



United States Department of the Interior



In Reply Refer to:
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2014-F-0576-2

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

MAR 11 2015

Mr. Boris Deunert
Attn: Tom Holstein
Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, California 94623-0660

Subject: Biological Opinion on the Proposed Sonoma-Marín Area Rail Transit (SMART) Non-Motorized Multi-use Pathway (NMP) Project Phase 1 in Sonoma and Marin Counties, California (California Department of Transportation (Caltrans) Federal Aid Project Number RPSTPLE 6411 (005))

Dear Mr. Deunert:

This letter is in response to your August 4, 2014, request for the initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) for the proposed SMART NMP Project Phase 1 (proposed project) in Sonoma and Marin Counties, California (Caltrans Federal Aid Project Number RPSTPLE 6411 (005)). Your request for consultation was received in our office on August 8, 2014. SMART proposes to construct a total of about 23 miles of a paved NMP in two segments: (1) the Marin County portion from McInnis Parkway in the City of San Rafael, Marin County (Mile Post [MP] 20.1) north to the City of Novato, Marin County (MP 26.8); and (2) the Sonoma County portion from the Petaluma River crossing in the City of Petaluma, Sonoma County (MP 39.0) north to Guerneville Road in the City of Santa Rosa, Sonoma County (MP 55.3). The majority of the NMP would be constructed within the existing right-of-way (ROW) for the SMART train. At issue are the effects of the proposed project on the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), endangered California clapper rail (*Rallus longirostris obsoletus*), threatened California red-legged frog (*Rana draytonii*), and endangered Sonoma Distinct Population Segment (DPS) of the California tiger salamander (Sonoma California tiger salamander) (*Ambystoma californiense*) and its designated critical habitat. This document is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). Critical habitat has been designated for the California red-legged frog but does not occur within the action area for the proposed project.

This document represents the Service's biological opinion on the effects of the proposed project on the salt marsh harvest mouse, California clapper rail, California red-legged frog, and Sonoma California tiger salamander and its designated critical habitat. The following sources of information were used to develop this biological opinion: (1) your letter requesting consultation on the proposed project dated August 4, 2014; (2) the July 2014 *Biological Assessment Sonoma-Marín Area Rail Transit*

Non-Motorized Multi-use Pathway Proposed Project, Sonoma and Marin Counties, California, USA (Biological Assessment) (Caltrans 2014); (3) the November 25, 2014 letter from SMART responding to the Service's request for additional information (B. Gamlen, SMART, *in litt.* 2014); (4) the February 9, 2015 electronic mail message from Caltrans revising the project description, conservation measures, and habitat compensation for the proposed project (T. Holstein, Caltrans, pers. comm. 2015); (5) protocol-level surveys for the California clapper rail (Olofson Environmental, Inc. 2013; Area West Environmental 2013); (6) the August 2014 *Draft Mira Monte Marina Wetlands Project Mitigation and Monitoring Plan* (Mira Monte Draft MMP) (ICF International 2014a); (7) the October 2014 *Draft Brand Phelan Conservation Area Long-Term Management Plan* (Phelan LTMP) (ICF International 2014c); (8) the "Summary of Ambient Noise Data along SMART Corridor" (M. Thrill, Illingworth and Rodkin, Inc., *in litt.* 2013); (9) the *Santa Rosa Plain Conservation Strategy* (Santa Rosa Plain Conservation Strategy Team 2005); (10) electronic mail and conversations among SMART, Caltrans, U.S. Army Corps of Engineers (Corps), ICF International, Area West Environmental, AECOM, California Department of Fish and Wildlife (CDFW), the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), the North Coast Regional Water Quality Control Board (NCRWQCB), and the Service; and (11) other information available to the Service.

CONSULTATION HISTORY

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|------------------|---|
| April 10, 2014 | The Service attended a meeting with staff from Caltrans, SMART, Corps, Graton Rancheria, AECOM, ICF International, CDFW, SFRWQCB, and NCRWQCB. |
| August 8, 2014 | The Service received from Caltrans the request for the initiation of formal consultation on the proposed project and the Biological Assessment. |
| August 13, 2014 | The Service sent via electronic mail to Caltrans, SMART, Area West Environmental, and AECOM a request for an onsite revegetation/monitoring plan, measures to reduce the long-term indirect effects of the proposed project on increased predation and the spread of invasive plant species, and clarification of the estimates of California red-legged frog and Sonoma California tiger salamander habitat disturbance. |
| October 15, 2014 | The Service sent a letter to Caltrans and SMART requesting additional information on the proposed project (<i>e.g.</i> , interconnected/interrelated trails; revised estimates of California red-legged frog, Sonoma California tiger salamander, and salt marsh harvest mouse habitat disturbance and compensation; measures to reduce dispersal barriers due to installation of retaining walls; and measures to reduce predation and the spread of invasive plant species along the NMP and SMART ROW). |
| November 5, 2014 | The Service attended a meeting with Caltrans, SMART, Area West Environmental, ICF International, AECOM, and CDFW to discuss the Service's October 15, 2014 letter. |

- November 26, 2014 The Service received from SMART a letter responding to the Service's request for additional information on the proposed project (B. Gamlen, SMART, *in litt.* 2014).
- January 21, 2015 The Service sent via electronic mail at the request of Caltrans the draft project description and draft conservation measures in the draft biological opinion for the proposed project.
- January 23, 2015 The Service attended a meeting with SMART, Area West Environmental, ICF International, and the Phelan property landowner to discuss the Service's comments on the Draft Phelan LTMP (ICF International, Inc. 2014c).
- February 9, 2015 The Service received via electronic mail from Caltrans edits to the draft project description, draft conservation measures, and acres of California red-legged frog and Sonoma California tiger salamander habitat disturbance and compensation for the proposed project.
- February 25, 2015 The Service sent via electronic mail at the request of Caltrans and SMART the revised draft project description and revised draft conservation measures in the revised draft biological opinion for the proposed project.
- February 26, 2015 The Service received via electronic mail from Caltrans approval of the revised draft project description and revised draft conservation measures in the revised draft biological opinion for the proposed project.

BIOLOGICAL OPINION

Description of the Proposed Project

Background

SMART proposes to construct Phase 1 of a NMP that would extend from McInnis Parkway in the City of San Rafael, Marin County, California (Mile Post [MP] 20.1) north to Guerneville Road in the City of Santa Rosa, Sonoma County, California (MP 55.3) (Figure 1). The NMP is designed to add non-vehicular transportation options within the U.S. Highway 101 Corridor. The portion of the pathway from MP 28.5 to MP 36.8 in northern Marin County is already environmentally approved and will be built as part of the Caltrans Marin-Sonoma Narrows Project (Service file number 81420-2008-F-1619, Service 2009). The proposed project resumes at MP 39.0 in Sonoma County north of the Petaluma River.

The proposed project will include construction of approximately 23 miles of paved pathway (with two 4-foot wide bicycle/pedestrian lanes and two associated 2-foot wide dirt shoulders), 12 prefabricated bridges, numerous culverts, fences, retaining walls, and other minor project elements such as signage and pavement striping. Construction is expected to commence in 2015, and may be constructed in as many as 10-12 segments; each taking one to two years to complete. Currently, no continuous NMP exists to connect the City of Santa Rosa to the City of San Rafael. Several small

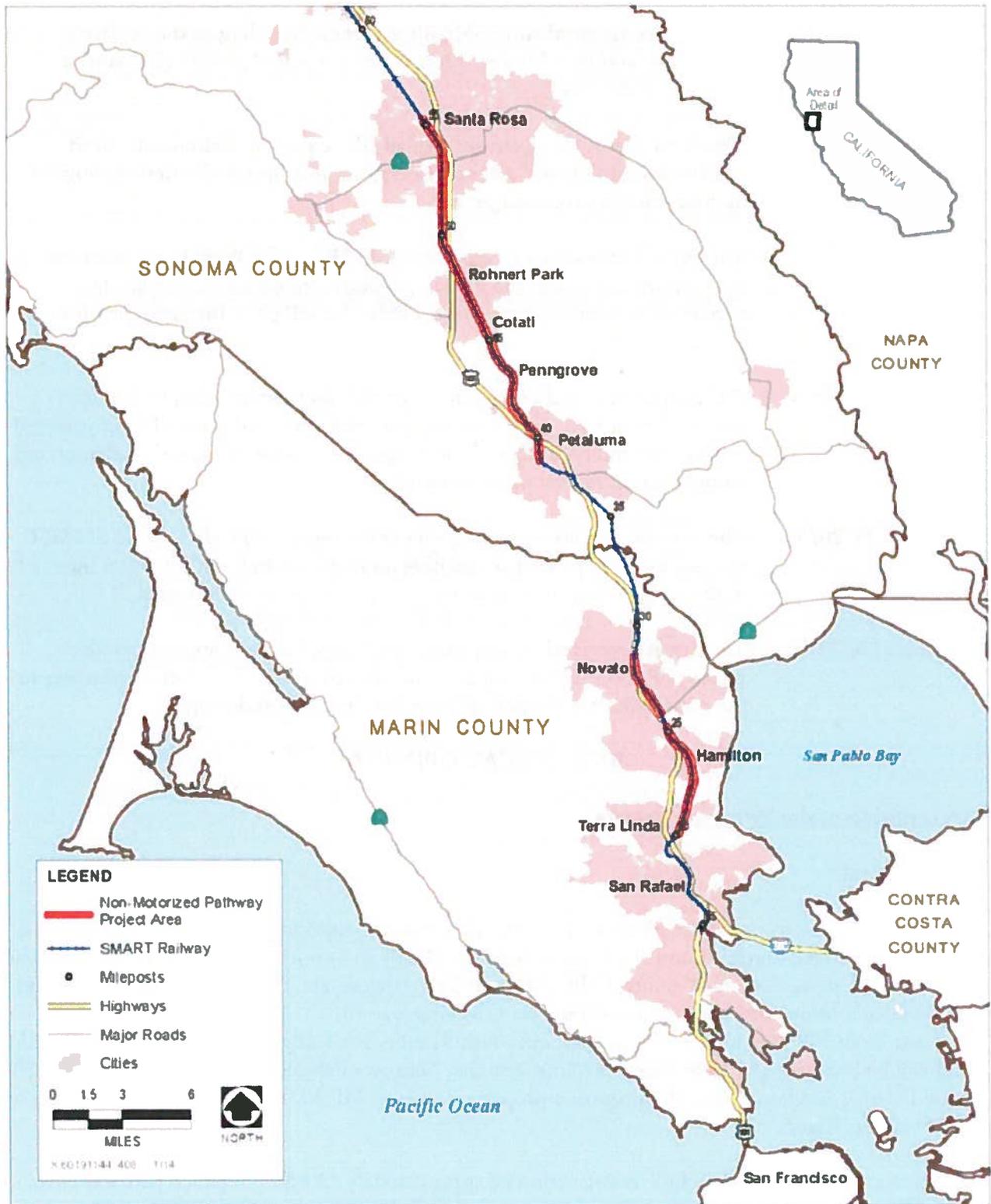


Figure 1. Map of the proposed project area (copied from Figure 1 in Caltrans 2014).

sections of the pathway have already been built by local jurisdictions, as have east-west extensions up and down the corridor; however, important linkages are still missing.

Phase 1 of the NMP is an independent component of the overall SMART multi-modal transportation program, which includes a commuter rail system and NMP from the City of Larkspur in Marin County to the City of Cloverdale in Sonoma County. After the entire pathway from the City of Larkspur to the City of Cloverdale is constructed, of which this proposed Phase 1 NMP is a part, it is expected that 7,000 to 10,000 users would use the pathway daily. The majority of that activity will be between the City of Larkspur in Marin County and the Town of Windsor in Sonoma County. For the segment covered by this proposed project (Phase 1), it is anticipated that possibly 5,000 users would be on the pathway daily.

The proposed project occurs within a shared ROW corridor with the SMART rail project (Service 2012a, 2013b, 2014a), which proposes to retrofit or replace existing railways, trestles, and drainage culverts, as well as implement other supporting infrastructure (*e.g.*, signals, sidings, grade crossings, etc.). A portion of the project footprint overlaps with areas of anticipated temporary and permanent impacts associated with the Initial Operating Segment (IOS) of the SMART rail project.

Implementation timing of the various phases of the SMART IOS project will influence the magnitude and extent of anticipated impacts associated with the proposed project. The SMART IOS-1 North phase (MP 38.5 to 53.3) is already constructed (Service file number 08ESMF00-2012-F-0064; Service 2012a, 2013b). The SMART IOS-1 South phase (MP 19.3 to 37.02) (Service file number 08ESMF00-2013-F-0467-3, Service 2014a) is currently undergoing construction and is expected to be finished prior to implementation of the proposed NMP Project.

Project Description

The proposed NMP Project will involve constructing approximately 23 miles of paved pathway, 12 bridges, and other ancillary features such as retaining walls, fences, curbs, and signage primarily within the existing SMART ROW. The pathway will consist of two 4-foot wide asphalt concrete lanes and two 2-foot wide dirt shoulders. In areas where the pathway crosses over a sidewalk, the lanes may be made of Portland cement concrete rather than asphalt. For drainage purposes, a 2:1 slope will be created on each side of the pathway. The minimum offset of the pathway from the SMART rail will be 10.5 feet from the rail center line but in some locations the offset will be as much as 100 feet.

The proposed project was designed to avoid and minimize impacts to wetlands and waters to the extent feasible. The project footprint is located almost exclusively within the previously disturbed SMART railway ROW. Only previously disturbed and existing paved areas would be affected where the footprint extends beyond the SMART ROW, and a large portion of the disturbance footprint overlaps the disturbance footprint of the SMART IOS-1 South rail project (Service file number 08ESMF00-2013-F-0467-3, Service 2014a) which will be implemented prior to construction of the proposed project.

Pathway Alignment

The portion of the pathway from MP 28.5 to MP 36.8 in northern Marin County is already environmentally approved and will be built as part of the Caltrans Marin-Sonoma Narrows Project (Service file number 81420-2008-F-1619, Service 2009); the proposed project resumes at MP 39.0 in Sonoma County north of the Petaluma River (Figure 1). In other locations, the pathway utilizes existing roadways or pathways, or the pathway will be constructed by others. The proposed pathway and its associated project features are entirely within the existing SMART ROW, except for the following locations:

1. Bridge crossing at McInnis Parkway near Bridgewater Drive (approximately MP 20.1);
2. Adjacent to San Rafael Airport and across existing bridge at Smith Ranch Road/Silveira Parkway (approximately MP 20.6 to MP 20.8);
3. North of Saint Vincent's Drive (approximately MP 22.1 to MP 22.55);
4. In the vicinity of Main Gate Road (approximately MP 23.5 to MP 23.7);
5. In the vicinity of B Street and Hamilton Parkway to near Hamilton Parkway and Aberdeen Road (approximately MP 23.9 to MP 24.2);
6. At Roblar Drive (approximately MP 24.5);
7. At the location where Frosty Lane and Hamilton Drive join the existing pathway just south of MP 25.3 until reaching Hannah Ranch Road just south of MP 25.9;
8. In the vicinity of the Vintage Oaks at Novato retail center (MP 26.25 to MP 26.8);
9. At Old Adobe Road near MP 43.6;
10. North of East Railroad Avenue near MP 44.8 to just north of MP 45.4;
11. From MP 46.3 to MP 47.0;
12. At Scenic Ave near MP 49.5;
13. At West 3rd Street near MP 53.6;
14. At West 6th Street near MP 53.8; and
15. From Jennings Avenue to Guerneville Road (approximately MP 55.0 to MP 55.3).

Key Project Features

Fencing and Wildlife Connectivity Corridor

To separate the pathway from rail use, a fence approximately four to five feet in height will be constructed between the rail and the pathway. To reduce the adverse visual impacts of the proposed bicycle/pedestrian safety fencing where there is no intervening landscaping or structures such as existing privacy fencing, the safety fencing associated with the bicycle/pedestrian pathway will be designed to fit in contextually with adjacent nearby fencing via the use of different materials.

No new access control fencing will be built as part of the proposed NMP project; however, safety fencing will be installed between the active rail and the pathway. In accordance with the mitigation requirements set forth in the Environmental Impact Report, in non-urban areas of the corridor that are not directly adjacent to U.S. Highway 101 and where a safety fence is proposed to be installed between the proposed bicycle/pedestrian pathway and railway, intermittent gaps will be placed along the barrier to allow passage of wildlife. These gaps will be at least three feet wide, extending from ground level to the top of the structure, and be spaced no farther apart than every 0.25 mile where feasible within existing or potential wildlife movement corridors along the ROW. Placement of gaps will be consistent with rail operations and safety guidelines required by the Surface Transportation Board and Federal Rail Administration.

For the proposed NMP project, gaps and tunnels will be located between Main Gate Road (MP 23.6) and Smith Ranch Road (MP 21.0) in Marin County. Gaps will also be placed in other major non-urban stream corridors to enable wildlife passage through these areas. Gaps will not be located in or adjacent to urban or residential areas. To facilitate movement of amphibians and other small wildlife across the safety structure/fencing, its design shall include openings at the bottom that are approximately 6 to 8 inches in diameter.

Bridges and Culverts

The proposed project will include bridges at the following locations described in Table 1 below. All of the bridges will be prefabricated and will not have piers or footings within the waterways. Rip-rap or other abutment protection within the banks of the waterways is not anticipated to be needed for the proposed project.

As shown in Table 2 below, new or modified culverts are within the footprint of the NMP. Some of these new or modified culverts may be constructed by the rail or other projects; however, in order to provide a conservative approach to impact assessment, the potential impacts are included as a part of this biological opinion.

Other Water Crossings

The proposed project will have other water crossings; however, these crossings would be constructed in advance of the proposed project as a result of other projects and are not part of the proposed NMP project and are not covered by this biological opinion.

Table 1. NMP bridge locations.

BRIDGE STRUCTURES SUMMARY SMART Non-Motorized Pathway McInnis Pkwy. to Guerneville Rd. (MP 20.3 to MP 53.9)																							
Bridge Location		PROPOSED STRUCTURE																					
Legacy MP	Name	South End of Bridge Abutment	Proposed Stationing	Proposed TOP	Proposed Prefabricated Structure Type	Span Length	Width (Clear)	Proposed Design Loading	100yr flood elevation	No. of Spans	No. of Piles in Stream Channel	No. of Piles in stream Bench	Est. Max. Depth of Piles/Footings	Permanent Impact on Wetlands (SF)	Temporary Impact on Wetlands (SF)	Permanent Impact on Waterway (SF)	Temporary Impact on Waterway (SF)	Comments					
20.1	GALLINAS CREEK	976+20		12	Modified Bow, H Truss	80'	10'	H-5 (10,000 lb)	9.3	1	0	0	40	30	71	0	0	EVA Bridge					
22.09	MILLER CREEK	1079+57.73		15.00	Underhung Through Truss	62'	10'	H-5 (10,000 lb)	13.18	1	0	0	40	0	0	0	0	EVA Bridge					
23.98	PACHECO CREEK	1178+50		25.00	Underhung Through Truss	60'	9'	85lb/ft reduced	N/A	1	0	0	20	0	0	0	0	Non-EVA Bridge					
24.81	SAN JOSE CREEK	1223+15.40		25.30	Underhung Through Truss	60'	9'	85lb/ft reduced	24.89	1	0	0	24	0	0	0	0	Non-EVA Bridge					
26	HANNA POND	1287+35		13.00	Modified Bow, H Truss	140'	9'	85lb/ft reduced	N/A	1	0	0	36	12	42	0	0	Non-EVA Bridge					
26.93	NOVATO CREEK	1335+45.77		13.50	Through Truss	240'	9'	85lb/ft reduced	13.93	1	0	0	40	0	0	0	0	Channel Piles align w/ Rail Piles					
39.74	PETALUMA RIVER	2011+55.43		23.60	Modified Bow, H Truss	200'	10'	H-5 (10,000 lb)	21.00	3	0	4	40	13	0	0	0	EVA Bridge					
42.42	WILLOW BROOK CREEK	2153+33.55		53.50	Underhung Through Truss	80'	10'	H-5 (10,000 lb)	51.95	1	0	0	36	0	0	0	0	EVA Bridge					
44.37	LICHAU CREEK	2256+07.85		100.30	Underhung Through Truss	60'	10'	H-5 (10,000 lb)	97.29	1	0	0	36	0	0	0	0	EVA Bridge					
46.97	COPELAND CREEK	2393+72		110.00	Underhung Through Truss	70'	9'	85lb/ft reduced	108.47	1	0	0	26	0	0	0	0	Non-EVA Bndge					
47.54	HINEBAUGH CREEK	2423+22.93		107.50	Underhung Through Truss	80'	9'	85lb/ft reduced	101.34	1	0	0	26	0	0	0	0	Non-EVA Bridge					
49.12	LAGUNA DE SANTA ROSA	2507+22.0		99.50	Modified Bow, H Truss	96'	10'	H-5 (10,000 lb)	95.77	1	0	0	40	0	0	0	0	EVA Bridge					
Totals														55	113	0	0						
<p>Permanent impacts based on fill, abutments and piles Temporary impacts based on additional 3' around fills and abutments for form work and erosion control No temporary impact areas are assumed for driven piles</p>														<p>Permanent impacts based on fill, abutments and piles Temporary impacts based on additional 3' around fills and abutments for form work and erosion control No temporary impact areas are assumed for driven piles</p>									
<p>TABLE NOTE</p> <p>Bridges that allow for Emergency Vehicle Access (EVA) are designed for AASHTO H-5 loading and have a clear width of 10'. Other bridges are designed for pedestrian loads (65w/SF) and have an anticipated clear width of 9'.</p>														<p>ABBREVIATIONS USED</p> <p>EVA - Emergency Vehicle Access (E) - Existing N - North N/A - Not Available</p>					<p>P - Proposed TOP - Top of Pathway</p>				

Table 2. NMP drainage culverts and structures summary.

