Bay.
- Larval and juvenile transport. Adequate river flow is necessary to transport larvae from upstream spawning areas to rearing habitat in Suisun Bay and to ensure that rearing habitat is maintained in Suisun Bay. To ensure this, 2 ppt isohaline (a line drawn to connect all points of equal salinity) must be located westward of the confluence of the Sacramento-San Joaquin Rivers, located near Collinsville (Confluence), during the period when larvae or juveniles are being transported, according to historical salinity conditions. 2 ppt isohaline is important because the "entrapment zone" or zone where particles, nutrients, and plankton are "trapped," leading to an area of high productivity, is associated with its location. Habitat conditions suitable for transport of larvae and juveniles may be needed by the species as early as February 1 and as late as August 31, because the spawning season varies from year to year and may start as early as December and extend until July.
- Rearing habitat. An area extending eastward from Carquinez Strait, including Suisun, Grizzly, and Honker bays, Montezuma Slough and its tributary sloughs, up the Sacramento River to its confluence with Three Mile Slough, and south along the San Joaquin River including Big Break, defines the specific geographic area critical to the maintenance of suitable rearing habitat. Three Mile Slough represents the approximate location of the most upstream extent of historical tidal incursion. Rearing habitat is vulnerable to impacts of export pumping and salinity intrusion from the beginning of February to the end of August.
- Adult migration. Adequate flow and suitable water quality is needed to attract migrating adults in the Sacramento and San Joaquin river channels and their associated tributaries, including Cache and Montezuma sloughs and their tributaries. These areas are vulnerable to physical disturbance and flow disruption during migratory periods.

Environmental Baseline

Environmental baseline refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

General

District parklands encompass the shorelines of San Francisco Bay, San Pablo Bay, Suisun Bay, the Delta Region, and inland areas of the coastal and transverse ranges of the East Bay. Located within Alameda and Contra Costa Counties, the parklands are situated in the Central California Coast, Central California Coast Range, and Northern California Coast Ecoregions (CDFW 2015). Currently, the District encompasses approximately 123,000 acres in 66 regional parks, including over 1,250 miles of trails and 55 miles of bay-delta tidal shoreline. The major watersheds on District parklands include Alameda, Alhambra, Claremont, Garrity, Rheem, Kirker, Marsh, Mount Diablo, Pinole, San Pablo, San Leandro, San Lorenzo, Walnut and Wildcat Creeks, San Francisco Bay, San Pablo Bay, and Suisun Bay. More than 90 percent of Park District lands are protected and operated as natural parklands.

Throughout the District, habitats are often delineated by elevation change (ranging from sea level to 3817 feet) and influenced by the coast and transverse ranges, creating mesic cismontane conditions in the west and xeric transmontane rain shadow effect in portions of eastern Alameda and Contra Costa Counties. A Mediterranean climate consisting of winter rain and summer dry periods influences the mosaic of vegetation types and ecotonal communities within the District. District natural parklands are characterized by a diversity of ecotones consisting of estuarine, saline-brackish-fresh water emergent wetlands, diked bay lands, willow woodlands, redwood forest, montane hardwood-conifer forest, mixed evergreen forest, eucalyptus forest, coastal oak woodland, valley oak woodland, blue oak woodland, blue oak-gray pine woodland, valley foothill riparian woodland, California sycamore-cottonwood riparian woodland, mixed chaparral, California sagebrush scrub, annual grassland, and perennial grassland.

Habitat within District parklands also includes lentic (i.e., still fresh water, such as a pond or lake) and lotic (i.e., flowing fresh water, such as a stream) features. Lentic waterbodies vary in size and depth, from small rock depressions or ponds less than one square meter and few centimeters deep, to larger waterbodies covering several square kilometers with depths greater than ten meters. Most lentic waterbodies are man-made ponds consisting of constructed earthen dams within stream channels or graded inland depressions creating upland waterbodies. Lotic habitat consists of very small ephemeral and seasonal drainages to intermittent and larger volume perennial streams. The bay delta shoreline areas are a complex of tidal and diked, muted tidal wetlands with varied transitional upland ecotones.

Throughout Alameda and Contra Costa Counties, the loss of habitat continues to further fragment and isolate listed species populations. Urban expansion and conversion of open grasslands to vineyards is prevalent in eastern regions and adversely affects Alameda whipsnake, California red-legged frog, California tiger salamander, San Joaquin kit fox, longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

Many anthropogenic effects are contributing to the fragmentation and degradation of tidal marsh habitat; most notable factors include: development of transitional upland ecotones, invasion of non-native species, contaminants, global climate change and sea level rise, which threaten giant garter snake, Ridgway’s rail, western snowy plover, California least tern, and salt marsh harvest mouse populations throughout this region.

Species

Alameda Whipsnake

Presence within the Action Area:
The Alameda whipsnake occurs, has the potential to occur, and has habitat on District lands in the following thirty-six park units: Anthony Chabot, Bishop Ranch, Black Diamond Mines, Briones, Brushy Peak, Claremont Canyon, Clayton Ranch, Contra Loma, Cull Canyon, Del Valle, Diablo Foothills, Don Castro, Dry Creek Pioneer, Dublin Hills, Garin, Huckleberry, Kennedy Grove, Lake Chabot, Las Trampas, Leona Canyon, Little Hills Ranch, Mission Peak, Morgan Territory, Ohlone, Pleasanton Ridge, Rancho Pinole, Redwood, Roberts, Round Valley, Sibley, Sobrante Ridge, Sunol, Thurgood Marshall, Tilden, Vargas Plateau, and Wildcat Canyon. See Enclosure 1 and Table 1 for more detail on habitat acreages for each park. General habitat types of Alameda whipsnake on District lands include chaparral, riparian woodlands, and montane hardwood land cover types.

In addition, California Natural Diversity Data Base (CNDDB) records list 67 occurrences for Alameda whipsnake on District properties: Anthony Chabot, Black Diamond Mines, Briones,Chabot-Garin Bay Area Ridge Trail, Claremont Canyon, Clayton Ranch, Del Valle, Diablo Foothills, Dry Creek/Pioneer, Garin, Huckleberry, Lake Chabot, Las Trampas, Mission Peak, Morgan Territory, Pleasanton Ridge, Redwood, Round Valley, Sibley, Sunol, Tilden; the majority of CNDDB occurrences are in Black Diamond Mines, Tilden, and Briones Regional Parks. Not all of the known District Alameda whipsnake locations have been included in the CNDDB (District 2017).

The Draft Recovery Plan for the Alameda whipsnake (Service 2002a) designated the following seven Recovery Units: Unit 1 (Tilden-Briones), Unit 2 (Oakland-Las Trampas), Unit 3 (Hayward-Pleasanton Ridge), Unit 4 (Mount Diablo-Black Hills), Unit 5 (Sunol-Cedar Mountain), Unit 6 (Caldecott Tunnel Corridor) and Unit 7 (Niles Canyon/Sunol Corridor). The action area includes all seven recovery units. Unit 1 includes Wildcat and Tilden Regional Parks, and Claremont Canyon Regional Preserve; Unit 6 includes portions of Sibley Regional Preserve; Unit 2 includes Huckleberry Preserve and Roberts Redwood and Anthony Chabot Regional Parks; Unit 3 includes portions of Don Castro, Pleasanton Ridge Garin/Dry Creek and Vargas Plateau Regional Parks; Unit 4 includes Dublin Hills, Black Diamond Mines and Morgan Territory Regional Preserves and Contra Loma Reservoir; Unit 5 includes extensive portions of the Sunol/Ohlone Regional Wilderness and Del Valle Reservoir and; Unit 7 includes a portion of Pleasanton Ridge Regional Park.

Through its mission to preserve and protect listed species, the District is implementing or has implemented the parts of the Draft Recovery Plan for the Alameda whipsnake (Service 2002a) that call for the protection of existing populations and habitat through purchase of private lands and adaptive management of public lands (Recovery Action 1; Service 2002a). The District protects Alameda whipsnake habitat on lands it either owns or manages throughout all seven recovery units. Specifically, the District has acquired the following acreage of land in the following recovery units that will be added to existing District lands in each region:

- Recovery Unit 3 includes the Hayward and Pleasanton Ridges and Recovery Unit 7 encompasses the Niles Canyon Sunol Corridor. The District has acquired substantial properties in this recovery unit, including 3,664 acres in the Garin/Dry Creek area

(Recovery Action 5.3.1.3, Service 2002a) and 4,953 acres in the Pleasanton Ridge/Sunol Ridge area (Recovery Actions 5.3.1.3 and 5.3.1.7, Service 2002a). These acquisitions provide vital corridor links to existing District lands, improving habitat connectivity between recovery units.

- Recovery Unit 4 (Mount Diablo-Black Hills). The District in conjunction with the East Contra Costa County Habitat Conservancy has acquired 10,893 acres of preserve lands in this unit. These acquisitions provide expanded habitat protection and links to other District properties and the extensive land holdings at Los Vaqueros Reservoir, Mount Diablo State Park and Cowell Ranch State Park.

- Recovery Unit 6 (Caldecott Tunnel Corridor). The District acquired 636 acres of land known as the McCosker and Western Hills properties in this extremely important Alameda whipsnake movement corridor (Recovery Action 5.3.1.6, Service 2002a), directly adjacent to the Sibley Regional and Huckleberry Regional Parks.

The Service has determined that Alameda whipsnake occurs within the action area (in District lands identified in Table 1) as demonstrated by: (1) historic and recent observation of the species at numerous locations within and outside the District (Service 2002a; CDFW 2017); (2) the biology and ecology of the animal, especially the ability of individuals to move considerable distances; and (3) the action area contains suitable scrub habitat for breeding and foraging, and suitable grassland, riparian, and oak woodland habitat for foraging and dispersal.

Critical Habitat:

The Service issued a Final Rule on Critical Habitat for the Alameda whipsnake on October 2, 2006 (Service 2006c). All designated Critical Habitat Units (1-5) overlap with either all of, or portions of, District park units, preserves and regional wildernesses located throughout Contra Costa and Alameda Counties. In addition, significant portions of the Critical Habitat Units also include lands of other public agencies, such as the East Bay Municipal Utility District, Contra Costa Water District, San Francisco Water District, and Mount Diablo State Park. Table 3 shows the current acreage and percentage of District lands in the proposed action within Alameda whipsnake critical habitat units. Overall, the District currently contains 43,817 acres of designated critical habitat for Alameda whipsnake (Table 3).

Table 3. Alameda Whipsnake Critical Habitat Acres within District Lands

Critical Habitat Subunits	District Parks within Subunits	Critical Habitat Unit Acres Overlap with District Parks	Total Acres in Unit	Percent of Critical Habitat Unit on District Lands
1		**11,897**	**34,119**	**34.86%**
	Trail: Bay Area Ridge to Sobrante Ridge	166		
	Briones	6,071		
	Kennedy Grove	221		
	Rancho Pinole	659		
	Sobrante Ridge	14		

Critical Habitat Subunits	District Parks within Subunits	Critical Habitat Unit Acres Overlap with District Parks	Total Acres in Unit	Percent of Critical Habitat Unit on District Lands
	Tilden	1,958		
	Wildcat Canyon	2,789		
	Other Trail Segments	19		
2		**7,109**	**24,436**	**29.09%**
	Anthony Chabot	403		
	Cull Canyon	80		
	Lake Chabot	39		
	Las Trampas	5,657		
	Little Hills Ranch	52		
	Redwood	705		
	Trail Segments	173		
3		**12,998**	**25,966**	**50.00%**
	Dry Creek Pioneer	1,555		
	Garin	2,850		
	Pleasanton Ridge	8,579		
	Trail Segments	14		
4		**578**	**23,225**	**2.48%**
	Diablo Foothills	410		
	Morgan Territory	166		
	Trail Segments	2		
5A		**605**	**24,723**	**2.45%**
	Del Valle	605		
5B		**8,869**	**18,214**	**48.69%**
	Mission Peak	368		
	Ohlone Wilderness	2,183		
	Sunol Wilderness	6,318		
6		**1,376**	**4,151**	**33.14%**
	Claremont Canyon	208		
	Huckleberry Botanic	240		
	Sibley Volcanic	928		
Grand Total		**43,817**		

In Critical Habitat Unit 4, the Service (Service 2006c) excluded District lands (Morgan Territory, Black Diamond Mines, Clayton Ranch, Round Valley, Vasco Caves) and all lands associated with acquisition under the ECCCHCP on the basis of assurances through the District's Master Plan, which provides for monitoring and conservation of rare, threatened and endangered species, including the Alameda whipsnake, and calls for species conservation efforts to take precedence over other park activities.

District lands contain and manage all three primary constituent elements: PCE 1) Scrub/shrub communities with a mosaic of open and closed canopy; PCE 2) Woodland or annual grassland plant communities contiguous to lands containing PCE 1; and PCE 3) Lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PCE 1 or PCE 2.

California Tiger Salamander

Presence within the Action Area:
Data from the District (District 2017) and CNDDB shows that the California tiger salamander is widely distributed in the eastern parklands of Alameda and Contra Costa Counties, with several small populations remaining in the East Bay Hills south of Highway 580 (Table 1). Overall, California tiger salamanders have been documented in 16 parkland units, including Black Diamond Mines Regional Preserve, Brushy Peak Regional Preserve, Clayton Ranch Regional Preserve, Contra Loma Regional Park, Del Valle Regional Park, Dry Creek Regional Park, Garin Regional Park, Las Trampas, Mission Peak Regional Wilderness, Morgan Territory Regional Preserve, Ohlone Regional Wilderness, Pleasanton Ridge Regional Park, Round Valley Regional Preserve, Sunol Regional Wilderness, Vargas Plateau Regional Preserve, and Vasco Caves Regional Preserve (see Enclosure 1, Figure 1)). However, California tiger salamanders appear to have recently disappeared from Dry Creek Regional Park and Garin Regional Park and the population is likely extirpated. A few higher elevation sites in the Bay Area occur in the Ohlone Wilderness, Alameda County (Service 2016).

The CNDDB contains 108 occurrence records of California tiger salamander within the District (CDFW 2023). Four of these CNDDB records are from areas where the populations are likely extirpated. Moreover, the District believes that not all of the 85 District California tiger salamander locations (1996 to present) have been included in the CNDDB (District 2017). Prior to a discovery in 2018, California tiger salamander had not been documented in or near Las Trampas Wilderness Regional Preserve for over 60 years (CNDDB 2018); the closest documented occurrence was approximately 1 mile north of the site but was extirpated in 1952 (CNDDB Occurrence No. 530), while other documented occurrences were greater than 5 miles from the site. However, a potentially gravid female California tiger salamander was observed in a pond on December 7, 2018, and a total of 26 adults were observed in the same pond on December 13, 2021.

The action area is located within the Central Valley and East Bay draft recovery units (Service 2016). The Central Valley draft recovery unit includes all or parts of 24 District parklands that fall within its boundaries: Antioch-Oakley Shore, Bay Point, Big Break Delta Recreation Area, Bishop Ranch, Black Diamond Mines, Briones, Browns Island, Brushy Peak, Byron Vernal Pools, Clayton Ranch, Contra Loma, Deer Valley, Delta Access, Diablo Foothills, Doolan Canyon, Las Trampas, Morgan Territory, Round Valley, Sycamore Valley, Vasco Caves, Vasco

Hills, Waterbird, Little Hills Ranch, and Thurgood Marshall. The East Bay draft recovery unit includes all or parts of 18 District parklands that fall within its boundaries: Ardenwood, Bay Area Ridge Trail, Bishop Ranch Open Space, Coyote Hills, Coyote Hills-Ardenwood Trail, Del Valle, Dry Creek Pioneer, Dublin Hills, Garin, Las Trampas, Mission Peak, Ohlone Wilderness, Pleasanton Ridge, Quarry Lakes, Shadow Cliffs, Sunol Wilderness, and Vargas Plateau.

In the Central Valley draft recovery unit, conserving rangelands and protecting the species from hybridization with non-native tiger salamanders is a high priority. The East Bay draft recovery unit has a high degree of habitat protection relative to other recovery units. Protecting the species from hybridization with non-native tiger salamanders and monitoring species status and trends is a high priority for this unit.

On District lands, California tiger salamanders breed almost exclusively in seasonal and perennial stock ponds from near sea level to above 3,700 feet. The only natural waterbodies where California tiger salamander breeding has been documented are the rock-outcrop depressions at Vasco Caves Regional Preserve and Frick Lake at Brushy Peak Regional Preserve (District 2017). Within the distributional range, California tiger salamander reproduction has occurred in 80 lentic (stock pond) waterbodies, four rock-outcrop depression pools, and Frick Lake (District 2017).

Between 1996 and 2008, the number of lentic waterbodies on District lands supporting California tiger salamander reproduction annually ranged from 29 to 35 ponds. Although the number of ponds with reproduction has remained relatively constant, the total number of ponds available for breeding has increased over this time period. However, the percent of ponds supporting California tiger salamander reproduction has decreased by 10 percent (District 2017). During years with average to above average rainfall, California tiger salamanders appear to only utilize ≤ 50 percent of the known breeding locations (District 2017). Moreover, in a subsequent and moderately dry year (2012), California tiger salamander breeding was limited to nine pond locations and one rock-outcrop pool (District 2017). This represented only 11.76 percent of known District breeding locations and was directly correlated with unseasonable dry conditions at many of the lentic waterbodies known to support salamander reproduction (District 2017). In contrast to other areas, California tiger salamander found on District land exhibit low reproductive site fidelity and often shift breeding locations (District 2017).

The Service has determined that California tiger salamander occurs within the action area (in District lands identified in Table 1) as demonstrated by: (1) historic and recent observation of the species at numerous locations within and outside the District (Service 2002; CDFW 2023); (2) the biology and ecology of the animal, especially the ability of individuals to move considerable distances and their ability to spend the dry months of the year in habitats with suitable environmental conditions; (3) the action area contains breeding habitat in the form of constructed drainage features, perennial and seasonal ponds, including stock ponds as well as upland non-breeding habitat in annual grassland and oak woodlands that contains rodent burrows and burrow complexes and provide valuable refuge, forage, and dispersal habitat for California tiger salamanders.

California Red-legged Frog

Presence within the Action Area:
The action area is located within the range and current distribution of the California red-legged frog. The survival and recovery of this species in the action area is important because most of the known populations of this species are found in the San Francisco Bay region and the central coast range (Service 2002b; Fellers 2005). The CNDDB contains 123 California red-legged frog occurrence records within the District (CDFW 2023). Moreover, not all of the 157 District California red-legged frog locations (1996 to present) have been included in CNDDB.

California red-legged frogs occur in small populations in the East Bay foothills on District lands and are widely distributed in the eastern District parklands of Alameda and Contra Costa Counties. California red-legged frogs have been documented in 24 parkland units, including Black Diamond Mines Regional Preserve, Briones Regional Park, Brushy Peak Regional Preserve, Castle Rock Regional Recreation Area, Clayton Ranch Regional Preserve, Del Valle Regional Park, Diablo Foothills Regional Park, Dry Creek Regional Park, Garin Regional Park, Las Trampas Regional Wilderness, Mission Peak Regional Wilderness, Morgan Territory Regional Preserve, Ohlone Regional Wilderness, Pleasanton Ridge Regional Park, Round Valley Regional Preserve, Sobrante Ridge Regional Preserve, Sunol Regional Wilderness, Sycamore Valley Regional Preserve, Tassajara Creek Regional Park, Thurgood Marshall Regional Park, Tilden Regional Park, Vargas Plateau Regional Preserve, and Vasco Caves Regional Preserve (see Enclosure 1 Figure 1).

The action area for the District Routine Maintenance Activities contains one recovery unit that was designated in the recovery plan for the California red-legged frog (Service 2002b): the South and East San Francisco Bay Unit with the East San Francisco Bay Core Area. (Service 2002b). This recovery unit extends from the northernmost portion of Contra Costa County, includes a portion of San Joaquin County south to Santa Clara County, includes the eastern portion of San Mateo County, and all of the San Francisco County. Within this Recovery Unit, red-legged frogs seem to have been nearly eliminated from the western lowland areas near urbanization, although they still occur in isolated populations in the East Bay Foothills (between Interstate 580 and Interstate 680), and are abundant in several areas in the eastern portions of Alameda and Contra Costa Counties. This Recovery Unit is essential to the survival and recovery of the California red-legged frog, as it contains the largest number of occupied drainages in the northern portion of its range (Service 2002b). Upper Alameda Creek (Sunol Regional Wilderness) and other creeks in Alameda County, as well as the Coral Hollow Creek Watershed near the San Joaquin/Alameda County border, support numerous occurrences (Service 2002b). The Recovery Plan established the following conservation needs for the East San Francisco Bay Core Area: (1) protect existing populations; (2) control non-native predators; (3) study effects of grazing on riparian corridors, ponds, and uplands (e.g. on District lands); (4) reduce impacts associated with livestock grazing; (5) protect habitat connectivity; (6) minimize effects of recreation and off-road vehicle use (e.g. Corral Hollow watershed); (7) avoid and reduce impacts of urbanization; and (8) protect habitat buffers from nearby urbanization (Service 2002b).