DRAINAGE CULVERTS & STRUCTURES SUMMARY Based on Revised Review of DP 2.3 & 6.130910, R2 131210 SMART Non-motorized Pathway McInnis Pkwy. to Guerneville Rd. (MP 20.3 to MP 53.9)												
Culvert Location (Stationing in feet) RR CL Mile Post, Approximate Stationing	Proposed Structure(s) Size (in)	Proposed Material / Structure Type	Proposed Structure Length (ft)	Extend / New / Remain	Added End Treatment	Turn Structure and/or Drop Inlet	Wetland Impacts		Crossing Description and Notes			
							Wetlands Impacted Area (Yes/No)	Impacted Wetlands (SF)				
20.60	(2) 12"	HDPE	30	New	(2) RSP	Yes	60	Yes	60			
21.50	(3) 24"	RCP	4	Extend	Headwall		30	No	0			
21.50	(4) 24"	RCP	4	Extend	Headwall		40	No	0			
21.60	36"	RCP	3	Extend	Headwall		40	Yes	40			
21.70	144"x84"	RCB	10	Extend	Headwall		200	No	0			
21.80	(2) 18"	RCP	6	Extend	Headwall		40	Yes	0	Extension in disturbed area		
21.80	(4) 36"x120"	RCB	3	Extend	Headwall		120	Yes	120			
22.00	(3) 36"x120"	RCB	0	N/A	Headwall		60	No	0			
23.50	1152+80 0	HDPE	36	New	(2) RSP	Yes	50	No	0	Add Headwall only, in disturbed area		
24.69	1216+95 0	HDPE	16	Extend	RSP	Yes	100	Yes	100	MUP Crosses un-named waterway		
40.90	(3) 36"	RCP	6	Extend	Headwall		100	No	0	Under Hwy 101		
41.07	2083+56 0	HDPE	200	Longitudinal	RSP	Inlet	150	Yes	150	Connect to New inlets, No of Corona		
41.38	2098+47 0	RCP	12	Extend	Headwall		100	Yes	100	Separate NMP Culvert		
42.14	(2) 24"	HDPE	100	Longitudinal	Headwall	Yes	400	Yes	400	So of Ely		
42.34	2149+20 0	RCP	12	Extend	Headwall		100	Yes	100			
42.73	2169+58 0	RCP	6	Extend	Headwall		60	No	0			
43.31	2188+50 0	HDPE	200	Longitudinal	(2) RSP		150	No	0	NMP storm drain angled Xing, so of Penngrove		
43.41	(2) 64"	RCP	12	Extend	Headwall		100	Yes	60			
43.63	2217+09 0	HDPE	20	New	RSP	TS/Inlet	60	No	0			
43.73	2222+80 0	HDPE	16	New	(2) Headwall		100	Yes	100			
43.94	2233+83 0	HDPE	16	New	(2) Headwall		80	Yes	50	So of E. Railroad Ave.		
49.45	(2) 24"	RCP	15	Extend	Headwall		80	Yes	80	No of the Laguna		
49.87	2546+79 0	RCP	12	Extend	Headwall		120	Yes	120			
50.36	2572+54 0	RCP	12	Extend	Headwall		120	Yes	120			
							Estimated MUP Culvert Impacts (SF)=		1600			

ABBREVIATIONS
 CMP - Corrugated Metal Pipe
 CMPA - Corrugated Metal Pipe Arch
 CP - Concrete Pipe
 DBL - Double
 (E) - Existing
 Inlet - Drainage Inlet
 N or No - North
 N/A - Not Applicable
 P - Proposed
 PSPC - Prestressed Concrete
 RCB - Reinforced Concrete Box
 RCP - Reinforced Concrete Pipe
 RSP - Rock Slope Protection
 SD - Storm Drain
 SP - Steel Pipe
 S or So - South
 TBD - To Be Determined
 TS - Turning Structure
 WBC - Wood Box Culvert
 (2) - Two units

Retaining Walls

The proposed project will require the construction of approximately 35 retaining walls along the 23-mile pathway; 19 retaining walls in Marin County and 16 retaining walls in Sonoma County. Many of the retaining walls are proposed in order to avoid and/or minimize wetland and other sensitive habitats impacts. The locations and approximate dimensions of the retaining walls are provided in Tables 3A-3B below. The retaining walls will be constructed out of precast masonry blocks and will be earth-toned.

The proposed project will construct nine retaining walls within the McInnis Parkway to Main Gate Road (MP 20.1 – MP 23.6) section in Marin County (Table 3A). The longest stretches of retaining walls are where the NMP are integral to the railroad embankment through the lowlands south and north of Miller Creek, MP 21.3 to MP 22.1, and MP 22.7 to MP 23.2, respectively. Through this segment three-foot-wide full height fence gaps, spaced no more than 0.25 mile apart will be included in the NMP construction. Fences in the wildlife corridor will be installed with a gap (6 to 8 inches) at the bottom to allow wildlife dispersal.

The proposed project will construct approximately eight retaining walls within the Ely Road to Sonoma Mountain Village section (MP 42.2 – MP 45.5) in Sonoma County (Table 3B). Wildlife dispersal pipes will be installed underneath the NMP and two of the retaining structures every 150 feet in this section. Through this segment, three-foot-wide full height fence gaps, spaced no more than 0.25 mile apart will be included in the NMP construction. Fences in the wildlife corridor will be installed with a gap (6 to 8 inches) at the bottom to allow wildlife dispersal.

Other Project Features

The proposed project will involve the potential for some utility relocations, mainly at street crossings. One potential underground utility relocation is at MP 28.0, just north of Grant Street in the City of Novato. All relocations will be “in place” and not expand outside of the proposed project footprint. The proposed project does not include any lighting. Plantings will be limited to grasses for soil retention and storm water pollution prevention.

Construction Footprint and Techniques

Unless otherwise noted in this section or in the “Pathway Alignment” section above, all construction activities will take place within the existing SMART ROW. All construction materials, including the prefabricated bridges, would be transported to the site via rail or trucks within public streets to the existing ROW.

No mandatory staging areas are included as part of the project footprint; prior to project construction, SMART will work with the contractor to identify staging areas most of which will be on properties already owned by SMART. In the south, staging may be at the vacant SMART parcel (formerly a proposed station site at MP 23.7). In the middle area of the proposed project, staging may be on the west side of tracks north of Payran Street (MP 39.3). In the north, staging may be on the west side of the tracks between 3rd Street and 6th Street (former railroad yard) (MP 53.7).

Table 3A. NMP retaining wall locations and dimensions in Marin County.

Number	Start Location (MP)	End Location (MP)	Approximate Length (feet)	Side of Pathway	Approximate Height (feet)
1	South of 20.2	20.2	75	East	3-5
2	South of 20.3	South of 20.3	52	East	3
3	Between 20.4 and 20.5	South of 20.6	721	East	3
4	Between 21.1 and 21.2	21.3	725	East	4
5	Between 21.3 and 21.4	Between 21.6 and 21.7	1510	East	3
6	North of 21.7	Between 21.8 and 21.9	774	East	3
7	North of 21.9	Just south of 22.1	916	East	5
8	Between 22.5 and 22.6	South of 22.7	602	East	3
9	Just south of 22.7	Between 23.3 and 23.3	2948 and 2 gaps	East	3
10	24.2	Between 24.3 and 24.4	803	West	4
11	Between 24.3 and 24.4	24.5	590	West	3
12	Between 24.6 and 24.7	24.7	209	East	4
13	South of 26	Between 26 and 26.1	358	West	11
14	South of 27	Between 27 and 27.1	229	West	2
15	South of 27.6	Just north of 27.7	675	West	2
16	Between 27.9 and 28	Between 28 and 28.1 (south of Olive Ave.)	899	West	2
17	Between 28.1 and 28.2	Between 28.2 and 28.4 (Ranch Rd.)	1122	West	3
18	Between 28.2 and 28.4	Just north of 28.5 (Rush Creek Dr)	795	West	4
19	Just north of 28.6	Between 28.6 and 28.7	330	West	4

Table 3B. NMP retaining wall locations and dimensions in Sonoma County.

Number	Start Location (MP)	End Location (MP)	Approximate Length (feet)	Side of Pathway	Approximate Height (feet)
20	South of 43.1	43.3 (Woodward Ave.)	834 (with 300-foot gap)	East	3
21	North of 43.3 (Woodward Ave.)	South of 43.3	370	East	3
22	Between 43.4 and 43.5	North of 43.5	476	East	3
23	North of 43.6 (Old Adobe Rd.)	Between 43.6 and 43.7	169	East	3
24	North of 43.7	43.8	400	East	3
25	Between 43.8 and 43.9	North of 43.9	473	East	3
26	North of 44	44.1	200	East	3
27	Between 44.2 and 44.3	North of 44.3	230	East	3
28	South of 50.3 (North of Todd Rd.)	50.3	76	East	3
29	Between 50.3 and 50.4	Between 50.3 and 50.4	100	East	3
30	Between 50.7 and 50.8 (South of W. Robles Ave.)	Between 50.7 and 50.8 (South of W. Robles Ave.)	52	East	3
31	South of 50.8 (North of W. Robles Ave.)	South of 50.8 (North of W. Robles Ave.)	57	East	3
32	Between 52.1 and 52.2 (North of Hearn Ave.)	Between 52.1 and 52.2 (North of Hearn Ave.)	46	East	4
33	South of 52.7	North of 52.7	120	East	2
34	53.6	53.6	59	East	3
35	53.6	53.6	59	West	3

Construction staging areas will utilize standard best management practices (BMPs) per the applicable water quality permits. Materials will be moved via rail or trucks driving within the rail ROW. Trucks will enter the rail ROW from public roads. The total footprint of the proposed staging areas is 7.48 acres; 4.74 acres at the north staging area, 1.00 acre at the middle staging area, and 1.75 acres at the south staging area.

The proposed project will likely be a net “fill” project, and fill would be obtained from commercially available sites. No borrow, fill, or disposal sites have been identified; the project specifications will require that the contractor comply with all environmental requirements and permits.

Construction equipment anticipated to be used includes: graders; bulldozers; backhoes; excavators; trucks to remove dirt and deposit base and asphalt; asphalt paving machines; compactors for base, soil, and asphalt; stripers; and concrete trucks and pumpers to pump concrete into forms.

Construction of the proposed project is expected to commence in 2015. The first segment to be constructed would most likely be three segments in Sonoma County, 6th Street to 8th Street, Santa Rosa (MP 53.8 to 54), Bellevue Avenue to Hearn Avenue (MP 51.3 to 52.2), and from Manor Drive to the Cotati Station (MP 45.6 to 46.1) with construction in 2015-2016; subsequent segments depend on availability of funding. For construction purposes, the proposed project may be separated into as many as 10-12 segments. Most segments will take one to two years for construction.

Conservation Measures

As part of the proposed project, SMART has committed to implementing the following conservation measures to avoid and minimize potential effects on the salt marsh harvest mouse, California clapper rail, California red-legged frog, Sonoma California tiger salamander, and their habitats.

General Conservation Measures

1. Daytime Work: Work will be restricted to daytime hours, noisy activities to be located away from sensitive noise receptors, and other noise minimization practices will be implemented.
2. Staging Areas: Construction access, staging, storage, and parking areas shall be located on ruderal or developed lands to the extent possible. Vehicle travel adjacent to wetlands and riparian areas shall be limited to existing roads and designated access paths. Sensitive natural communities (*i.e.*, wetlands, waters, riparian zones and oak woodlands) shall be conspicuously marked in the field to minimize impacts on these communities, and work activities shall be limited to outside the marked areas. Potential impacts to streams from activities at staging areas would be avoided by establishing buffer zones. The minimum distances for these buffer zones will be determined for each site during consultation with the Corps and CDFW.
3. Biological Monitors: Service-approved biologists shall monitor construction activities that could potentially cause significant impacts on sensitive biological resources. Before the start of work each morning, the biological monitor will check for salt marsh harvest mice, California red-legged frogs, and Sonoma California tiger salamanders under any equipment such as vehicles and stored pipes. The biological monitor will check under all equipment for California red-legged frogs and Sonoma California tiger salamanders after rain events. All construction activities will stop if a salt marsh harvest mouse, California clapper rail, California red-legged frog, or Sonoma California tiger salamander is observed within or near the work area. Work will not resume until the Service-approved biological monitor has determined that the listed animal has safely left the work area on its own volition. If a California red-legged frog or Sonoma California tiger salamander is observed within the work area and the listed amphibian will not leave the work area on its own volition, then the

Service-approved biological monitor may relocate the listed amphibian to suitable cover outside of the work area (any Sonoma California tiger salamanders will be translocated as described in Section 4.7.2 of the *Santa Rosa Plain Conservation Strategy* (Santa Rosa Plain Conservation Strategy Team 2005)).

4. Worker Education Program: A worker education program shall be developed and presented to all construction personnel before they start work on the proposed project. The program shall summarize relevant laws and regulations that protect biological resources, discuss sensitive habitats and special-status species with the potential to occur in the work zone, explain the role and authority of the biological monitors and review applicable avoidance and minimization measures to protect sensitive species and habitats.
5. Invasive Plant Species: During construction activities, the following measures shall be implemented to the extent feasible to reduce the spread of exotic invasive plants in temporary work areas and throughout the project corridor:
 - a. Minimize vehicle travel through weed-infested areas.
 - b. Minimize soil disturbance and the removal of existing vegetation (exotic or native) to the extent feasible during construction activities.
 - c. Use only certified weed-free straw and mulch or weed-free fiber roll barriers or sediment logs.
 - d. Use only certified weed-free native seed mixes and native plants that are appropriate to the pre-existing or adjacent natural habitat for revegetation.
 - e. At sites where restoration is required, remove pre-existing invasive species, such as *Arundo donax*, that are growing in the ROW.
 - f. SMART will develop and implement a Long-Term Invasive Plant Species Management Plan that will address control of noxious and invasive plant species and ongoing vegetation management along the NMP, which may be included as part of the revised draft Maintenance of Way Control Plan for the NMP (note: the Long-Term Invasive Plant Species Management Plan and Maintenance of Way Control Plan that SMART is developing for the NMP is separate from the Maintenance of Way Control Plan that SMART is developing for the ROW for the SMART railroad project (ICF International 2014b)). The Maintenance of Way Control Plan for the NMP will be submitted to the Service for their review and approval within six months of the beginning of construction of the first NMP segment. The Long-Term Invasive Plant Species Management Plan in the revised Maintenance of Way Control Plan will provide specific information on the proposed methods of revegetation and restoration for areas subject to temporary impacts, and will describe monitoring methods, performance criteria, and reporting requirements.

- g. Reseeding and replanting of areas of disturbed ground will conform to the Storm Water Pollution Prevention Plan (SWPPP) best practices outlined in Table 2 - Environmental Compliance Measures of the SMART Final Environmental Impact Report (SMART 2006). During construction, SMART will implement the measures described in the Mitigation Monitoring Plan of the SMART Final Environmental Impact Report to reduce the spread of invasive plant species and avoid the introduction of new invasive weeds.
6. Habitat Restoration Plan: SMART will develop a habitat restoration plan to replace impacted wetlands and waters. A separate habitat restoration plan will be prepared for the pathway (see the *Mitigation and Monitoring Plan for the SMART Project* in Appendix H in the Biological Assessment). Final mitigation ratios will depend on quality of sites impacted and location of mitigation lands (*i.e.*, on or off-site).
7. Wetland Mitigation: To replace impacted wetlands, a habitat restoration plan shall be developed and implemented.
8. Oak Woodland Mitigation: In areas where oaks or other protected trees cannot be avoided, SMART will replace trees removed with the same native tree species at a minimum 3:1 ratio, or as required by applicable ordinance(s). An oak woodland restoration plan shall be developed and provided to CDFW for concurrence. The plan shall include the total acreage of temporary and permanent impacts to all oak woodland habitat. Areas shall be mapped using aerial photographs and provided to CDFW for concurrence. All temporary and permanently disturbed areas shall be mitigated at a 1:1 ratio for creation and preservation of new oak woodlands or a 3:1 ratio for preservation of existing habitat. Sites should be maintained in perpetuity and managed under an approved management plan.
9. Wildlife Passage: In non-urban areas of the corridor that are not directly adjacent to Highway 101 and where a safety structure or wall is proposed to be installed between the proposed bicycle/pedestrian pathway and railway, intermittent gaps shall be placed along the barrier to allow passage of wildlife. These gaps shall be at least three feet wide, extending from ground level to the top of the structure, and be spaced no farther apart than every 0.25 mile where feasible within existing or potential wildlife movement corridors along the ROW. In addition to gaps, wildlife tunnels shall be installed at appropriate locations to facilitate the movement of animals across the safety structure. Gaps and tunnels shall be located between Main Gate Road (MP 23.6) and Smith Ranch Road (MP 21.0) in Marin County. Gaps shall not be located in or adjacent to urban or residential areas. To facilitate movement of amphibians and other small wildlife across the safety structure, its design shall include openings at the bottom that are approximately 6 to 8 inches in diameter.
10. Predator Management: SMART will develop a long-term predator management plan that will include regular enforcement of leash laws, litter laws and controls, and laws and measures to minimize straying off trail. The long-term predator management plan may be incorporated into SMART's revised Maintenance of Way Control Plan, which will be submitted to the Service for their review and approval within six months of the beginning of construction of the first NMP segment. SMART will post all major entrances to the NMP

with signs stating: “All dogs must be on leash at all times” and “It’s the Law” with reference to the applicable Municipal/County Code or Ordinance.

Water Quality BMPs

1. SMART will develop and implement a SWPPP to control potential surface erosion and sedimentation during construction and stabilize areas of ground disturbance after construction.
2. During construction, measures will be implemented to prevent and control the accidental release of hazardous materials into the aquatic environment. BMPs as prescribed in the SWPPP will also be used to stabilize the construction area and prevent sediments from reaching the aquatic habitat.
3. SMART will sample soils and groundwater for contaminants and establish appropriate BMPs to protect health and safety and for resource protection.
4. In-channel work (*e.g.*, culvert installation) will be conducted during dry conditions or low flows; dewatering diversions will be minimized and include appropriate fish screens, as needed. Also a qualified biological monitor will be present for all work immediately abutting wetlands and waters and for the restoration of wetlands and waters temporarily impacted by the proposed project. Temporary culverts and all construction materials and debris shall be removed from the affected area prior to reestablishing flow and prior to the rainy season.
5. Upon completion of the proposed project, all temporarily disturbed natural areas, including stream banks, shall be returned to original contours to the extent feasible. Affected wetlands, stream banks, or stream channels shall be stabilized prior to the rainy season and/or prior to reestablishing flow. For wetland areas, the top six inches of native topsoil should be stockpiled and replaced following work. Wetland and riparian vegetation shall be reestablished as appropriate.

Salt Marsh Harvest Mouse Measures

1. All fencing would be designed with 6 to 8-inch openings at the bottom to facilitate movement of salt marsh harvest mice, and occasional gaps in the fencing would occur at all major non-urban stream corridors, such as the north fork of Gallinas Creek.
2. All vegetation within potential habitat for the salt marsh harvest mouse within the project area and within a two-foot buffer around the project area shall be removed by hand using only non-mechanized hand tools (*i.e.*, trowel, hoe, rake, and shovel) prior to the initiation of work within these areas. Vegetation shall be removed to bare ground or stubble no higher than one inch. Vegetation shall be removed under the supervision of the Service-approved biologist. Vegetation removal may begin when no salt marsh harvest mice are observed and shall start at the edge farthest from the salt marsh or the poorest quality habitat and work its way towards the salt marsh or the better quality salt marsh habitat.

3. To prevent salt marsh harvest mice from moving through the proposed project site during construction, temporary exclusion fencing shall be placed around a defined work area prior to the start of construction activities. The temporary exclusion fencing shall be installed immediately after the hand removal of all vegetation (as described above) from the work area and a two-foot buffer around the work area. The fence shall be made of a heavy plastic sheeting material that does not allow salt marsh harvest mice to pass through or climb, and the bottom shall be buried to a depth of four inches so that the listed mouse cannot crawl under the fence. Fence height shall be at least 12 inches higher than the highest adjacent vegetation with a maximum height of four feet. All supports for the exclusion fencing shall be placed on the inside of the work area.
4. No work will occur within 50 feet of suitable tidal marsh habitat for the salt marsh harvest mouse during extreme high tide events (two hours before and after a high tide event of 6.5 feet or higher measured at the Golden Gate Bridge, adjusted to the timing of local high tide events) or when the adjacent marsh plain is flooded because this is when the mouse is most likely to approach the adjacent upland areas including the work area.
5. Temporary and permanent impacts to salt marsh habitat for the salt marsh harvest mouse habitat will be compensated at 2:1 and 3:1 ratios respectively. The permanent loss of 0.194 acre of ruderal/grassland habitat for the salt marsh harvest mouse (within 328 feet of suitable salt marsh habitat) will be compensated at a 1:1 ratio; the lower compensation ratio for permanent effects to low quality ruderal/grassland habitat is proposed by SMART since it will be replaced by preserving higher quality tidal marsh habitat. SMART proposes to achieve this through the preservation and management of suitable tidal marsh habitat for the salt marsh harvest mouse at SMART's Mira Monte Marsh Restoration Project site along the Marin-Sonoma county line and/or at the Phelan Conservation Area site in the Petlauma River Marshes in Sonoma County under a Service-approved long-term management plan (drafts of these plans are in ICF International 2014a, 2014c).
6. Raptor perch deterrents: SMART has designed fencing and sign posts to minimize perching opportunities for raptors and other avian predators. These design considerations and construction contract requirements include:
 - a. The top of sign posts shall not be exposed; post tops will terminate four to six inches below the tops of the sign panels, making the signs unsuitable raptor perches.
 - b. The number of tall (up to seven feet) sign posts that are established will be minimized, and they will be located only at intersections and roads. Only six to 10 signs of this height are proposed in areas around Las Gallinas Creek.
 - c. Non-regulatory signs (way-finding, informational, etc.) shall not exceed five feet in height and also will not have exposed post tops.
 - d. The lengths of safety fencing between the pathway and the railroad will be minimized, and the height will not exceed five feet except where required by the Federal Rail Authority or the California Public Utilities Commission. The five-foot

fences will not have a top rail, and with the exception of end posts, the top of posts will feature metal loops that make the fence undesirable as a raptor perch.

- e. Any new post or pole installed that has the potential to provide a raptor perch will be fitted with perch deterrents to discourage use by raptors.

California Clapper Rail Measures

1. All work within or near suitable habitat for the California clapper rail will be supervised by a Service-approved biological monitor. Caltrans will consult with the Service and SMART will consult with CDFW, as needed, for areas where construction would occur on or adjacent to potentially suitable habitat for California clapper rails, and implement all applicable protection measures specified through consultation. Protection measures include: biological monitoring near potential habitat; avoiding work during the California clapper rail's breeding season (January 15 to August 31) near suitable breeding habitat; implementation of temporary exclusion barriers; and locating staging and access away from salt and brackish marsh habitats.
2. No work will occur within 700 feet of suitable breeding habitat for the California clapper rail during the rail's breeding season (January 15 to August 31) unless protocol-level surveys determine the California clapper rail to be absent, and the Service has determined that no breeding California clapper rails will be disturbed.
3. No work will occur within 50 feet of suitable California clapper rail habitat during extreme high tide events (two hours before and after a high tide event of 6.5 feet or higher measured at the Golden Gate Bridge, adjusted to the timing of local high tide events) or when the adjacent tidal marsh is flooded.
4. Temporary and permanent impacts to California clapper rail habitat will be compensated at 2:1 and 3:1 ratios respectively. SMART proposes to achieve this through the preservation and management of suitable tidal marsh habitat for the California clapper rail at SMART's Mira Monte Marsh Restoration Project site along the Marin-Sonoma county line and/or at the Phelan Conservation Area site in the Petlauma River Marshes in Sonoma County under a Service-approved long-term management plan (drafts of these plans are in ICF International 2014a, 2014c).
5. SMART will install the raptor perch deterrents as described above in the "Salt Marsh Harvest Mouse Measures".

California Red-legged Frog Measures

1. All fencing will be designed with 6-inch to 8-inch openings at the bottom to facilitate California red-legged frog movements, and occasional gaps in the fencing will occur between MP 21.0 and MP 23.6 and at all major non-urban stream corridors. Three-foot-wide fence gaps will be spaced no more than 0.25 mile apart to provide California red-legged frog dispersal.

2. Retaining structures will be constructed of masonry units that are battered (not vertical), have rough surfaces for traction and are stepped every eight inches, making dispersal across structures easier for some wildlife including California red-legged frogs. This type of structure also allows the length and height of the structures to be minimized as the slope face of the wall can more closely mimic the natural terrain.
3. In wildlife corridors where the NMP is elevated above the natural grade, additional conduits will be constructed for California red-legged frog dispersal. The conduits will be 6 to 8 inches in diameter and spaced every 100 to 150 feet. Where the walls are uphill of the NMP, the walls will be laid back to provide a gentler slope where environmental and ROW constraints allow.
4. Work within 50 feet of suitable aquatic habitat for the California red-legged frog will be limited to dry periods from May 15 through October 31. No work will occur in these areas on days with a 40 percent chance or greater for rain when the California red-legged frog is most likely to be migrating through the action area. SMART will check the weather forecast the day before construction activities and the morning of construction activities.
5. Prior to any construction activities a qualified biologist shall conduct a preconstruction survey for California red-legged frog no more than 30 days prior to construction in suitable aquatic habitats within the action area. If a California red-legged frog is found near any proposed construction areas, impacts on individuals and their habitat shall be avoided and SMART will notify the Service immediately for guidance on how to proceed.
6. To prevent inadvertent entrapment of a California red-legged frog during construction, all excavated, steep-walled holes or trenches more than one foot deep will be covered at the close of each working day with plywood or similar material, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the onsite biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service will be contacted by telephone for guidance. The Service will be notified of the incident by telephone and email within one working day.
7. SMART will compensate at a 3:1 ratio for the permanent loss of 0.535 acre of potential California red-legged frog aquatic habitat and at a 3:1 ratio for the permanent loss of 3.471 acres of potential California red-legged frog upland habitat within 200 feet of potential aquatic habitat by purchasing 12.02 acres of credits at a Service-approved conservation bank for the California red-legged frog. Prior to purchase any credits shall be at a location approved by the Service.

Sonoma California Tiger Salamander Measures

1. All safety fencing will be designed with 6-inch to 8-inch openings at the bottom to facilitate movement by Sonoma California tiger salamanders and burrowing mammals, and gaps in the

fencing will occur at all major nonurban stream corridors. Three-foot-wide fence gaps will be spaced no more than 0.25 mile apart to provide Sonoma California tiger salamander dispersal.

2. In wildlife corridors where the NMP is elevated above the natural grade, additional conduits will be constructed for Sonoma California tiger salamander dispersal. The conduits will be 6 to 8 inches in diameter and spaced every 100 to 150 feet. Where the walls are uphill of the NMP, the walls will be laid back to provide a gentler slope.
3. SMART will comply with the *Santa Rosa Plain Conservation Strategy* (Santa Rosa Plain Conservation Strategy Team 2005) in non-urban areas within the range of the Sonoma California tiger salamander. Caltrans will consult with the Service, and SMART will consult with CDFW to obtain applicable incidental take permits, and will implement measures resulting from consultation. Likely measures would include: exclusion fencing, work windows during the dry season (and also avoiding rainy nights), and checking under equipment for individuals after rain events.
4. Minimization measures will be employed in design and construction of projects in or adjacent to conservation areas to reduce impacts to the Sonoma California tiger salamander, listed plants, wetlands, and hydrology of the surrounding areas. Design-related minimization measures include construction during the dry season, passageways/under-crossings for Sonoma California tiger salamander, curbing to exclude Sonoma California tiger salamanders from harmful areas, lighting designed to minimize off-road ground illumination, retaining the hydrologic characteristics of the surrounding area, and avoiding breeding habitat. Construction-related minimization measures will generally include the following, as appropriate, depending on the specific site situation:
 - a. A Service-approved biological monitor will be onsite each day during wetland restoration and construction, and during initial site grading of development sites where Sonoma California tiger salamanders have been found.
 - b. The biological monitor will conduct a training session for all construction workers before work is started on the proposed project.
 - c. Before the start of work each morning, the biological monitor will check for Sonoma California tiger salamanders under any equipment such as vehicles and stored pipes. The biological monitor will check all excavated steep-walled holes or trenches greater than one foot deep for any Sonoma California tiger salamanders. Sonoma California tiger salamanders will be removed by the biological monitor and translocated as described in Section 4.7.2 of the *Santa Rosa Plain Conservation Strategy* (Santa Rosa Plain Conservation Strategy Team 2005).
 - d. An erosion and sediment control plan will be implemented to prevent impacts of wetland restoration and construction on habitat outside the work areas.

- e. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to achieve the project goals. Routes and boundaries of the roadwork will be clearly marked prior to initiating construction/grading.
 - f. All foods and food-related trash items will be enclosed in sealed trash containers at the end of each day, and removed completely from the site once every three days.
 - g. No pets will be allowed anywhere in the project site during construction.
 - h. A speed limit of 15 miles per hour on dirt roads will be maintained.
 - i. All equipment will be maintained such that there will be no leaks of automotive fluids such as gasoline, oils, or solvents.
 - j. Hazardous materials such as fuels, oils, solvents, etc., will be stored in sealable containers in a designated location that is at least 200 feet from aquatic habitats. All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 200 feet from any aquatic habitat.
 - k. Grading and clearing will typically be conducted between April 15 and October 15, of any given year, depending on the level of rainfall and/or site conditions.
 - l. Proposed project areas temporarily disturbed by construction activities will be re-vegetated with native plants approved by the Service and CDFW.
5. SMART will compensate for the permanent loss of suitable, potentially occupied habitat for the Sonoma California tiger salamander consistent with the *Santa Rosa Plain Conservation Strategy*. Thus SMART will compensate at a 2:1 ratio for the permanent loss of 7.56 acres of Sonoma California tiger salamander habitat by purchasing 15.12 acres of credits from one of the approved mitigation banks within the Santa Rosa Plain Conservation Strategy planning area.

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 purposes of the effects assessment, the action area is defined as a 50-foot buffer around the 23-mile-long proposed project footprint and all associated staging and work areas.

Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analyses in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the salt marsh harvest mouse’s, California clapper rail’s, California red-legged frog’s, and Sonoma California tiger salamander’s range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of these species in the action area, the

factors responsible for that condition, and the relationship of the action area to the survival and recovery of these listed species; (3) the *Effects of the Proposed Project*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the salt marsh harvest mouse, California clapper rail, California red-legged frog, and Sonoma California tiger salamander; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on these species.

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

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

Adverse Modification Determination

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this biological opinion relies on four components: (1) the *Status of Critical Habitat*, which evaluates the range-wide condition of critical habitat for the Sonoma California tiger salamander in terms of primary constituent elements (PCE)s, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the *Effects of the Proposed Project*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units; and (4) *Cumulative Effects* which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the Sonoma California tiger salamander critical habitat are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of

currently unsuitable but capable habitat) to serve its intended recovery role for the Sonoma California tiger salamander.

The analysis in this biological opinion places an emphasis on using the intended range-wide recovery function of Sonoma California tiger salamander critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

Status of the Species and Critical Habitat

Salt Marsh Harvest Mouse

There are two subspecies of the salt marsh harvest mouse: the northern subspecies (*R. r. halicoetes*) and the southern subspecies (*R. r. raviventris*). Both subspecies are listed as endangered. The status of the salt marsh harvest mouse and information about its biology, ecology, distribution, and current threats is available in the *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Recovery Plan; http://www.fws.gov/sacramento/es/Recovery-Planning/Tidal-Marsh/es_recovery_tidal-marsh-recovery.htm; Service 2013a). Critical habitat has not been designated for this species.

California Clapper Rail

The status of the California clapper rail and information about its biology, ecology, distribution, and current threats is available in the Recovery Plan (http://www.fws.gov/sacramento/es/Recovery-Planning/Tidal-Marsh/es_recovery_tidal-marsh-recovery.htm; Service 2013a). Critical habitat has not been designated for this species. Recent genetic analyses of rail species resulted in a change in the common name and taxonomy of the large, “clapper-type” rails (*Rallus longirostris*) of the west coast of North America to Ridgway’s rail (*Rallus obsoletus*) (Maley and Brumfield 2013, Chesser *et al.* 2014). Thus the California clapper rail (*Rallus longirostris obsoletus*) is now referred to in the scientific community as the California Ridgway’s rail (*Rallus obsoletus obsoletus*). The change in the common name and taxonomy of the California clapper rail, however, does not change the listing status of the species.

California Red-Legged Frog

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813) (Service 1996). Critical habitat was designated for this species on April 13, 2006 (71 FR 19244) (Service 2006) with a special rule exception for routine ranching activities and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816) (Service 2010b). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). A Recovery Plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description: The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen

and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution: The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay Area and the Central California Coast. Isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (CDFW 2014).

Status and Natural History: California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, they also inhabit ephemeral creeks, drainages and ponds with minimal riparian and emergent vegetation. California red-legged frogs breed from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules or overhanging willows (Storer 1925, Hayes and Jennings 1988). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984).

Habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer including vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees (Fellers 2005). Sheltering habitat for California red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provides cover, such as animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5 mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site

to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al.* (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger *et al.* (2003) reported that non-migrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, i.e., California blackberry, poison oak and coyote brush. Dispersing frogs in northern Santa Cruz County traveled distances from 0.25-mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment in eastern Contra Costa County, Tatarian (2008) noted that a 57 percent majority of frogs fitted with radio transmitters in the Round Valley study area stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. This study reported a peak seasonal terrestrial movement occurring in the fall months associated with the first 0.2-inch of precipitation and tapering off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the base of trees or rocks, logs, and under man-made structures; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from 1 to 4 days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Upland refugia closer to aquatic sites were used more often and were more commonly associated with areas exhibiting higher object cover, *e.g.*, woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand resulted in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3½ to 7 months following hatching and reach sexual maturity 2 to 3 years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations can fluctuate from year to year; favorable conditions allow the species to have extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, the animal may temporarily disappear from an area when conditions are stressful (*e.g.*, during periods of drought, disease, etc.).

The diet of California red-legged frogs is highly variable; changing with the life history stage. The diet of the larval stage has been the least studied and is thought to be similar to that of other ranid frogs, which feed on algae, diatoms, and detritus (Fellers 2005; Kupferberg 1996a, 1996b, 1997). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific chorus frog, three-spined stickleback and, to a limited extent, California mice, which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult frogs varied in their feeding activity periods; juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination, feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Threats: Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs, and suggested that bullfrogs could prey on subadult California red-legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with California red-legged frog reproduction by eating adult male California red-legged frogs. Both California and northern red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; Jennings 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

The urbanization of land within and adjacent to California red-legged frog habitat has also affected the threatened amphibian. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks dispersal, and the introduction of predatory fishes and bullfrogs. Diseases may also pose a significant threat, although the specific effects of disease on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Chytridiomycosis and ranaviruses are a potential threat because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson *et al.* 2003; Lips *et al.* 2006). Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric threespine sticklebacks in northwestern California. Non-native species, such as bullfrogs

and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al.* 2006). Humans can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (*i.e.*, contaminated boots, waders or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease.

Recovery Plan: The Recovery Plan for the California red-legged frog identifies eight recovery units (Service 2002). The establishment of these recovery units is based on the determination that various regional areas of the species' range are essential to its survival and recovery. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of its range. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations. Thus when combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy identified within the Recovery Plan will allow for the recolonization of habitats within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

Sonoma California Tiger Salamander

The status of the Sonoma California tiger salamander and information about its biology, ecology, distribution, and current threats is available in the *Draft Recovery Plan for the Santa Rosa Plain* (http://ecos.fws.gov/docs/recovery_plan/Draft%20Recovery%20Plan%20for%20Santa%20Rosa%20Plain%20for%20publication%201-6-2015.pdf, Service 2014c).

Sonoma California Tiger Salamander Critical Habitat

On December 14, 2005, the Service concluded that the designation of critical habitat for the Sonoma County DPS of the California tiger salamander would have negative impacts on the finalization and implementation of the Santa Rosa Plain Conservation Strategy (70 FR 74137, Service 2005b; Santa Rosa Plain Conservation Strategy Team 2005); therefore, no critical habitat was designated for the Sonoma County DPS of the California tiger salamander in 2005. The Service agreed to re-propose critical habitat in settlement of a lawsuit, and further to complete its rule-making by July 1, 2011. On August 31, 2011, the Service designated approximately 47,383 acres of land as revised critical habitat for the Sonoma California tiger salamander in a single critical habitat unit (76 FR 54346, Service 2011).

Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, the Service determined that the PCEs specific to Sonoma California tiger salamanders are: (1) standing bodies of fresh water (including natural and manmade (*e.g.*, stock) ponds, vernal pools, and other ephemeral or permanent water bodies) that typically support inundation during winter and early spring, and hold water for a minimum of 12 consecutive weeks in a year of average rainfall; (2) upland habitats adjacent to and accessible from

breeding ponds that contain small mammal burrows or other underground refugia that the species depends upon for food, shelter, and protection from the elements and predation; and (3) accessible upland dispersal habitat between locations occupied by the species that allow for movement between such sites.

The Santa Rosa Plain Unit is the only designated critical habitat unit for the Sonoma California tiger salamander. This unit is located on the Santa Rosa Plain in central Sonoma County and contains approximately 47,383 acres, which includes 745 acres of State lands, 744 acres of city lands, 498 acres of county lands, 9 acres of individually owned tribal trust land, and 45,387 acres of private lands. No Federal lands are included in this unit. The unit is partially bordered on the west by the generalized eastern boundary of the 100-year Laguna de Santa Rosa floodplain, on the southwest by Hensley Road, on the south by Pepper Road (northwest of the City of Petaluma), on the east generally by and near Petaluma Hill Road or by the urban centers of Santa Rosa and Rohnert Park, and on the north by the Town of Windsor.

This unit is characterized by vernal pools, seasonal wetlands, and associated grassland habitat. This unit contains the physical and biological features essential to the conservation of the Sonoma California tiger salamander, and is within the geographical area occupied at the time of listing. The critical habitat unit supports vernal pool complexes and manmade ponds that are currently known to support breeding Sonoma California tiger salamanders (PCE 1), upland habitats with underground refugia (PCE 2), and upland dispersal habitat allowing movement between occupied sites (PCE 3). A segment of the 100-year floodplain that is located between the Stony Point Conservation Area (near Wilfred Avenue) and the Northwest Cotati Conservation Area (near Nahmens Road) is included within the final designation to prevent fragmentation of the northern and southern breeding concentrations within the unit, by allowing for potential dispersal and genetic exchange.

Environmental Baseline

Existing and Future Rail Operations and Noise Levels

The action area is mostly an existing railway corridor historically operated by the Northwest Pacific Railroad. The SMART ROW averages around 60 feet wide (ranges between 50 and 120 feet) and is generally characterized by disturbed conditions relative to drainage, soils, and vegetation, although many areas have become naturalized or vegetated over time. The existing rail is single-track, generally centered on the ROW width, with an occasional second track for passing sidings and wood timber bridges over waterways. In sections of the Marin County portion of the action area, the track is currently out of service and maintenance has been very limited until construction of the SMART IOS-1 South Project began in 2014 to provide frequent (every 30 minutes) passenger rail service between the cities of San Rafael and Petaluma (Service 2014a). In the Sonoma County portion of the action area, the track is in use and maintained to a Class II railroad providing freight service on a weekly basis; the frequency of use of the railroad will increase to every 30 minutes once construction of the SMART IOS-1 North Project is completed (Service 2012a, 2013b). Land uses include urban centers (Santa Rosa, Rohnert Park, Petaluma, Novato, San Ignacio, and northern San Rafael area), residential neighborhoods, agricultural lands (primarily agricultural pastures/ranches), and occasional parks and open space.

The existing ambient noise environment in the action area is primarily caused by the vehicle traffic along U.S. Highway 101 and adjacent roadways. Other noise sources in the action area include aircraft overflights, and infrequent (less than once per week) freight train operations in the Sonoma County portion. Noise measurements taken by Illingworth & Rodkin, Inc. for SMART in the Marin County portion of the action area and near the Petaluma River crossing indicate that average daily ambient noise levels range between 52 and 65 decibels with peak noise levels ranging between 67 and 88 decibels (M. Thrill, Illingworth and Rodkin, Inc., *in litt.* 2013). Once the SMART IOS-1 North, SMART IOS-1 South, and SMART Haystack Bridge Replacement projects are constructed, the introduction of frequent (every 30 minutes on weekdays) SMART passenger train traffic will result in an increase in noise above ambient conditions up to 55 feet from the center line of the SMART ROW (M. Thrill, Illingworth and Rodkin, Inc., *in litt.* 2013; Service 2012a, 2013b, 2014a, 2014b). The loudest noise anticipated from the SMART passenger train is estimated to be about 80.3 decibels (Service 2014a).

Sonoma County Portion (Petaluma – Santa Rosa)

The Sonoma County portion of the action area (MP 39.0 – MP 55.2) between the cities of Santa Rosa and Petaluma in Sonoma County is a broad northwest-southeast oriented valley (Coastal Hills-Santa Rosa Plain). This area is a combination of developed urban centers, suburban neighborhoods, and rural areas, some of which are currently undergoing development at a rapid rate. Scattered natural plant communities found along the corridor are primarily non-native grassland, oak woodland, riparian scrub, freshwater marshes, and seasonal wetlands. Vernal pools also occur within and adjacent to the action area in this region, which are characteristic of the Santa Rosa Plain ecosystem. The Santa Rosa Plain is home to the Sonoma California tiger salamander, California red-legged frog, and three endangered plant species. The Sonoma County portion of the action area occurs within the watersheds for the Petaluma River and Russian River and crosses the following 13 perennial and intermittent waterways: (1) Bellevue-Wilfred Flood Control Channel (tributary to Laguna de Santa Rosa) (MP 49.12); (2) Hinebaugh Creek (MP 47.54); (3) Copeland Creek (MP 46.97); (4) Lichau Creek (MP 44.37); (5) a tributary to Lichau Creek (MP 43.73); (6) a tributary to Lichau Creek (MP 43.41); (7) a tributary to Lichau Creek (MP 42.95); (8) a tributary to Lichau Creek (MP 42.73); (9) Willow Brook Creek (MP 42.42); (10) a tributary to Petaluma River (MP 41.07); (11) a tributary to Petaluma River (MP 40.2); (12) a tributary to Petaluma River (MP 39.9); and (13) Petaluma River (MP 39.74). All 13 of the waterway crossings in the Sonoma County portion are freshwater except for the Petaluma River crossing which is tidal.

Marin County Portion (San Rafael to Novato)

The Marin County portion of the action area (San Rafael to Novato) (MP 20.1 – MP 28.0) between the cities of San Rafael and Novato crosses an area that is less developed than the Sonoma County portion and primarily dominated by non-native grassland, freshwater marsh, brackish marsh, and coastal salt marsh. In this area, the action area passes through hills and valleys (Marin Hills and Valleys), primarily to the west, and San Pablo Bay flats (within Mount St. Helena Flows and Valleys) to the east. The Marin Hills and Valleys areas are primarily urban and suburban.

The Petaluma Marsh and San Pablo Bay Wildlife Areas occur just to the east-northeast of the action area in this area, protecting thousands of acres of mudflats, salt marsh, coastal oak woodland and

coastal scrub, including the largest remaining natural tidal brackish marsh in California. The Marin County portion of the action area contains suitable habitat for the salt marsh harvest mouse, California clapper rail, and California red-legged frog. The Marin County portion of the action area occurs within the San Pablo Bay watershed and crosses the following nine perennial and intermittent waterways: (1) the tidal Novato Creek (MP 26.93); (2) a dead end tidal slough surrounded by tidal marsh at Hannah Pond (MP 26.0); (3) the freshwater San Jose Creek (MP 24.81); (4) a freshwater tributary to Pacheco Creek (MP 24.37); (5) the freshwater Pacheco Creek (23.98); (6) a freshwater tributary to San Pablo Bay (MP 22.7); (7) a freshwater tributary to San Pablo Bay (MP 22.5); (8) the freshwater Miller Creek (MP 22.09); and (9) a tidal tributary slough to Gallinas Creek (MP 20.1).

Habitats within the Action Area

Table 4 below summarizes the acres of each habitat type that occur within the action area for the proposed project. A brief description of each habitat type is below.