According to the District, California red-legged frogs occur in 126 lentic waterbodies, 27 distinct stream reaches, and four spring box locations on their lands (District 2017). Between 1996 and 2008 the number of lentic waterbodies where California red-legged frogs were observed ranged from 51 to 73 ponds. From 1996 to the present, California red-legged frogs have exhibited

relatively consistent fidelity at lentic and lotic breeding sites. Within District lentic waterbodies, 73 percent to 89 percent of known California red-legged frog locations supported successful reproduction (District 2017). Similarly, nine of ten stream reaches had breeding activity most years with conditions suitable to complete metamorphosis. In contrast, egg deposition has been documented in only one of the four spring box locations. Depending on annual precipitation, the California red-legged frog populations vary considerably, with notable decline during drier years or extended drought periods.

The Service has determined that California red-legged frog occurs within the action area (in District lands identified in Table 1) as demonstrated by: (1) historic and recent observation of the species at numerous locations within and outside the District (Service 2002b; CDFW 2017); (2) the biology and ecology of the animal, especially the ability of individuals to move considerable distances and their ability to spend the dry months of the year in habitats with suitable environmental conditions; (3) the action area contains numerous creeks, streams, constructed drainage features, perennial and seasonal ponds, including stock ponds that provide breeding and non-breeding aquatic habitat for the California red-legged frog. Riparian vegetation along creeks and drainages and landscape vegetation in the action area provide valuable refuge, forage, and dispersal habitat for red-legged frogs; (4) the action area contains upland habitat with rodent burrows and other cover sites; (5) the action area contains upland habitat that provides refuge, forage, and dispersal habitat for the species; and (6) the numerous locations and movement corridors where the species can move within the parklands between breeding sites.

Critical Habitat:
The action area is within California red-legged frog critical habitat units ALA-1A, ALA-1B, ALA-2, CCS-1, CCS-2a, and CCS-2b (Table 4). Overall, the District currently contains 33,470 acres of designated critical habitat for California red-legged frog. See Table 4 for the current acreage and percentage of District lands in the proposed action within California red-legged frog critical habitat units.

Table 4. California Red-legged Frog Critical Habitat Acres within District Lands

Critical Habitat Subunits	District Parks within Subunits	Acres Overlap with District Parks	Total Acres in Unit	Percent of Critical Habitat Unit in District Park
ALA-1A		**642**	**3,653**	**17.6%**
	Bishop Ranch Open Space	2		
	Dublin Hills	639		
	Trail Segments	1		
ALA-1B		**4,511**	**10,166**	**44.4%**
	Dry Creek Pioneer	595		
	Garin	2,219		
	Pleasanton Ridge	1,695		
	Trail Segments	2		
ALA-2		**19,724**	**153,689**	**12.8%**
	Del Valle	3,802		
	Mission Peak	370		

Critical Habitat Subunits	District Parks within Subunits	Acres Overlap with District Parks	Total Acres in Unit	Percent of Critical Habitat Unit in District Park
	Ohlone Wilderness	9,049		
	Sunol Wilderness	6,504		
CCS-1		**4,744**	**13,853**	**34.2%**
	Briones	4,194		
	Rancho Pinole	548		
	Trail Segments	3		
CCS-2A		**520**	**4,227**	**12.3%**
	Diablo Foothills	517		
	Trails	3		
CCS-2B		**3,268**	**44,478**	**7.3%**
	Brushy Peak	1,932		
	Doolan Canyon	774		
	Morgan Territory	562		
Grand Total		**33,411**		

Subunits ALA-1A, ALA-1B, ALA-2, CCS-1, CCS-2a, and CCS-2b contain the features that are essential for the conservation of the species. These subunits contain aquatic habitat for breeding and non-breeding activities (PCE 1 and PCE 2), and upland habitat for foraging and dispersal activities (PCE 3 and PCE 4). These six subunits were all known to be occupied at the time of listing and are currently occupied. The subunits contain permanent and ephemeral aquatic habitats, which provide breeding for frogs. They consist of manmade stock ponds and natural streams with emergent vegetation, willows, or are surrounded by riparian vegetation, grasslands and oak forest. These aquatic habitats also have adjacent upland areas for dispersal, shelter, and foraging opportunities. Subunits ALA-1A and ALA-1B provide for connectivity between populations farther south in the East San Francisco Bay foothills and represent the southernmost distribution of the California red-legged frogs and its habitat in the East San Francisco Bay region. The physical and biological features essential to the conservation of California red-legged frog in all six subunits may require special management considerations or protection due to the removal and alteration of habitat as a result of urbanization, alteration of aquatic and riparian habitats, dumping, and erosion and siltation of ponded habitat, which may alter aquatic or upland habitats and thereby result in the direct or indirect loss of egg masses or adults.

Foothill Yellow-legged Frog

Presence within the Action Area:
The species has historically been documented on Park District Lands in the East Bay Hills, Mount Diablo Range, and Mount Hamilton ecoregions (CNDDB 2022). However, based on Park District surveys and current CNDDB records, the species is currently believed to be restricted to District Lands within the upper Alameda Creek and Arroyo Del Valle watersheds, which includes the following Park District Lands: Sunol Wilderness Regional Preserve, Ohlone Wilderness Regional Preserve, and possibly Del Valle Regional Park.

Based on historic and recent observations of the species within and outside the District, the presence of suitable habitat, and the biology and ecology of the species, the Service has determined that foothill yellow-legged frog occurs within the action area (in District lands identified in Table 1).

Longhorn Fairy Shrimp

Presence within the Action Area:
Occupied longhorn fairy shrimp habitat located on District lands is only found in depressed pools in sandstone or rock outcroppings (District 2017) however, other vernal pool substrates may provide habitat if the appropriate inundation period occurs. Systematic surveys from 2009 to 2012 for longhorn fairy shrimp on District lands in Contra Costa and Alameda counties have detected longhorn fairy shrimp at just two locations in sandstone rock pools at Vasco Caves and Brushy Peak Regional Preserves, respectively, in a single year (2011). Based on these results, no conclusions about population trends in longhorn fairy shrimp on District lands can made at this time. CNDDB records list just one occurrence (but two locations) of longhorn fairy shrimp at Vasco Caves Regional Preserve; additionally, there are two occurrences just outside of Brushy Peak Preserve. The likely District lands with occurrences, potential for occurrence, and potential habitat include four parks: Brushy Peak, Byron Vernal Pools, Vasco Caves, and Vasco Hills (See Table 1 for more detail).

The action area is located within three recovery units, the Livermore Recover Unit (Altamont Hills Core Area), the Central Coast Recovery Unit, and the Santa Rosa Recovery Unit. The Livermore Vernal Pool Region includes Altamont Hills core area and includes District owned lands or lands managed by the District at Vasco Caves Regional Preserve, Byron Hills Regional Preserve, and Brushy Peak Regional Preserve. The Livermore Vernal Pool Region with the Altamont Hills core area was identified as being one of the highest priority areas for recovery (Zone 1 ranking). Through its mission to preserve and protect listed species, the District is implementing or has implemented elements of the Vernal Pool Ecosystems Recovery Plan strategy (Service 2005a) for the benefit of the longhorn fairy shrimp and other vernal pool species. All known suitable longhorn fairy shrimp vernal pool habitat (Recovery Criteria 1A and 1B; Service 2012) in the Livermore Vernal Pool Region core area is protected public land at Vasco Caves Regional Preserve and Brushy Peak Regional Preserve, including land owned by the Livermore Area Recreation and Park District. Known occurrences in this region, to date, include only rock vernal pools located in sandstone outcroppings on both properties. In addition, the District has acquired and continues to acquire land in the immediate vicinity of these two units of the core area, which contain vernal pools and may support or have the potential to support longhorn fairy shrimp (Recovery Criteria 1D; Service 2012). The District acquired the 4,767 acre Byron Hills Regional Preserve in conjunction with the ECCHCP and NCCP. If funding can be obtained, the District plans to address the experimental introduction of longhorn fairy shrimp to other rock vernal pools within the preserve complexes in an effort to increase pool occupancy beyond the two existing pools (Recovery Criterion 1C). Habitat protection of existing rock vernal pools has maintained and protected the hydrology of the rock vernal pools that support longhorn fairy shrimp (Recovery Criterion 1E).

Based on these occurrences, the presence of suitable habitat as described above, and the biology and ecology of the species, the Service concludes that the longhorn fairy shrimp occurs within the action area at the lands identified in Table 1.

Critical Habitat:
In its Final Rule, the Service (2006a, 2006b) designated a total of 13,557 acres of land as critical habitat for this species in three major units: The critical habitat designation on District lands encompasses the northern limit of this longhorn fairy shrimp. The Service has designated Unit 1, Altamont Hills Units A (304 acres) and B (487 acres), Contra Costa and Alameda Counties, 791 acres of critical habitat (Service 2003, 2006a, 2006b). Unit 1A almost entirely overlaps a small western portion of Vasco Caves Regional Preserve (269 acres) and Vasco Hills Preserve (4 acres), and Unit 1B has a small portion that overlaps a small part of the northeastern section of Brushy Peak Preserve (42 acres). Vasco Caves Regional Preserve makes up to 88 percent of Unit 1A while the Vasco Hills Preserve about 1 percent. The Brushy Peak Preserve makes up about 8.6 percent of Unit 1B.

Vernal Pool Fairy Shrimp

Presence within the Action Area:
The CNDDB contains six occurrence records of vernal pool fairy shrimp on District lands (CDFW 2023) located in Brushy Peak Preserve, Vasco Hills Preserve, Vasco Caves Preserve, and Byron Vernal Pools Preserve. General habitat types on District lands used by vernal pool fairy shrimp include rock outcrop depressions and vernal pools. On District properties there are known occurrences in numerous sandstone depression vernal pools (rock pools) at the 1,400 acre Vasco Caves Regional Preserve and the 507 acre Bushy Peak Regional Preserve (District 2017). Systematic surveys for fairy shrimp were undertaken at Vasco Caves and Brushy Peak during the rainy seasons of 2009-2012 (District 2017). In any given year, not all rock pools sampled harbored vernal pool fairy shrimp, and percent occupancy varied over time and space. For example, at Vasco Caves and Brushy Peak, the percentage of sampled rock pools occupied by vernal pool fairy shrimp ranged from 0-90 percent depending on the sample date, and peak population densities can be greater than 200 individuals per rock pool in February (District 2017). At the 3,543-acre Byron Hills Regional Preserve, presence/absence surveys for fairy shrimp were undertaken in 34 soil-based, grassland vernal pools, and vernal pool fairy shrimp were detected in only three pools (District 2017). The latter preserve was acquired jointly between the ECCCHCP and the District.

Given the non-systematic record of historical occurrences and the short duration of intensive monitoring for vernal fairy shrimp on District lands, the District does not have any population trends for this species at this time. With up to 91 percent pool occupancy, it would appear that the populations of vernal pool fairy shrimp on District lands are potentially sustainable. However, the percent occupancy by vernal pool fairy shrimp of sampled rock pools varies substantially within and between years.

The action area encompasses the same recovery units for vernal pool fairy shrimp as those described above for longhorn fairy shrimp. The District protects vernal pool fairy shrimp habitat (Recovery Criteria 1A and 1B; Service 2012) in the Livermore Vernal Pool Region at Vasco Caves Regional Preserve and Brushy Peak Regional Preserve, including land owned by the Livermore Area Recreation and Park District. Known occurrences in this region to-date include the rock vernal pools (tinajas) located in sandstone outcroppings on both properties. Habitat protection of existing rock vernal pools and the soil-based vernal pools has maintained and protected the hydrology of these ecosystems that support vernal pool fairy shrimp (Recovery Criteria 1E).

The District lands with occurrences, potential for occurrence, and potential habitat include four parks: Brushy Peak, Byron Vernal Pools, Vasco Caves, and Vasco Hills (see Table 1 for more detail). Based on these occurrences, the presence of suitable habitat as described above, and the biology and ecology of the species, the Service concludes that the vernal pool fairy shrimp occurs within the action area at District lands identified in Table 1.

Critical Habitat:
In the Final Rule, the Service (2006a, 2006b) designated a total of 7,892 acres of critical habitat for the vernal pool fairy shrimp in the Altamont Hills core area subdivided into Units 19A (1,524 acres), 19B (4,912 acres), and 19C (1,455 acres)(Service 2003, 2006a). This critical habitat includes the only known locations of rock outcrops containing rock pools which support vernal pool fairy shrimp. Small portions of this critical habitat are on District owned lands or on lands managed by the District: 19B slightly overlaps 158 acres of Vasco Hills Regional Preserve and 291 acres of Byron Vernal Pools Regional Preserve; 19C slightly overlaps 56 acres of Brushy Peak Regional Preserve; 19A is located about 600 feet east of a small portion of Deer Valley Regional Park and will not be affected by proposed activities. In total, about three percent of 19B and four percent of 19C are included on District lands.

Vernal Pool Tadpole Shrimp

Presence within the Action Area:
General habitat types on District lands used by vernal pool tadpole shrimp include seasonal ponds and vernal pools. While extensive surveys have occurred on District lands, no tadpole shrimp have been detected. Potential habitat for the vernal pool tadpole shrimp on District lands includes the northeast section of Brushy Peak Regional Preserve and Vasco Caves Regional Preserve. Extensive surveys of all rock-based vernal pools at Vasco Caves and Brushy Peak Regional Preserves over three winters did not record this species (District 2017). Surveys of 34 grassland vernal pools on District properties in Black Diamond Mines, Vasco Caves, and Byron Hills Regional Preserves did not detect any vernal pool tadpole shrimp and the East Contra Costa County Habitat Conservancy has no records of occurrences in Contra Costa County (District 2017).

The action area encompasses the same recovery units for vernal pool tadpole shrimp as those described above for vernal pool fairy shrimp and longhorn fairy shrimp. The District protects vernal pool tadpole shrimp habitat (Recovery Criteria 1A and 1B; Service 2012) in the Livermore Vernal Pool Region at Vasco Caves Regional Preserve and Brushy Peak Regional Preserve, including land owned by the Livermore Area Recreation and Park District. Known occurrences in this region to-date include the rock vernal pools (tinajas) located in sandstone outcroppings on both properties. Habitat protection of existing rock vernal pools and the soil-based vernal pools has maintained and protected the hydrology of these ecosystems that support vernal pool fairy shrimp (Recovery Criterion 1E).

The CNDDB contains no occurrence records of vernal pool tadpole shrimp on District lands. The closest known occurrences of vernal pool tadpole shrimp in terms of their proximity to District lands are located at Collinsville and the Jepson Prairie, in the vicinity of Fremont on private land, and within the San Francisco Bay National Wildlife Refuge complex (Service 2024). Given that these occurrences are within 5 to 15 miles from District properties, and the fact that this species may be more prone to dispersal by birds than other fairy shrimp (King et al. 1996), there is a potential for this species to occur on District lands within the action area as identified in Table 1.

The likely District lands with potential for occurrence and potential habitat include four parks: Brushy Peak, Byron Vernal Pools, Vasco Caves, and Vasco Hills (See Table 1 for more detail).

San Joaquin Kit Fox

Presence within the Action Area:
General habitat types on District lands used by San Joaquin kit fox include grasslands and oak savannahs. In the northern part of its range, including Alameda and Contra Costa Counties, most of the valley floor habitat has been eliminated and, in this area, kit foxes now occur primarily in foothill grasslands, valley oak savanna, and alkali grasslands (Service 1998). From 1990 to the present, there have been a total of 12 San Joaquin kit fox occurrences on District lands in eastern Alameda and Contra Costa Counties. This includes occurrences at Black Diamond Mines Regional Preserve, Brushy Peak Regional Preserve, Contra Loma Regional Park, Round Valley Regional Preserve, and Vasco Caves Regional Preserve (District 2017, CDFW 2017). All documented occurrences are of individual kit foxes, with the exception of the Round Valley sightings (1992), when two adults and four juvenile kit fox were documented (District 2017). The most recent San Joaquin kit fox sightings occurred in July and August 2002 at Vasco Caves and Brushy Peak Regional Preserves, respectively (District 2017).

The action area is located in the north-eastern most part of San Joaquin kit fox's range. Eastern portions of Alameda and Contra Costa County are located within the San Joaquin kit fox recovery satellite populations, also labeled as S1 or Livermore Unit. In addition to protection of core areas, the protection of at least three satellite populations is required for down-listing, and the protection of additional satellite populations, with three or more showing stable or increasing populations during one precipitation cycle is required for delisting. The area of the Livermore Unit is almost entirely within Contra Costa and Alameda Counties with a small portion in San Joaquin county connecting to linkage populations. According to the recent species status assessment (Service 2020g), the condition for the Livermore Unit, the population within the action area, is very low, with no evidence of a current population and the only records are 10 years old or greater. The Recovery Plan (Service 1998) lists as recovery actions the protection of habitat in the northern, northeastern, and northwestern segments of the range and the preservation of existing connections between habitat in those areas and habitat to the south.

From 1997 through 1999, extensive live trapping and/or spotlight surveys for San Joaquin kit fox were conducted at Black Diamond Mines, Round Valley, and Vasco Caves Regional Preserves (District 2017). During this period, no San Joaquin kit fox were captured or observed on these parklands. Subsequently, all of the occurrences on District lands and throughout the East Bay region have consisted of incidental observations of individual foxes. Although historically San Joaquin kit fox sightings were numerous in the northwestern portion of their range, by the 1980's kit fox were declining, remaining in isolated pockets, and being extirpated from Contra Costa County and northern parts of Alameda County (District 2017). It appears that the current population density of San Joaquin kit fox on District lands is extremely low and most recent observations suggest this portion of their range is occasionally frequented by dispersing transient individuals rather than resident animals.

Based on these occurrences, the presence of suitable habitat as described above, and the biology and ecology of the species, the Service concludes that the San Joaquin kit fox may occur within the action area. The likely District lands with occurrences, potential for occurrence, and potential habitat include ten parks: Black Diamond Mines, Brushy Peak, Byron Vernal Pools, Contra

Loma, Deer Valley, Delta Access, Doolan Canyon, Round Valley, Vasco Caves, and Vasco Hills (See Table 1 for more detail).

Pallid Manzanita

Presence within the Action Area:
Only two large, naturally-occurring pallid manzanita populations are known to exist: one at Huckleberry Ridge, the presumed type locality in Alameda and Contra Costa Counties, and the other at Sobrante Ridge Regional Preserve in Contra Costa County. Most of the population at Huckleberry Ridge occurs on land owned and managed by the District as part of the 236-acre Huckleberry Botanic Regional Preserve. At the present time, these pallid manzanita populations consist of 924 plants at Huckleberry Ridge (mostly within the boundaries of Huckleberry Botanic Regional Preserve) and an estimated 454 plants on Sobrante Ridge (entirely within the 277-acre Sobrante Ridge Regional Preserve). Additionally, three plants (one confirmed) have been reported in Sibley Volcanic Regional Preserve, 75 plants are confirmed in Redwood Regional Park, and 20 plants have been located and mapped in Tilden Regional Park (District 2017). General habitat types of pallid manzanita on the District lands include chaparral and montane hardwood land cover types.

The Sobrante Ridge population of pallid manzanita has the least human impact. The genetic integrity of pallid manzanita is threatened by hybridization with other species of manzanita introduced into the vicinity of pallid manzanita populations (District 2017). Approximately 50 percent of the Huckleberry Ridge population of pallid manzanita was affected in the 1980's by a *Botryosphaeia* fungus and an unknown root fungus that attacked the roots of the plants, causing branch and stem dieback (District 2017).

The CNDDB contains seven occurrence records of pallid manzanita on District lands (CDFW 2017). Based on these occurrence records, the presence of suitable chaparral habitat, and the biology and ecology of the species, the Service has determined that the pallid manzanita occurs within the action area at District lands identified in Table 1.

Giant Garter Snake

Presence within the Action Area:
Most information on the status of the snake comes from work on agricultural and managed refuge lands; much less is known about the snake outside of these areas in other habitats. Nevertheless, scattered records documented on the CNDDB indicate a wider distribution that includes marshes and waterways of the Delta, which includes and is hydrologically connected to the proposed project area. Big Break Regional Shoreline (1,648 acres), which includes the mouth of Marsh Creek and its watershed, near Oakley, Delta Access (366 acres) near Discovery Bay, and Browns Island (595 acres), at the confluence of the Sacramento and San Joaquin Rivers, as well as all locations in the Sacramento-San Joaquin Delta, Contra Costa County, are considered District locations where the giant garter snake is assumed to occur (District 2017). The four parks that could or do support giant garter snakes include Antioch/Oakely Shoreline, Big Break Shoreline, Brown's Island, and Delta Access based on nearby occurrences, potential aquatic and adjacent upland habitat, and the ecology of the species. The CNDDB lists only one occurrence of giant garter snake on District lands at Antioch/Oakely Shoreline, although Big Break Shoreline has multiple occurrences adjacent to it within the Delta.

The action area is located within the draft Delta Basin Recovery Unit (Service 2017b). The Delta Basin draft recovery unit (380,863 acres) has four management units, two of which include District lands. The draft White Slough Management Unit includes Brown's Island (595 acres) and the draft Stockton Management Unit includes Big Break Shoreline (1,648 acres) and Delta Access (1,012 acres). The recovery plan calls for a minimum of ten habitat block pairs with no less than two block pairs per management unit in the draft Delta Basin Recovery Unit. These blocks should provide sufficient quality connected habitat in each Recovery Unit that will reduce the threats associated with habitat loss.

The four District lands within the action area include permanent waters with varying amounts of aquatic vegetation and adjacent uplands which could potentially support the snake. The distribution of the snake and range of habitat types at these parks, lead the Service to conclude that the snake is present in the action area on the four parks identified in Table 1.

California Ridgway's Rail

Presence within the Action Area:
California Ridgway's rail has been documented in the following shoreline parks and tidal emergent wetland locations within the Bay Area: Martin Luther King Jr. Regional Shoreline at Airport Channel, Alameda East, Arrowhead Marsh, Damon Marsh, Doolittle Pond, Fan Marsh, New Marsh, and San Leandro Creek; Crown Beach Regional Shoreline at Elsie Roemer Marsh; Hayward Regional Shoreline at Cogswell A, Cogswell West, Cogswell East, Hayward Landing/Triangle, H.A.R.D Marsh, Hoffman Marsh, Johnson's Landing, Meeker Slough, Oro Loma East and Oro Loma West, and Triangle Marsh; Oyster Bay Regional Shoreline, Emeryville Crescent, Hoffman Marsh, Southern Marsh, Sulphur Creek, and Whittel Marsh. Martinez Shoreline, McLaughline Eastshore, North Richmond Shore, Point Isabel Shore, Point Pinole Shore, and San Pablo Bay Shore parks are also areas of potential habitat and occurrence for California Ridgway's rail within the action area.

District data show that nine of the parks within the action area have known or potentially occupied rail tidal marsh habitat (see Table 1). The general habitat type used by California Ridgway's rail on District lands is saline – brackish emergent wetland land cover types.

The estimated, all-time historical low of 500 California Ridgway's rails was in 1991 and at that time, the majority of rails were found in the South Bay (District 2017). Within District marshes, annual District survey results documented a rebound in California Ridgway's rail numbers between 1993 and 2007. During the 2006 and 2007 breeding seasons, Arrowhead Marsh supported 148 and 137 rails, respectively. Similarly, winter surveys of 2007 documented 134 California Ridgway's rails in four marshes of the San Leandro Bay Complex, including 112 rails in Arrowhead Marsh (District 2017). From 2007 to 2009, data collected showed substantial declines throughout the South Bay eco-region (47 marshes) (District 2017). This population decline continued from 2007 to 2012, with an overall negative trend of 70.9% within San Leandro Bay and most notably at Arrowhead Marsh, with a negative trend of 77.3 percent (District 2017). Moreover, since 2009 California Ridgway's rails have not been documented during high tide surveys at six locations within the San Leandro Bay Complex, most notably Elsie Roemer and Doolittle Marsh (District 2017).

California Ridgway's rail density and population trend data throughout the District marsh complexes suggests there is a strong positive correlation between the presence of non-native

Spartina spp., and increased rail densities and reproductive success. Conversely, the removal of non-native *Spartina spp*. appears to be a major contributing factor in the decline of California Ridgway's rails. Survey results indicated a shift in distribution and density of California Ridgway's rails at Arrowhead Marsh following treatment of non-native *Spartina spp.* (District 2017) where areas largely dominated by non-native *Spartina spp*. had higher densities of rails per hectare.

District shoreline tidal marshes support California Ridgway's rail populations within three of the five units identified in the *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Service 2013): Suisun Bay Area Recovery Unit, San Pablo Bay Recovery Unit, and Central/South San Francisco Bay Recovery Unit. The Recovery Units include 11 parks in the Central/South San Francisco Bay Recovery Unit, three in the San Pablo Bay Recovery Unit, and five within the Suisun Bay Recovery Unit (Table 5).

Table 5. Tidal Marsh Recovery Unit Acres within District Lands

District Lands and Recovery Units	Recovery Unit Acres Overlap with District Parks	Total Acres in Recovery Unit	Percent of District Lands in Recovery Units
Central/South SF Bay	**5,830**	**243,073**	**2.4%**
Brooks Island	378		
Coyote Hills	1,246		
Coyote Hills /Ardenwood Trail	12		
Crown Beach Shoreline	166		
East Bay Gateway	8		
Hayward Shoreline	1,063		
ML King Jr Shoreline	755		
McLaughlin EastShore	1,824		
Miller-Knox Shoreline	159		
Oyster Bay Shoreline	195		
Point Isabel Shoreline	24		
San Pablo Bay	**2,059**	**146,792**	**1.4%**
North Richmond Shoreline	33		
Point Pinole Shoreline	1,789		
San Pablo Bay Shoreline	237		
Suisun Bay	**1,183**	**115,556**	**1.0%**
Bay Point	135		
Brown's Island	600		
Carquinez St. Shoreline	40		
Martinez Shoreline	330		
Waterbird	78		
Grand Total	**9,072**		

The Plan identifies high priority areas for tidal marsh and ecotone restoration, including restoring to tidal action many of the salt ponds and other diked baylands along San Francisco Bay. The

Central/South San Francisco Bay Recovery Unit supports the majority of California Ridgway's rail populations and dispersal to other units appears to be limited (Service 2013).

The CNDDB contains 12 occurrence records of California Ridgway's rail within District lands (CDFW 2017). Some of these CNDDB records are from areas where the populations are likely extirpated (i.e. Elsie Roemer Marsh, Damon Marsh). Moreover, not all of the District locations have been included in the CNDDB. Based on these occurrences, the presence of suitable habitat in ten parks identified in Table 1, and the biology and ecology of the species, the Service has determined that California Ridgway's rail occurs within the action area.

Salt Marsh Harvest Mouse

Presence within the Action Area:
The action area is located within the Central/South San Francisco Bay, San Pablo Bay, and Suisun Bay recovery units. See California Ridgway's rail discussion for more information on these Recovery Units.

General habitat types used by salt marsh harvest mouse on District lands include saline – brackish emergent wetland land cover types. District data show that fourteen of the parks within the action area have known or potentially occupied marsh habitat (see Table 1). The southern salt marsh harvest mouse subspecies (*R. r. raviventris*) is found within the tidal marshes of the District lands, predominately the Hayward Regional Shoreline, Coyote Hills Regional Park, and Point Pinole Regional Shoreline. Salt marsh harvest mouse is also highly likely to occur at Martin Luther King Jr. Shoreline (Arrowhead Marsh), Martinez Regional Shoreline, North Richmond Shoreline, McLaughlin Eastshore State Park, and Waterbird Regional Preserve. CNDDB contains 10 occurrence records of salt marsh harvest mouse on District lands (CDFW 2017).

District biologists have conducted systematic salt marsh harvest mouse surveys at tidal marshes of Coyote Hills Regional Park, Hayward Regional Shoreline, specifically Oro Loma Marsh and Hayward Shoreline Mouse Preserve, and Point Pinole Regional Shoreline. The results from Oro Loma Marsh and Hayward Shoreline Marsh Preserve illustrated substantial population variability from year to year, with the highest density of salt marsh harvest mice at Oro Loma Marsh and the lowest densities at Coyote Hills. The salt marsh harvest mouse population at Point Pinole Regional Shoreline has shown little population fluctuation over the years.

Based on these occurrences (detailed above), the presence of suitable habitat on parklands identified in Table 1, and the biology and ecology of the species, the Service has determined that the salt marsh harvest mouse occurs within the action area.

California Least Tern

Presence within the Action Area:
The California least tern occurs and has habitat on District lands on the Hayward Regional Shoreline and Brooks Shoreline (see Table 1). The CNDDB contains one occurrence record of California least tern on District land (CDFW 2014) at Hayward Shoreline. California least terns have been observed foraging near shore or interior waters and periodically roosting at several District locations, including Hayward Regional Shoreline and Brooks Island. California least terns have only been noted to occasionally forage in the channel offshore of Robert W. Crown

Memorial State Beach, but do not utilize shoreline or interior waters. Generally, the habitat types used by California least tern on these District lands include estuarine, open shoreline beaches, plains, and islands land cover types.

Since the Hayward Regional Shoreline colonies' establishment in 2005, the number of breeding pairs has steadily increased from a low of 8 in 2005 to a high of 162 in 2012, with a nine year average of 62 breeding pairs (District 2017). While the California least tern nesting island at the Hayward Regional Shoreline is relatively small and limited as compared to other locations in the state, this colony has a very successful egg hatching and fledgling rate compared to other areas of the state. The California least tern breeding population at the Hayward Regional Shoreline has substantially increased and is expected to stabilize as the island becomes saturated with nesting terns.

The California Least Tern Recovery Plan was finalized in 1985 (Service 1985) and no recovery units were designated. Within the action area, the plan calls for the development of management plans and programs that identify special site protection problems of certain insecure colonies, including Coyote Hills in Alameda County. However, according to District biologist Steve Bobzien (pers. com. 2017), no habitat exists at the Coyote Hills park and too many raptor predators preclude tern nesting in that area.

Based on these occurrence records (above), the presence of suitable habitat within the two parks identified in Table 1, and the biology and ecology of the species, the Service has determined that it is reasonable to conclude that the California least tern occurs in the action area.

Western Snowy Plover

Presence within the Action Area:
General habitat types of snowy plover on District lands include estuarine, open shoreline beaches, plains, and islands land cover types. The western snowy plover occurs, has been documented at and has habitat on District lands in the following four park units: Brooks Island, Crown Beach Shoreline, Martin Luther King Jr. Shoreline, and Hayward Regional Shoreline (Table 1). Western snowy plovers have also been documented foraging, roosting, and/or exhibiting courtship behavior at Robert W. Crown Memorial State Beach, Martin Luther King Jr. Shoreline, and Brooks Island. These parks generally have open shoreline habitat that the plovers use for foraging. However, within the District western snowy plover breeding populations are extremely small, highly variable, and exhibit limited population growth. A total of 15 snowy plover nest sites have been documented at the Hayward Regional Shoreline where nesting occurs on a small 0.59 acre island and several levee sites. Since early 2000, all of the plover breeding activity has been on this island that also supports a colony of nesting California least tern (*Sternula antillarum browni*).

The action area includes the snowy plover Recovery Unit 3 (San Francisco Bay) and overlaps with 40 acres of the snowy plover Recovery Plan site CA-28 (Alameda South Shoreline) on the District's Crown Beach (Service 2007). Recovery unit 3 is unique and has been designated as a separate recovery unit because much of the habitat in the San Francisco Bay area consists of salt ponds and salt pond levees. According to the Recovery Plan (Service 2007), the population in Recovery Unit 3 is relatively lower than a third of the population, but has the potential to increase with intensive management of salt pond habitat. The Recovery Plan calls for each of the six recovery units to maintain metapopulation dynamics and ensure protection and appropriate

management of wintering and migratory habitat to ensure the long term health and sustainability of the Pacific Coast population of western snowy plovers across its current range.

The CNDDB contains two occurrence records of Western snowy plover on District lands (CDFW 2017). Based on these occurrence records, the presence of suitable habitat on District lands, and the biology and ecology of the species, the District has determined it is reasonable to conclude that the Western snowy plover occurs in the action area at the parks identified in Table 1.

Critical Habitat:
Western snowy plover critical habitat unit CA 12 is completely included in 0.56 acre of Hayward Regional Shoreline. A small nesting population in this habitat unit is restricted to a small 0.59 acre island and several levee sites at Hayward Regional Shoreline. A total of 15 snowy plover nest sites have been documented at the Shoreline. Since early 2000, all of the plover breeding activity has been on an island that supports a colony of nesting California least tern. Hayward Regional Shoreline is separated by Highway 92 and just north of critical habitat designation Eden Landings Subunits CA13A, CA 13B, or CA 13C. Western snowy plovers have also been documented foraging, roosting, and/or exhibiting courtship behavior at Robert W. Crown Memorial State Beach, Martin Luther King Jr. Shoreline, and Brooks Island. These District parklands are considerable distance from any critical habitat designation units. Overall, the District currently contains 0.56 acres of designated critical habitat for western snowy plover.

<u>Delta Smelt</u>

Presence within the Action Area:
The action area includes shallow subtidal waters that can be used by the species. The action area also includes adjacent levees and vegetation; however, the quality of that habitat for smelt varies with location within the action area and the immediate vicinity. Some portions of the action area include heavily armored channels with limited vegetation on levee slopes or in adjacent shallow water. Other parts of the action area have less armoring and more vegetation growing on the levee slopes.

The most recent survey results show low overall abundance for larval and adult delta smelt along District shoreline areas. Delta smelt were observed around Sherman Island, West Island, Browns Island, and in Carquinez Straight (CDFW 2016). Within the District, delta smelt may occur in the waterbodies of Carquinez Shoreline, Martinez Shoreline, Bay Point, Antioch/Oakley, Browns Island, and Big Break.

The Service has determined that the delta smelt occur in the action area at or near six of the parks identified in Table 1 based on the recent observations of this species near the parks, the biology and ecology of the species, the location of the project area within critical habitat, and the presence of suitable habitat in and near the parks.

Critical Habitat:
The action area of the proposed projects includes tidal waterways of the Delta that are wholly within critical habitat for the species. The action area is within delta smelt critical habitat Unit 1 (818,953 acres), which covers the entire delta and implies that efforts to recover the delta are essential to restoring the delta smelt. Delta smelt critical habitat extends east from San Pablo Bay along the entire delta. This includes all of the Sacramento and San Joaquin Delta and the parts of

the delta within Solano, Contra Costa, and Alameda counties (Service 2010b). This unit encompasses 3,546 acres of District lands including Antioch/Oakley Regional Shoreline, Bay Point Regional Shoreline, Big Break Regional Shoreline, Browns Island, Carquinez Straight Regional Shoreline, Martinez Regional Shoreline, and several shoreline trails (Table 6). District lands account of 0.42 percent of delta smelt critical habitat.

Delta smelt are not isolated to certain parts of their critical habitat and their population locations vary considerably every year and in every season. They are more likely to be found in the open water of Suisun Bay, but are sometimes found in marshland, as well. Individual delta smelt occasionally occur in turbid water (Moyle 2002) and it is possible to find these lone delta smelt distributed around their critical habitat.

Table 6. Delta Smelt Critical Habitat within on District Lands

Recovery Unit	Critical Habitat Unit Acres Overlap with District Parks (acres)
Antioch/Oakley Shoreline	9
Bay Point Shoreline	6
BB Delta Shoreline Trail	5
Big Break Regional Trail	4
Big Break Shoreline	1,657
Browns Island	600
Carquinez Strait Shoreline	21
Delta Access	993
Martinez Shoreline	186
Shoreline Trails	66
Grand Total	**3,546**

Longfin Smelt

Presence within the Action Area:
Juvenile and sub adult longfin smelt predominately inhabit brackish water areas of the San Francisco Bay estuary (San Pablo Bay and Central Bay) and nearshore coastal marine waters outside the Golden Gate (Baxter 1990, Rosenfield and Baxter 2007). Adult longfin smelt return to spawn in the freshwater regions of the lower Sacramento River, near or downstream of Rio Vista, and the lower San Joaquin River downstream of Medford Island.

Knowledge of longfin smelt use and distribution in tributaries feeding into the Bay, such as Coyote Creek, and the Napa and Petaluma Rivers, is limited. Longfin smelt use of bay tributaries is likely related to the extent of a freshwater signal in the Bay right before and during the longfin spawning migration (Baxter, pers. comm.). Sampling done in the Lower South Bay, near Coyote Creek in February 2010, found high numbers of longfin smelt in Coyote Creek, Alviso Slough, and nearby salt ponds (James Hobbs, unpublished data). Bay Study data shows spawner use of Coyote Creek (adults then larvae in the South Bay) in 1982 and 1983, both very high outflow years. Longfin smelt inhabits various depths depending on the time of day and life history stage, with adults inhabiting deeper areas close to the bottom during the day and becoming more associated with surface waters at night (Chigbu et al. 1998 in Garwood 2017).

Distribution of adult longfin smelt changes seasonally, with the majority of adults found in Central Bay, San Pablo Bay and Suisun Bay in the summer, and moving upstream in early fall. Adult distribution is the most widespread in the winter and spring, extending from the South Bay through the Delta, with the greatest concentrations in San Pablo Bay, Suisun Bay, and the West Delta (Rosenfield 2009).

While there may be seasonal variations in abundance of longfin smelt, the species occurs year-round throughout the Bay and larger bay tributaries, including areas in the action area. However, the action area is outside of known spawning areas of the species.

The Service has determined that the longfin smelt occur in the action area at or near sixteen of the parks identified in Table 1 based on the recent observations of this species near the parks, the biology and ecology of the species, and the presence of suitable habitat in and near the parks.

Effects of the Action

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action.

General

The District proposed activities and routine maintenance projects include the replacement of existing structures and facilities, minor improvement projects, and the restoration of various waterbodies to enhance habitat for listed species. The proposed activities consist of minor construction and the maintenance of existing structures or facilities that are mostly small in scale. The footprint of individual projects, except for restoration projects, is extremely small and rarely exceeds 2,000 square feet or 0.05 acres. Overall, the anticipated range of cumulative impacts for the five-year period of 2024-2029 is estimated to be a maximum of approximately 10.41 acres within the District's approximately 109,033 acres on non-Habitat Conservation Plan (HCP) lands (Table 7). Annually, this equates to about 2.08 acres of impact to various habitats that could potentially support listed species on the District lands. This includes disturbed sites and developed areas, which are unlikely to provide the habitat features suitable to support the listed species covered under this biological opinion. Considering that the vast majority of covered projects involve the maintenance of existing structures, most of the effects are anticipated to be temporary, with little permanent loss of vegetation or habitats.

Nonetheless, adverse effects to listed species could occur as a result of the work activities associated with these various construction and continuing maintenance projects. However, these effects are expected to be minor, since the vast majority of the projects are of short duration, with very small footprints and have minimal ground disturbance or permanent habitat alteration. As anticipated for a five-year period, the total impact to all habitat types (land cover area) is extremely small and less than 0.010 percent of District non-HCP lands.

Temporary impacts are defined as any impact that affects natural land cover for a limited duration with most sites returning to their preexisting conditions in less than two years. Most of the activity impacts defined as temporary in Table 2 would return to their preexisting condition

in a year; only a few would take less than two years to return. Examples of temporary impacts include removal of wetland, riparian, or terrestrial vegetation to the extent that natural land cover habitat is affected and other actions that temporarily reduce stream or wetland function and habitat value (e.g., dewatering). Actual wetland impacts may be somewhat lower than those calculated because of flexibility in implementing avoidance measures (e.g., building clear-span bridges to avoid streams, building in sites where no riparian vegetation exists).

Table 7. Acreage of Anticipated Routine Maintenance Projects (5 years)

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.450	0.000	0.450
Upgrade Culvert	0.900	0.900	1.800
Install New Culvert	0.270	0.305	0.575
Clearing Culvert	1.075	0.000	1.075
Culvert Head-Tailwalls	0.075	0.075	0.150
Install Energy Dissipaters	0.100	0.100	0.200
Installation of New Armored Fords	0.135	0.135	0.270
Maintenance of Existing Armored Fords	0.050	0.000	0.050
Maintenance and Installation of Bridges	0.050	0.000	0.050
Bank Stabilization	1.800	1.800	3.600
Springbox Maintenance and Installation	0.04	0.250	0.290
Maintenance Dredging of Waterbodies	1.500	0.000	1.500
Maintenance Shoreline Facilities	0.200	0.200	0.400
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**6.645**	**3.765**	**10.410**

Species

The effects of the Proposed Action on individual species are described below. This analysis assumes that projects in a specific District Park will be affecting the species determined as located in that District parks by Table 1. Conservation Measures are referenced below with the acronym CM. Effects common to all species are as follows:

Direct effects on all listed species as a result of the proposed project would include injury or mortality from being crushed by equipment, maintenance materials, or worker foot traffic. These effects would be reduced by the avoidance and minimization measures proposed by the District, including minimizing and clearly demarcating the boundaries of activity areas (CM3), pre-construction surveys (CM12), and the presence of a Service-approved biologist during construction activities (CM11). Relocating listed species out of harm's way, as proposed, may further reduce injury or mortality (CM14, CM21, CM22). However, injury or mortality of listed species may occur as a result of improper handling, containment, or transport of individuals or from releasing them into unsuitable habitat (e.g., where exotic predators are present).

Uninformed workers could disturb, injure, or kill listed species. The potential for this to occur may be greatly reduced by proposed education of workers as to the presence and protected status of species and the measures that are being implemented to protect it during District activities (CM10).

Indirect effects on listed species could occur through the possible spread of invasive plant species that could degrade or remove species habitat. To reduce adverse effects of invasive plant species being brought in by project activities, the District will ensure that the spread or introduction of any invasive exotic plants will be avoided and will remove any located in project areas when feasible (CM7). Additionally, proposed projects, restoration projects, and adaptive management conservation measures will benefit listed species because they include the control and removal of known populations of invasive species that are adversely affecting listed species habitats.