Herbaceous Vegetation

Herbaceous vegetation communities within the action area include: wild oat grasslands, California broom grasslands, Harding grass swards, perennial rye grass fields, poison hemlock or fennel patches, knapweed and purple-flowered star-thistle fields, and cultivated oats fields. There are a total of about 99.48 acres of herbaceous vegetation community types within the action area. Wild oat grasslands (84.87 acres) are the dominant herbaceous community within the action area. Herbaceous vegetation communities within the Marin County portion of the action area that are within 328 feet of and contiguous with suitable brackish and salt marsh habitat for the salt marsh harvest mouse along the north and south forks of Gallinas Creek provide suitable foraging and dispersal habitat for the salt marsh harvest mouse (Service 2010a). Herbaceous vegetation communities throughout the action area that are within dispersal distance of suitable California red-legged frog breeding habitat provide suitable upland refugia, dispersal, and foraging habitat for California red-legged frogs. Herbaceous vegetation communities within the Sonoma County portion of the action area that are within dispersal distance of suitable Sonoma California tiger salamander breeding habitat provide suitable upland refugia, dispersal, and foraging habitat for Sonoma California tiger salamanders.

Freshwater Marshes and Seeps

Freshwater marshes and seeps communities within the action area include: pale spikerush marshes, white-root beds, cattail marshes, and California bulrush marsh. There are a total of about 6.91 acres of freshwater marshes and seeps within the action area. Freshwater marshes and seeps throughout the action area provide potential breeding or non-breeding aquatic habitat for the California red-legged frog. Freshwater marshes and seeps within the Sonoma County portion of the action area that hold water for at least 12 consecutive weeks in a year of average rainfall provide suitable breeding habitat for the Sonoma California tiger salamander.

Table 4. Habitats within the action area for the proposed project.

Vegetation Type¹	Biological Study Area (Acres)
<i>Herbaceous Vegetation</i>	
Wild Oats Grasslands	84.87
California Brome Grasslands	5.53
Harding Grass Swards	1.82
Perennial rye grass fields	7.06
Poison Hemlock or Fennel Patches	0.14
Knapweed and Purple-flowered Star-thistle Fields	<0.01
Cultivated Oats Fields	0.07
<i>Herbaceous Total</i>	99.48
<i>Marshes and Seeps</i>	
Pale Spikerush Marshes	0.22
White-root Beds	0.08
Cattail Marshes	0.75
California Bulrush Marsh	5.86
Pickleweed Mats	0.63
Perennial Pepper Weed Patches	2.10
<i>Marshes and Seeps Total</i>	9.65
<i>Shrublands</i>	
Coyote Brush Scrub	4.09
Himalayan Blackberry Brambles	2.99
<i>Shrublands Total</i>	7.07
<i>Woodland Vegetation</i>	
Valley Oak Woodland	5.23
Coast Live Oak Woodland	2.89
Arroyo Willow Thickets	2.22
Eucalyptus Groves	1.05
<i>Woodland Total</i>	11.40
<i>Other Non-Native Landscapes</i>	
Unvegetated	3.60
Ornamental	1.88
Developed Areas	86.78
Open Water	1.41
Total	221.29

Pale Spikerush Marshes

Pale spikerush marshes in the proposed project footprint are dominated by pale spikerush, with the native California semaphore grass and nonnative perennial rye grass as co-dominants. In these marshes, pale spikerush is present with at least 30 percent relative cover. This vegetation type is

present in the vernal pools that are scattered throughout the Sonoma County portion of the project footprint outside the Santa Rosa Plain, which extends from approximately MP 41.1 (Corona Road in Petaluma) to MP 44.4 (Lichau Creek in Penngrove). Pale spikerush marshes in the action area correspond most closely to the northern vernal pool or northern hardpan vernal pool community.

White-root Beds

White-root beds consist of nearly monotypic stands of white-root sedge. These are found in seeps in a few locations in the Sonoma County portion of the proposed project footprint. White-root beds in the action area correspond most closely to the freshwater seep community.

Cattail Marshes

Cattail marshes are dominated by cattails at greater than 50 percent relative cover in the herbaceous layer. In the proposed project footprint, cattail marshes are nearly monotypic stands of cattails found in drainages and ditches.

California Bulrush Marsh

California bulrush marsh is dominated by California bulrush at greater than or equal to 10 percent absolute cover in the herbaceous layer. Some cattails, common tule, and Himalayan blackberry are also present in this vegetation type. California bulrush marshes are present in a few locations in the Marin County portion of the proposed project footprint.

Tidal and Brackish Marshes

Tidal and brackish marshes within the action area include: California cordgrass marsh, pickleweed mats, and invasive perennial pepperweed patches. There are a total of about 2.73 acres of tidal and brackish marshes within the action area. Tidal and brackish marshes within the action area occur at the Novato Creek crossing, the Gallinas Creek tributary crossing, and the Hannah Pond crossing in Marin County and the Petaluma River crossing in southern Sonoma County. Tidal marshes provide suitable breeding, foraging, and dispersal habitat for salt marsh harvest mice and California clapper rails. Non-tidal brackish marshes provide suitable breeding, foraging, and dispersal habitat for salt marsh harvest mice.

California Cordgrass Marsh

California cordgrass marsh is dominated by California cordgrass at greater than 50 percent relative cover, with pickleweed co-dominant. Salt grass, alkali heath, jaumea, and curly dock are also present in this vegetation type. California cordgrass marsh is present along the lower edge of the salt marsh along the water's edge, below the pickleweed marsh (described below). This vegetation type occurs adjacent to the proposed project footprint in Marin County; beneath the deck of a proposed bridge where it would not be impacted. California cordgrass marsh within the action area provides suitable breeding, foraging, and dispersal habitat for salt marsh harvest mice and California clapper rails.

Pickleweed Mats

Pickleweed mats are dominated by pickleweed, with perennial pepperweed, alkali heath, and salt grass as common associates. In this vegetation type, pickleweed has at least 10 percent absolute cover. In the project footprint, pickleweed mats are present in the mid-elevation salt marsh, above the California cordgrass marsh. This vegetation type occurs in the project footprint in Marin County. Pickleweed mats within the action area provide suitable breeding, foraging, and dispersal habitat for salt marsh harvest mice and California clapper rails.

Perennial Pepperweed Patches

Perennial pepperweed patches are dominated by the nonnative perennial pepperweed with other nonnative species found in the wild oats grasslands. Absolute cover of perennial pepperweed in the herbaceous layer is at least 30 percent, and can be as high as 90 percent relative cover in the project footprint. Perennial pepperweed patches are found in the high-elevation salt marsh on slopes just above the pickleweed mats in the Marin County portion of the project footprint. Perennial pepperweed patches provide low quality high tide refugia habitat for salt marsh harvest mice and California clapper rails because perennial pepperweed is leafless in the winter when the mouse and the rail are in most need of suitable cover from predators during the more frequent winter storm and extreme high tide events.

Shrublands

Shrubland vegetation types within the action area include coyote brush scrub (4.99 acres) and Himalayan blackberry brambles (2.99 acres). Coyote brush scrub in the project footprint is dominated by coyote brush and underlain by a grassy herbaceous layer. Coyote brush scrub is found scattered throughout the project footprint, although it is more common in the Marin County portion. Himalayan blackberry brambles are dominated by nearly 100 percent cover of nonnative Himalayan blackberry vines. This vegetation type is scattered throughout the project footprint, commonly near waterways. Shrubland habitats provide suitable dispersal and foraging habitat for California red-legged frogs throughout the action area and suitable dispersal habitat for Sonoma California tiger salamanders in the Sonoma County portion of the action area.

Woodland Vegetation Types

Woodland vegetation types within the action area include valley oak woodland (5.23 acres), coast live oak woodland (2.89 acres), arroyo willow thickets (2.22 acres), and non-native eucalyptus groves (1.05 acres). Valley oak woodland occurs scattered throughout the action area in both uplands and occasionally along riparian corridors. Coast live oak woodland occurs scattered in a few locations throughout the action area, often near waterways. Arroyo willow thickets grow along creeks within the action area. Non-native eucalyptus groves occur planted widely as windbreaks and ornamental specimens throughout the action area. Woodland habitats provide suitable dispersal and foraging habitat for California red-legged frogs throughout the action area and suitable dispersal habitat for Sonoma California tiger salamanders in the Sonoma County portion of the action area. Valley oak woodland and coast like oak woodland habitats with small mammal burrowing activity in the

Sonoma County portion of the action area also provide suitable upland refugia habitat for Sonoma California tiger salamanders.

Unvegetated

Unvegetated areas are areas where recent construction in the SMART ROW had taken place or was currently taking place at the time of the survey. These areas are covered by bare dirt or gravel, and some have been hydroseeded and will be vegetated in the near future.

Ornamental

Ornamental areas include landscaped sidewalks and private properties. They may include any number of ornamental plant species; some that were observed include London planetrees, day lilies, oleander shrubs, and palm trees.

Developed Areas

Developed areas include human-made infrastructure such as buildings, roads and sidewalks, and the railroad (including the gravel berm). Roads may be bare dirt, gravel, or asphalt. Developed areas are present throughout the project footprint.

Jurisdictional Wetlands and Waters

There are a total of 15.92 acres of wetlands and 1.61 acres of other waters within the action area. Wetlands within the action area include: coastal brackish marsh (0.42 acre), coastal freshwater marsh (6.21 acres), coastal freshwater seasonal wetland (7.53 acres), coastal salt marsh (0.63 acre), seasonal wetland (0.91 acre), and restored wetland (0.21 acre). Other waters within the action area include seasonal watercourses (0.34 acre) and open water (1.27 acres). Some of the wetlands and other waters within the action area provide suitable habitat for the salt marsh harvest mouse, California clapper rail, California red-legged frog, and Sonoma California tiger salamander.

Salt Marsh Harvest Mouse

Recovery Plan's San Pablo Bay Recovery Unit

Parts of the Marin County portion of the action area for the proposed project occur within the Recovery Plan's San Pablo Bay Recovery Unit (Service 2013a). This recovery unit includes tideland habitats from Point San Pablo on the Contra Costa County coast and Point San Pedro, Marin County, to the Carquinez Strait at the Carquinez Bridge (Interstate 80). Limited populations of salt marsh harvest mouse exist within the San Pablo Bay Recovery Unit. This recovery unit is less altered by development at higher elevations than the Central/South San Francisco Bay Recovery Unit, so accommodation of rising sea level can be more readily achieved here, and accompanying increased salinity may enhance habitat conditions for the salt marsh harvest mouse. Population dynamics of salt marsh harvest mice in this recovery unit are likely decoupled from adjacent recovery units because of low dispersal relative to local recruitment (Service 2013a).

The action area occurs within the range of the northern subspecies of salt marsh harvest mouse (*R. r. halicoetes*). The fringing salt marshes along northern San Pablo Bay (Petaluma River to Mare Island Strait) support what is considered to be the largest population of the northern subspecies of salt marsh harvest mouse in San Pablo Bay (Service, unpubl. report). Outside of the Highway 37 and Mare Island marsh areas, there are other major centers of stable or large populations of the northern subspecies of salt marsh harvest mouse, including some parts of the Contra Costa County coastline and Petaluma River Marshes (Duke *et al.* 1990, Duke *et al.* 1991)). The northern subspecies is more widespread and patchy in distribution in both diked and tidal marshes than the southern subspecies (*R. r. raviventris*), although its densities may be very low outside of the Highway 37 and Mare Island marshes and the marshes of the Contra Costa County shoreline (Duke *et al.* 1990, Duke *et al.* 1991).

Occurrences near the Action Area

The salt marsh harvest mouse has the potential to occur in and adjacent to the action area in suitable tidal marsh and adjacent ruderal/grassland habitats in the vicinity of the south and north forks of Gallinas Creek between MP 20.1 and MP 20.9 at the southern extent of the Marin County portion of the proposed project. Nine occurrences of the salt marsh harvest mouse are documented in the California Natural Diversity Database (CNDDDB) within five miles of the action area (CDFW 2014). The closest CNDDDB occurrence of the salt marsh harvest mouse to the action area is at the mouth of Gallinas Creek about 1.06 miles east (downstream) of the SMART ROW's north fork and south fork Gallinas Creek crossings (CNDDDB occurrence number 30, CDFW 2014). Less than 0.2 acre of potentially suitable habitat occurs within the proposed project footprint along the east side of the ROW just south of MP 20.2 and at the proposed bridge site over the south fork of Gallinas Creek.

No surveys have been conducted for salt marsh harvest mouse recently within the action area. The San Francisco Estuary Institute (<http://www.sfei.org/content/salt-marsh-harvest-mouse-database-and-maps>) reports the following salt marsh harvest mouse survey data near the action area for the proposed project: 38 salt marsh harvest mice captured in tidal marsh habitat near the mouth of Gallinas Creek about 1.4 miles east (downstream) of the SMART ROW Gallinas Creek crossing MP 20.9 during trapping surveys in 1974, 1975, 1980, and 1981 (capture efficiency (CE) = 1 in 1974, 1975, and 1980; CE = 5.06 in 1981) (site numbers 33, 34, 119, and 139; Service, unpubl. data, 1975; CDFW unpubl. data, 1980; CH2M-Hill, unpubl. data, 1981). Based on the known occurrence of the salt marsh harvest mouse within the Gallinas Creek watershed near the action area, the Service considers the salt marsh harvest mouse to have a high potential to occur within all suitable tidal marsh and adjacent upland habitat (within 328 feet of suitable tidal marsh habitat) within the action area in the vicinity of the south and north forks of Gallinas Creek between MP 20.1 and MP 20.9.

The Recovery Plan includes the following two areas within the action area along the SMART ROW under the designation as potential future tidal marsh restoration (Segments F and G in Figures III-12 and III-13 on pp. 264-265 in Service 2013b): (1) along the east side of the SMART ROW between MP 21.3 and MP 23.5; and (2) along the east side of the SMART ROW between MP 20.4 and MP 20.6.

Mira Monte Compensation Site

The Mira Monte habitat compensation site for the salt marsh harvest mouse and California clapper rail occurs along the Marin-Sonoma county line. The Draft Mitigation and Monitoring Plan for the Mira Monte compensation site (ICF International 2014a) proposes to:

1. Restore/re-establish about 5.1 acres of tidal marsh habitat by removing structures and areas of fill to reestablish tidal hydrology and native plant communities;
2. Enhance about 10.9 acres of muted tidal marsh and seasonal wetland habitat by removing structures impeding tidal circulation and removing and controlling invasive plant species;
3. Preserve about 38.1 acres of existing tidal marsh habitat through deed restriction and limiting public access; and
4. Remove infrastructure in upland refugia on Burdell Island.

SMART is currently proposing that 2.5 acres of tidal wetlands re-establishment/restoration and 3.643 acres of tidal wetlands rehabilitation/enhancement at the Mira Monte property will be credited toward the SMART IOS-1 South Project (Service file number 08ESMF00-2013-F-0467-3, Service 2014a). An additional 7.634 acres of tidal marsh restoration/preservation at the Mira Monte property will be credited toward the SMART Haystack Bridge Replacement Project (Service file number 08ESMF00-2014-F-0077-1, Service 2014b; D. Sulouff, U.S. Coast Guard, *in litt.* 2014). Any surplus wetland mitigation credits for wetland restoration, enhancement, or preservation at the Mira Monte property will be proposed for future SMART projects. The tidal wetlands restoration, creation, re-establishment, and enhancement at the Mira Monte property were initiated in October 2014. The effects of the tidal marsh restoration and enhancement activities on listed species at the Mira Monte property are covered under the biological opinion for the SMART IOS-1 South Project (Service 2014a).

The Mira Monte tidal marsh restoration, enhancement, and preservation site occurs within the San Pablo Bay Recovery Unit (Service 2013a). The CNDDDB reports the occurrence of the salt marsh harvest mouse within the proposed Mira Monte tidal marsh preservation site north of the confluence of San Antonio Creek and the Petaluma River (occurrence number 18, CDFW 2014). The closest documented captures of the salt marsh harvest mouse (<http://www.sfei.org/content/salt-marsh-harvest-mouse-database-and-maps>; San Francisco Estuary Institute, undated) to the Mira Monte tidal marsh preservation site from trapping survey data are: (1) near the confluence of the mouth of Black John's Slough and the Petaluma River about 2.0 miles to the southeast (site number 301; WESCO, unpubl. data, 1987); and (2) near Neil's Island about 2.4 miles to the north-northeast (site number 12; D. Schaub, CDFW, unpubl. data, 1971). Based on the availability of suitable habitat within the proposed tidal marsh preservation site and the known occurrence of the salt marsh harvest mouse near the site, the Service believes the salt marsh harvest mouse is likely to occur within the proposed Mira Monte tidal marsh preservation site.

Phelan Conservation Area

The Phelan Conservation Area for the salt marsh harvest mouse and California clapper rail occurs within the Petaluma River Marshes near 4811 Redwood Highway near the City of Petaluma, Sonoma County. The proposed 20-acre Phelan Conservation Area is located within the San Pablo Bay Recovery Unit about 400 feet southeast of the Gambini Road crossing of the SMART ROW near MP 35 (Service 2014c). The Phelan Conservation Area contains existing tidal marsh habitat for the salt marsh harvest mouse and California clapper rail. A total of 15 acres of the 20-acre Phelan Conservation Area are proposed as salt marsh harvest mouse and California clapper rail habitat compensation for the SMART IOS-1 South Project (Service file number 08ESMF00-2013-F-0467-3, Service 2014a). The Service is currently in negotiations with SMART and the landowner of the Phelan Conservation Area regarding the long-term management requirements and endowment for the Phelan LTMP (Service 2014c). The CNDDDB reports the salt marsh harvest mouse as occurring within the proposed Phelan Conservation Area (occurrence number 18; CDFW 2014). Seven salt marsh harvest mice were captured in tidal marsh habitat about 1.2 miles to the southeast of the proposed Phelan Conservation Area near Neil's Island (<http://www.sfei.org/content/salt-marsh-harvest-mouse-database-and-maps>, site number 12; D. Schaub, CDFW, unpubl. data, 1971). Based on the availability of suitable habitat within the Phelan Conservation Area and the known occurrence of the salt marsh harvest mouse near the site, the Service believes the salt marsh harvest mouse is likely to occur within the proposed Phelan Conservation Area.

California Clapper Rail*Recovery Plan's San Pablo Bay Recovery Unit*

Parts of the Marin County portion of the action area for the proposed project occur within the Recovery Plan's San Pablo Bay Recovery Unit (Service 2013a). Estuary-wide surveys conducted between 2005 and 2008 show that the San Pablo Bay Recovery Unit contains 33 percent of the total range-wide California clapper rail population, with the highest densities at Gallinas Creek (western San Pablo Bay in Marin County) (PRBO Conservation Science 2009). This recovery unit is less altered by development at higher elevations than the Central/South San Francisco Bay Recovery Unit, so accommodation of rising sea level can be more readily achieved here, and accompanying increased salinity may enhance habitat conditions for the California clapper rail. Population dynamics of California clapper rails in this recovery unit are likely decoupled from adjacent recovery units because of low dispersal relative to local recruitment.

Small populations of California clapper rails are patchy and discontinuously distributed throughout San Pablo Bay in small isolated tidal marsh habitat fragments (Collins *et al.* 1994). Population densities of California clapper rails within tidal marsh of San Pablo Bay are generally considered low relative to other locations within the San Francisco Bay Estuary although populations of western San Pablo Bay have been increasing (Block 2010). California clapper rail breeding densities in the San Pablo Bay region in 1993 were 0.64 rail per acre in the Petaluma River marshes, 0.44 rail per acre at Sonoma Creek, and 0.57 rail per acre at the Napa River marshes (Collins *et al.* 1994). The highest numbers of California clapper rails in the San Pablo Bay region currently occur in South Gallinas and Hamilton Army Airfield marshes and at the mouth of Gallinas Creek in Marin County (Herzog *et al.* 2006). California clapper rails also occur along the Petaluma River (as far north as the U.S.

Highway 101 Bridge); the Strip Marsh West, Tolay Creek, Lower Tubbs Island, and Sonoma Creek units of the San Pablo Bay National Wildlife Refuge; and along most major tidal sloughs that empty into the Napa River (Collins and Evens 1992; Evens 2000a, 2000b; Block 2010; U.S. Geological Survey, unpubl. data). In 2004 there were between 84 and a few hundred pairs of California clapper rails in the San Pablo Bay region (Avocet Research Associates 2004). PRBO Conservation Science detected 313 California clapper rails within the San Pablo Bay region during surveys conducted in 2010 (PRBO Conservation Science 2011).

Occurrences within the Action Area

The California clapper rail is likely to occur in and adjacent to the action area in suitable tidal marsh habitats and adjacent transition zone habitat in the vicinity of the south and north forks of Gallinas Creek between MP 20.1 and MP 20.9 at the southern extent of the Marin County portion. A total of nine occurrences of California clapper rails are documented by the CNDDDB within five miles of the action area (CDFW 2014). The CNDDDB reports the California clapper rail as occurring within the action area from the north and south fork Gallinas Creek crossings of the SMART ROW downstream to the mouth of Gallinas Creek (CNDDDB occurrence number 62, CDFW 2014).

Protocol-level surveys along the SMART ROW in 2013 detected numerous California clapper rails in the Gallinas Creek watershed (Olofson Environmental, Inc. 2013). Between 12 and 16 California clapper rails were detected within 656 feet of the SMART ROW along the south and north forks of Gallinas Creek (MP 20.2 – MP 20.9) during protocol-level surveys in 2013 (Olofson Environmental, Inc. 2013). Several California clapper rail detections occurred within 200 and 500 feet east of the SMART ROW along the south fork of Gallinas Creek between MP 20.3 to MP 20.5; an additional three detections occurred within 600 feet east of the SMART ROW at Gallinas Creek (MP 20.9), one of which was immediately adjacent to the ROW along the south bank.

Occupied California clapper rail habitat occurs adjacent to the SMART ROW along the south fork of Gallinas Creek and along Gallinas Creek. Less than 0.1 acre of suitable, potentially occupied, habitat for the California clapper rail occurs within the proposed project footprint along the east side of the ROW south of MP 20.2 and at the proposed bridge site over the south fork of Gallinas Creek. Based on the known occurrence of the California clapper rail within the Gallinas Creek watershed near the action area, the Service considers the California clapper rail to have a high potential to occur within the action area in the vicinity of the south and north forks of Gallinas Creek between MP 20.1 and MP 20.9.