Temporary effects from vegetation removal include vegetative cover reduction in terrestrial areas and increased water flow, increased turbidity, and increased sediment loading in waterbodies; most of these effects should be gone within a year. In-channel removal of vegetation would be limited and is expected to have a negligible effect on channel flow or ponding, respectively. Such maintenance activities are typically localized (generally less than 0.01 acre), have a limited footprint and are usually targeted at road crossings, culverts, and at storm drain outlets. It is expected that most removal of in-channel vegetation that does not involve the placement of rip-rap or armoring will reestablish to its current condition within a year. Conservation measures (CM6) and BMPs (Table 2) as described above for erosion control will be required for any mechanized vegetation removal activities and sedimentation or erosion effects will be minimized and avoided.

Selective pruning and removal activities for site access may result in the short-term reduction of canopy and vegetative cover provided by understory trees, shrubs, and plants. The loss of cover may encourage the growth of invasive plants, such as cattails, in the creek or channel or yellow star thistle along the banks, which may require future removal. The presence of invasive species may reduce the quality of breeding, foraging, or dispersal habitat, inhibiting listed species from reproducing, foraging, or dispersing. Invasive species management during project activities would minimize the invasion or re-invasion of invasive plant species and will also allow for planting of native species (CM7).

Most effects from sediment removal will be temporary and localized as effects will be immediately around roads, culverts, bridges, crossings, shorelines, levees, and at target locations along streams; also, the time required to complete the work at each site will usually be short (approximately a week) and during the dry season when water levels are reduced or absent. Overall, sediment removal activities would not significantly alter stream function. Removal of fine sediment from the stream channel outfalls will improve water filtration and flow rates.

Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality or upland habitat to a degree where species are adversely affected or killed. The potential for this effect to occur will be reduced by implementation of measures proposed by the District to thoroughly inform workers of the importance of preventing hazardous materials from entering the environment and by locating staging and fueling areas away from channels and the immediate floodplain (CM4).

Best Management Practices (BMP) described in the *Conservation Measures* section above will be implemented prior to and during work activities in order to avoid and minimize adverse effects to all life stages of listed species. The proposed lentic, lotic, and tidal restoration projects may involve sediment and vegetation removal that would temporarily affect aquatic and upland habitat for these species. However, all restoration projects are required to have permanent neutral or beneficial effects to all listed species. Therefore, no significant habitat degradation would occur as a result of these activities (CM 18) to listed species covered in this biological opinion. The proposed lentic, lotic, and tidal restoration activities may involve sediment and vegetation removal that would temporarily affect aquatic and upland habitat for these species. However, all restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18) to listed species habitat in this biological opinion. Additionally, as described in the *Description of the Proposed Action* above, all restoration projects covered under this biological opinion will have the primary objective to promote the conservation and recovery of listed species. Adaptive management conservation measures, as detailed above, will provide suitable habitat for feeding, dispersal, or sheltering commensurate with or better than habitat lost as a result of the proposed routine maintenance projects implemented at that site. The continued preservation and restoration of lands essential to the conservation of these listed species by the District also helps offset these routine maintenance activities. Long-term management for the health of these listed species populations and their habitats is part of the District's mission and District lands will continue to provide essential conservation for these species and their populations despite some temporary and permanent effects from these routine maintenance, conservation measures, and restoration projects.

In summary, routine maintenance projects will enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion, while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will likely contribute to the recovery of the listed species addressed in this biological opinion.

Alameda Whipsnake

While most activities do not take place within scrub habitat or rock outcroppings, they will occur within or near waterbodies or along roads where Alameda whipsnakes forage and disperse through grasslands, riparian areas, and oak savanna. In these areas, injury or mortality could be a direct result of contact with construction equipment, vehicles, or personnel. Activities associated with the proposed projects will result in the loss of suitable Alameda whipsnake habitat-specifically riparian or scrub habitat, and could reduce the protective cover and foraging area needed for survival.

In the absence of conservation measures, District activities could result in increased level of disturbance to Alameda whipsnake from noise, vibrations from equipment, and maintenance activities. Disturbance through noise and vibration could result in the displacement of Alameda whipsnake from protective cover which may disrupt normal behavior of foraging, sheltering, and dispersal. Displaced individuals may be more vulnerable to predators or starvation. Avoidance and minimization measures will be utilized to reduce potential adverse effects to the Alameda whipsnake. These measures include avoiding rock outcroppings and scrub habitats, limiting the timing of activities to the summer and early fall to avoid disturbance to breeding and young, and

removing vegetation by hand in areas with shrub vegetation (CM20). They also include the use of biological monitors (CM10); covering all holes and trenches deeper than 12 inches at the end of each day (CM5); and use of BMPs to reduce soil erosion into waterways (Table 2, CM6). In addition, all handling of Alameda whipsnake will be by a Service-approved biologist (CM11, CM14).

Sediment removal activities should not affect Alameda whipsnake habitat or individuals other than direct effects described above. Vegetation removal activities would most likely remove protective cover in foraging and dispersal areas but acreage should be so minimal as to be discountable. If scrub habitat is removed for project activities, it is likely to be for site access, stream crossing, or culvert replacement work and will be minimal.

Effects of District routine maintenance activities on Alameda whipsnake populations, and on these species as a whole, will be relatively low proportionally – only 8.5 acres (0.010 percent) of 88,784 acres of potential range area in the District for the Alameda whipsnake would be affected by activities in the five-year period; while this is an overestimation of the proportion of habitat affected (because not all area in the range is habitat and the range acres depicted here may not be suitable habitat- see Table 1), the proportion of habitat affected would still be a small percentage, and should affect whipsnake populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer) and habitat in those areas are already disturbed and marginal. Therefore, the number of individuals and the effects of habitat disturbance to its populations that will be impacted by District routine maintenance are expected to be low (Table 8). The installation of livestock water systems could result in some removal of shrub habitat but will also improve grazing management, resulting in reduced weed species and improved foraging and dispersal habitat in grasslands for the Alameda whipsnake. Improved grazing practices can also reduce fuel loads, minimizing the chances of catastrophic wildfires, which are a threat to Alameda whipsnake habitat. The long-term effects of construction and continuing maintenance projects on the Alameda whipsnake and its habitat are likely to be negligible, neutral, or beneficial.

Restoration projects that involve sediment and vegetation removal would affect aquatic and upland habitat for this species. In additional, all restoration projects are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). The Alameda whipsnake would directly benefit from District project work involving the construction, maintenance and restoration of stock ponds and spring boxes, which provide foraging habitat, may be used for thermoregulation, and the enhancement of stream reach conditions and riparian habitat within areas that the species' may utilize. The proposed District spring boxes and pond construction projects will improve livestock water systems and grazing distribution which can enhance grassland habitat conditions for this species in over and underutilized areas allowing for reduced barriers to movement through grasslands. Proposed restoration or creation of riparian habitat along stream reaches would enhance or restore important dispersal and foraging habitat for this species. In summary, the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 8. Acreage of Anticipated Routine Maintenance Projects (5 years) to Alameda Whipsnake Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.367	0.000	0.367
Upgrade Culvert	0.734	0.734	1.468
Install New Culvert	0.220	0.248	0.469
Clearing Culvert	0.877	0.000	0.877
Culvert Head-Tailwalls	0.061	0.061	0.122
Install Energy Dissipaters	0.082	0.082	0.163
Installation of New Armored Fords	0.110	0.110	0.220
Maintenance of Existing Armored Fords	0.041	0.000	0.041
Maintenance and Installation of Bridges	0.041	0.000	0.041
Bank Stabilization	1.468	1.468	2.936
Springbox Maintenance and Installation	0.033	0.204	0.237
Maintenance Dredging of Waterbodies	1.223	0.000	1.223
Maintenance Shoreline Facilities	0.163	0.163	0.326
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**5.419**	**3.070**	**8.489**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for Alameda whipsnake includes chaparral, montane hardwood, and riparian woodlands within parks listed in Table 1.

Alameda Whipsnake Critical Habitat

The proposed project is located throughout the entire designated Alameda whipsnake critical habitat. The Service anticipates that the activities associated with the proposed activities could negatively affect some of the PCEs of Alameda whipsnake critical habitat within the action area temporarily. However, the proposed project will not affect significant amounts of any scrub/shrub communities or rocky features, two primary constituent elements (PCE 1; PCE 3) for Alameda whipsnake, or oak woodland and grassland habitat (PCE 2). Most of the proposed projects are located in riparian areas and along creeks and not in core scrub habitat. Thus, these activities will only result in minor effects to critical habitat and these activities (implemented with the conservation measures) and will not prevent critical habitat from providing essential conservation values for the Alameda whipsnake permanently. Most activities will be maintenance to existing facilities, are small in scale, and are not likely to diminish the quality of the PCEs in critical habitat, in general. All restoration projects and adaptive management conservation measures proposed would result in either beneficial effects to critical habitat or no effect. The effects of the project on Primary Constituent Elements (PCEs) for Alameda whipsnake will be minor based on the small project areas annually, the temporary nature of most project effects, and the implementation of the proposed Conservation Measures. The temporary disturbance of such small areas annually that provide PCE 1, PCE 2, and PCE 3 for Alameda whipsnake is not expected to appreciably diminish the value or function of the Alameda

whipsnake's designated critical habitat. Because the PCE's will remain intact and the District will manage and restore whipsnake habitat within its parks, the units will continue to contribute to the high conservation value of the units as a whole, and to sustain the units' role in the conservation and recovery of the species.

California Tiger Salamander, California Red-legged Frog, and Foothill Yellow-legged Frog

Direct effects on California tiger salamanders, California red-legged frogs, and foothill yellow-legged frogs as a result of the proposed project would include injury or mortality from being crushed during construction work as described above. Avoidance and minimization measures will be utilized to reduce potential adverse effects to the California red-legged frog, foothill yellow-legged frog and California tiger salamander. These measures include use of work windows to avoid times when ponds may have red-legged frog or yellow-legged frog tadpoles and California tiger salamander larvae; use of biological monitors; avoidance of areas with high numbers of small mammal burrows; pre-construction surveys; environmental awareness training; covering all holes and trenches deeper than 12 inches at the end of each day; and use of BMPs to reduce soil erosion into streams. In addition, all handling of California red-legged frogs, foothill yellow-legged frogs, or California tiger salamanders will be by a Service-approved biologist (CM5, CM9, CM10, CM11, CM12, CM14, CM21, CM22).

Work activities, including noise and vibration, may cause California tiger salamanders, California red-legged frogs, and foothill yellow-legged frogs to leave the work area. This disturbance may increase the potential for individual frogs to become victims of predation and/or desiccation. Minimizing the area disturbed by District activities will reduce the potential for fleeing as a result of the action (CM3). California tiger salamanders, California red-legged frogs, and foothill yellow-legged frogs are more likely to disperse overland in mesic conditions. Because all ground-disturbing maintenance activities occurring in the channel would take place during the dry season, these impacts are less likely (CM9, CM21a, CM22a). Temporary dewatering of creeks, ponds, or wetlands may harm or kill California red-legged frog, foothill yellow-legged frog, and California tiger salamander adults, larvae and eggs if they are not translocated to suitable habitat. Tadpoles or larvae may be injured or killed if entrained by pump or water diversion intakes (CM16). Screening pump intakes as proposed by the District will reduce the potential that tadpoles would be caught in the inflow.

The possible spread of chytrid fungus or other pathogens would be minimized by following the Declining Amphibian Populations Task Force's Fieldwork Code of Practice (CM 21d), in conjunction with the use of a Service-approved biologist, to reduce or prevent improper handling, containment, or transport of California tiger salamanders, California red-legged frogs, and foothill yellow-legged frogs. These measures have been included in the conservation measures for the California tiger salamander, California red-legged frog, and foothill yellow-legged frog described above.

Work in active streams or in floodplains could cause high levels of siltation downstream. This siltation could alter the quality of the habitat to the extent that use by individuals of the species is precluded. Implementing BMPs for erosion control and reducing the area to be disturbed to the minimum necessary through conservation measures (CM6, CM8d, Table 2) and BMP's from Section 404, 401, and Regional Water Quality permits should decrease the amount of sediment that is washed downstream as a result of District activities. Erosion control materials that use plastic or synthetic monofilament netting could entrap individuals. To prevent injury or mortality

from entrapment, these erosion control materials are prohibited from project sites and only acceptable materials with natural fibers will be used.

Any replacement of natural or armored banks that provide refugia for California tiger salamanders, California red-legged frogs, and foothill yellow-legged frogs with banks that provide no such refugia (e.g., concrete crib walls or sacked concrete) would result in permanent habitat loss for the California tiger salamander, California red-legged frog, and foothill yellow-legged frog. Bank stabilization activities include: installation of culvert head/tail walls, installation of energy dissipaters, installation of new armored fords, and bank stabilization. Based on the locations where bank stabilization activities have generally been required and the annual limits (Table 2) on these activities, the acreage of potential California tiger salamander, California red-legged frog, and foothill yellow-legged frog habitat that may be both temporarily and permanently impacted by bank stabilization work is estimated at 1.95 acres for California tiger salamander, approximately 2.54 acres for California red-legged frog, and 0.65 acres for foothill yellow-legged frog for the five-year time period covered by the biological opinion (Table 9, Table 10, and Table 11). The loss of habitat will decrease survivorship of individuals by reducing the availability of cover, dispersal, and foraging habitat near aquatic habitats.

Sediment removal activities (e.g., sediment removal in silt basins, ponds, and lakes; access road construction; road maintenance; and staging area construction) may result in the removal of instream or inbasin emergent vegetation, rocky substrate, and riparian vegetation along the channel banks, resulting in the loss of up to instream habitat and associated streamside habitat for California red-legged frogs and foothill yellow-legged frogs (i.e., the emergent vegetation, submerged roots, or rocky substrate to which eggs are attached). The actual acreage cannot be determined at this time, but sediment removal in lakes, basins, and ponds, would remove up to 1.06 acres of potential egg-laying and cover habitat for California red-legged frogs and 0.270 acre of habitat for foothill yellow-legged frogs (Table 9 and Table 10). Sediment removal could also benefit California red-legged frogs by providing a longer inundation period for frog's life history stages or may create breeding habitat in areas where pond inundation was inadequate. Sediment removal activities may result in impacts to upland habitat potentially used by the California tiger salamander. Loss of subterranean habitat for California tiger salamanders and California red-legged frogs may occur from grading of access roads or staging area construction. Removal of burrows that California tiger salamanders and California red-legged frogs use as refugia could result in increased mortality due to predation or desiccation but the area affected in these parks should be a small proportion of the area and new burrows will continue to be excavated from the surrounding population. Construction-related disturbance to frog foraging areas or rodent burrows will be avoided or minimized (CM3, CM23d).

Effects of District routine maintenance activities on California tiger salamander, California red-legged frog, and foothill yellow-legged frog distributional range, and on these species as a whole, will be relatively low proportionally. Approximately 5.7 acres (0.007 percent) of the 77,552 acres of distributional range in the District for the California tiger salamander, approximately 7.4 acres (0.012 percent) of the 59,539 acres of distributional range in the District for California red-legged frog, and approximately 1.874 acres (0.009 percent) of the 20,303 acres of distributional range in the District for foothill-yellow legged frog would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all area in the range is habitat and the range acres depicted here may not be suitable habitat-see Table 1), the proportion affected would still be a small percentage, and

should affect salamander and frog populations negligibly. Additionally, most of the proposed activities involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer) and habitat in these areas is already disturbed and marginal and would not likely be used by listed species. Therefore, the number of individuals and the effects of habitat disturbance to their populations that will be adversely affected by District routine maintenance are expected to be low.

Restoration projects will involve sediment and vegetation removal that would affect aquatic and upland habitat for these species. In addition, although approximately 43.75 acres of distributional range in the District for the California tiger salamander and California red-legged frog may be affected by restoration activities in the five-year period, all restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Herbicides that may be used to remove vegetation could have sublethal or lethal effects to these amphibians if runoff occurs into aquatic features or they used at the wrong time or at a dosage harmful to these animals. The application of CM7 that requires that herbicides are applied according to label instructions will minimize these temporary potential adverse effects to individuals. Additionally, all herbicide applications will be reviewed and will require approval by the Service prior to implementation as approval is required for all restoration projects and adaptive management conservation measures. The California red-legged frog, foothill yellow-legged frog, and California tiger salamander directly benefit from District project work involving the construction, maintenance and restoration of stock ponds and spring boxes, which provide breeding habitat, and the enhancement of stream reach conditions and riparian habitat within areas that the species' may utilize. The proposed District spring box and pond construction projects will improve livestock water systems and grazing distribution which can enhance aquatic, grasslands, and upland habitat conditions for these species in over- and under-utilized areas. In summary, the routine maintenance projects that will generally enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of these species.

Table 9. Acreage of Anticipated Routine Maintenance Projects (5 years) to California Red-legged Frog Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.318	0.000	0.318
Upgrade Culvert	0.636	0.636	1.272
Install New Culvert	0.191	0.215	0.406
Clearing Culvert	0.760	0.000	0.76
Culvert Head-Tailwalls	0.053	0.053	0.106
Install Energy Dissipaters	0.071	0.071	0.142
Installation of New Armored Fords	0.095	0.095	0.190
Maintenance of Existing Armored Fords	0.035	0.000	0.035
Maintenance and Installation of Bridges	0.035	0.000	0.035
Bank Stabilization	1.272	1.272	2.544

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.318	0.000	0.318
Springbox Maintenance and Installation	0.028	0.177	0.205
Maintenance Dredging of Waterbodies	1.060	0.00	1.060
Maintenance Shoreline Facilities	0.141	0.141	0.282
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Subtotal	**4.697**	**2.661**	**7.358**
Restoration	35.000	8.750	43.750
Total	**39.697**	**11.411**	**51.108**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for California red-legged frog includes lentic and lotic waterbodies, springs, and floodplains within parks listed in Table 1.

Table 10. Acreage of Anticipated Routine Maintenance Projects (5 years) to Foothill Yellow-legged Frog Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.081	0.000	0.081
Upgrade Culvert	0.162	0.162	0.324
Install New Culvert	0.049	0.055	0.104
Clearing Culvert	0.194	0.000	0.194
Culvert Head-Tailwalls	0.014	0.014	0.027
Install Energy Dissipaters	0.018	0.018	0.036
Installation of New Armored Fords	0.024	0.024	0.049
Maintenance of Existing Armored Fords	0.009	0.000	0.009
Maintenance and Installation of Bridges	0.009	0.000	0.009
Bank Stabilization	0.324	0.324	0.648
Springbox Maintenance and Installation	0.007	0.045	0.052
Maintenance Dredging of Waterbodies	0.270	0.000	0.270
Maintenance Shoreline Facilities	0.036	0.036	0.072
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**1.196**	**0.678**	**1.874**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for Foothill yellow-legged frog includes lentic and lotic waterbodies, springs, and riparian woodland within parks listed in Table 1.

Table 11. Acreage of Anticipated Routine Maintenance Projects (5 years) to California tiger salamander Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.244	0.000	0.244
Upgrade Culvert	0.488	0.488	0.976
Install New Culvert	0.147	0.165	0.312
Clearing Culvert	0.583	0.000	0.583
Culvert Head-Tailwalls	0.041	0.041	0.082
Install Energy Dissipaters	0.054	0.054	0.108
Installation of New Armored Fords	0.073	0.073	0.146
Maintenance of Existing Armored Fords	0.027	0.000	0.027
Maintenance and Installation of Bridges	0.027	0.000	0.027
Bank Stabilization	0.977	0.977	1.954
Springbox Maintenance and Installation	0.021	0.136	0.157
Maintenance Dredging of Waterbodies	0.814	0.000	0.814
Maintenance Shoreline Facilities	0.108	0.109	0.217
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Subtotal	**3.606**	**2.043**	**5.649**
Restoration	35.000	8.750	43.750
Total	**38.606**	**10.793**	**49.399**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for California tiger salamander includes lentic vernal pools, grasslands, and oak savannahs within parks listed in Table 1.