While documented California clapper rail records also occur near (within 0.5 mile) the Novato Creek crossing (MP 27.0) of the proposed project (CNDDDB occurrence number 6, CDFW 2014), conditions along Novato Creek within and adjacent to the action area are not suitable for California clapper rails due to regular vegetation maintenance and lack of suitable marsh vegetation along the banks upstream and downstream of the crossing; the banks here are managed levees. Therefore, the Service considers the California clapper rail to have a low potential to occur within the action area at the Novato Creek crossing.

Mira Monte Compensation Site

See the previous discussion of the Mira Monte compensation site under the Environmental Baseline section for the salt marsh harvest mouse. Five California clapper rails were detected within the proposed Mira Monte tidal marsh preservation site and three additional California clapper rails were detected within 700 feet of the proposed Mira Monte preservation site during protocol-level surveys conducted by Olofson Environmental, Inc. on March 3, 2014 (T. Engle, ICF International, pers. comm. 2014). Between two and three California clapper rails were observed along San Antonio Creek within 0.5 mile north of the proposed Mira Monte tidal marsh preservation site in 2011 (site number 58, PRBO Conservation Science 2012). One California clapper rail was observed along Mira Slough within 0.7 mile north of the proposed Mira Monte tidal marsh preservation site in 2011 (site number 60, PRBO Conservation Science 2012). Between 13 and 14 California clapper rails were observed about 1.2 miles southeast of the proposed tidal marsh preservation area in 2011 (site number 71, PRBO Conservation Science 2012). Based on the availability of suitable habitat within the proposed tidal marsh preservation site and the known occurrences of the California clapper rail within and near the site, the Service believes the California clapper rail is likely to occur within the proposed Mira Monte tidal marsh preservation site.

Phelan Conservation Area

See the previous discussion of the Phelan Conservation Area under the Environmental Baseline section for the salt marsh harvest mouse. The CNDDDB reports the California clapper rail as occurring within the proposed 20-acre Phelan Conservation Area (occurrence number 105; CDFW 2014). One California clapper rail was detected within the proposed Phelan Conservation Area and between four and six California clapper rails were detected within 700 feet of the proposed Phelan Conservation Area during protocol-level surveys in April 2013 (Olofson Environmental, Inc. 2013). Based on the availability of suitable habitat within the Phelan Conservation Area and the known occurrence of the California clapper rail within and near the site, the Service believes the California clapper rail is likely to occur within the proposed Phelan Conservation Area.

California Red-legged Frog*North Coast and North San Francisco Bay Recovery Unit*

All of the action area for the Marin County portion of the proposed project (MP 20.1 – MP 28.0) and the southern three-fifths of the action area for the Sonoma County portion of the proposed project (MP 39.0 - MP 48.3 south of the City of Rohnert Park) occur within the recovery plan's North Coast and North San Francisco Bay Recovery Unit for the California red-legged frog (Service 2002). This recovery unit has a high recovery status due to many existing populations and many areas of high habitat suitability. Threats to California red-legged frogs within this recovery unit include overgrazing, non-native species, urbanization, water management, water diversions, and reservoirs (Service 2002).

The action area for the proposed project does not occur within a core area for the California red-legged frog. The nearest core area to the Sonoma County portion of the SMART ROW is the Petaluma Creek-Sonoma Creek Core Area located about three miles east-southeast of MP 40. The

Petaluma Creek-Sonoma Creek Core Area was identified in the recovery plan as a core area for the California red-legged frog based on the area currently being occupied by California red-legged frogs, containing a source population of California red-legged frogs, and providing connectivity to other source populations (Service 2002). The conservation needs for the Petaluma Creek-Sonoma Creek Core Area identified within the recovery plan include the protection of existing populations; reducing impacts of urban development; and the protection, restoration, and/or creation of breeding and dispersal habitat for California red-legged frogs (Service 2002).

The nearest core area to the Marin County portion of the SMART ROW is the Point Reyes Peninsula Core Area located about three miles west of MP 25 (Service 2002). The Point Reyes Peninsula Core Area was identified in the recovery plan as a core area for the California red-legged frog based on the area currently being occupied and containing a source population of California red-legged frogs (Service 2002). The conservation needs for the Point Reyes Peninsula Core Area identified within the recovery plan include the protection of existing populations, controlling bullfrogs, and managing livestock and horse corrals to prevent nutrient loading problems (Service 2002).

Surveys within the Action Area

There are 18 CNDDDB occurrences of the California red-legged frog within five miles of the proposed project footprint (CDFW 2014). The closest occurrences of the California red-legged frog to the action area are: (1) about 1.5 miles southwest of the City of Petaluma (MP 39) in Marin and Kelly creeks and their associated tributaries in Sonoma County (CNDDDB occurrence numbers 653, 840, and 968; CDFW 2014); (2) about 2.0 miles west of the Lichau Creek crossing (MP 44) west of the community of Penngrove in Sonoma County (CNDDDB occurrence numbers 932, 1344; CDFW 2014); and (3) approximately 2.2 miles southeast of the City of Petaluma (MP 39) in Ellis Creek in Sonoma County (CNDDDB occurrence number 959; CDFW 2014).

No California red-legged frogs were observed during any of the previous survey efforts or field reconnaissance for the proposed project, although potentially suitable aquatic breeding habitat was identified in the proposed project footprint. The aquatic breeding habitat evaluated was found to vary in quality because of the presence of predatory species, physical limitations and isolation of the habitat, and barriers from known occurrences or other potentially suitable habitat (Appendix D in Caltrans 2014).

A total of about 0.592 acre of potential California red-legged frog aquatic habitat is present in the proposed project footprint including seasonal wetlands, ponds, and creeks. About 5.337 acres of suitable upland/dispersal habitat for the California red-legged frog occur within the proposed project footprint within 200 feet of potential aquatic habitat for the California red-legged frog. About 0.026 acre of suitable aquatic habitat and 0.997 acre of suitable upland/dispersal habitat for the California red-legged frog within the proposed project footprint overlap with the work and staging areas authorized for other SMART projects (*e.g.*, Service 2013b, 2014a).

Potentially suitable aquatic habitat was identified at 14 locations within and/or adjacent to the proposed project footprint; however, only seven of these locations have the potential to support California red-legged frogs (Table 5). All locations of potential California red-legged frog habitat

within and near the project footprint are somewhat to completely isolated from natural, unaltered habitat by development, highways, unsuitable tidal marshes, or a combination of all three.

No critical habitat for the California red-legged frog is present in the action area. The closest designated critical habitat units to the action area are units SON-3, SON-2, and SON-1 in Sonoma County (Service 2010). The SON-3 critical habitat unit is located about 1.4 miles southwest of MP 38 (Service 2010). The SON-2 critical habitat unit is located about 3.2 miles east of MP 40-46. The SON-1 critical habitat is located about 4.9 miles east of MP 51.5 (Service 2010).

Table 5. Potential California red-legged frog aquatic habitat within the action area (continues on next page).

Mile Post	Habitat Type	Habitat Characteristics	Potential for California Red-legged Frog Occurrence
21.35	Seasonal wetland	Seasonal pond located in an actively grazed pasture/grassland. The pond held water at the time of the survey (May 28, 2013) with a 6-foot diameter. No riparian or emergent vegetation was present; margins were vegetated with grass, hoof marks and other evidence of heavy cattle grazing were observed. No predatory species were observed.	No Potential. Feature does not provide habitat due to short hydroperiods.
21.40-21.45	Seasonal wetland	Pond located approximately 600 feet from the existing rail line measured approximately 130 by 40 feet and was dry on May 28, 2013. No riparian or emergent vegetation was present; margins were vegetated with grass; hoof marks and other evidence of heavy cattle grazing were observed. No predatory species were observed. No riparian or emergent vegetation was present; margins were vegetated with grass; hoof marks and other evidence of heavy cattle grazing were observed. No predatory species were observed.	Low Potential. Seasonal wetland is of sufficient size and ponding duration to support CRLFs. This habitat feature has been surveyed multiple times for CRLF with negative results, and is isolated from known occurrences by highways and development.
21.55	Seasonal wetland	Seasonal wetland is located adjacent to west side of the existing rail line. Feature measures approximately 120 feet long by 40 feet wide at its widest point. No predatory species were observed.	Low Potential. Seasonal wetland has sufficient ponding duration to support CRLFs. Feature is isolated from known occurrences by highways and development.
21.70	Seasonal wetland	The existing rail line crosses immediately above this seasonal wetland, which was dry during the May 28, 2013 visit. The seasonal wetland measured approximately 80 by 20 feet, with a primarily dirt margin, some blackberry growing under rail crossing, and no emergent or riparian vegetation. This location was surveyed during the 2004 and 2009 protocol surveys.	No Potential. This habitat has too short of a hydroperiod to support CRLFs, and is isolated from known occurrences by highways and development.
22.10	Perennial stream	Miller Creek. This small creek appears to be perennial, although it had intermittent flow and dry sections during the May 28, 2013 survey. The creek is heavily incised, with an approximately 15-foot bankfull width and was up to 3-4 feet deep in pools with extensive overhanging vegetation and some undercut banks. This location was surveyed during the 2004 and 2009 protocol surveys.	Low Potential. This habitat feature has been surveyed multiple times for CRLFs with negative results, and is isolated from known occurrences by highways and development.
22.70	Agricultural ditch	Located west of the existing rail line, and between the rail line and a large mobile home park and townhome developments. Bullfrogs were observed. A culvert runs under the existing rail line and forms a small pool before turning into an agricultural ditch. The culvert pool was approximately 2.5 feet deep, with overhanging and emergent vegetation.	Low potential. This habitat feature is currently occupied by bullfrog, and is isolated from known occurrences and other natural habitats by highways and development.

Table 5. Potential California red-legged frog aquatic habitat within the action area (continues on next page).

Mile Post	Habitat Type	Habitat Characteristics	Potential for California Red-legged Frog Occurrence
22.75	Ponds (2)	The two ponds appear to hold perennial water; the larger of the two (70-foot diameter, 4-foot depth) has a cattail margin and supports riparian vegetation. Adult bullfrogs were observed in both features, with Pacific treefrog tadpoles were observed in the small pond, and bullfrog tadpoles were observed in the larger pond.	Low potential. These habitat features are currently occupied by bullfrog, and are isolated from known occurrences and other natural habitats by highways and development.
22.85	Seasonal wetlands (2)	Two seasonal wetlands located west of the rail alignment. Bullfrogs were observed within both features at the time of surveys.	Low potential. These habitat features are currently occupied by bullfrog, and are isolated from known occurrences and other natural habitats by highways and development.
23.95	Perennial creek	Pacheco Creek. In the ROW, the creek has cement walls, pool habitat with moderate algal growth, and some emergent vegetation.	No Potential. The area of Pacheco Creek within the ROW and immediate vicinity is concrete lined, and does not offer suitable habitat for CRLFs, and is isolated from known occurrences by highways and development.
24.30	Perennial drainage	This location is immediately behind a shopping center; an existing bridge crosses a tributary to Pacheco Creek. The tributary daylight at this location and flows into a riparian woodland meeting up with Pacheco Creek. Extensive vegetation and limited pool habitat are present as the tributary meets with Pacheco Creek.	No Potential. Feature is too shallow to support CRLFs. This habitat feature is isolated from known occurrences and natural habitats by highways and development.
24.80	Perennial creek	San Jose Creek. This creek is approximately 25 feet bankfull width with mixed substrate including boulders, cobble, and gravel. Extensive overhanging vegetation, and instream habitat complexity with rootballs in pools (up to 4 feet deep) and undercut banks. Bluegill (<i>Lepomis macrochirus</i>) observed.	No potential. Habitat is highly isolated and surrounded by development. Predatory fish observed in feature.
26.10	Pond	West of the rail line and just north of the bridge over the Hanna Ranch Slough is a large pond (600-foot diameter) with emergent vegetation and riparian cover on the margins.	No Potential. This habitat is connected to the Hanna Ranch Marsh, and consequently is too saline to support CRLF. The feature is completely isolated from known occurrences and natural habitats by highways and development.
39.60	Seasonal wetland	Small seasonal wetland with willows on margin. The seasonal wetland measures approximately 150 by 50 feet and is up to 3 feet deep, with some open grasslands and riparian habitat along the Petaluma River to the north and east. This location is relatively close (approximately 1.8 miles) to a known CRLF occurrence, but could be isolated by residential and other urban development.	Low Potential. This habitat feature is isolated from known occurrences and natural habitats by development.

Table 5. Potential California red-legged frog aquatic habitat within the action area (continued from previous pages).

Mile Post	Habitat Type	Habitat Characteristics	Potential for California Red-legged Frog Occurrence
42.40 - 44.40	Perennial creek	Lichau Creek. This perennial creek has extensive riparian cover, riffle, pool, and glide habitats, and runs both immediately adjacent to the ROW and separated from the ROW by various developments over 2 miles. To the east of the ROW and creek are some non-developed habitats including fields and grasslands, a couple of small drainages with some riparian or overstory cover, and some shallow seasonal wetlands.	Low Potential. This habitat feature is isolated from known occurrences by highways and development, and is essentially a narrow strip of potentially suitable habitat surrounded by unsuitable habitat and development.

Based on the known occurrences of the California red-legged frog and availability of suitable aquatic breeding habitat within dispersal distance (two miles) of the action area, the Service believes the California red-legged frog is likely to occur within suitable aquatic and upland/dispersal habitats within the Sonoma County and Marin County portions of the proposed project.

Sonoma California Tiger Salamander

There are 73 CNDDDB occurrences of the Sonoma California tiger salamander within 3.1 miles of the proposed project footprint and 33 CNDDDB occurrences within 1.24 miles of the proposed project footprint (CDFW 2014, Caltrans 2014). The digital data from the Santa Rosa Plain Conservation Strategy include occurrence information for 145 observations in the Conservation Strategy study area, as well as 17 known breeding locations within 1.3 miles (*i.e.*, dispersal distance) of the proposed project footprint (14 of which are also listed in the CNDDDB (CDFW 2014)). The closest occurrences and known breeding locations to the proposed project footprint are located within designated critical habitat between MP 44.2 and MP 45.2 and between MP 48.7 and MP 53.3.

Figure 2 below shows the location of the action area within the Santa Rosa Plain Conservation Strategy area. No Sonoma California tiger salamanders were documented during field surveys, but potentially suitable aquatic, upland, and dispersal habitat was identified in the Sonoma County section of the proposed project footprint. The Sonoma California tiger salamander is not expected to occur within the Marin County section of the proposed project because this section is outside of the species' known range. The Sonoma County section of the proposed project is generally centered within the densely developed portions of the Santa Rosa Plain; however, some undeveloped and potentially suitable habitats are located within and adjacent to the proposed project footprint between the cities of Rohnert Park and Santa Rosa, and south of the City of Cotati. The suitable habitat locations are primarily within the Sonoma California tiger salamander's designated critical habitat but also occur within or adjacent to the Stony Point Conservation Area, between the cities of Rohnert Park and Santa Rosa, and the Southeast Cotati Conservation Area, south of the City of Cotati. The action area for the proposed project bisects the Southeast Cotati Conservation Area between MP 44.2 and MP 45.2 (Figure 2). The action area follows along (within 100 – 300 feet of) the southeastern boundary of the East Cotati Management Area of the *Draft Recovery Plan for the Santa*

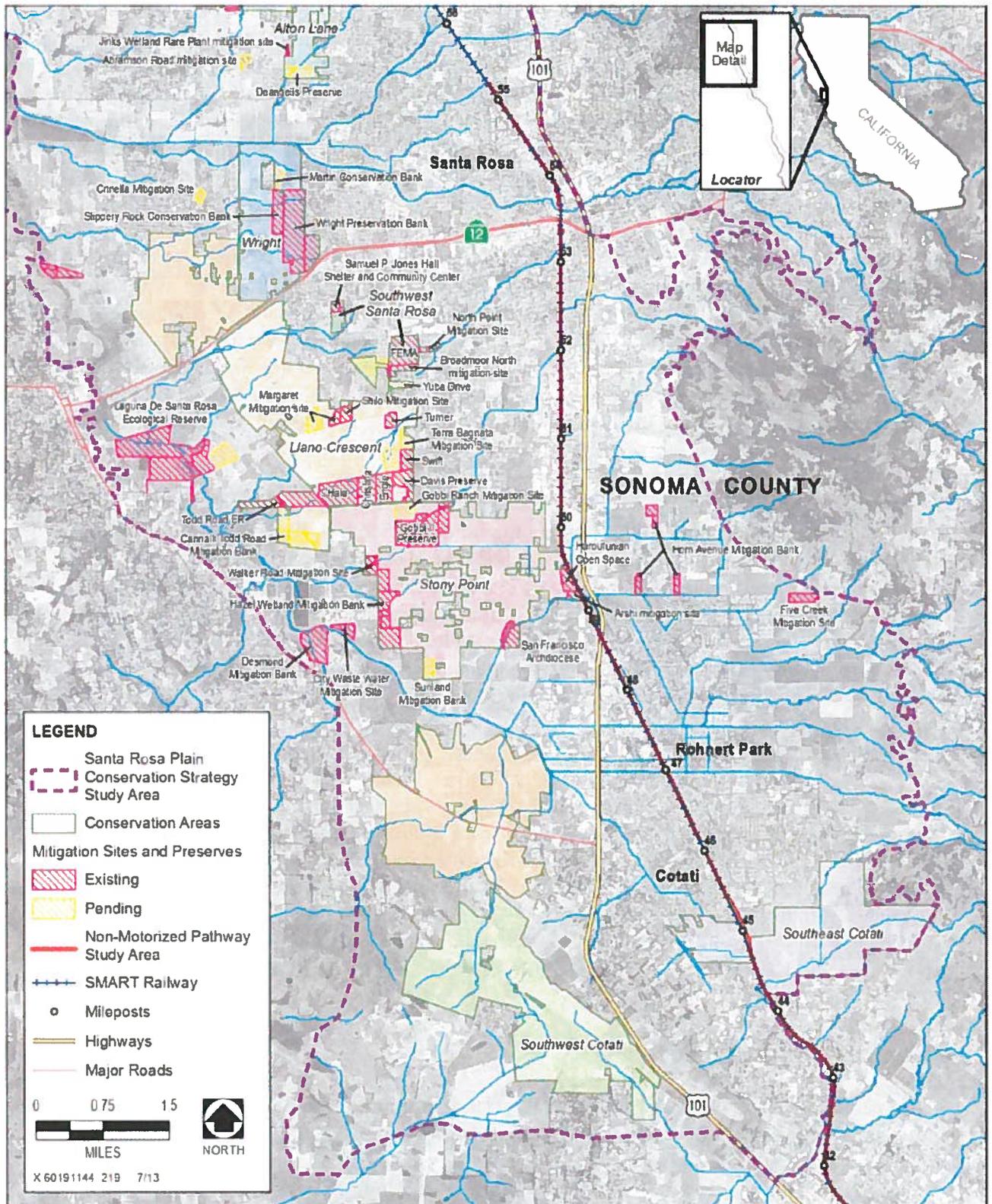


Figure 2. Santa Rosa Plain Conservation Strategy Area (Figure 3 in Appendix E of Caltrans 2014).

Rosa Plain between MP 42 and MP 44 (Service 2014c). The action area follows along the eastern boundary of the Stony Point Conservation Area between MP 49.1 and MP 49.8 (Figure 2). Additionally occupied suitable aquatic, upland, and dispersal habitats for the Sonoma California tiger salamander exist within 1.3 miles of the proposed project footprint. There are 17 known breeding locations within 1.3 miles of the proposed project footprint. Although some of these locations are isolated from the proposed project footprint, many—particularly those within the critical habitat and conservation areas—are contiguous with potentially suitable habitat within the proposed project footprint.

The Biological Assessment and revised information provided by Caltrans and SMART estimate that a total of about 0.119 acre of suitable aquatic habitat (including seasonal wetlands and ditches) and 8.59 acres of suitable upland/dispersal habitat for the Sonoma California tiger salamander are present in the proposed project footprint (Caltrans 2014; B. Gamlen, SMART, *in litt.* 2014; T. Holstein, Caltrans, pers. comm. 2015). About 1.146 acres of suitable upland/dispersal habitat within the proposed project footprint overlap with the work and staging areas authorized for other SMART projects (*e.g.*, Service 2013b; B. Gamlen, SMART, *in litt.* 2014; T. Holstein, Caltrans, pers. comm. 2015).

The analysis of areas of suitable Sonoma California tiger salamander habitat conducted for the Biological Assessment was based on the boundaries of the Santa Rosa Plain Conservation Strategy, designated critical habitat, and the *Draft Recovery Plan for the Santa Rosa Plain* (Santa Rosa Plain Conservation Strategy Team 2005; Service 2011, 2014c). Based on the known occurrences of the Sonoma California tiger salamander near the action area and the availability of suitable habitat within the action area, the Service considers the Sonoma California tiger salamander to have a high potential to occur within the 8.71 acres of suitable habitat within the action area that occur in the Santa Rosa Plain Conservation Strategy area in Sonoma County.

Sonoma California Tiger Salamander Critical Habitat

A total of about 9.7 acres of designated Sonoma California tiger salamander critical habitat occur in the Sonoma County portion of the proposed project footprint between approximately MPs 44.2-45.2 and MPs 48.7 – 53.3 (Figure 3). Within designated critical habitat, about 0.119 acre of the proposed project footprint contains suitable aquatic habitat (PCE 1) and about 8.585 acres contain suitable upland/dispersal habitat (PCE 2/PCE 3). About 1.146 acres of PCE 2/PCE3 within the proposed project footprint overlap with the work and staging areas authorized for other SMART projects (*e.g.*, Service 2013b; B. Gamlen, SMART, *in litt.* 2014; T. Holstein, Caltrans, pers. comm. 2015).

Effects of the Proposed Project

Implementation of the proposed project will result in temporary and permanent, and direct and indirect impacts associated with the following primary project activities: pathway construction (including retaining walls and safety fences); bridge construction; installation, replacement, and extension of drainage culverts; site access and staging; and long-term pathway use.