California Red-legged Frog Critical Habitat

The action area is located within California red-legged frog critical habitat units which contain PCEs as defined in the designation: PCE 1 (aquatic breeding habitat), PCE 2 (aquatic non-breeding habitat), PCE 3 (upland habitat) and PCE 4 (dispersal habitat). The Service anticipates that the activities associated with the proposed maintenance and restoration projects could negatively affect some of the PCEs of California red-legged frog critical habitat within the action area. However, these activities will only result in minor effects to habitat (only temporary effects for restoration projects) and these activities (implemented with the conservation measures) will not prevent critical habitat from providing essential conservation values for the California red-legged frog. The action area contains aquatic habitat for breeding activities (PCE 1 and 2) in the form of ponds and creeks. This breeding habitat could be affected by construction activities through erosion from project activities. However, conservation measures to prevent erosion from construction activities would prevent this and no direct effects to breeding or non-breeding aquatic habitat would occur as a result of this project during the breeding season. Most of these activities will only result in minor effects to aquatic breeding and non-breeding habitat and minimal effects to upland and dispersal habitat. In addition, these construction activities are mostly maintenance of existing sites, small in scale, and not likely to diminish the quality of

PCEs. While disturbance within critical habitat may prevent some California red-legged frogs from using portions of the critical habitat for essential life functions temporarily, they will still be able to complete their essential ecological and biological functions in the remaining areas of critical habitat. All restoration projects and adaptive management conservation measures proposed would result in either permanent beneficial effects to critical habitat or no effect. The effects of the project on these Primary Constituent Elements for California red-legged frog will be minor based on the small project footprints, the temporary nature of most of the project effects on aquatic and terrestrial habitats, the beneficial effects of restoration activities on ponds and creeks, and the implementation of the proposed Conservation Measures to avoid and minimize adverse effects during construction. Because the PCE's will remain intact and the District will manage and restore California red-legged frog habitat within its parks, the sites will continue to contribute to the high conservation value of the units as a whole, and to sustain the units' role in the conservation and recovery of the species. Because the Primary Constituent Elements at these sites will remain intact and these sites will continue to contribute to the high conservation value of the critical habitat unit as a whole and be enhanced by these projects.

Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, and Vernal Pool Tadpole Shrimp

Ground-disturbing activities have the potential to result in direct mortality, life cycle disturbance, and reduced habitat quality for the longhorn vernal pool fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp. These mortality-related effects will be minimized through implementation of CM24, which requires work within 250 feet of vernal pool branchiopod habitat to be avoided to the maximum extent possible and, if it does occur, to happen only in the dry season and to have no permanent adverse effects to hydrology of the pools or the pool complex. Although work at locations with vernal pool crustaceans would occur during the dry season when adults would not be present, excavation and soil disturbance associated with sediment and vegetation removal activities could destroy cysts potentially occurring in soil in affected areas, if work occurs directly in pools. According to the District, no work is currently planned to occur within known pools of listed brachiopods (pers. comm. Steve Bobzien, May 11, 2017). However, new occurrences may be found in the future in seasonal ponds or wetlands and may require maintenance and could be temporarily affected by sediment or vegetation removal activities.

Additionally, indirect effects could occur to shrimp cysts that are buried by soil moved into vernal pools, swales, or other habitat during ground-disturbing activities from wind activities; additional soil could also decrease the inundation period and water quality of the pools. CM24 minimizes the risk of effects to pools from nearby activities by avoiding, to the maximum extent possible, work within 250 feet of the pools. The majority of known longhorn vernal pool fairy shrimp occurrences in the northern portion of their range occurs in rock-out crops and several of the occupied pools on District property and are within 250 of existing roads or trails which need to be maintained. Sedimentation into these pools from current and past road maintenance activities, according to the District, is not currently affecting the rock outcrops any pools with listed shrimp populations within them (Steve Bobzien pers. com. 2017- comments on the proposed project description); proposed maintenance activities should have the same effects and would not affect these pools.

Upland habitat and swales around a vernal pool and within a vernal pool complex are essential to the hydrological and biological integrity of the vernal pool and complex. Vernal pool habitat

indirectly affected would include all habitat supported by upland areas and all habitat otherwise damaged by effects to the watershed, introduced species, human intrusion, or pollution caused by a project. Where the reach of these indirect effects cannot be determined definitively, the Service considers all areas within 250 feet of a vernal pool to be indirectly affected. If any habitat within a vernal pool complex is impacted, then all remaining habitat within the complex is considered indirectly affected. Examples of potential indirect effects from proposed activities include possible disruption of hydrological integrity within a vernal pool, sandstone outcropping, or other suitable habitat within the associated upland habitat, or within the vernal pool complex. The known locations of all occurrences of listed vernal pool shrimp species on District lands are in rock pools or sandstone outcroppings; thus, ground disturbing work within 250 feet of rock habitat should not directly affect the hydrology of pools. If new pools are found that are not protected within rock or sandstone outcroppings, the hydrology in these pools could be negatively affected by any ground disturbing activities with a 250-foot radius. If work occurs within 250 feet of known habitat for listed brachiopods, the District will design work to avoid any permanent adverse effects to hydrology and consult with the Service to develop site specific measures to reduce adverse effects to hydrology; the District (CM24e); if adverse effects cannot be avoided, the District will contact the Corps to initiate a separate consultation. This conservation measure is intended to avoid the effect on the species' habitat of the proposed activities' anticipated incidental take, resulting from the permanent loss or modification of habitat from adverse hydrological changes.

Water and habitat quality could be reduced by a variety of indirect effects associated with proposed activities. Potential indirect effects to vernal pool habitat, however, could result from dust generated during covered activities and subsequently deposited within vernal pools adjacent to work sites. Sedimentation into pools could reduce inundation periods, reduce water quality, or bury adults or cysts. To reduce effects from airborne sedimentation, CM24c will require implementation of measures to control dust and prevent transport of soil from exposed soil to the shrimp habitat. Proposed activities have the potential to spread invasive weeds that could reduce habitat quality within vernal pools or their associated uplands. Implementation of the Conservation measures to reduce sedimentation effects (CM24a, CM24c, CM6, BMPs in Table 2) and reduce invasive weed transferal (CM7) will reduce the potential for these effects to these species.

Only a small number of potentially occupied pools with longhorn vernal pool fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp will be adversely affected. Approximately 0.26 acres (0.009 percent) of the 2,862 acres of the distributional range in the District for the longhorn vernal pool fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp would be affected by activities in the five-year period. This is likely an overestimation of the proportion of habitat affected (because not all area in the range is habitat and the range acres depicted here may not be suitable habitat- see Table 1). The proportion of habitat affected would still be a small percentage and should affect these listed vernal pool shrimp populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the effects of habitat disturbance to pools and their populations that will be impacted by District routine maintenance are expected to be low (Table 12). The long-term effects of proposed restoration projects in vernal pools and seasonal wetlands will be beneficial for shrimp habitat as the activities will enhance or create

habitat; it is not anticipated that restoration projects will have permanent adverse effects to listed species habitat as required by CM18.

Proposed restoration projects that may be beneficial for the listed brachiopods may be the creation or restoration of seasonal waterbodies and the implementation of invasive plant removal. Some lentic waterbodies proposed for restoration or creation will be designed to be seasonal and could provide habitat for these listed brachiopods. Herbicides that may be used to remove vegetation could have sublethal or lethal effects to these species if runoff occurs into aquatic features. The application of CM7 that requires that herbicides are applied according to label instructions will minimize these temporary potential adverse effects to individuals. Additionally, all herbicide applications will be reviewed and will require approval by the Service prior to implementation as approval is required for all restoration projects and adaptive management conservation measures. The proposed District spring box and pond construction projects will improve livestock water systems and grazing distribution which can enhance aquatic habitat, grasslands, and upland habitat conditions for these species in over-utilized areas by allowing more growth of vegetation in seasonal wetlands which provide debris and detritus forage for these brachiopods.

In summary, the routine maintenance projects will generally enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 12. Acreage of Anticipated Routine Maintenance Projects (5 years) to Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, and Vernal Pool Tadpole Shrimp Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.012	0.000	0.018
Upgrade Culvert	0.024	0.024	0.047
Install New Culvert	0.007	0.008	0.015
Clearing Culvert	0.028	0.000	0.028
Culvert Head-Tailwalls	0.002	0.002	0.004
Install Energy Dissipaters	0.003	0.003	0.005
Installation of New Armored Fords	0.004	0.004	0.007
Maintenance of Existing Armored Fords	0.001	0.000	0.001
Maintenance and Installation of Bridges	0.001	0.000	0.001
Bank Stabilization	0.047	0.047	0.094
Springbox Maintenance and Installation	0.001	0.007	0.008
Maintenance Dredging of Waterbodies	0.039	0.000	0.039
Maintenance Shoreline Facilities	0.000	0.000	0.000
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Total	**0.1679**	**0.0929**	**0.2608**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for vernal pool fairy shrimp and longhorn fairy shrimp include rock outcrop depressions and vernal pools within parks listed in Table 1. Land cover types used in the analysis for vernal pool tadpole shrimp include vernal pools and seasonal ponds within parks listed in Table 1.

Longhorn Fairy Shrimp and Vernal Pool Fairy Shrimp Critical Habitat

The Service anticipates that the activities associated with the proposed project would not negatively affect PCEs 1 (vernal pool complexes), PCE 2 (vernal pools holding water for 18 days), PCE3 (adequate food sources in pools) and PCE 4 (structure within pools) of known occupied longhorn fairy shrimp and vernal pool fairy shrimp critical habitat within the action area due the expected location of projects and implementation of conservation measures. Construction activities are not anticipated to directly affect known locations in rock outcrops in which all known populations of these species exist in the action area. However, currently unknown features outside of rock pools could be affected by project activities. If these features are present at project sites, activities implemented with the conservation measures will only result in minor effects to habitat (see previous analysis for species above) and will not prevent critical habitat from providing essential conservation values for the longhorn fairy shrimp and vernal pool fairy shrimp. As per Conservation Measures 24e, if work occurs within 250 feet of known habitat for listed brachiopods, the District will design work to avoid any permanent adverse effects to hydrology and consult with the Service to develop site specific measures to eliminate permanent adverse effects to hydrology; if adverse effects cannot be avoided, the District will contact the Corps to initiate a separate consultation. The effects of the project on these Primary Constituent Elements for longhorn fairy shrimp and vernal pool fairy shrimp will be minor. Because the Primary Constituent Elements at these sites will remain intact, the District will continue to manage and restore vernal pool species habitat for these species, and these sites will continue to contribute to the high conservation value of the critical habitat unit as a whole and be enhanced by these projects.

San Joaquin Kit Fox

While this species is rare in Alameda and Contra Costa Counties, San Joaquin kit fox adults and pups, if they are present, could be adversely affected by some proposed activities through site access or road maintenance; construction in open, upland habitat areas during project activities may have adverse effects to kit fox adults or pups by burying them in their diurnal burrows. Construction-related noise and vibration could indirectly affect individuals as described above as effects common to all species. Disturbance to denning areas will be avoided by measures that require preconstruction surveys for dens, seasonal limitations, and/or buffer zones around occupied dens (CM23).

Most activities will occur in or near waterbodies with some in the middle of open areas. In these areas, ground disturbance and vegetation removal associated with road maintenance, pond construction, staging areas, and site access could remove foraging, cover, or denning habitat; in these instances, most habitat removal or disturbance would be temporary and most of these areas only provide marginal habitat because of previous disturbance from routine maintenance

activities. Construction-related disturbance to foraging areas of rodent burrows will be avoided or minimized (CM3, CM23d).

Effects of District routine maintenance activities on San Joaquin kit fox populations, and on this species as a whole, will be relatively low proportionally – only 1.11 acres (0.009 percent) of 11,736 acres of potential habitat in the District for the San Joaquin kit fox would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all of this area is considered habitat - see Table 1), the proportion of habitat affected would be a small percentage, and would affect kit fox populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance to its populations that will be affected by District routine maintenance are expected to be low (Table 13). District spring and pond construction and maintenance projects will improve livestock water systems and grazing distribution. Managed grazing and proper distribution of livestock can enhance grassland habitat conditions for the species, resulting in reduced weed species and improved foraging habitat in grasslands for the San Joaquin kit fox by rodent populations. The long-term effects of construction and continuing maintenance projects on the San Joaquin kit fox and its habitat are likely to be negligible, neutral, or beneficial.

All proposed restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). It is unlikely that proposed restoration projects in lentic, lotic, or tidal areas would directly benefit the San Joaquin kit fox. The kit fox would indirectly benefit from District project work involving the construction, maintenance and restoration of stock ponds and spring boxes and the enhancement of stream reach conditions and riparian habitat that prey species may utilize. The proposed District spring boxes and pond construction projects will also improve livestock water systems and grazing distribution which can enhance aquatic, grasslands, and upland habitat conditions for prey species in over-utilized areas. It would also improve foraging opportunities and decrease predation on individuals by keep grasslands open and short and increasing visual ability of individuals. The proposed restoration or creation of riparian habitat along stream reaches would enhance or restore prey habitat. In summary, the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 13. Acreage of Anticipated Routine Maintenance Projects (5 years) to San Joaquin Kit Fox Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.048	0.000	0.048
Upgrade Culvert	0.096	0.096	0.193
Install New Culvert	0.029	0.033	0.062
Clearing Culvert	0.115	0.000	0.115
Culvert Head-Tailwalls	0.008	0.008	0.016
Install Energy Dissipaters	0.011	0.011	0.021
Installation of New Armored Fords	0.014	0.014	0.029

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Maintenance of Existing Armored Fords	0.005	0.000	0.005
Maintenance and Installation of Bridges	0.005	0.000	0.005
Bank Stabilization	0.192	0.192	0.385
Springbox Maintenance and Installation	0.004	0.027	0.031
Maintenance Dredging of Waterbodies	0.160	0	0.160
Maintenance Shoreline Facilities	0.021	0.021	0.043
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.711**	**0.403**	**1.113**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for San Joaquin kit fox include grasslands and oak savannahs within parks listed in Table 1.

Pallid Manzanita

Adverse effects of pallid manzanita plants could occur as a result of construction and routine maintenance activities – mainly from road maintenance or culvert replacement adjacent to known populations or future new occurrences. The use of heavy construction equipment in transitional ecotone upland habitat areas may adversely affect plants by hitting, removing, or crushing them. Known occupied areas are not expected to be affected, but new occurrences or expansion of known areas may occur in the future and plants and those currently unknown areas may be impacted. Mapping and flagging the location of known populations (CM32a), preconstruction surveys (CM12), using only hand removal near manzanita populations (CM32b), and educational training (CM32d) will help to avoid and minimize these direct adverse effects to pallid manzanita plants.

A non-native pathogen that infects and kills pallid manzanita plants, *Phytophthora cinnamomi*, could decimate populations by being brought in on vehicles. A wash station for all vehicles and equipment will be required and should minimize potential transmission of *Phytopthora* (CM32c).

Effects of District routine maintenance activities on pallid manzanita populations, and on this species as a whole, will be relatively low proportionally (if at all) – only 0.490 acres (0.009 percent) of the 5,356 acres of the distributional range in the District for the pallid manzanita that would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all the distributional range is habitat - see Table 1), the proportion of habitat affected would still be a small percentage, and would affect pallid manzanita populations negligibly because of the conservation measures described above and because most projects are not likely to affect individual manzanita plants. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance to their populations that will be affected by District routine maintenance are expected to be low (Table 14).

All proposed restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Herbicides that may be used to remove vegetation in adaptive management conservation measures could have sublethal or lethal effects to this species if runoff occurs into occupied habitat. The application of CM7 that requires that herbicides are applied according to label instructions will minimize these temporary potential adverse effects to individuals. Additionally, all herbicide applications will be reviewed and will require approval by the Service prior to implementation as approval is required for all restoration projects and adaptive management conservation measures. No restoration projects covered under this biological opinion are likely to occur in pallid manzanita habitat. It is also unlikely that proposed restoration projects in lentic, lotic, or tidal areas would directly benefit pallid manzanita. The District has developed a Service-approved long-term adaptive management plan for all pallid manzanita populations that occur on District lands (nearly 75 percent of the total range-wide population of the pallid manzanita) which will contribute to the recovery of the pallid manzanita (Service File No. 81420-2010-F0849-3). Long-term management for the health of listed species populations and their habitats is part of the District's mission and will continue to provide essential conservation for this species and its populations despite some temporary and permanent effects from these routine maintenance and restoration projects.

Table 14. Acreage of Anticipated Routine Maintenance Projects (5 years) to Pallid Manzanita Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.022	0.000	0.022
Upgrade Culvert	0.044	0.044	0.088
Install New Culvert	0.013	0.015	0.028
Clearing Culvert	0.053	0.000	0.053
Culvert Head-Tailwalls	0.004	0.004	0.008
Install Energy Dissipaters	0.005	0.005	0.010
Installation of New Armored Fords	0.007	0.007	0.010
Maintenance of Existing Armored Fords	0.002	0.000	0.002
Maintenance and Installation of Bridges	0.002	0.000	0.002
Bank Stabilization	0.088	0.088	0.176
Springbox Maintenance and Installation	0.002	0.012	0.014
Maintenance Dredging of Waterbodies	0.073	0.000	0.073
Maintenance Shoreline Facilities	0.000	0.000	0.000
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.315**	**0.175**	**0.490**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for San Joaquin kit fox include chaparral and montane hardwood within parks listed in Table 1.

Giant Garter Snake

Giant garter snakes likely inhabit aquatic habitats at only a handful of District parks in and along the Delta (see environmental baseline description). Marshes, sloughs, drainage canals, irrigation ditches and other managed wetlands that are periodically flooded in and around these parks can be used by garter snake during their active period in the spring and summer. The adjacent terrestrial habitat is used by garter snakes more than half the time during the summer and all the time during their fall/winter brumation period; garter snakes are found in their terrestrial habitats or underground, mainly within 30 feet of water (Halstead et al. 2015b). Ground disturbance work, vegetation removal, or in water work within and adjacent to these areas could adversely affect giant garter snakes from routine maintenance activities. The noise and vibration associated with construction work and continuing maintenance activities may affect this species at the project site and adversely alter behavior as described above for effects common to all species. The indirect effects of District projects may also result in adverse effects to giant garter snake. Giant garter snakes that move or are translocated away from a construction area may move away from shelter and be more susceptible to injury and mortality from predation and vehicular or foot traffic.

Displaced snakes may experience increased competition from animals in adjacent areas. The implementation of an approved relocation plan (CM14) and the requirement of a Service-approved biologist for relocation (CM11, CM14) should minimize any adverse effects from relocation because snakes should be places in environments that will ensure their survival and safety.

Avoidance and minimization measures will be utilized to reduce potential adverse effects to individual giant garter snakes. These measures include: the use of work windows during the active summer season to avoid times giant garter snake are primarily underground (CM30); the use of biological monitors (CM11); avoidance of areas with high numbers of small mammal burrows (CM3); pre-construction surveys (CM12); environmental awareness training (CM10); covering all holes and trenches deeper than 12 inches at the end of each day (CM12); removal of vegetation by hand in known or potential giant garter snake habitat to prevent mortality by mowers and other equipment (CM30); and all handling of giant garter snake will be by a Service-approved biologist (CM11, CM14).

Temporary dewatering of creeks, ponds, or wetlands may harm or kill giant garter snakes adults or young if they are not translocated to suitable habitat. Measures to avoid disruption of aquatic life, avoiding use of heavy mechanical equipment in waterbodies, avoiding disturbance of water flow, and the isolation of cement pouring from waterbodies during dewatering will minimize any harm to giant garter snakes (CM16).

Erosion control materials that use plastic or synthetic monofilament netting could entrap smaller individuals. To prevent injury or mortality from entrapment, these erosion control materials are prohibited from project sites and only acceptable materials with natural fibers will be used (CM6).

Sediment removal activities (e.g., sediment removal in channels; access road construction; road maintenance; and staging area construction) may result in the removal of emergent vegetation and riparian vegetation along banks or in the channel or wetland, resulting in the loss of terrestrial habitat cover needed for basking, foraging, or shelter during the five-year time period.

Loss of subterranean habitat for giant garter snakes may occur from grading of access roads or staging area construction. Removal of burrows that these snakes could use as refugia could result in increased mortality due to predation but the area affected in these parks should be a small proportion of the area and new burrows will continue to be excavated from the surrounding population. Construction-related disturbance to rodent burrows will be avoided or minimized (CM3).

Restoration projects that will involve sediment and vegetation removal would affect aquatic and upland habitat for these species. However, all restoration projects are required to have permanent neutral or beneficial effects to all listed-species and so no permanent habitat degradation or removal would occur as a result of these activities (CM18).

Effects of District routine maintenance activities on giant garter snake, and on this species as a whole, will be relatively low proportionally– approximately 0.250 acres (0.010 percent) of the 2,637 acres of potential habitat in the District for the giant garter snake would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all of the action area is habitat - see Table 1), the proportion of habitat affected would still be a very small percentage and would affect giant garter snake populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance to its populations that will be impacted by District routine maintenance are expected to be low (Table 15). The long-term effects of proposed restoration projects in tidal emergent wetlands will be beneficial for giant garter snake as they will enhance or create habitat; no proposed restoration activities will have permanent adverse effects to giant garter snake habitat as required by CM18.

All proposed restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Tidal marsh restoration on District lands will provide suitable habitat commensurate with or better than habitat lost as a result of the proposed project. Proposed restoration of levees and tidal channel creation will help provide and enhance foraging and basking habitat. Long-term management for the health of listed species populations and their habitats is part of the District's mission and will continue to provide essential conservation for this species and its populations despite some temporary and permanent effects from these routine maintenance and restoration projects In summary, the routine maintenance projects will enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 15. Acreage of Anticipated Routine Maintenance Projects (5 years) to Giant Garter Snake Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.011	0.000	0.011
Upgrade Culvert	0.027	0.022	0.049
Install New Culvert	0.007	0.007	0.014

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Clearing Culvert	0.026	0.000	0.026
Culvert Head-Tailwalls	0.002	0.002	0.004
Install Energy Dissipaters	0.002	0.002	0.004
Installation of New Armored Fords	0.003	0.003	0.006
Maintenance of Existing Armored Fords	0.001	0.000	0.001
Maintenance and Installation of Bridges	0.001	0.000	0.001
Bank Stabilization	0.043	0.043	0.086
Springbox Maintenance and Installation	0.001	0.006	0.007
Maintenance Dredging of Waterbodies	0.036	0.000	0.036
Maintenance Shoreline Facilities	0.005	0.005	0.010
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.160**	**0.090**	**0.250**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for giant garter snake include riverine and freshwater emergent wetlands within parks listed in Table 1.

California Ridgway's Rail

California Ridgway's rails could be disturbed by human activity and movement of equipment as a result of bank stabilization, sediment removal (or reuse), manual vegetation management, management of animal conflicts, or minor maintenance. Disturbance such as loud noise or the presence and movement of people and heavy equipment in or near Ridgway's rail habitat may alter bird behavior in ways that result in adverse effects to individuals or reduced nesting success. Such disturbance could result in temporary habitat loss due to the following: California Ridgway's rail avoidance of areas that have suitable habitat but intolerable levels of disturbance; abandonment of nests, eggs, or young by nesting pairs; a reduction in foraging efficiency if high quality foraging areas are impacted; and increased movement or flushing from cover, or altered activity patterns, that reduce energy reserves and increase predation risk. Implementation of CM26, ensuring that all District activities immediately within 700 feet of vegetated tidal marsh will occur only during the non-breeding season, would likely prevent any disturbance of breeding rails.

Disturbance during the non-breeding season could also result in adverse effects to Ridgway's rails. Ridgway's rails could be forced to adjust the boundaries of their territories or to disperse to other habitat areas. Work in or adjacent to Ridgway's rail habitat during very high tides could cause flushing of rails from the edges of levees during maintenance/access activities. Ridgway's rails disturbed by work activities also could be subjected to predation if they increase their movements within their home range or disperse to other nearby or distant tidal wetlands.

Maintenance activities, such as repair or maintenance of tide gates (or other water control structures), levee stabilization, or culvert replacement could potentially occur nearer to saltmarsh habitat, but such activities will occur very infrequently (not annually). Implementation of CM26,

which indicates that all District activities immediately within 700 feet of vegetated tidal marsh will occur only during the non-breeding season, would likely prevent any disturbance of breeding rails.

Even with the implementation of conservation measures to minimize disturbance near Ridgway's rail nesting areas during the breeding season, birds that disperse away from disturbance may not successfully establish new breeding territories and successfully breed. Ridgway's rails forced to disperse would need to either maintain existing pair bonds or develop new pair bonds and establish new breeding territories in other suitable habitat areas. The ability of displaced Ridgway's rails to reestablish new breeding territories would be hampered by the fact that Ridgway's rails maintain year-round home ranges and defend established breeding territories from intrusions by other Ridgway's rails. Loss of any female Ridgway's rails would be compounded by the loss of potential future progeny.

To minimize effects to Ridgway's rails from an increase in raptor and corvid (eggs/young) predation through the installation of poles, fencing, or other structures related to recreational uses in tidal marsh habitat, CM25 requires installation of anti-perching devices in areas that are appropriate.

Within tidal salt or brackish marshes, any replacement of natural bank with hard armoring (e.g., concrete crib walls or sacked concrete) could result in the loss of breeding and/or foraging habitat for the California Ridgway's rail. Replacement of natural banks with armoring would preclude the re-establishment of vegetation that provides cover and foraging habitat. However, the extent of bank stabilization work that is expected to occur in California Ridgway's rail habitat will be very low, judging from proposed activities in Table 16. The District expects that no more than 0.269 acre of Ridgway's rail habitat, and likely much less, will be disturbed as a result of bank stabilization activities and no population level effects are expected.

Effects of District routine maintenance activities on California Ridgway's rail populations, and on this species as a whole, will be relatively low proportionally– only 0.732 acre (0.009 percent) of the 8,191 acres of potential habitat in the District for the California Ridgway's rail would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all of the action area is habitat - see Table 1), the proportion of habitat affected would still be a small percentage, and would affect Ridgway's rail populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance to its populations that will be impacted by District routine maintenance are expected to be low (Table 16). The long-term effects of proposed restoration projects in tidal emergent wetlands will be beneficial for California Ridgway's rail as the activities will enhance or create habitat; restoration projects will not have permanent adverse effects to California Ridgway's rail habitat as required by CM18.

All proposed restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Tidal marsh restoration on District lands will provide suitable habitat commensurate with or better than habitat lost as a result of the proposed project. Proposed restoration of levees and tidal channel creation will help provide and enhance foraging, breeding, and transitional habitat for California Ridgway's rail.

Long-term management for the health of listed species populations and their habitats is part of the District's mission and will continue to provide essential conservation for this species and its populations despite some temporary and permanent effects from these routine maintenance and restoration projects. In summary, the routine maintenance projects will enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 16. Acreage of Anticipated Routine Maintenance Projects (5 years) to California Ridgway's Rail Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.034	0.000	0.034
Upgrade Culvert	0.067	0.067	0.134
Install New Culvert	0.020	0.023	0.043
Clearing Culvert	0.080	0.000	0.080
Culvert Head-Tailwalls	0.006	0.006	0.011
Install Energy Dissipaters	0.008	0.008	0.015
Installation of New Armored Fords	0.000	0.000	0.000
Maintenance of Existing Armored Fords	0.000	0.000	0.000
Maintenance and Installation of Bridges	0.004	0.000	0.004
Bank Stabilization	0.134	0.134	0.269
Springbox Maintenance and Installation	0.000	0.000	0.000
Maintenance Dredging of Waterbodies	0.112	0.000	0.112
Maintenance Shoreline Facilities	0.015	0.015	0.030
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.479**	**0.252**	**0.732**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for California Ridgway's rail include saline-brackish emergent wetlands within parks listed in Table 1.

Salt Marsh Harvest Mouse

The use of heavy construction equipment in tidal marsh and adjacent transitional ecotone upland habitat areas may have adverse effects to salt marsh harvest mouse individuals by approaching, hitting, or crushing them while they seek cover. The noise and vibration associated with construction work and continuing maintenance activities may adversely affect this species and by disrupting normal behavioral patterns of breeding, foraging, sheltering, and dispersal as described above in the effects common to all species. Implementation of CM27 will avoid and minimize effects to salt marsh harvest mouse by avoiding pickleweed areas, where feasible, using non-mechanized hand tools in areas within 50 feet of pickleweed habitat in all areas except outboard wave exposed levees, mowing from the top to the bottom along levees to allow mice to

move downslope, and the presence of a Service-approved biologist during all ground disturbing activities and within 50 feet of pickleweed habitat during mowing.

To minimize adverse effects to salt marsh harvest mouse from an increase in raptor predation through the installation of poles, fencing, or other structures related to recreational uses in tidal marsh habitat, CM25 requires the installation of anti-perching devices in area that are appropriate.

Any replacement of natural bank with hardscape (e.g. concrete crib walls or sacked concrete) could result in the loss of breeding and foraging habitat for the salt marsh harvest mouse. Replacement of natural banks with armoring would preclude the re-establishment of vegetation that provides cover and foraging habitat. The extent of bank stabilization work that is expected to occur in salt marsh harvest mouse habitat will be low, according to the maximum proposed acreages shown in Table 17. The District expects that no more than 0.38 acre of salt marsh harvest mouse habitat, and likely much less, will be impacted as a result of 2024-2029 bank stabilization activities.

It is possible that sediment removal could be required. If sediment removal were necessary in salt marsh harvest mouse habitat, then given the time that would be required for sediment to build up and become colonized by vegetation adequate to support harvest mice (likely five years or more), this sediment removal would thus result in a long-term loss of habitat for this species.

Vegetation management activities such as mowing on levees could remove suitable harvest mouse habitat, including protective vegetation that provides cover in upland transitional areas during high tides. Some of this vegetation management, such as control of perennial pepperweed, is actually beneficial to the salt marsh harvest mouse because it inhibits the invasion of suitable habitat by non-native pepperweed. However, some vegetation management will remove suitable habitat for the mouse. Although the loss of habitat resulting from vegetation management would be temporary in any given area, the frequency with which most vegetation management in potential harvest mouse habitat will occur will preclude the recovery of high-quality habitat. Therefore, vegetation management may result in long-term adverse effects on salt marsh harvest mouse habitat; however most areas with proposed routing maintenance activities are likely poor quality or marginal habitat because of continuing maintenance activities.

Effects of District routine maintenance activities on salt marsh harvest mouse, and on this species as a whole, will be relatively low proportionally– only 1.038 acres (0.009 percent) of the 11,605 acres of potential habitat in the District for the salt marsh harvest mouse would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all of the action area is habitat - see Table 1), the proportion of habitat affected would still be a very small percentage and should affect salt marsh harvest mouse populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance to its populations that will be impacted by District routine maintenance are expected to be low (Table 17). The long-term effects of proposed restoration projects in tidal emergent wetlands will be beneficial for salt marsh harvest mouse as they will enhance or create habitat; no proposed restoration projects will have permanent adverse effects to salt marsh harvest mouse habitat as required by CM18.

All proposed restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Tidal marsh restoration on District lands will provide suitable habitat commensurate with or better than habitat lost as a result of the proposed project. Proposed restoration of levees and tidal channel creation will help provide and enhance foraging, breeding, and transitional habitat for Salt marsh harvest mouse. Long-term management for the health of listed species populations and their habitats is part of the District's mission and will continue to provide essential conservation for this species and its populations despite some temporary and permanent effects from these routine maintenance and restoration projects. In summary, the routine maintenance projects will enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 17. Acreage of Anticipated Routine Maintenance Projects (5 years) to Salt Marsh Harvest Mouse Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.048	0.000	0.048
Upgrade Culvert	0.095	0.095	0.191
Install New Culvert	0.029	0.032	0.061
Clearing Culvert	0.114	0.000	0.114
Culvert Head-Tailwalls	0.008	0.008	0.016
Install Energy Dissipaters	0.011	0.011	0.021
Installation of New Armored Fords	0.000	0.000	0.000
Maintenance of Existing Armored Fords	0.000	0.000	0.000
Maintenance and Installation of Bridges	0.005	0.000	0.005
Bank Stabilization	0.190	0.190	0.381
Springbox Maintenance and Installation	0.000	0.000	0.000
Maintenance Dredging of Waterbodies	0.159	0.000	0.159
Maintenance Shoreline Facilities	0.021	0.021	0.042
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.679**	**0.358**	**1.038**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for salt marsh harvest mouse include saline-brackish emergent wetlands within parks listed in Table 1.

California Least Tern

Most California least terns do not breed in or adjacent to the action area (except at Hayward Regional Shoreline), and so the parks within the action area are mainly important post-breeding staging areas. California least terns forage in late summer and early fall over the open waters of

the Bay and in saline managed ponds within and adjacent to the Bay; both adult and juvenile least terns roost on saline managed pond levees and boardwalks. Thus, the proposed activities mainly have potential to affect foraging habitats and/or individuals of this species if maintenance activities occur near occupied foraging habitat. For example, maintenance activities near foraging habitat could adversely affect least tern(s) through the alteration of foraging patterns by avoidance of activity areas due to increased noise and activity levels during maintenance activities. Direct mortality or injury of individuals is not likely or expected from proposed activities, but adverse effects could lead indirect injury or mortality through behavioral disruption of foraging activities. On Hayward Regional Shoreline, proposed activities could adversely affect nesting terns and could cause direct morality or injury as well as indirect adverse effects through noise and visual disturbance. Implementation of CM27 will avoid and minimize indirect and direct take of California least terns by limiting activities within 600 feet of known or potential nesting areas to the non-nesting season and suspending work if a bird with within 50 feet of a project site.

Dredging activities in open water near California least tern breeding areas would cause turbidity in the waters, making it harder for terns to forage; thus, dredging could decrease available foraging area near nesting colonies and adversely affect reproductive success by making adult forage farther away, using more energy to forage, and increasing their probability of predation. CM29c would minimize this effect by limiting activities to the non-nesting season in open water foraging habitat.

An increase in raptor or corvid (eggs/young) predation through the installation of poles, fencing, or other structures related to recreational uses on shoreline habitat at Hayward Regional Shoreline or other future nesting areas could adversely affect reproductive success of this population. Thus, long-term adverse effects will occur because of increased predation from the installation of structures in areas of tern nesting.

Sediment that is removed from other locations potentially could be deposited in areas close to least tern foraging and roosting areas (e.g., to provide upland transition zone habitat for future marsh restoration); in particular sediment could be deposited on levees used for roosting. However, sediment depositional work would not occur during the season that terns would be roosting or foraging in these areas (CM26). Additionally, some levee maintenance work would enhance roosting habitat for terns; sediment deposition sites will be selected to enhance marsh/island complexes for nesting or roosting California least terns (pers. com. Steve Bobzien, May 11, 2017)

Effects of District routine maintenance activities on California least terns, and on this species as a whole, will be relatively low proportionally– only 0.318 acre (0.01 percent) of the 2,188 acres of the distributional range in the District for the California least terns would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all of the action area is habitat - see Table 1), the proportion of habitat affected would still be a very small percentage and would affect tern populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance to its populations that will be impacted by District routine maintenance are expected to be low (Table 18). The long-term effects of proposed restoration projects in tidal emergent wetlands will

be beneficial for California least tern as they will enhance or create habitat; no proposed restoration projects or adaptive management conservation measures will have permanent adverse effects to California least tern habitat as required by CM18.

All proposed restoration projects are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Tidal marsh restoration on District lands will provide suitable habitat commensurate with or better than habitat lost as a result of the proposed project. Restoration to tidal habitats and species via proposed restoration projects is expected to benefit the least tern both by providing foraging habitat during high tides, in the short-term (until these marshes become well vegetated), and in the long-term by serving as nurseries for fish that provide prey for least terns. Long-term management for the health of listed species populations and their habitats is part of the District's mission and will continue to provide essential conservation for this species and its populations despite some temporary and permanent effects from these routine maintenance and restoration projects.

In summary, the routine maintenance projects will enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 18. Acreage of Anticipated Routine Maintenance Projects (5 years) to California Least Tern Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.009	0.000	0.009
Upgrade Culvert	0.018	0.0179	0.036
Install New Culvert	0.005	0.0061	0.011
Clearing Culvert	0.021	0.000	0.021
Culvert Head-Tailwalls	0.002	0.0015	0.004
Install Energy Dissipaters	0.002	0.002	0.004
Installation of New Armored Fords	0.000	0.000	0.000
Maintenance of Existing Armored Fords	0.000	0.000	0.000
Maintenance and Installation of Bridges	0.001	0.000	0.001
Bank Stabilization	0.036	0.036	0.072
Springbox Maintenance and Installation	0.000	0.000	0.000
Maintenance Dredging of Waterbodies	0.030	0.000	0.030
Maintenance Shoreline Facilities	0.126	0.004	0.130
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.250**	**0.067**	**0.318**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for California least tern include estuarine, open shoreline beaches, plains, and islands within parks listed in Table 1.

Western Snowy Plover

Western snowy plover forage and nest within parks within the action area (see species baseline above). This species can select breeding areas opportunistically, and it is possible that changes in habitat during the five-year period could result in use of new areas by breeding plovers. For example, if management of ponds adjacent to District activities changes so that these ponds become suitable for nesting, then plovers may nest in areas adjacent to District activities. Likewise, it is possible that activities such as vegetation management or sediment removal may need to occur in areas adjacent to western snowy plover nesting and foraging. Non-breeding individuals may occasionally forage in ponds or around islands near proposed activities. Conservation measures which entail pre-activity surveys for nesting birds (CM12) and maintenance of a buffers around actively nesting and foraging plovers (CM28) (limits work within 600 feet of potential nesting areas to the non-nesting season and suspends work within a 50-foot radius of the bird) are expected to avoid adverse effects to snowy plover eggs, young, or adults.

An increase in raptor or corvid (eggs/young) predation through the installation of poles, fencing, or other structures related to recreational uses on shoreline habitat at current or future nesting areas could adversely affect reproductive success of this population. Thus, long-term adverse effects could occur because of increased predation from the installation of structures in areas of western snowy plover nesting.

Effects of District routine maintenance activities on western snowy plover, and on this species as a whole, will be relatively low proportionally– only 0.328 acre (0.01 percent) of the 3,323 acres of potential habitat in the District for the western snowy plover would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all of the action area is habitat - see Table 1), the proportion of habitat affected would still be a very small percentage and would affect western snowy plover populations negligibly. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance to its populations that will be impacted by District routine maintenance are expected to be low (Table 19). The long-term effects of proposed restoration projects in tidal emergent wetlands will be beneficial for western snowy plover as they will enhance or create habitat; no proposed restoration projects will have permanent adverse effects to western snowy plover habitat as required by CM18.

All proposed restoration projects or adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Tidal marsh restoration on District lands will provide suitable habitat commensurate with or better than habitat lost as a result of the proposed project. Long-term management for the health of listed species populations and their habitats is part of the District’s mission and will continue to provide essential conservation for this species and its populations despite some temporary and permanent effects from these routine maintenance and restoration projects.

In summary, the routine maintenance projects will enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 19. Acreage of Anticipated Routine Maintenance Projects (5 years) to Western Snowy Plover Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.011	0.000	0.011
Upgrade Culvert	0.021	0.021	0.042
Install New Culvert	0.006	0.007	0.013
Clearing Culvert	0.025	0.000	0.025
Culvert Head-Tailwalls	0.002	0.002	0.004
Install Energy Dissipaters	0.002	0.002	0.004
Installation of New Armored Fords	0.000	0.000	0.000
Maintenance of Existing Armored Fords	0.000	0.000	0.000
Maintenance and Installation of Bridges	0.001	0.000	0.001
Bank Stabilization	0.042	0.042	0.084
Springbox Maintenance and Installation	0.000	0.000	0.000
Maintenance Dredging of Waterbodies	0.035	0.000	0.035
Maintenance Shoreline Facilities	0.104	0.005	0.114
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.250**	**0.079**	**0.328**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for western snowy plover include estuarine, open shoreline beaches, plains, and islands within parks listed in Table 1.

Western Snowy Plover Critical Habitat

The designated critical habitat for Western snowy plover is limited to a small geographical area within Hayward Regional Shoreline and the anticipated adverse effects of the routine maintenance activities on the primary constituent elements are minimal. The Service anticipates that the activities associated with the proposed project could negatively affect PCE 1 (Areas above high tide but below vegetated areas), PCE 2 (shoreline habitat areas for feeding, and PCE 3 (organic debris or driftwood), and PCE 4 (minimal disturbance) of western snowy plover critical habitat within the action area temporarily but most effects are likely to be neutral or beneficial because of the seasonal conservation measures associated with the project and the results of the proposed actions that will likely enhance or create habitat for this species. Specifically, the maintenance of the District shoreline levees, tide gate structures, and tidal regimes at Hayward Shoreline protects the interior basins and a complex of islands. One particular island contains all the physical and biological features identified in the primary

constituent elements and supports Western snowy plover nesting activity. The proposed activities will only result in minor effects to habitat and these activities (implemented with the conservation measures) will not prevent critical habitat from providing essential conservation values for the plover.

While temporary disturbance within critical habitat may prevent some snowy plover from using portions of the critical habitat for essential life functions whether temporarily or permanently (e.g., disturbance that cannot be restored to pre-project condition within more than two calendar years), they will still be able to complete their essential ecological and biological functions in the remaining areas of critical habitat. All restoration projects and adaptive management conservation measures proposed would result in either beneficial or negligible effects to critical habitat. Therefore, all critical habitat units will retain their PCEs and the PCEs within each critical habitat unit will still remain functional. Consequently, the designated critical habitat for the snowy plover will still be able to perform its intended functions and conservation role.

Delta Smelt and Longfin Smelt

Incidental take of delta smelt and longfin smelt could occur as a result of construction and project operations. The use of heavy construction equipment in open water, estuarine, and ecotone tidal marsh habitat areas may adversely affect smelt by approaching, injuring, or killing them while they seek cover. The noise and vibration associated with construction work and continuing maintenance activities may adversely affect these species at the project site. The indirect effects of District projects may also adversely affect delta smelt and longfin smelt. Delta smelt that move away from a construction area may be more susceptible to mortality from predation. The use of the work window will reduce these potential adverse effects.

Effects of District routine maintenance activities on delta smelt and longfin smelt, and on these species as a whole, will be relatively low proportionally– approximately 0.392 acre (0.009 percent) of the 4,394 acres of the potential habitat in the District for the delta smelt and approximately 2.842 ac (0.02 percent) of the 12,864 acres of the potential habitat in the District for the longfin smelt would be affected by activities in the five-year period. While this is an overestimation of the proportion of habitat affected (because not all of the action area in the range is habitat - see Table 1), the proportion of habitat affected would still be a very small percentage. Additionally, most of the proposed effects are temporary and involve ongoing maintenance of a type that has been performed along these roads and streams, and in these waterbodies, for decades (or longer). Therefore, the number of individuals and the effects of habitat disturbance impacted by District routine maintenance are expected to be low (Table 20 and Table 21).