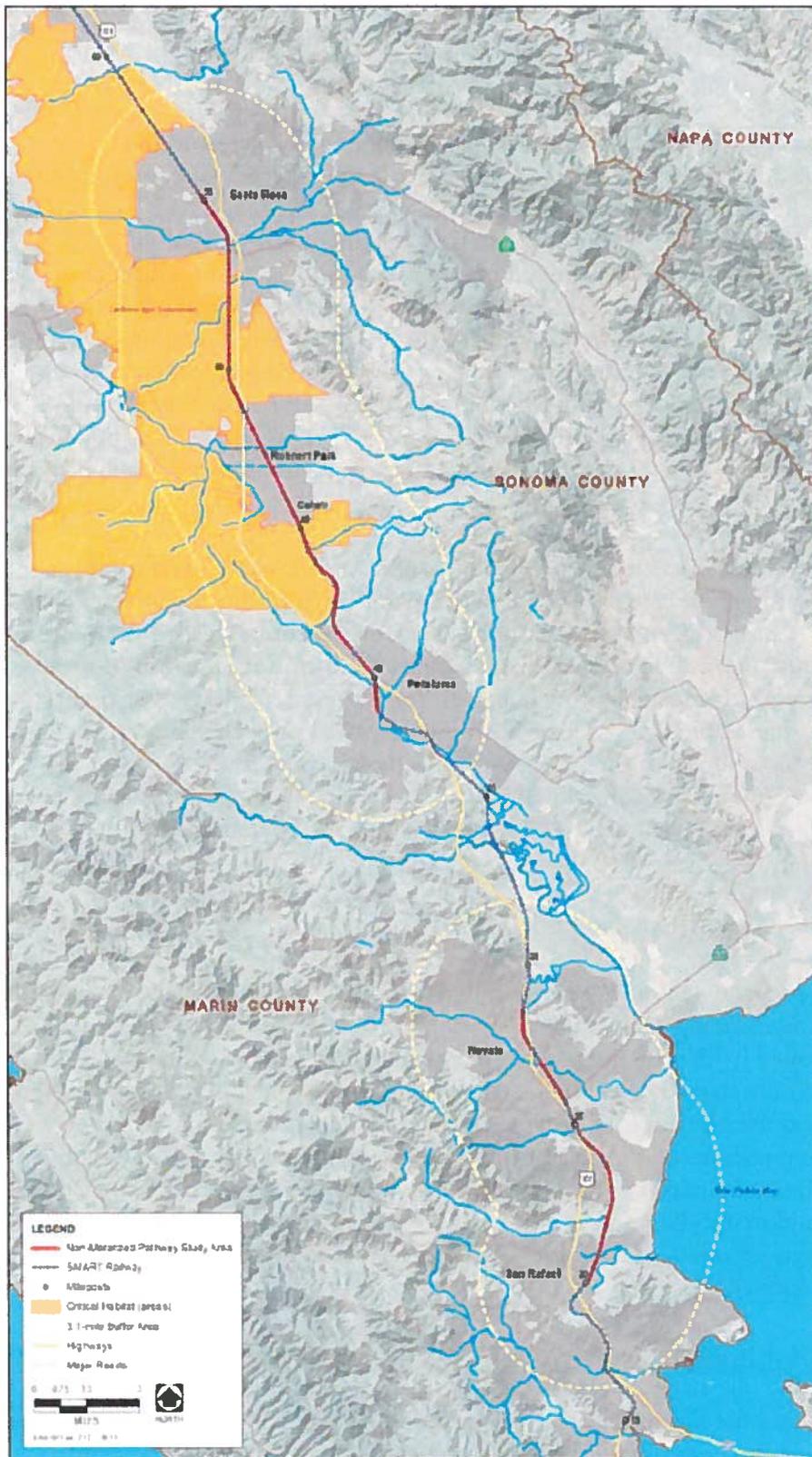


Figure 3. Sonoma California tiger salamander critical habitat within the action area (Caltrans 2014).

Salt Marsh Harvest Mouse and California Clapper Rail

Habitat Disturbance

The proposed project will result in the temporary disturbance of about 0.002 acre and the permanent loss of about 0.009 acre of suitable tidal marsh habitat for the salt marsh harvest mouse and California clapper rail in the vicinity of the south and north forks of Gallinas Creek between MP 20.1 and MP 20.9. The proposed project will also result in the permanent loss of about 0.194 acre of suitable upland foraging/dispersal habitat for the salt marsh harvest mouse that is adjacent to (within 328 feet of) the tidal marsh along the south and north forks of Gallinas Creek. These habitats will be disturbed or filled as a result of pathway construction, including a retaining wall near MP 20.2, and from construction of bridge abutments for the proposed south fork Gallinas Creek bridge (MP 20.1). These actions will remove suitable cover used by the salt marsh harvest mouse and California clapper rail for nesting, foraging, and sheltering. Proposed project areas temporarily disturbed by construction activities will be re-vegetated with native plants under a Service-approved revegetation plan.

SMART will compensate for the disturbance of suitable habitat for the salt marsh harvest mouse and California clapper rail by preserving at least 0.225 acre of suitable high quality tidal marsh habitat for the mouse and the rail at the Mira Monte property or Phelan Conservation Area within the San Pablo Bay Recovery Unit. This land will be protected and managed for the conservation of these species in perpetuity. The protected lands will provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. These lands will help maintain the geographic distribution of these species and will contribute to the recovery of these species by increasing the amount of habitat that is secure from development threats and the other factors that threaten these species that can be addressed by habitat protection and management.

Direct Effects to Individuals

Any salt marsh harvest mice occurring within the proposed project area during pathway construction, installation of the retaining walls, and construction of the bridge abutments could be injured or killed by being crushed by the use heavy equipment within the marsh. Individual salt marsh harvest mice and California clapper rails may be displaced by noise and vibrations associated with construction activities and the operation of heavy equipment within and adjacent to suitable marsh habitat. Displaced salt marsh harvest mice and California clapper rails may have to compete for resources in occupied habitat and may be more vulnerable to predators. Disturbance of female salt marsh harvest mice from March to November may cause abandonment or failure of the current litter. Displaced salt marsh harvest mice may suffer from increased predation, competition, mortality, and reduced reproductive success.

The type and severity of effect depends on several factors, including the intensity and characteristics of the sound, the distance of the salt marsh harvest mice and California clapper rails from the source, the timing of actions, and the frequency and duration of the noise-generating activities. The range of effects potentially includes behavioral effects, physiological stress, physical injury, and

mortality. The level of effects from construction noise would be exacerbated if the construction work occurred during the California clapper rail's breeding season. California clapper rails are especially sensitive to noise disturbance during the rail's February 1 – August 31 breeding season (Albertson 1995). However, SMART will minimize the potential for disturbing breeding California clapper rails by avoiding work within 700 feet of suitable breeding habitat during the rail's breeding season (including the rail's early pair bonding period January 15 – January 31) unless protocol-level surveys determine that California clapper rails are absent from the action area. SMART will also avoid construction work at night.

Salt marsh harvest mice and California clapper rails are also most sensitive to disturbance during extreme high tide events when cover is limited. This is when the salt marsh harvest mice and California clapper rails are most vulnerable to predation and when the mouse and the rail are most likely to approach the upland habitats near the work area to seek cover that is not flooded. SMART will minimize the potential for disturbing salt marsh harvest mice and California clapper rails during extreme high tide events by avoiding work within 50 feet of suitable tidal marsh habitat within two hours before and after an extreme high tide event or when the marsh plain is flooded.

SMART will minimize the potential for injury and mortality of salt marsh harvest mice and reduce the level of disturbance during construction activities within suitable salt marsh harvest mouse habitat by having a Service-approved biological monitor supervise the removal of all vegetation within a two-foot buffer around the work area by hand tools to bare ground or stubble no higher than one inch. Vegetation removal will proceed in a manner that passively herds salt marsh harvest mice into adjacent areas of suitable habitat outside of the work area. The Service-approved biologist will then supervise the installation of salt marsh harvest mouse-proof exclusion fencing around the work areas immediately after the vegetation is cleared.

A Service-approved biological monitor will be onsite during all construction activities within or adjacent to potential habitat for the salt marsh harvest mouse and California clapper rail. Prior to construction activities, environmentally sensitive areas will be flagged or fenced in order to clearly delineate the extent of the construction. A worker awareness program will be presented to all construction personnel before they start work on the proposed project; the program will summarize relevant laws and regulations that protect biological resources, discuss sensitive habitats and listed species with the potential to occur in the work zone, explain the role and authority of the biological monitors, and review applicable avoidance measures to protect listed species and habitats.

SMART will minimize the potential for attracting predators of the salt marsh harvest mouse and California clapper rail to the work area by enclosing all foods and food-related trash items in sealed trash containers and removing the trash from the site at the end of each workday.

Train operations along the SMART ROW between the cities of Novato and San Rafael were discontinued 20 years ago. Thus California clapper rails within the action area along the SMART ROW within the Gallinas Creek tidal marshes are not currently exposed to noise and visual disturbance from train operations. During the week of August 5, 2013, Illingworth and Rodkin, Inc. evaluated ambient noise levels at 10 sites near potential California clapper rail breeding habitat and known California clapper rail occurrences along the SMART IOS-1 South Project ROW (M. Thrill,

Illingworth & Rodkin, Inc., *in litt.* 2013). Average ambient noise levels (L_{dn}) at the 10 sites ranged from 51 to 66 decibels with the lowest ambient noise levels occurring near Gallinas Creek (MP 20.85) (M. Thrill, Illingworth & Rodkin, Inc., *in litt.* 2013). The loudest instantaneous noise levels (L_{max}) at the 10 sites ranged from 77 to 99 decibels with the lowest L_{max} occurring at the two sites within the Gallinas Creek watershed (MP 19.90 and MP 20.85) (M. Thrill, Illingworth & Rodkin, Inc., *in litt.* 2013). Once the SMART IOS-1 South Project is constructed, the introduction of frequent SMART passenger train traffic (every 30 minutes on weekdays) will result in an increase in ambient noise extending up to 55 feet from the center line of the SMART ROW (M. Thrill, Illingworth and Rodkin, Inc., *in litt.* 2013; Service 2014a). The loudest noise anticipated from the SMART passenger train is estimated to be about 80.3 decibels (Service 2014a). Thus California clapper rails within 55 feet of the SMART ROW within the Gallinas Creek watershed (MP 20.2 – MP 20.9) will experience an increase in noise levels above ambient conditions with the introduction of frequent SMART passenger train traffic. California clapper rails are particularly sensitive to noise disturbance during the rail's breeding season. For example, Albertson (1995) documented a California clapper rail abandoning its territory in Laumeister Marsh in south San Francisco Bay shortly after a repair crew worked on a nearby transmission tower. The rail did not establish a stable territory within the duration of the breeding season. As a result of this territorial abandonment, the opportunity for successful reproduction during the breeding season was eliminated. Thus the introduction of frequent SMART passenger train traffic through the Gallinas Creek marshes may result in California clapper rails abandoning breeding territories near the SMART ROW; however, it is possible that some California clapper rails may acclimate to the frequent train traffic. SMART intends to promote the recovery of the California clapper rail by preserving and managing in perpetuity suitable tidal marsh habitat for the California clapper rail within the Petaluma River marshes at the Phelan Conservation Area and Mira Monte property in Sonoma and Marin counties, respectively (Service 2014a).

Invasive Plant Species

The proposed project has the potential to degrade salt marsh harvest mouse and California clapper rail habitat through the introduction of invasive weeds during proposed project construction and later through NMP traffic. Invasive weeds, such as perennial pepperweed, could spread into marsh habitats when seeds are attached to vehicles, equipment, clothing, and bicycles. The spread of perennial pepperweed and other invasive plants can displace native marsh vegetation and lower habitat quality for salt marsh harvest mice and California clapper rails by reducing the amount of plants they use for refugia, foraging, and nesting, such as marsh gumplant and pickleweed. Perennial pepperweed provides poor upland refugia cover because the plant is leafless in the winter when the salt marsh harvest mouse and California clapper rail are in most need of suitable upland refugia cover during the more frequent winter extreme high tides and storm events. Without suitable upland refugia cover, the salt marsh harvest mouse and California clapper rail are more vulnerable to predation during extreme high tide events. SMART will implement standard practices to minimize the potential for the spread of invasive plant species during proposed project implementation. SMART will also implement a Service-approved onsite revegetation and monitoring plan with invasive plant species control, annual reporting, photo documentation, and success criteria to ensure the temporary disturbance areas revegetate with suitable native plant species. SMART will also implement a Service-approved Long-Term Invasive Plant Species Management Plan to minimize the effects of the continued introduction and spread of invasive plant species by NMP pathway users.

Contamination of Marsh Habitat

Construction activities within and near suitable tidal marsh habitat for the salt marsh harvest mouse and California clapper rail could result in the contamination and degradation of the marsh if appropriate measures are not taken to reduce the potential for a spill of fuel or other hazardous materials. Salt marsh harvest mice and California clapper rails could be directly injured or killed if exposed to hazardous chemicals. The spill of fuel or other hazardous materials into suitable marsh habitat could also indirectly affect the salt marsh harvest mouse and California clapper rail by killing or stunting the growth of vegetation that they utilize for foraging, sheltering, or nesting or by reductions in the rail's invertebrate prey base. SMART will minimize the potential for the contamination of the marsh during construction of the proposed project by implementing water quality BMPs, a hazardous materials management/fuel spill containment plan, and a SWPPP. Contaminants and pollutants could also enter the marsh through ongoing traffic along the NMP pathway; however, since only non-motorized traffic will be allowed on the pathway, the potential for the spill of fuel or other hazardous chemicals is reduced.

Other Indirect Effects of Long-term NMP Pathway Use

Long-term use of the NMP pathway may result in human or domestic animal encroachment on adjacent habitat for the salt marsh harvest mouse and California clapper rail, increases in ambient noise levels (but this is likely to be minimal relative to the adjacent railway and existing residential development), spread of invasive or noxious weeds, an increase in mammalian and avian predators, and an increase in litter or other pollutants in adjacent areas. Salt marsh harvest mice and California clapper rails may be disturbed by pathway users and their dogs causing the mice and rails to avoid adjacent areas or to abandon nests in these areas. However, it is possible that some salt marsh harvest mice and California clapper rails may acclimate to the presence of pathway users.

Salt marsh harvest mice and California clapper rails are most vulnerable to disturbance and predation during extreme high tide events when suitable unsubmerged cover is limited; this is also when the mouse and the rail are most likely to approach the upland areas along the NMP to seek cover that is unsubmerged. Pathway users and their dogs using the NMP during an extreme high tide event could flush salt marsh harvest mice and California clapper rails from suitable high tide refugia cover or prevent the mice and rails from seeking suitable cover near the NMP thereby increasing their risk of predation. Litter left by NMP users along the pathway may attract mammalian and avian predators which may prey on the salt marsh harvest mice and California clapper rails in the adjacent marsh. Installation of the pathway may also increase mammalian predator access to tidal marsh and upland refugia habitat for the salt marsh harvest mouse and California clapper rail; however, the existing SMART ROW currently provides access for mammalian predators. Fencing and tall signs installed along the pathway may provide artificial perches for raptors that may prey on salt marsh harvest mice and California clapper rails in the adjacent marsh.

Studies of 108 radio-collared California clapper rails at four marshes in central and southern San Francisco Bay over 166 weeks between 2007 and 2009 found that most of the California clapper rails (53 percent) died due to predation with raptors depredating 30 individual California clapper rails

(28 percent) and mammals depredating 27 individual California clapper rails (25 percent) (Overton *et al.* 2014). Thus predation is one of the primary causes of mortality of the California clapper rail in the Central/South San Francisco Bay Recovery Unit. It is not known how significant a threat predation is to California clapper rails and salt marsh harvest mice within the San Pablo Bay Recovery Unit. However, based on the location of the tidal marsh within the action area adjacent to a residential area, the introduction of NMP user traffic and litter along the pathway, and the lack of a significant upland refugia buffer between the marsh and developed areas, the Service believes that predation is likely to be a significant threat to salt marsh harvest mice and California clapper rails within the action area. Additionally, there are no predator management plans currently in place for the benefit of salt marsh harvest mice and California clapper rails within the San Pablo Bay Recovery Unit. Installation of the NMP is likely to increase the amount of predation on salt marsh harvest mice and California clapper rails within the action area.

SMART will reduce the potential for predation by raptors by installing raptor perch deterrents on all signs and fences near tidal marsh habitat for salt marsh harvest mice and California clapper rails. SMART will also develop and implement a long-term predator management plan that includes regular enforcement of leash laws, litter laws and controls, and laws and measures to minimize straying off trail. The plan will be incorporated into SMART's revised Maintenance of Way Compliance Plan, which will be submitted to the Service for review and approval within six months of the initiation of construction of the proposed project. SMART will also implement a Service-approved long-term invasive plant species control plan to control invasive weeds like perennial pepperweed within the ROW that displace high quality upland refugia cover for salt marsh harvest mice and California clapper rails.

Barriers to Salt Marsh Harvest Mouse Dispersal

The movement or dispersal of individual salt marsh harvest mice would not be expected to be restricted by the proposed safety fencing. The proposed project is designed to include 6 to 8-inch gaps along the bottom of fencing that would permit salt marsh harvest mouse movement. Non-motorized traffic along the pathway is unlikely to restrict salt marsh harvest mice dispersal across the pathway because the traffic would occur primarily during the daytime when salt marsh harvest mice are less active. However, the installation of a 52-foot-long retaining wall at MP 20.2 and a 75-foot long retaining wall at MP 20.3 could restrict salt marsh harvest mice dispersal across these sections of the action area. The installation of these barriers to salt marsh harvest mouse dispersal may result in a reduction in foraging activities and the ability of salt marsh harvest mice to access upland refugia cover during extreme high tides and flooding events. These barriers however are not likely to significantly reduce gene flow among populations of salt marsh harvest mice since the mice would still be able to disperse around the 52-foot-long and 75-foot long retaining walls. SMART will reduce the potential for the retaining walls to act as a barrier to salt marsh harvest mouse dispersal by constructing the retaining structures of masonry units that are battered (not vertical), have rough surfaces for traction and are stepped every eight inches, making dispersal across structures easier for salt marsh harvest mice.

California Red-legged Frog

Habitat Disturbance

Table 6 below summarizes the estimates of the amounts of suitable aquatic habitat, upland refugia habitat (within 200 feet of aquatic habitat), and upland/dispersal habitat (more than 200 feet from aquatic habitat) for the California red-legged frog that occur within the NMP footprint that will be new disturbance versus that which overlaps with the disturbance footprint authorized for other SMART rail projects (B. Gamlen, SMART, *in litt.* 2014; Service 2013b, 2014a). The proposed project will result in the permanent loss of about 0.535 acre of suitable aquatic habitat for the California red-legged frog (note: a total of about 0.592 acre of aquatic habitat occurs within the proposed project footprint but 0.026 acre overlaps with the temporary habitat disturbance footprint and 0.031 acre overlaps with the permanent habitat loss footprint authorized for other SMART projects, therefore, only 0.535 acre would be new disturbance) (B. Gamlen, SMART, *in litt.* 2014; Service 2013b, 2014a). The proposed project will result in the permanent loss of about 3.471 acres of suitable upland refugia habitat for the California red-legged frog that occurs within 200 feet of potential aquatic habitat (note: a total of about 5.337 acres of upland refugia habitat occurs within the proposed project footprint within 200 feet of aquatic habitat but 0.997 acre overlaps with the temporary habitat disturbance footprint and 0.869 acre overlaps with the permanent habitat loss footprint authorized for other SMART projects, therefore, only 3.471 acres would be new disturbance of upland refugia habitat) (B. Gamlen, SMART, *in litt.* 2014; Service 2013b, 2014a). The proposed project will also result in the permanent loss of about 3.312 acres of potential upland dispersal habitat for the California red-legged frog that occurs more than 200 feet away from potential aquatic habitat (note: a total of about 4.957 acres of upland dispersal habitat occurs within the proposed project footprint more than 200 feet from aquatic habitat but 0.65 acre overlaps with the temporary habitat disturbance footprint and 0.995 acre overlaps with the permanent habitat loss footprint authorized for other SMART projects, therefore, only 3.312 acres would be new disturbance of upland dispersal habitat) (B. Gamlen, SMART, *in litt.* 2014; Service 2013b, 2014a). Proposed project areas temporarily disturbed by construction activities will be re-vegetated with native plants under a Service-approved revegetation plan.

Bishop *et al.* (2014) demonstrated through stable isotopic analysis of the stomach contents of California red-legged frogs the importance of riparian and upland habitats to post-metamorphic California red-legged frogs with 90 percent of their prey from terrestrial sources. However, Bulger

Table 6. California red-legged frog habitat disturbance for the proposed project and overlap with other SMART rail projects.

Habitat Type	Total Acres within NMP Footprint	Acres of New Disturbance (no overlap with SMART rail impact area)	Acres of Overlap with SMART Rail Temporary Impact Area	Acres of Overlap with SMART Rail Permanent Impact Area
Aquatic Habitat	0.592	0.535	0.026	0.031
Upland Refugia Habitat (within 200 feet of aquatic habitat)	5.337	3.471	0.997	0.869
Upland/Dispersal Habitat (more than 200 feet from aquatic habitat)	4.957	3.312	0.65	0.995

et al. (2003) reported that non-migrating California red-legged frogs typically stay within 200 feet of aquatic habitat more than 90 percent of the time. Only a small amount of potential low quality breeding habitat for the California red-legged frog will be disturbed by the proposed project. Therefore, the disturbance of about 0.535 acre of suitable aquatic habitat and 3.471 acres of upland refugia habitat within 200 feet of aquatic habitat will remove habitat the California red-legged frog utilizes primarily for foraging, dispersing, sheltering, and aestivating. The disturbance of about 3.312 acres of upland dispersal habitat that is more than 200 feet from potential aquatic habitat will primarily affect only dispersing California red-legged frogs.

SMART will compensate for the loss of 0.535 acre of suitable aquatic habitat and 3.471 acres of suitable upland refugia habitat (within 200 feet of aquatic habitat) for the California red-legged frog by purchasing 12.02 acres of California red-legged frog credits from a Service-approved conservation bank for the California red-legged frog. This land will be protected and managed for the conservation of the species in perpetuity. The protected lands will provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. These lands will help maintain the geographic distribution of this species and will contribute to the recovery of this species by increasing the amount of habitat that is secure from development threats and the other factors that threaten this species that can be addressed by habitat protection and management.