All proposed restoration projects and adaptive management conservation measures are required to have permanent neutral or beneficial effects to all listed-species and so no significant habitat degradation would occur as a result of these activities (CM18). Herbicides that may be used to remove vegetation could have sublethal or lethal effects to this species if runoff occurs into aquatic features. The application of CM7 that requires that herbicides are applied according to label instructions will minimize these temporary potential adverse effects to individuals. Additionally, all herbicide applications will be reviewed and will require approval by the Service prior to implementation as approval is required for all restoration projects and adaptive management conservation measures. Tidal marsh restoration on District lands will provide suitable habitat commensurate with or better than habitat lost as a result of the proposed project.

Proposed restoration projects associated with levees and tidal channel creation will help provide and enhance shallow water habitat for delta smelt. Long-term management for the health of listed species populations and their habitats is part of the District's mission and will continue to provide essential conservation for this species and its populations despite some temporary and permanent effects from these routine maintenance and restoration projects.

In summary, the routine maintenance projects that enhance or protect habitat from the adverse effects to water quality from sedimentation and erosion while the combined beneficial effects of District preservation of habitat, adaptive management conservation measures, and restoration projects will create or enhance habitat and will contribute to the recovery of this species.

Table 20. Acreage of Anticipated Routine Maintenance Projects (5 years) to Delta Smelt Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.018	0.000	0.018
Upgrade Culvert	0.036	0.036	0.072
Install New Culvert	0.011	0.012	0.023
Clearing Culvert	0.043	0.000	0.043
Culvert Head-Tailwalls	0.003	0.003	0.006
Install Energy Dissipaters	0.004	0.004	0.008
Installation of New Armored Fords	0.000	0.000	0.000
Maintenance of Existing Armored Fords	0.000	0.000	0.000
Maintenance and Installation of Bridges	0.002	0.000	0.002
Bank Stabilization	0.072	0.072	0.144
Springbox Maintenance and Installation	0.000	0.000	0.000
Maintenance Dredging of Waterbodies	0.060	0.000	0.060
Maintenance Shoreline Facilities	0.008	0.008	0.016
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**0.257**	**0.135**	**0.392**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for delta smelt include estuarine habitat adjacent or within parks listed in Table 1.

Table 21. Acreage of Anticipated Routine Maintenance Projects (5 years) to Longfin Smelt Potential Range on District lands[1,2]

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Replacing Same Size Culvert	0.131	0.000	0.131
Upgrade Culvert	0.261	0.261	0.522
Install New Culvert	0.078	0.088	0.167
Clearing Culvert	0.312	0.000	0.312
Culvert Head-Tailwalls	0.022	0.022	0.044

Project Type	Maximum Temporary Effect (acres)	Maximum Permanent Effect (acres)	Maximum Total Effect
Install Energy Dissipaters	0.029	0.029	0.058
Installation of New Armored Fords	0.000	0.000	0.000
Maintenance of Existing Armored Fords	0.000	0.000	0.000
Maintenance and Installation of Bridges	0.015	0.000	0.015
Bank Stabilization	0.522	0.522	1.044
Springbox Maintenance and Installation	0.000	0.000	0.000
Maintenance Dredging of Waterbodies	0.435	0.000	0.435
Maintenance Shoreline Facilities	0.058	0.058	0.116
Removal of Hazardous Structures	0.000	0.000	0.000
Removal of Vessels	0.000	0.000	0.000
Total	**1.862**	**0.980**	**2.842**

[1]ECCCHPC lands were excluded for calculations
[2]Land cover types used in the analysis for longfin smelt include estuarine and open water habitat adjacent or within parks listed in Table 1.

Delta Smelt Critical Habitat

The Service anticipates that the activities associated with the proposed activities could negatively affect some of the PCEs (physical habitat (PCE 1), water (PCE 2), and river flow (PCE 3) essential for all life stages of delta smelt) of delta smelt critical habitat within the action area. Activities proposed by the District would not negatively affect water quality, flow, or larval/juvenile transport; thus PCEs 2 and 3 would not be affected. However, these activities will only result in minor effects to habitat and these activities (implemented with the conservation measures) will not prevent critical habitat from providing essential conservation values for the delta smelt. Most of the covered activities will only result in minor effects limited to narrow areas of District shoreline habitats. These activities are mostly maintenance of existing sites or facilities, small in scale, and no likely to diminish the quality of PCEs in a unit. While disturbance within critical habitat may prevent some delta smelt from using portions of the critical habitat for essential life functions whether temporarily or permanently (e.g., disturbance that cannot be restored to pre-project condition within more than two calendar years), they will still be able to complete their essential ecological and biological functions in the remaining areas of critical habitat. All restoration projects proposed would result in either beneficial effects to critical habitat or no effect. Therefore, all critical habitat units will retain their PCEs and the PCEs within each critical habitat unit will still remain functional. Consequently, the designated critical habitat for the delta smelt will still be able to perform its intended functions and conservation role.

Proposed Restoration Projects, Conservation Measures, and Adaptive Management Conservation Measures

As noted previously in the Description of the Proposed Action section and in the Effects of the Action section, the District has also proposed a set of conservation measures as a condition of the

action and proposed restoration projects. The proposed restoration projects and adaptive management conservation measures within lotic, lentic, and tidal waterbodies will remove and control non-native vegetation, improve water quality, reduce erosion and sedimentation, and restore or create natural stream, pond, and tidal marsh conditions. Habitat restoration projects will enhance or create habitat for the listed species discussed in this biological opinion while adaptive management conservation measures that restore habitat after maintenance activities. While these restoration projects and adaptive management conservation measures are not intended to minimize the effect on the species of the proposed project's anticipated incidental take, they will improve habitat for most of the listed species and will contribute to the recovery of these species by doing so. While not certain, it is likely that the sum of these improvements will be equal to or exceed the acreage of impacts from the proposed activities over the 5-year period of the biological opinion.

These actions will enhance already protected lands for the species in perpetuity and will provide suitable habitat for breeding, feeding, or sheltering likely commensurate with or better than habitat lost as a result of the proposed maintenance activities. Providing habitat restoration projects that enhance or create habitat and adaptive management conservation measures that reestablish habitat after proposed activities in an already relatively large, contiguous block of conserved land, such as the District, should help contribute to other recovery efforts for the species on District lands.

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 that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. During this consultation, the Service did not identify any future non-federal actions that are reasonably certain to occur in the action area of the proposed project.

Conclusion

After reviewing the current status of California Ridgway's rail, California least tern, salt marsh harvest mouse, San Joaquin kit fox, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Alameda whipsnake, California red-legged frog, California tiger salamander, delta smelt, foothill yellow-legged frog, giant garter snake, western snowy plover, pallid manzanita, and longfin smelt the environmental baseline for the action area, the effects of the proposed the District Routine Maintenance Activities, and the cumulative effects, it is the Service's biological opinion and conference opinion that the District Routine Maintenance Activities, as proposed, are not likely to jeopardize the continued existence of the California Ridgway's rail, California least tern, salt marsh harvest mouse, San Joaquin kit fox, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Alameda whipsnake, California red-legged frog, California tiger salamander, delta smelt, foothill yellow-legged frog, giant garter snake, western snowy plover, pallid manzanita, and longfin smelt. The Service reached this conclusion because the project-related effects to the species (Table 22), 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 the species. This conclusion is based on the very minimal proposed impact on habitat and range in the District over the five-year period (Table 22), project-level BMPs, the beneficial effects on

water quality from routine maintenance activities through reduced erosion and sedimentation, the proposed lentic, lotic, and tidal restoration projects, the preservation and enhancement of listed species habitat into perpetuity by the District, and conservation measures to avoid and minimize adverse effects for each species, and the adaptive management conservation measures that will reestablish habitat.

After reviewing the current status of designated critical habitat for the longhorn fairy shrimp, vernal pool fairy shrimp, Alameda whipsnake, California red-legged frog, delta smelt, and western snowy plover, the environmental baseline for the action area, the effects of the proposed District's Routine Maintenance Activities, and the cumulative effects, it is the Service's biological opinion that the District Routine Maintenance Activities, as proposed, are not likely to destroy or adversely modify designated critical habitat. The Service reached this conclusion because the project-related effects to the designated critical habitat, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding the function of the longhorn fairy shrimp, vernal pool fairy shrimp, Alameda whipsnake, California red-legged frog, delta smelt, and western snowy plover critical habitat to serve its intended conservation role for the species based on the following: although critical habitat for the longhorn fairy shrimp, vernal pool fairy shrimp, Alameda whipsnake, California red-legged frog, delta smelt, and western snowy plover will be affected, none will be destroyed or adversely modified by the projects that meet the qualifications of this biological opinion. The effects to longhorn fairy shrimp, vernal pool fairy shrimp, Alameda whipsnake, California red-legged frog, delta smelt, and western snowy plover critical habitat are small and discrete, relative to the entire area designated, and are not expected to appreciably diminish the value of the critical habitat or prevent it from sustaining its role in the conservation of the longhorn fairy shrimp, vernal pool fairy shrimp, Alameda whipsnake, California red-legged frog, delta smelt, and western snowy plover.

These determinations are based on the *Description of the Proposed Action* that provides a maximum number of acres for the proposed projects in the listed species distributional range in the District Parks as well as numerous conservation measures that would be implemented to avoid or minimize adverse effects of the future proposed projects on listed species and their critical habitats. Implementing the proposed maintenance projects that should help maintain ecological integrity in aquatic features and along roads and trails, the proposed lotic, lentic, and tidal restoration projects, the preservation and enhancement of listed species habitat into perpetuity by the District, and conservation measures to avoid and minimize adverse effects for each species, ensure that habitat for these species will be enhanced and conserved in the long-term.

Table 22. Percentage of Listed Species Range with Maximum Disturbance Estimated from Proposed Activities over Five Years

Species	Maximum Proposed Range Disturbance (Acres)	Percentage of Proposed Range Disturbance on the Species' Distributional Range on Non-HCP lands	Distributional Range on East Bay Regional Parks Non-HCP lands	General Habitat Types
Alameda whipsnake	8.50	0.010%	89,471	Chaparral, Montane Hardwood, Riparian Woodlands
California red-legged frog	7.36	0.010%	77,552	Lentic and Lotic Waterbodies, Springs, Floodplains
California tiger salamander	5.65	0.010%	59,539	Lentic and Vernal Pools, Grasslands, Oak Savannahs
Foothill yellow-legged frog	1.87	0.009%	20,303	Lentic and Lotic Waterbodies, Springs, Riparian Woodlands
Longhorn fairy shrimp	0.26	0.009%	2,862	Rock Outcrop Depressions and Vernal Pools
Vernal pool fairy shrimp	0.26	0.009%	2,862	Rock Outcrop Depressions and Vernal Pools
Vernal pool tadpole shrimp	0.26	0.009%	2,862	Vernal Pools and Seasonal Ponds
San Joaquin kit fox	1.11	0.010%	11,736	Grasslands, Oak Savannahs
Pallid manzanita	0.49	0.009%	5,356	Chaparral, Montane Hardwood
Giant garter snake	0.25	0.010%	2,637	Riverine and Freshwater Emergent Wetlands
California Ridgway's rail	0.73	0.009%	8,192	Saline - Brackish Emergent Wetlands
Salt marsh harvest mouse	1.04	0.009%	11,605	Saline - Brackish Emergent Wetlands
California least tern	0.20	0.009%	2,188	Estuarine, Open Shoreline Beaches, Plains, and Islands
Western snowy plover	0.30	0.009%	3,323	Estuarine, Open Shoreline Beaches, Plains, and Islands
Delta smelt	0.39	0.009%	4,394	Estuarine
Longfin smelt	2.84	0.020%	12,864	Estuarine, Open Water

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.

This incidental take statement is based upon the proposed action occurring as described in the accompanying biological opinion. Take of listed species in accordance with this incidental take statement is exempted under section 7(o)(2) of the Act. The Corps must ensure that the applicant implements the proposed action as described in this biological opinion and undertake the non-discretionary measures described below; otherwise, the exemption provided under section 7(o)(2) of the Act may lapse. 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 District 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)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage of such plants on areas under federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take

Alameda Whipsnake

The Service anticipates that incidental take of the Alameda whipsnake will be difficult to detect because most will likely be in dense riparian vegetation at project sites where, due to their small size and cryptic coloring, they may be hard to detect. It may be difficult to locate these species due to their cryptic appearance and small size. The finding of an injured or dead individual is unlikely because of their relatively small body size; losses of this species also may be difficult to quantify as a result. In instances when take is difficult to detect, the Service may estimate take in

numbers of species per acre of habitat lost or degraded as a result of the action as a surrogate measure for quantifying individuals. Therefore, the Service anticipates that all Alameda whipsnakes inhabiting approximately 8.50 acres will be subject to incidental take in the form of non-lethal harm and harassment over five years (2024-2029); restoration projects over the five-years may also cause incidental take through non-lethal harm and harassment in additional acres. The Service anticipates that no more than one Alameda whipsnake individual per year over five years, and a maximum of five individuals over five years, would be captured, killed, or injured as a result of project-related activities and would be detected by biological monitors. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harm, harassment, capture, injury, and death of the Alameda whipsnake caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

California Red-legged Frog

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because of their life history, biology, and ecology. Specifically, California red-legged frogs are difficult to locate due to their cryptic appearance and behavior; they may be located a distance from aquatic features; and the finding of an injured or dead individual is unlikely because of their relatively small body size, the large amount of Project ground disturbance expected, the limited ability of Service approved biologists to effectively monitor Project activities, and the possibility of carcasses being eaten by scavengers. Therefore, the Service anticipates that all California red-legged frogs inhabiting the approximately 7.36 acres of habitat within the routine maintenance projects, and all California red-legged frogs inhabiting the approximately 43.75 acres of habitat within the restoration projects will be subject to incidental take in the form of non-lethal harm, harassment, and capture over the five-year period (2024-2029). The Service anticipates that a maximum of one (1) California red-legged frog individual per year and a maximum of five (5) California red-legged frog individuals over five years would be killed or injured as a result of routine maintenance project-related activities, and that a maximum of three (3) California red-legged frog individuals per year and a maximum of fifteen (15) California red-legged frog individuals over five years would be killed or injured as a result of restoration project-related activities. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harm, harassment, capture, injury, and death of the California red-legged frogs caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

Foothill Yellow-legged Frog

The Service anticipates that incidental take of the foothill yellow-legged frog will be difficult to detect because of their life history, biology, and ecology. Specifically, foothill yellow -legged frogs are difficult to locate due to their cryptic appearance and behavior; they may be located a distance from aquatic features; and the finding of an injured or dead individual is unlikely because of their relatively small body size, the large amount of Project ground disturbance expected, the limited ability of Service approved biologists to effectively monitor Project

activities, and the possibility of carcasses being eaten by scavengers. Therefore, the Service anticipates that all foothill yellow-legged frogs inhabiting the approximately 1.87 acres of habitat will be subject to incidental take in the form of non-lethal harm, harassment, and capture over the five-year period (2024-2029); restoration projects over the five-years may also cause incidental take through non-lethal harm and harassment in additional acres. The Service anticipates that a maximum of one (1) foothill yellow-legged frog individual per year and a maximum of five (5) foothill yellow-legged frog individuals over five years would be killed or injured as a result of project-related activities. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harm, harassment, capture, injury, and death of the California red-legged frogs caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

California Tiger Salamander

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when these amphibians are not located in breeding habitat, they inhabit the burrows of ground squirrels, other rodents, or other microhabitat features. It may be difficult to locate these species due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from breeding habitat; dispersal and migration occurs during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of these species also may be difficult to quantify due to seasonal fluctuations in numbers, random environmental events, changes in water regimes at breeding sites, or other environmental disturbances. In instances when take is difficult to detect, the Service may estimate take in numbers of species per acre of habitat lost or degraded as a result of the action as a surrogate measure for quantifying individuals. Therefore, the Service anticipates that all California tiger salamanders inhabiting the approximately 5.65 acres of habitat within the routine maintenance projects, and all California tiger salamanders inhabiting the approximately 43.75 acres of habitat within the restoration projects will be subject to incidental take in the form of non-lethal harm, harassment, and capture over the five-year period (2024-2029). The Service anticipates that a maximum of one (1) California tiger salamander individual per year and a maximum of five (5) California tiger salamander individuals over five years would be killed or injured as a result of routine maintenance project-related activities, and that a maximum of three (3) California tiger salamander individuals per year and a maximum of fifteen (15) California tiger salamander individuals over five years would be killed or injured as a result of restoration project-related activities. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harm, harassment, capture, injury, and death of the California tiger salamanders caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp

The incidental take of longhorn fairy shrimp, vernal pool fairy shrimp, and tadpole fairy shrimp anticipated for the proposed activities could result from the destruction of the cysts from the ground disturbance within pools. The life stage affected by this action will be the listed shrimp's

cysts, which are embedded in the soil of the pools they occupy. Due to the fact that it is not possible to know how many cysts are in the soil of any storm drain feature, or how many cysts will occupy any storm drain feature later in time, the Service cannot quantify the total number of listed fairy shrimp cysts that we anticipate will be taken as a result of the proposed action. In instances in which the total number of cysts anticipated to be taken cannot be determined, the Service may use the acreage of habitat impacted as a surrogate; since the take of cysts anticipated will result from the destruction or temporary alteration of the listed shrimp habitat, the quantification of habitat acreage serves as a direct surrogate for the listed shrimp that will be lost. Therefore, the Service anticipates take incidental to this project as the 0.26 acre of longhorn fairy shrimp, vernal pool fairy shrimp, and tadpole fairy shrimp habitat that will be disturbed by District routine maintenance activities as well as the additional acres of approved-restoration projects. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed activities in the form of harm, harassment, capture, injury, and death of longhorn fairy shrimp, vernal pool fairy shrimp, and tadpole fairy shrimp caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

San Joaquin Kit Fox

The Service anticipates that incidental take of the San Joaquin kit fox may occur in the form of harassment to an unknown number of individuals that may attempt to den in or near project sites. Foraging or denning kit fox may be harassed by District restoration and routine maintenance activities. Implementation of CM23, which includes preconstruction surveys for dens and individuals, is expected to avoid harassment of denning individuals. Use of the project site may be avoided by San Joaquin kit fox for denning or foraging and thus incidental take for San Joaquin kit fox is expected in the form of harassment of all San Joaquin kit fox in approximately 1.11 acres over five years due to District routine maintenance activities; restoration projects over the five-years may result in incidental take by harassment in additional acres. Up to two San Joaquin kit fox could be taken by harassment over the five-year period (2024-2029) due to District restoration projects and routine maintenance activities. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harassment of the San Joaquin kit fox caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

California Ridgway's Rail

The Service anticipates that incidental take of the California Ridgway's rail will be difficult to detect or quantify because of the reclusive nature of this species. In instances when take is difficult to detect, the Service may estimate take in numbers of species per acre of habitat lost or degraded as a result of the action as a surrogate measure for quantifying individuals. Incidental take for California Ridgway's rails is expected in the form of non-lethal harassment of all California Ridgway's rails in approximately 0.73 acre of existing California Ridgway's rail habitat due to District routine maintenance activities; restoration projects over the five-years may result in incidental take by harassment in additional acres. The Service does not anticipate any lethal injury or mortality as a result of project activities. Reinitiation will be triggered if the

amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harassment of the California Ridgway's rail caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

Salt Marsh Harvest Mouse

The Service anticipates that incidental take of the salt marsh harvest mouse will be difficult to detect or quantify because of the variable, unknown size of any resident population over time, and the difficulty of finding killed or injured small mammals. In instances when take is difficult to detect, the Service may estimate take in numbers of species per acre of habitat lost or degraded as a result of the action as a surrogate measure for quantifying individuals. Therefore, the Service anticipates that all salt marsh harvest mouse inhabiting the approximately 1.04 acres of habitat will be subject to incidental take in the form of non-lethal harm and harassment over the five-year period (2024-2029); restoration projects over the five-years may also cause incidental take through non-lethal harm and harassment in additional acreages. The Service anticipates that a maximum of one salt marsh harvest mouse annually, with up to five individuals over the five-year period, would be captured, killed, or injured as a result of project-related activities and would be detected by biological monitors. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harm, harassment, capture, injury, and death of the salt marsh harvest mouse caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

Giant Garter Snake

The Service anticipates that incidental take of the giant garter snake will be difficult to detect or quantify because; (1) the snakes are secretive and notoriously sensitive to human activities, and (2) individual snakes are difficult to detect unless they are observed, undisturbed, at a distance. Giant garter snake habitat is present in the action area; however, the number of giant garter snakes using the action area is expected to be small. While activities in terrestrial habitats are limited during the bromation, giant garter snakes still use terrestrial areas during their active period and could be injured or killed from disturbance associated with sediment removal or vegetation management (terrestrial and aquatic) and dewatering activities in the delta near District lands listed in Table 2. In instances when take is difficult to detect, the Service may estimate take in numbers of species per acre of habitat lost or degraded as a result of the action as a surrogate measure for quantifying individuals. Therefore, the Service anticipates that all giant garter snake inhabiting the approximately 0.25 acres of habitat will be subject to incidental take in the form of non-lethal harm and harassment over the five-year period (2024-2029); restoration projects over the five-years may also cause incidental take through non-lethal harm and harassment in additional acreages. The Service anticipates that a maximum up to two giant garter snake individuals over the five-year period, would be captured, killed, or injured as a result of project-related activities and would be detected by biological monitors. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harm, harassment, capture, injury, and death of the giant garter snake caused by District

routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

Western Snowv Plover

The Service anticipates that incidental take of the snowy plover may occur in the form of harassment to an unknown number of individuals of snowy plovers that may attempt to nest parks within the District. Foraging or nesting snowy plovers may be harassed by District routine maintenance activities at the parks listed in Table 1. Implementation of CM28, which entails preactivity surveys for nesting birds and maintenance of a buffer around actively nesting snowy plovers, is expected to avoid injury or mortality of western snowy plover eggs or young. Incidental take for western snowy plover is expected in the form of non-lethal harassment of all western snowy plovers in approximately 0.33 acre of existing western snowy plover habitat due to routine maintenance activities; restoration projects over the five-years may result in incidental take by harassment in additional acres. The Service does not anticipate lethal injury or mortality due to project activities. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harassment of the snowy plover caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

California Least Tern

The Service anticipates that incidental take of the California least tern may occur in the form of harassment to an unknown number of individuals that may attempt to nest parks within the District. Foraging or nesting California least terns may be harassed by District routine maintenance activities at the parks listed in Table 1. Implementation of CM29, which entails pre-activity surveys for nesting birds and maintenance of a buffer around actively nesting snowy plovers, is expected to avoid injury or mortality of California least tern eggs or young. Incidental take for California least tern is expected in the form of non-lethal harassment of all California least terns in approximately 0.32 acre of existing California least tern habitat due to District routine maintenance activities; restoration projects over the five-years may result in incidental take by harassment in additional acres. The Service does not anticipate lethal injury or mortality due to project activities. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harassment of the California least tern caused by District routine maintenance activities, conservation measures, and restoration projects will become exempt from the prohibitions described under section 9 of the Act.