The permanent placement of fill and installation of new drainage culverts could alter downstream hydrology or otherwise affect flows into or out of adjacent wetlands and waters, potentially affecting adjacent habitat quality; but these effects would be minimized because the proposed project is designed to maintain existing drainage patterns across the ROW.

Direct Effects to Individuals

Any California red-legged frogs occurring within the proposed project area during pathway construction, installation of the retaining walls, construction of the bridge abutments, and installation of drainage culverts could be injured or killed by being crushed by heavy equipment or the movement of soil. Any California red-legged frogs hiding or aestivating in burrows could be injured or killed if the burrows were collapsed during construction activities. Individual California red-legged frogs may be displaced by noise and vibrations associated with construction activities and the operation of heavy equipment within and adjacent to suitable habitat. Displaced California red-legged frogs may have to compete for resources in occupied habitat, and may be more vulnerable to predators. Thus, displaced California red-legged frogs may suffer from increased predation, competition, mortality, and reduced reproductive success.

The level of disturbance of individual California red-legged frogs may vary depending on the type of equipment being used; different pieces of equipment have different noise levels and, thus, cause more or less disturbance. Noise and vibrations may result in displacement of California red-legged frogs from protective cover and their territories. These disturbances are likely to disrupt normal behavior patterns of breeding, foraging, sheltering, and dispersal. SMART will minimize the potential for injury and mortality of California red-legged frogs and reduce the level of disturbance by having a Service-approved biologist conduct a pre-construction survey for California red-legged frogs prior to construction in suitable aquatic habitats within the project area. If California red-legged frogs are found near any proposed construction areas, impacts on individuals and their habitat will be minimized, and SMART will contact the Service immediately for guidance on how to proceed. A Service-approved biological monitor will be onsite during all construction activities within or adjacent to potential habitat for the California red-legged frog. Prior to construction activities, environmentally sensitive areas will be flagged or fenced in order to clearly delineate the extent of the construction. A worker awareness program will be presented to all construction personnel before they start work on the proposed project; the program will summarize relevant laws and regulations that protect biological resources, discuss sensitive habitats and listed species with the potential to occur in the work zone, explain the role and authority of the biological monitors, and review applicable avoidance measures to protect listed species and habitats.

SMART will minimize the potential for disturbing breeding and dispersing California red-legged frogs by restricting work within 50 feet of suitable aquatic habitat for the California red-legged frog to dry periods during the dry season (May 15 – October 15) and days with a less than 40 percent chance of rain. All work will occur during the daylight hours to minimize the potential for injuring or killing California red-legged frogs at night when the frog is most active. All foods and food-related trash items will be enclosed in sealed trash containers and removed from the site at the end of each workday to prevent attracting predators to the work site.

To prevent inadvertent entrapment of a California red-legged frog during construction, all excavated, steep-walled holes or trenches more than one foot deep will be covered at the close of each working day with plywood or similar material, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the onsite biologist will immediately place escape ramps or other appropriate structures to allow the

animal to escape, or the Service will be contacted by telephone for guidance. The Service will be notified of the incident by telephone and email within one working day.

Contamination of Aquatic Habitat

Construction activities within and near suitable aquatic habitat for the California red-legged frog could result in the contamination and degradation of the habitat if appropriate measures are not taken to reduce the potential for a spill of fuel or other hazardous materials. California red-legged frogs could be directly injured or killed if exposed to hazardous chemicals. The spill of fuel or other hazardous materials into suitable habitat could also indirectly affect the California red-legged frog by reducing availability of its prey. SMART will minimize the potential for the contamination of aquatic habitat during construction of the proposed project by implementing water quality BMPs, a hazardous materials management/fuel spill containment plan, and a SWPPP. Contaminants and pollutants could also enter aquatic habitat through ongoing traffic along the NMP pathway; however, since only non-motorized traffic will be allowed on the pathway, the potential for the spill of fuel or other hazardous chemicals is reduced.

Barriers to California Red-legged Frog Dispersal

The movement or dispersal of individual California red-legged frogs would not be expected to be restricted by the proposed safety fencing. The proposed project is designed to include 6 to 8-inch gaps along the bottom of fencing that would permit California red-legged frog movement. Non-motorized traffic along the pathway is unlikely to restrict California red-legged frog dispersal across the pathway because the traffic would occur primarily during the daytime and during dry periods when California red-legged frogs are less active. However, the installation of 35 retaining walls along a combined total of about 3.42 miles (15 percent) of the 23-mile-long NMP (Table 3A-3B) would likely restrict California red-legged frog dispersal across sections of the action area. The dimensions of the retaining walls will vary from about 52 to 2,948 feet in length and from about 2 to 11 feet in height (with most retaining walls 3-4 feet in height).

Eight retaining walls totaling about 0.6 mile in length will be installed along about 50 percent of a potential California red-legged frog dispersal corridor between MP 43.1 – MP 44.3 north of the City of Petaluma where the SMART ROW parallels Lichau Creek for about 1.2 miles (Table 3B). There are two CNDDB occurrences of the California red-legged frog within dispersal distance about 1.8 miles west of this portion of the action area (CNDDB occurrences numbers 932, 1344; CDFW 2014). Thus installation of the retaining walls near Lichau Creek and within other potential California red-legged frog dispersal corridors may reduce the ability of California red-legged frogs to access suitable aquatic habitat within and near the action area. California red-legged frogs could desiccate or be eaten by predators if the retaining walls or other barriers within the ROW kept them from accessing suitable aquatic habitat or other suitable cover. California red-legged frogs could also be injured or killed by bicycle or train traffic if the retaining walls or other barriers along the ROW resulted in frogs being trapped along the NMP or SMART railroad. These barriers however are not likely to significantly reduce gene flow among populations of California red-legged frogs since most frogs would still be able to disperse around the retaining walls. Additionally, California red-legged frogs are likely to disperse under the NMP pathway through culverts or under bridge crossings.

SMART will reduce the potential for the retaining walls to act as a barrier to California red-legged frog dispersal by constructing the retaining structures of masonry units that are battered (not vertical), have rough surfaces for traction and are stepped every eight inches, making dispersal across structures easier for California red-legged frogs. Additionally, in wildlife corridors where the NMP is elevated above the natural grade, additional conduits will be constructed to assist in California red-legged frog dispersal. The conduits will be 6 to 8 inches in diameter and spaced every 100 to 150 feet. Where the walls are uphill of the NMP, the walls will be laid back to provide a gentler slope.

Other Indirect Effects of Long-term NMP Pathway Use

Long-term use of the NMP pathway may result in human or domestic animal encroachment on adjacent habitat for the California red-legged frog, increases in ambient noise levels (but this is likely to be minimal relative to the adjacent railway and existing residential development), spread of invasive or noxious weeds, and an increase in litter or other pollutants in adjacent areas. Increases in litter along the pathway may attract predators which may prey on California red-legged frogs in adjacent habitat. California red-legged frogs may be disturbed by pathway users and their dogs causing the frogs to avoid adjacent areas. California red-legged frogs could also be injured or killed by bicycle traffic along the pathway. However, since California red-legged frogs are primarily crepuscular or nocturnal, pathway users would be less likely to utilize the pathway when the California red-legged frog is most active (*e.g.*, rainy nights). SMART will minimize the potential for predation on California red-legged frogs by implementing a long-term litter cleanup program along the NMP. SMART will also minimize the potential for the spread of invasive weeds into California red-legged frog habitat by implementing a long-term invasive plant species control program along the NMP and SMART ROW.

Sonoma California Tiger Salamander

Habitat Disturbance

The proposed project will result in the permanent loss of about 0.119 acre of suitable aquatic breeding habitat (including seasonal wetlands and ditches) and about 7.439 acres of suitable upland refugia/dispersal habitat for the Sonoma California tiger salamander (note: a total of about 8.585 acres of suitable upland/dispersal habitat occur within the proposed project footprint but 1.146 acres overlaps with the permanent habitat loss footprint authorized for other SMART projects, therefore, only 7.439 acres would be new disturbance of upland habitat) (B. Gamlen, SMART, *in litt.* 2014; Service 2013b; T. Holstein, Caltrans, pers. comm. 2015).

The disturbance of suitable aquatic and upland refugia/dispersal habitat for the Sonoma California tiger salamander will remove habitat the Sonoma California tiger salamander utilizes for breeding, foraging, dispersing, and sheltering. The permanent placement of fill and installation of new drainage culverts could alter downstream hydrology or otherwise affect flows into or out of adjacent wetlands and waters, potentially affecting adjacent habitat quality; but these effects would be minimized because the proposed project is designed to maintain existing drainage patterns across the ROW. Proposed project areas temporarily disturbed by construction activities will be revegetated with native plants under a Service-approved revegetation plan.

SMART will compensate for the disturbance of a total of about 7.56 acres of suitable habitat for the Sonoma California tiger salamander by purchasing 15.12 acres of credits from one of the Service-approved conservation banks within the Santa Rosa Plain Conservation Strategy planning area. This land will be protected and managed for the conservation of the species in perpetuity. The protected lands will provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. These lands will help maintain the geographic distribution of this species and will contribute to the recovery of this species by increasing the amount of habitat that is secure from development threats and the other factors that threaten this species that can be addressed by habitat protection and management.

The effects analysis in the Biological Assessment for the proposed project assumed the presence of Sonoma California tiger salamanders within all suitable aquatic and upland habitat within the Santa Rosa Plain Conservation Strategy's core and management areas and within the boundaries of the *Draft Recovery Plan for the Santa Rosa Plain* (Santa Rosa Plain Conservation Strategy Team 2005, Service 2014c).

Direct Effects to Individuals

Any Sonoma California tiger salamanders occurring within the proposed project area during pathway construction, installation of the retaining walls, construction of the bridge abutments, and installation of drainage culverts could be injured or killed by being crushed by heavy equipment or the movement of soil. Any Sonoma California tiger salamanders occurring in burrows could be injured or killed if the burrows were collapsed during construction activities. The level of disturbance of individual Sonoma California tiger salamanders may vary depending on the type of equipment being used; different pieces of equipment have different noise levels and, thus, cause more or less disturbance. These disturbances are likely to disrupt normal behavior patterns of breeding, foraging, sheltering, and dispersal.

SMART will minimize the potential for injury and mortality of Sonoma California tiger salamanders and reduce the level of disturbance by having a Service-approved biological monitor onsite each day during construction and during initial site grading of development sites within suitable Sonoma California tiger salamander habitat. The biological monitor will conduct a training session for all construction workers before work is started on the proposed project; the training will summarize relevant laws and regulations that protect biological resources, discuss sensitive habitats and listed species with the potential to occur in the work zone, explain the role and authority of the biological monitors, and review applicable avoidance measures to protect listed species and habitats. Before the start of work each morning, the biological monitor will check for Sonoma California tiger salamanders under any equipment such as vehicles and stored pipes. The biological monitor will check under all equipment for Sonoma California tiger salamanders after rain events. All work and staging areas within or near suitable Sonoma California tiger salamander habitat will be surrounded with Sonoma California tiger salamander-proof exclusion fencing.

SMART will minimize the potential for injuring or killing any dispersing Sonoma California tiger salamanders by generally restricting any grading and clearing to the dry season (generally April 15 - October 15, of any given year, depending on the level of rainfall and/or site conditions). All work will occur during the daylight hours to minimize the potential for injuring or killing Sonoma

California tiger salamanders at night when the salamander is most likely to disperse through the project area. All foods and food-related trash items will be enclosed in sealed trash containers at the end of each day, and removed completely from the site once every three days.

To prevent inadvertent entrapment of a Sonoma California tiger salamander during construction, all excavated, steep-walled holes or trenches more than one foot deep will be covered at the close of each working day with plywood or similar material, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped Sonoma California tiger salamanders. If at any time a trapped Sonoma California tiger salamander is discovered, the onsite biologist will remove the Sonoma California tiger salamander and translocate the salamander as described in Section 4.7.2 of the Santa Rosa Plain Conservation Strategy (Santa Rosa Plain Conservation Strategy Team 2005).

Contamination of Aquatic Habitat

Construction activities within and near suitable aquatic habitat for the Sonoma California tiger salamander could result in the contamination and degradation of the habitat if appropriate measures are not taken to reduce the potential for a spill of fuel or other hazardous materials. Sonoma California tiger salamanders could be directly injured or killed if exposed to hazardous chemicals. The spill of fuel or other hazardous materials into suitable habitat could also indirectly affect the Sonoma California tiger salamander by reducing availability of its prey. SMART will minimize the potential for the contamination of aquatic habitat during construction of the proposed project by implementing water quality BMPs, a hazardous materials management/fuel spill containment plan, and a SWPPP. Contaminants and pollutants could also enter aquatic habitat through ongoing traffic along the NMP pathway; however, since only non-motorized traffic will be allowed on the pathway, the potential for the spill of fuel or other hazardous chemicals is reduced.

Barriers to Sonoma California Tiger Salamander Dispersal

The movement or dispersal of individual Sonoma California tiger salamanders would not be expected to be restricted by the proposed safety fencing. The proposed project is designed to include 6 to 8-inch gaps along the bottom of fencing that would permit the movement of Sonoma California tiger salamanders. The 6 to 8-inch gaps at the bottom of the fencing would also permit the movement of most burrowing mammals (*e.g.*, ground squirrels) which the Sonoma California tiger salamander relies on for creating suitable upland refugia habitat.

Non-motorized traffic along the pathway is unlikely to restrict Sonoma California tiger salamander dispersal across the pathway because the traffic would occur primarily during the daytime and during dry periods when Sonoma California tiger salamanders are unlikely to disperse through the action area. However, the installation of 16 retaining walls along a combined total of about 0.7 mile (4 percent) of the 16.2-mile-long Sonoma County portion of the NMP (Table 3B) would likely restrict Sonoma California tiger salamander dispersal across sections of the action area. The dimensions of the retaining walls within the Sonoma County portion will vary from about 52 to 834 feet in length and from about 2 to 4 feet in height. Thus installation of the retaining walls within potential Sonoma California tiger salamander dispersal corridors may reduce the ability of Sonoma California tiger salamanders to access suitable aquatic breeding habitat or upland refugia within and near the

action area. Sonoma California tiger salamanders could desiccate or be eaten by predators if the retaining walls or other barriers within the ROW kept them from accessing suitable upland refugia. Sonoma California tiger salamanders could also be injured or killed by bicycle or train traffic if the retaining walls or other barriers along the ROW resulted in salamanders being trapped along the NMP or SMART railroad. These barriers however are not likely to significantly reduce gene flow among populations of Sonoma California tiger salamanders since most salamanders would still be able to disperse around the retaining walls.

SMART proposes to reduce the potential for the retaining walls to act as a barrier to wildlife dispersal by constructing the retaining structures of masonry units that are battered (not vertical), have rough surfaces for traction and are stepped every eight inches, making dispersal across structures easier for some wildlife. However, the stepped retaining walls with rough surfaces are still likely to be a barrier to Sonoma California tiger salamander dispersal because the salamanders are unlikely to be able to scale these walls. In wildlife corridors where the NMP is elevated above the natural grade, additional conduits will be constructed to assist in Sonoma California tiger salamander dispersal. The conduits will be 6 to 8 inches in diameter and spaced every 100 to 150 feet. Where the walls are uphill of the NMP, the walls will be laid back to provide a gentler slope.

The smooth paved pathway with no raised surfaces would not be expected to create a movement barrier to Sonoma California tiger salamanders. Additionally, no curbs are proposed along the pathway, except in localized areas immediately adjacent to paved urban road crossings, where movements of Sonoma California tiger salamanders would not be desired.

Other Indirect Effects of Long-term NMP Pathway Use

Long-term use of the NMP pathway may result in human or domestic animal encroachment on adjacent habitat for the Sonoma California tiger salamander, increases in ambient noise levels (but this is likely to be minimal relative to the adjacent railway and existing residential development), spread of invasive or noxious weeds, and an increase in litter or other pollutants in adjacent areas. The spread of invasive or noxious weeds may degrade the quality of upland refugia and dispersal habitat for the Sonoma California tiger salamander by restricting Sonoma California tiger salamander movement or decreasing the suitability of the habitat for burrowing mammals (*e.g.*, ground squirrels). Increases in litter along the pathway may attract predators which may prey on Sonoma California tiger salamanders in adjacent habitat. Sonoma California tiger salamanders may be disturbed by pathway users and their dogs causing the salamanders to avoid adjacent areas. Sonoma California tiger salamanders could also be injured or killed by bicycle traffic along the pathway. However, most Sonoma California tiger salamander overland dispersal through the area would occur on rainy nights when the pathway would not be in use. SMART will minimize the potential for predation on Sonoma California tiger salamanders by implementing a long-term litter cleanup program along the NMP. SMART will also minimize the potential for the spread of invasive weeds into Sonoma California tiger salamander habitat by implementing a long-term invasive plant species control program along the NMP and SMART ROW.

Sonoma California Tiger Salamander Critical Habitat

Habitat Disturbance

The proposed project will result in the permanent loss of about 0.119 acre of PCE 1 (suitable aquatic breeding habitat including seasonal wetlands and ditches) and about 7.439 acres of PCE 2/PCE 3 (suitable upland refugia/dispersal habitat) within designated Sonoma California tiger salamander critical habitat (note: a total of about 8.585 acres of PCE 2/PCE 3 occurs within the proposed project footprint but 1.146 acres overlaps with the permanent habitat loss footprint authorized for other SMART projects) (B. Gamlen, SMART, *in litt.* 2014; Service 2013b; T. Holstein, Caltrans, pers. comm. 2015). The permanent placement of fill and installation of new drainage culverts could alter downstream hydrology or otherwise affect flows into or out of adjacent wetlands and waters, potentially affecting adjacent habitat quality; but these effects would be minimized because the proposed project is designed to maintain existing drainage patterns across the ROW. Proposed project areas temporarily disturbed by construction activities will be re-vegetated with native plants under a Service-approved revegetation plan.

SMART will compensate for the permanent loss of a total of about 7.56 acres of suitable habitat containing PCEs for the Sonoma California tiger salamander by purchasing 15.12 acres of credits from one of the Service-approved conservation banks within the Santa Rosa Plain Conservation Strategy planning area within designated critical habitat. This land will be protected and managed for the conservation of the species in perpetuity. The protected lands will provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the proposed project. These lands will help maintain the geographic distribution of this species and will contribute to the recovery of this species by increasing the amount of habitat that is secure from development threats and the other factors that threaten this species that can be addressed by habitat protection and management.

Barriers to Sonoma California Tiger Salamander Dispersal

The installation of fencing and retaining walls within or near designated critical habitat for the Sonoma California tiger salamander could affect the ability of Sonoma California tiger salamanders to access breeding habitat (PCE 1) or upland refugia (PCE 2) and degrade the quality of dispersal habitat (PCE 3). The movement or dispersal of individual Sonoma California tiger salamanders would not be expected to be restricted by the proposed safety fencing. The proposed project is designed to include 6- to 8-inch gaps along the bottom of fencing that would permit the movement of Sonoma California tiger salamanders. The 6- to 8-inch gaps along the bottom of fencing will also permit the movement of most burrowing mammals (*e.g.*, ground squirrels) which the Sonoma California tiger salamander relies on for creating suitable PCE 2.

Non-motorized traffic along the pathway is unlikely to restrict Sonoma California tiger salamander dispersal across the pathway because the traffic would occur primarily during the daytime when Sonoma California tiger salamanders are unlikely to disperse. However, the installation of seven retaining walls along a combined total of about 681 feet (2 percent) of the 5.6-mile-long Sonoma County portion of the NMP through Sonoma California tiger salamander critical habitat (Table 3B) would likely restrict Sonoma California tiger salamander dispersal across sections of the action area

through critical habitat. The dimensions of the retaining walls within critical habitat will vary from about 52 to 230 feet in length and from about 2 to 4 feet in height. These barriers however are not likely to significantly reduce gene flow among populations of Sonoma California tiger salamanders since the salamanders would still be able to disperse around the retaining walls. Seven additional retaining walls will be installed along a combined total of about 2,922 feet immediately east of (within 300 feet) and parallel to the southeastern boundary of critical habitat between MP 43.1 and MP 44.1. Although these seven additional retaining walls will be installed outside of critical habitat, their proximity to critical habitat (within 100 – 300 feet) may reduce the ability of Sonoma California tiger salamanders immediately outside of critical habitat to access breeding habitat within the critical habitat unit.

SMART proposes to reduce the potential for the retaining walls to act as a barrier to wildlife dispersal by constructing the retaining structures of masonry units that are battered (not vertical), have rough surfaces for traction and are stepped every eight inches, making dispersal across structures easier for some wildlife. However, the stepped retaining walls with rough surfaces are still likely to be a barrier to Sonoma California tiger salamander dispersal within critical habitat and thereby degrade the quality of PCE 3. In wildlife corridors where the NMP is elevated above the natural grade, additional conduits will be constructed to assist in Sonoma California tiger salamander dispersal. The conduits will be 6 to 8 inches in diameter and spaced every 100 to 150 feet. Where the walls are uphill of the NMP, the walls will be laid back to provide a gentler slope.

The smooth paved pathway with no raised surfaces would not be expected to create a movement barrier to Sonoma California tiger salamanders. Additionally, no curbs are proposed along the pathway, except in localized areas immediately adjacent to paved urban road crossings, where movements of Sonoma California tiger salamanders would not be desired.

Cumulative Effects

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

Climate Change

The global average temperature has risen by approximately 0.6 degree Centigrade during the 20th Century (International Panel on Climate Change [IPCC] 2001, 2007a, 2007b; Adger *et al.* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IPCC 2001, 2007a, 2007b; Adger *et al.* 2007), and that it is “very likely” that it is largely due to man-made emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Inkley *et al.* 2004, Adger *et al.* 2007, Kanter 2007) likely imperils the salt marsh harvest mouse, California clapper rail, California red-legged frog, and Sonoma California tiger salamander and the resources necessary for their survival, since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, diseases, and non-native competitors. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of

habitat. Rising sea levels are likely to inundate much of the remaining salt marsh habitat available for the salt marsh harvest mouse and California clapper rail. Without upland habitat buffers available for the landward transgression of the marsh, the amount of suitable salt marsh habitat is likely to decrease with rising sea levels. Decreases in rainfall or changes in the seasonal timing of rainfall may result in the loss of suitable breeding habitat for the California red-legged frog and Sonoma California tiger salamander.