Delta Smelt

The Service expects that incidental take of delta smelt will be difficult to detect or quantify for the following reasons: the small size of adults and larvae, the difficulty of detecting delta smelt in their turbid aquatic habitat, and the low likelihood of finding dead or impaired specimens. The Service anticipates that the extent of incidental take will be minimized due to the proposed conservation measures and low relative abundance. Due to the difficulty in quantifying the number of delta smelt that will be taken as a result of the proposed action, the number of acres of affected habitat becomes a surrogate for the species that will be taken. The Service anticipates

that all individual adult delta smelt in 0.39 acre of the proposed activities and the additional restoration areas may be subject to incidental take in the form of harm as described in this biological opinion. Reinitiation will be triggered if the amount of incidental take is exceeded by the District. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the proposed action in the form of harassment of the delta smelt caused by District restoration projects and routine maintenance activities will become exempt from the prohibitions described under section 9 of the Act.

Longfin Smelt

The Service expects that incidental take of longfin smelt will be difficult to detect or quantify for the following reasons: the small size of adults and larvae, the difficulty of detecting longfin smelt in their turbid aquatic habitat, and the low likelihood of finding dead or impaired specimens. The Service anticipates that the extent of incidental take will be minimized due to the proposed conservation measures and low relative abundance. Due to the difficulty in quantifying the number of longfin smelt that will be taken as a result of the proposed action, the number of acres of affected habitat becomes a surrogate for the species that will be taken. The Service anticipates that all individual adult longfin smelt in 2.84 acre of the proposed activities and the additional restoration areas may be subject to incidental take in the form of harm as described in this biological opinion. Reinitiation will be triggered if the amount of incidental take is exceeded by the District.

Effect of the Take

In the accompanying biological opinion and conference opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the Alameda whipsnake, California red-legged frog, foothill yellow-legged frog, California tiger salamander, longhorn fairy shrimp, vernal pool fairy shrimp, tadpole fairy shrimp, San Joaquin kit fox, California Ridgway's rail, salt marsh harvest mouse, giant garter snake, western snowy plover, California least tern, delta smelt, and longfin smelt. In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the Alameda whipsnake, California red-legged frog, foothill yellow-legged frog, Central California tiger salamander, longhorn fairy shrimp, vernal pool fairy shrimp, tadpole fairy shrimp, San Joaquin kit fox, pallid manzanita, California Ridgway's rail, salt marsh harvest mouse, giant garter snake, western snowy plover, California least tern, delta smelt, and longfin smelt resulting from implementation of this project have been incorporated into the project's proposed conservation measures. Therefore, the Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of the Alameda whipsnake, California red-legged frog, foothill yellow-legged frog, Central California tiger salamander, longhorn fairy shrimp, vernal pool fairy shrimp, tadpole fairy shrimp, San Joaquin kit fox, pallid manzanita, California Ridgway's rail, salt marsh harvest mouse, giant garter snake, western snowy plover, California least tern, delta smelt, and longfin smelt:

1) The applicant shall minimize the potential for harm, harassment, injury, and mortality to the Alameda whipsnake, California red-legged frog, foothill yellow-legged frog, Central California tiger salamander, longhorn fairy shrimp, vernal pool fairy shrimp, tadpole fairy shrimp, San Joaquin kit fox, pallid manzanita, California Ridgway's rail, salt marsh harvest mouse, giant garter snake, western snowy plover, California least tern, delta smelt, and longfin smelt resulting from project related activities.

2) The applicant shall ensure their compliance with this biological opinion. All conservation measures, as described in the biological assessment and restated here in the *Description of the Proposed Action* section of this biological opinion, shall be fully implemented and adhered to in order to minimize adverse effects to the listed species discussed in this biological opinion. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

3) To ensure that activities do not cause high levels of sedimentation downstream of project sites, all BMPs associated with Section 404 and 401 permitting as well as State Regional Water Quality permitting will be followed and implemented.

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 projects permitted under this biological opinion.

2. No activities will occur until the Corps' approval of the routine maintenance activities.

3. No restoration projects or adaptive management conservation measures will occur until they are approved by the Corps, Service, and CDFW.

4. All parks within the distributional range of the species listed in Table 1 will have the species-specific conservation measures required unless specifically requested at the time of the June 1st project list. Any deviations from the Table 1 will need to be approved by the Service.

5. The District shall require that all personnel associated with this project are made aware of the conservation measures and the responsibility to implement them fully.

6. In addition to the terms and conditions specified in the biological opinion, the applicant will implement the following conservation measures to further reduce potential for take to the 15 listed species:

    a. All night-time emergency construction per Conservation Measure 9 must be approved by the Service prior to implementation to minimize take of listed species such as Central California tiger salamander and California red-legged frog.

b. To reduce predation on listed tidal species, recreational structures (i.e., tall light poles, utility poles, fencing, signage, etc.) near habitat for the salt marsh harvest mouse, California Ridgway's rail, California least tern, or western snowy plover will be minimized or designed in such a way as to be appropriate for recreational use and deter perching by avian predators.

c. Any potential take of pallid manzanita plants will be detailed in the June 1st project list in terms of number and age (seedling, mature), acreage, and any additional conservation measures to minimize take may be required by the Service at that time. No associated activities will occur until projects that could remove or damage pallid manzanita plants are approved by the Service. Herbicides will not be used in pallid manzanita habitat unless approved for use by the Service.

d. Restoration planting locations will be approved by a California red-legged frog and Central California tiger salamander Service-approved biologist who will ensure that plantings of trees and wetland plants do not degrade pools that may be potential breeding habitat (i.e., providing too much shading over pools or too much emergent vegetation in pools).

e. To reduce take of listed species from herbicide and pesticide use:

    - Chemical treatment will be conducted in accordance with a Service-approved treatment plan. The plan will include a Pesticide Use Spill Plan. The treatment plan must be submitted to the Service 60-days prior to planned implementation.

    - Contractors will have all necessary licensing by the California Department of Pesticide Regulation (CDPR) for herbicide application. Use of herbicides will be consistent with label instructions, and Material Safety Data Sheets documents will be maintained.

    - Integrated Pest Management Approaches: Applicators will also use non-chemical methods such as hand pulling or chip deposition on seed stock to prevent seedling germination, thus reducing the need for herbicides.

    - Herbicides will not be applied to or near open water. A 60-foot buffer zone adjacent to the wetted channel will be established in the action area. No foliar application of herbicides will occur within the buffer. Within the buffer, only aquatic-safe formulations of herbicides would be used (e.g., Garlon 3A). Herbicide formulations that are not safe for aquatic application or that may be harmful to California red-legged frogs such as Garlon 4 Ultra would not be used within the buffer.

    - Herbicide will not be applied during the wet season (November 1 - April 15) to minimize herbicide transport in the environment.

    - Spray nozzles would be kept within a vertical distance of 24 inches of vegetation being sprayed.

- The lowest effective concentration needed for effectiveness will be used, typically specified as a range on the product label. However, the concentration is dependent on method of application.

- No herbicide will be applied within suitable amphibian habitat if there is a > 30% chance of more than 0.1 inches of precipitation predicted within the next 48 hours. No herbicide will be applied outside suitable amphibian habitat if there is a > 50% chance of more than 0.1 inches of precipitation predicted within the next 48 hours. 0.1 inch is based on following "measurable" precipitation prediction data provided by National Weather Service.

- Herbicide applications will treat the minimum area necessary to meet site objectives.

- All mixing and/ or loading of herbicides will take place at least 500 feet from occupied streams and associated riparian areas, lakes, ponds or wetlands and at least 150 feet from all non-occupied sites. Precautions will be issued to and care will be taken by workers to avoid crushing or trampling amphibians.

- Any herbicides applied to project sites with suitable habitat for California red-legged frogs and California tiger salamanders will adhere to the requirements and restrictions for use as outlined in the October 20, 2006, Northern District of California U.S. District Court Stipulated Injunction and Order.

- To reduce take of vernal pool brachiopods, no herbicide use will be allowed within 100 feet of areas with suitable habitat for vernal pool brachiopods unless approved by the Service.

7. At the time of the June 1st project list, the Service can require species-specific conservation measures in the future in any parks covered under this biological opinion, if the species is found to inhabit parks or are reasonably certain to occur due to close proximity of future occurrences.

8. The project description requires the District to submit a detailed list or spreadsheet with the proposed maintenance and restoration projects for the upcoming year to the Corps and the Service prior to June 1 each year. A more detailed description of what the Service requires in the submittal is explained below. At a minimum, the preconstruction project list will include the following information:

    a. A description of activities/projects proposed and their location shall include:

        - What routine maintenance activity type (as listed in Table 2) or restoration project type are associated with each project site.

        - A full description of habitat restoration projects and adaptive management conservation measures.

- Any additional conservation measures to ensure adequate avoidance and minimization to the take of listed species.

b. Location and extent of habitat disturbance (temporary and permanent) shall include:

- Locational maps for each project and a table documenting projected acreages of temporary and permanent habitat disturbance.

c. Anticipated effects to listed species shall include:

- For Routine Maintenance Projects: Acreage of affected species habitat at each project site (if species affected at the project site differ from that listed in Table 1 associated with that park).
  - This biological opinion assumes that projects in a specific District Park will be affecting the species habitat located in that park as determined by Table 1. If a project is not affecting species habitat as identified in Table 1, then the nonimpact to that species habitat would need to be identified in the preconstruction project list. Otherwise, the Service will assume that all projects affect species habitat associated with the District Parks as listed in Table 1.
  - Description of any additional adverse effects not already mentioned in the biological opinion.
- For Restoration Projects and Adaptive Management Conservation Measures only:
  - Potential for species to be at the project site (if different from that listed in Table 1).
  - Listed species suitable habitat associated with each site (breeding, foraging, dispersal, etc.) by the project.
  - Determination of beneficial or neutral effects to listed species (can be in spreadsheet/ table form).
  - Description of any additional adverse temporary effects not already mentioned in the biological opinion.
  - Any additional conservation measures to ensure adequate avoidance and minimization to the take of listed species.

Monitoring:

1. 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 District shall provide a precise accounting of the total acreage of habitat impacted to the Service after completion of construction as detailed in the *Description of the Proposed Action* and CM19.

2. In the February 15th annual report, if the species habitat that is affected by the proposed activity differs from those species associated with the Park of the project site in Table 1, then the Service must approve that the species' habitat is not being impacted.

3. Results of preconstruction surveys for listed species (positive and negative observations, dates, method, etc.) will be included in the February 15th annual report of project activities.

4. A monthly construction monitoring report will be due to the Service a week after month's end that lists the year's project sites, listed species observed/captured/handled/relocated (and any associated details), and reports compliance status with conservation measures at each project site.

5. The Corps or Applicant shall immediately contact the Coast Bay Division Supervisor, Ryan Olah (ryan_olah@fws.gov) or (916) 414-6623, to report direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harassment, harm, injury, or death occurs. If the 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.

6. For those components of the action that will require the capture and relocation of any listed species, the Corps or Applicant shall immediately contact the Coast Bay Division Supervisor, Ryan Olah (ryan_olah@fws.gov) or (916) 414-6623, to report the action. If capture and relocation need to occur after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day.

Salvage and Disposition of Individuals

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 Supervisor at the Sacramento Office 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) The District should identify California red-legged frog, California Ridgway’s rail, salt marsh harvest mouse, and California least tern breeding habitat that is at risk to

significant change (i.e. salinization, erosion etc.) due to climate change, tidal action, and sea level rise. Should a site be at significant risk, corrective actions should be identified and taken to protect the habitat.

2) The District should acquire, preserve, and manage lands containing the pallid manzanita, longhorn fairy shrimp, San Joaquin kit fox, and Alameda whipsnake that are currently unprotected on private lands. The District should educate and work with adjacent landowners to minimize the potential for the introduction and spread of *P. cinnamomi* into areas containing the pallid manzanita.

3) The District should manage scrub, grassland, and oak woodland habitats for the benefit of the Alameda whipsnake. The District should re-route trails and roads away from suitable Alameda whipsnake and pallid manzanita habitat.

4) The District should promote the eradication of non-native eucalyptus, Monterey pine, Monterey cypress, and French broom within and near suitable habitat for the Alameda whipsnake.

5) The District should avoid the use of rodenticides in suitable habitat for the California red-legged frog and Alameda whipsnake and other listed species that rely on small mammals for creating burrows or as a prey source.

6) All listed species detections associated with this project should be reported to the CNDDB within sixty calendar days. A copy of the submission should be sent to the Service for confirmation.

7) To reduce predation by predation on listed tidal species, recreational structures (i.e. tall light poles, utility poles, fencing, signage, etc.) within 700 feet of habitat for the salt marsh harvest mouse, California Ridgway's rail (nesting), California least tern (nesting), or western snowy plover (nesting) should be restricted to only those structures which can be designed to deter perching by avian predators.

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 reinitiation of formal consultation on the District's Routine Maintenance Activities. As provided in 50 CFR §402.16(a), reinitiation of consultation is required and shall be requested by the federal agency or by the Service where discretionary federal involvement or control over the action has been retained or is authorized by law, and:

1) If the amount or extent of taking specified in the incidental take statement is exceeded;

2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or written concurrence, or

4) If a new species is listed or critical habitat designated that may be affected by the identified action.

This concludes the conference for the longfin smelt. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the longfin smelt is listed. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After listing of the longfin smelt as threatened and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the longfin smelt is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the longfin smelt has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the longfin smelt may occur between the listing of longfin smelt and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

If you have any questions regarding this biological opinion and conference opinion, please contact Stephanie Levins, Senior Fish and Wildlife Biologist (stephanie_levins@fws.gov) or Ryan Olah, Coast Bay Division Supervisor (ryan_olah@fws.gov), at the letterhead address or at (916) 414-6623.

Sincerely,

MICHAEL FRIS

Digitally signed by MICHAEL FRIS
Date: 2024.06.04 09:43:32 -07'00'

Michael Fris
Field Supervisor

Enclosure

cc:
U.S. Army Corps of Engineers, San Francisco, California
Josh Phillips, East Bay Regional Park District, Oakland, California

Becky Tuden, East Bay Regional Park District, Oakland, California
Brook Vinnedge, East Bay Regional Park District, Oakland, California
Desiree Dela Vega, California Department of Fish and Wildlife, Bay Delta Region, California

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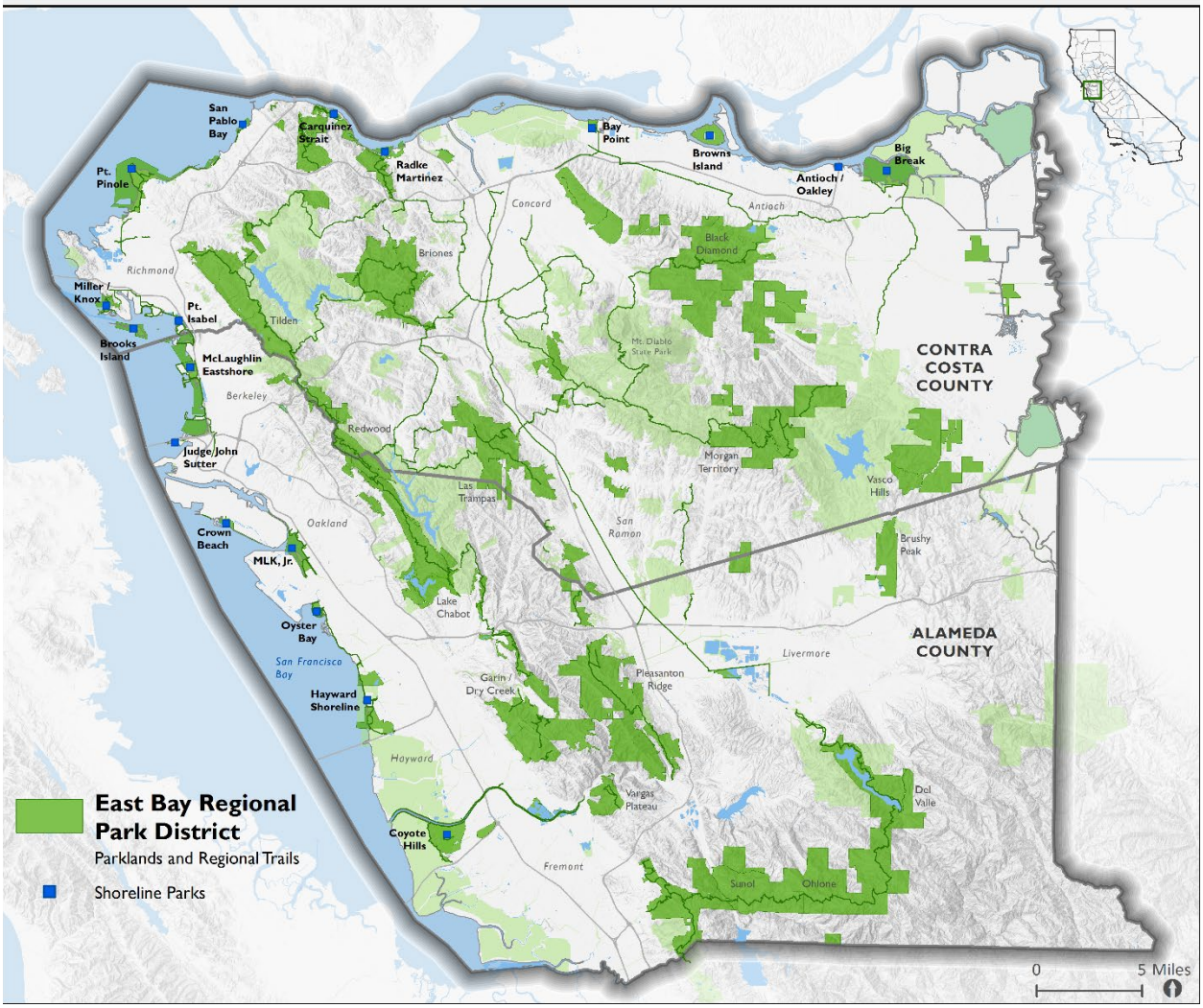
San Pablo Bay
Carquinez Strait
Bay Point
Browns Island
Big Break
Antioch / Oakley
Pt. Pinole
Radke Martinez
Concord
Antioch
Black Diamond
Briones
Richmond
Miller / Knox
Pt. Isabel
Tilden
Brooks Island
McLaughlin Eastshore
Mt. Diablo State Park
CONTRA COSTA COUNTY
Berkeley
Redwood
Morgan Territory
Vasco Hills
Judge John Sutter
Las Trampas
San Ramon
Oakland
Crown Beach
Brushy Peak
MLK, Jr.
Lake Chabot
Oyster Bay
ALAMEDA COUNTY
Livermore
San Francisco Bay
Garin / Dry Creek
Pleasanton Ridge
Hayward Shoreline
Hayward
Vargas Plateau
Del Valle
Coyote Hills
Fremont
Sunol
Ohlone
East Bay Regional Park District
Parklands and Regional Trails
Shoreline Parks
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