San Rafael Airport Recreational Facility

The City of San Rafael proposes to construct a 71,300-square-foot indoor sports fields/courts, a lighted outdoor soccer field, an unlighted soccer warm-up area, and a new 184-car paved parking lot on a 9.1-acre portion of the San Rafael Airport property adjacent to the north fork of Gallinas Creek (City of San Rafael 2011). The City Council approved the project on December 17, 2012.

Construction of the proposed recreational facility may result in significant cumulative effects to salt marsh harvest mice and California clapper rails within the action area near Gallinas Creek due to the construction of a large sports complex with additional parking and nighttime outdoor sporting events adjacent to the tidal marsh (Service file number 08ESMF00-2012-TA-0571-1, Service 2012b). Additional noise and lighting from the sports complex and parking lot may result in California clapper rails avoiding the marshes near the new sports complex and the loss of California clapper rail breeding activity or nest abandonment. The installation of lighting for the parking lot and outdoor sporting events could result in disturbance of salt marsh harvest mice and California clapper rail activities by disrupting activity cycles and the internal circadian system (Rich and Longcore 2006).

The proposed recreation facility will result in an increase in the presence of people, traffic, and trash near the marshes of Gallinas Creek. Trash left near the marsh will attract predators (*e.g.*, foxes, raccoons, rats, feral cats, corvids, and gulls) that may prey on salt marsh harvest mice and California clapper rails in the adjacent marsh. The introduction of additional traffic and paved surfaces within the floodplain of Gallinas Creek will result in additional untreated contaminated water containing petroleum hydrocarbons and other toxins entering the marsh which will degrade the water quality of Gallinas Creek. The degradation of the water quality and introduction of petroleum hydrocarbons and other contaminants into the Gallinas Creek marshes may have direct toxic effects to salt marsh harvest mouse and California clapper rail or indirectly affect the California clapper rail due to a reduction in the invertebrate prey base.

Conclusion

After reviewing the current status of the salt marsh harvest mouse and the California clapper rail, the environmental baseline for these species within the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of these species. We based this determination on the following: (1) successful implementation of the conservation measures described in this biological opinion will minimize the adverse effects on individual salt marsh harvest mice and California clapper rails; (2) the avoidance of disturbing any breeding California clapper rails during construction; (3) the small amount (0.011 acre) of suitable tidal marsh habitat that will be directly disturbed; (4) the implementation of a long-term invasive plant species control and litter cleanup

program; and (5) the preservation and management in perpetuity of 0.225 acre of existing high quality tidal marsh habitat for the salt marsh harvest mouse and the California clapper rail at the Mira Monte property or Phelan Conservation Area within the San Pablo Bay Recovery Unit.

After reviewing the current status of the California red-legged frog, the environmental baseline for this species within the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of this species. We based this determination on the following: (1) successful implementation of the conservation measures described in this biological opinion will minimize the adverse effects on individual California red-legged frogs; (2) the small amount of suitable aquatic habitat (0.535 acre) that would be disturbed; (3) the installation of 6 to 8-inch gaps along the bottom of the safety fencing to allow California red-legged frog dispersal across the 23-mile-long project area; and (4) the preservation and management in perpetuity of 12.02 acres of suitable high quality habitat for the California red-legged frog at a Service-approved conservation bank.

After reviewing the current status of the Sonoma California tiger salamander, the environmental baseline for this species within the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of this species. We based this determination on the following: (1) successful implementation of the conservation measures described in this biological opinion will minimize the adverse effects on individual Sonoma California tiger salamanders; (2) the small amount of potential breeding habitat (0.119 acre) that would be removed; (3) the installation of 6 to 8-inch gaps along the bottom of the safety fencing will allow Sonoma California tiger salamander and burrowing mammal (*e.g.*, ground squirrel) dispersal across the 16.2-mile-long project area within Sonoma County; (4) the implementation of a long-term invasive plant species control program along the SMART ROW; and (5) the preservation and management in perpetuity of 15.12 acres of suitable high quality habitat for the Sonoma California tiger salamander at one of the Service-approved conservation banks within the Santa Rosa Plain Conservation Strategy planning area.

After reviewing the current status of Sonoma California tiger salamander critical habitat, the environmental baseline for the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the proposed project is not likely to result in the destruction or adverse modification of Sonoma California tiger salamander critical habitat. We base this conclusion on the following: (1) the permanent loss of 7.56 acres of critical habitat containing PCEs is less than 0.02 percent of the 47,383-acre Santa Rosa Plain critical habitat unit; (2) the small amount of PCE 1 (0.119 acre) that would be removed; (3) the installation of 6 to 8-inch gaps along the bottom of the safety fencing will allow Sonoma California tiger salamander dispersal across the 5.6-mile-long project area within critical habitat; and (4) the preservation and management in perpetuity of 15.12 acres of suitable high quality habitat for the Sonoma California tiger salamander within its designated critical habitat at one of the Service-approved conservation banks within the Santa Rosa Plain Conservation Strategy planning area.

INCIDENTAL TAKE STATEMENT

Section 9 of the Endangered Species Act and Federal regulations pursuant to section 4(d) of the Act, prohibit take of endangered and threatened species, respectively, without special exemption. Take is

defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. The Service defines harassment as an intentional or negligent act or omission that creates the likelihood of injury to listed species 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. The Service defines harm to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as 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), take that is incidental to and not intended as part of the agency action is not considered to be prohibited, provided such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are nondiscretionary, and must be implemented by Caltrans so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption under section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity that is covered by this incidental take statement. If Caltrans: (1) fails to require the applicant or any of its contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Caltrans or SMART must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

Salt Marsh Harvest Mouse

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

1. The harassment and harm of all salt marsh harvest mice within the 0.002 acre of suitable tidal marsh habitat temporarily disturbed and 0.009 acre of suitable tidal marsh habitat permanently removed during construction of the proposed project.
2. The harassment and harm of all salt marsh harvest mice within the 0.194 acre of suitable upland habitat permanently removed during construction of the proposed project.
3. The ongoing harassment by trail users of all salt marsh harvest mice within 25 feet of the 0.8 mile segment of the NMP (MP 20.1 – MP 20.9) at the south and north fork Gallinas Creek crossings.

California Clapper Rail

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

1. The harassment of all California clapper rails within the 0.002 acre of suitable tidal marsh habitat temporarily disturbed and 0.009 acre of suitable tidal marsh habitat permanently removed during construction of the proposed project.
2. The ongoing harassment by trail users of all California clapper rails within 50 feet of the 0.8 mile segment of the NMP (MP 20.1 – MP 20.9) at the south and north fork Gallinas Creek crossings.

California Red-legged Frog

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect for the following reasons: their relatively small body size makes the finding of a dead specimen unlikely; the cryptic nature of the species; losses may be masked by seasonal fluctuations in numbers or other causes; and the species occurs in aquatic, riparian and upland habitats that makes it difficult to detect. Due to the difficulty in quantifying the number of California red-legged frogs that will be taken as a result of the proposed project, the Service is quantifying take incidental to the proposed project as the following:

1. The harassment, harm, capture, injury, and mortality of all adult, sub-adult, and juvenile California red-legged frogs within the 0.535 acre of suitable aquatic habitat, 3.471 acres of suitable upland refugia habitat (within 200 feet of aquatic habitat), and 3.312 acres of potential upland dispersal habitat (more than 200 feet from aquatic habitat) permanently removed during construction of the proposed project.
2. The injury or mortality of two (2) adult, sub-adult, or juvenile California red-legged frogs due to bicycle strikes along the NMP.

Sonoma California Tiger Salamander

The Service anticipates that incidental take of the Sonoma California tiger salamander will be difficult to detect because when this amphibian is not in its breeding ponds, foraging, migrating, or conducting other surface activity, it inhabits fossorial mammal burrows and other underground refugia; upland refugia may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of its relatively small body size and cryptic nature. Losses of this species may also be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in the water regime at their breeding ponds, or additional environmental disturbances. Due to the difficulty in quantifying the number of Sonoma California

tiger salamanders that will be taken as a result of the proposed project, the Service is quantifying take incidental to the proposed project as the following:

1. The harassment, harm, capture, injury, and mortality of all egg masses, larvae, adult, and juvenile Sonoma California tiger salamanders within the 0.119 acre of suitable aquatic breeding habitat permanently removed during construction of the proposed project.
2. The harassment, harm, capture, injury, and mortality of all adult and juvenile Sonoma California tiger salamanders within the 7.439 acres of suitable upland refugia/dispersal habitat permanently removed during construction of the proposed project.
3. The injury or mortality of two (2) adult or juvenile Sonoma California tiger salamanders due to bicycle strikes along the NMP.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the salt marsh harvest mouse, California clapper rail, California red-legged frog, or Sonoma California tiger salamander.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measures are necessary and appropriate to minimize the effects of the proposed project on the salt marsh harvest mouse, California clapper rail, California red-legged frog, and Sonoma California tiger salamander:

1. Caltrans through SMART will minimize adverse effects to the salt marsh harvest mouse, California clapper rail, California red-legged frog, and Sonoma California tiger salamander and their habitats in the action area by following the conservation measures in this biological opinion as modified by the terms and conditions.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These Terms and Conditions are nondiscretionary.

The following Terms and Conditions implement Reasonable and Prudent Measure Number One (1):

1. Caltrans shall ensure that the salt marsh harvest mouse-proof exclusion fencing is inspected before the start of each work day and any needed repairs to the fencing are made within 24 hours. A qualified biologist should survey the work area to ensure no salt marsh harvest mice have entered the work area.

2. Caltrans shall ensure that SMART has an onsite revegetation and monitoring plan with photo documentation, annual reporting, success criteria, and invasive plant species control reviewed and approved by the Service prior to the initiation of construction of the proposed project. The onsite revegetation and monitoring plan should include the planting of high tide refugia cover (*e.g.*, marsh gumplant) within suitable tidal marsh/transition zone habitat for the California clapper rail and salt marsh harvest mouse.
3. Caltrans shall ensure that SMART has an ongoing invasive plant species control plan, litter cleanup plan, and leash law enforcement plan for the SMART NMP reviewed and approved by the Service prior to the initiation of construction of the proposed project. Caltrans shall ensure that prior to the initiation of construction of the proposed project that SMART has identified sufficient funding to implement these long-term plans.
4. Caltrans shall ensure that the long-term management plans at the Mira Monte property and the Phelan Conservation Area are reviewed and approved by the Service prior to the initiation of construction of the proposed project. The long-term management plans shall include long-term plans for monitoring California clapper rail and salt marsh harvest mouse populations, controlling invasive plant species, restoring high-tide refugia/transition zone habitat (*e.g.*, planting marsh gumplant), controlling mammalian predators, and removing raptor perches for the benefit of the salt marsh harvest mouse and California clapper rail. The conservation easements shall be recorded with a fully funded endowment under a Service-approved plan within 12 months of the start of construction of the proposed project and prior to the introduction of NMP traffic.
5. Caltrans shall ensure that no rodenticides are used within or near suitable marsh or upland habitat for the California clapper rail and salt marsh harvest mouse (*i.e.*, all suitable marsh and wetland habitats and all upland habitats within 328 feet of suitable marsh and wetland habitats) or suitable aquatic or upland/dispersal habitat for the California red-legged frog and Sonoma California tiger salamander.
6. Caltrans shall ensure that no plastic monofilament netting or similar material is used for erosion control because it may entangle California red-legged frogs and Sonoma California tiger salamanders. Acceptable erosion control materials are straw wattles and coconut coir.
7. Caltrans shall ensure that SMART has a plan for the installation of suitable cover (*e.g.*, woody debris, rocks, or suitable vegetative cover) near potential barriers to California red-legged frog and Sonoma California tiger salamander dispersal within the SMART ROW to minimize the potential for any California red-legged frogs and Sonoma California tiger salamanders desiccating or getting eaten by predators while attempting to cross the barriers.
8. Caltrans shall ensure that SMART installs fencing and signage along the NMP near the south and north forks of Gallinas Creek to keep the public and their dogs out of tidal marsh habitat for the salt marsh harvest mouse and California clapper rail. The fencing should be no higher than four feet and include raptor perch deterrents.

9. Caltrans shall ensure that prior to SMART purchasing California red-legged frog compensation credits that the location is approved by the Service and is within the North Coast and North San Francisco Bay Recovery Unit for the California red-legged frog.

Reporting Requirements

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

1. The Service must be notified within one (1) working day of the finding of any injured or dead listed species or any unanticipated damage to its habitat associated with the proposed project. Notification will be made to the Coast/Bay Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at (916) 414-6600, and must include the date, time, and precise location of the individual/incident clearly indicated on a U.S. Geological Survey 7.5 minute quadrangle or other maps at a finer scale, as requested by the Service, and any other pertinent information. When an injured or dead individual of the listed species is found, Caltrans shall follow the steps outlined in the Disposition of Individuals Taken section below.

Disposition of Individuals Taken

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact persons are the Coast/Bay Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at (916) 414-6600.

CONSERVATION RECOMMENDATIONS

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

1. Develop, fund, and annually implement a predator management program along the SMART ROW for controlling avian and mammal predators that threaten the salt marsh harvest mouse and California clapper rail.
2. Control invasive perennial pepperweed within suitable upland transition zone and tidal marsh habitat for the salt marsh harvest mouse and California clapper rail within the

SMART ROW and implement measures to minimize the introduction and spread of perennial pepperweed and other invasive plant species.

3. Restore upland transition zone habitat for the California clapper rail and salt marsh harvest mouse near suitable tidal marsh habitat for these species (*e.g.*, plant marsh gumplant).
4. Decommission trails or require that dogs be kept on a leash near breeding habitat for the California clapper rail. Avoid constructing trails near suitable habitat for the California clapper rail and salt marsh harvest mouse.
5. Incorporate safe passageways and improve habitat connectivity for salt marsh harvest mice, California red-legged frogs, and Sonoma California tiger salamanders and other listed species in railroad, highway, and other transportation projects.
6. Report sightings of any listed or sensitive animal species to the CNDDDB of the CDFW. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

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

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed SMART NMP Project Phase 1 in Sonoma and Marin Counties, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any additional take will not be exempt from the prohibitions of section 9 of the Act, pending reinitiation.

Mr. Boris Deunert

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If you have any questions regarding this biological opinion on the proposed SMART NMP Project Phase 1, please contact Joseph Terry, Senior Biologist, or Ryan Olah, Coast/Bay Division Chief, at the letterhead address, electronic mail (Joseph_Terry@fws.gov; Ryan_Olah@fws.gov), or at telephone (916) 414-6600.

Sincerely,



Jennifer M. Norris
Field Supervisor

cc:

Karen Weiss, California Department of Fish and Wildlife, Napa, California

Xavier Fernandez, San Francisco Bay Regional Water Quality Control Board, Oakland, California

Bill Gamlen, Sonoma-Marín Area Rail Transit District, Petaluma, California

Dan Logan, National Oceanic and Atmospheric Administration/National Marine Fisheries Service,
Santa Rosa, California

Bryan Matsumoto, U.S. Army Corps of Engineers, San Francisco, California

Michelle Tovar, Area West Environmental, Inc., Orangevale, California

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United States Department of the Interior



In Reply Refer to:
08ESMF00-2014-
F-0576-R001

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

Mr. Boris Deunert
Attn: Tom Holstein
Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, California 94623-0660

OCT - 8 2015

Subject: Reinitiation of Formal Consultation on the Proposed Sonoma-Marin Area Rail Transit (SMART) Non-Motorized Multi-use Pathway (NMP) Project Phase 1 in Sonoma and Marin Counties, California (California Department of Transportation (Caltrans) Federal Aid Project Number RPSTPLE 6411 (005))

Dear Mr. Deunert:

This letter is in response to Caltrans's August 25, 2015 request for the reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) for the SMART NMP Project Phase 1 (proposed project) in Sonoma and Marin Counties, California (Caltrans Federal Aid Project Number RPSTPLE 6411 (005)). At issue are the proposed project's effects on the federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), endangered California clapper rail (*Rallus longirostris obsoletus*), threatened California red-legged frog (*Rana draytonii*), and endangered Sonoma Distinct Population Segment (DPS) of the California tiger salamander (Sonoma California tiger salamander) (*Ambystoma californiense*) and its designated critical habitat. Critical habitat has been designated for the California red-legged frog but does not occur within the action area for the proposed project. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

In considering your request, we based our evaluation on the following: (1) the Service's biological opinion on the SMART NMP Project Phase 1 in Sonoma and Marin Counties (Service file number 08ESMF00-2014-F-0576-2), dated March 11, 2015; (2) the August 25, 2015 letter from Caltrans requesting the reinitiation of formal consultation; (3) the June 12, 2015 meeting among the Service, Caltrans, SMART, ICF International, and Area West Environmental; (4) the August 19, 2015 memorandum from ICF International to Caltrans regarding proposed reductions in the amount of Sonoma California tiger salamander habitat compensation (ICF International *in litt.* 2015); and (5) other information available to the Service.

The following additions are made to the **Consultation History** on page 2 of the March 11, 2015 biological opinion:

March 11, 2015 The Service issued the biological opinion for the proposed project (Service file number 08ESMF00-2014-F-0576-2).

- May 12, 2015 The Service received via electronic mail from SMART the request to amend the biological opinion.
- June 12, 2015 The Service attended a meeting among Caltrans, SMART, ICF International, and Area West Environmental to discuss amending the biological opinion for the proposed project.
- August 4, 2015 The Service provided comments on the draft June 12, 2015 meeting notes.
- August 25, 2015 The Service received the letter from Caltrans requesting the reinitiation of formal consultation on the proposed project. The reinitiation request letter also included the August 19, 2015 memorandum from ICF International to Caltrans regarding proposed reductions in the amount of Sonoma California tiger salamander habitat compensation (ICF International *in litt.* 2015).

The Service removes the following General Conservation Measures in the **Conservation Measures** on page 15 of the March 11, 2015 biological opinion:

6. Habitat Restoration Plan: SMART will develop a habitat restoration plan to replace impacted wetlands and waters. A separate habitat restoration plan will be prepared for the pathway (see the *Mitigation and Monitoring Plan for the SMART Project* in Appendix H in the Biological Assessment). Final mitigation ratios will depend on quality of sites impacted and location of mitigation lands (*i.e.*, on or off-site).
7. Wetland Mitigation: To replace impacted wetlands, a habitat restoration plan shall be developed and implemented.
8. Oak Woodland Mitigation: In areas where oaks or other protected trees cannot be avoided, SMART will replace trees removed with the same native tree species at a minimum 3:1 ratio, or as required by applicable ordinance(s). An oak woodland restoration plan shall be developed and provided to CDFW for concurrence. The plan shall include the total acreage of temporary and permanent impacts to all oak woodland habitat. Areas shall be mapped using aerial photographs and provided to CDFW for concurrence. All temporary and permanently disturbed areas shall be mitigated at a 1:1 ratio for creation and preservation of new oak woodlands or a 3:1 ratio for preservation of existing habitat. Sites should be maintained in perpetuity and managed under an approved management plan.

The Service removes Term and Condition Number 2 on page 68 of the March 11, 2015 biological opinion:

Remove:

2. Caltrans shall ensure that SMART has an onsite revegetation and monitoring plan with photo documentation, annual reporting, success criteria, and invasive plant species control reviewed and approved by the Service prior to the initiation of construction of the proposed project. The onsite revegetation and monitoring plan should include the planting of high tide refugia cover (*e.g.*, marsh gumplant) within suitable tidal marsh/transition zone habitat for the California clapper rail and salt marsh harvest mouse.

The Service changes Term and Condition Number 3 on page 68 of the March 11, 2015 biological opinion:

From:

3. Caltrans shall ensure that SMART has an ongoing invasive plant species control plan, litter cleanup plan, and leash law enforcement plan for the SMART NMP reviewed and approved by the Service prior to the initiation of construction of the proposed project. Caltrans shall ensure that prior to the initiation of construction of the proposed project that SMART has identified sufficient funding to implement these long-term plans.

To:

3. Caltrans shall ensure that SMART has an ongoing invasive plant species control plan, litter cleanup plan, and leash law enforcement plan for the SMART NMP reviewed and approved by the Service. These plans, which may be included with a single NMP Maintenance of Way Plan, shall be submitted to the Service prior to beginning construction of the first NMP segment and will be reviewed and approved by the Service within six months of beginning construction of the first NMP segment. Caltrans shall ensure that prior to the initiation of construction of the proposed project that SMART has identified sufficient funding to implement these long-term plans.

The Service changes Term and Condition Number 4 on page 68 of the March 11, 2015 biological opinion:

From:

4. Caltrans shall ensure that the long-term management plans at the Mira Monte property and the Phelan Conservation Area are reviewed and approved by the Service prior to the initiation of construction of the proposed project. The long-term management plans shall include long-term plans for monitoring California clapper rail and salt marsh harvest mouse populations, controlling invasive plant species, restoring high-tide refugia/transition zone habitat (*e.g.*, planting marsh gumplant), controlling mammalian predators, and removing raptor perches for the benefit of the salt marsh harvest mouse and California clapper rail. The conservation easements shall be recorded with a fully funded endowment under a Service-approved plan within 12 months of the start of construction of the proposed project and prior to the introduction of NMP traffic.

To:

4. Caltrans shall ensure that the long-term management plans at the Mira Monte property and the Phelan Conservation Area are reviewed and approved by the Service prior to the initiation of construction of the proposed project. The long-term management plans shall include long-term plans for monitoring California clapper rail presence/absence, controlling invasive plant species, restoring high-tide refugia/transition zone habitat (*e.g.*, planting marsh gumplant), controlling mammalian predators, and removing raptor perches for the benefit of the salt marsh harvest mouse and California clapper rail. The conservation easements shall be recorded with a fully funded endowment under a Service-approved plan within 12 months of the start of construction of the proposed project and prior to the introduction of NMP traffic.

The reinitiation request letter from Caltrans dated August 25, 2015 also stated that SMART would like to revisit the Sonoma California tiger salamander habitat loss and compensation calculations submitted in the Biological Assessment for the proposed project and carried through in the biological opinion. The request refers to a memorandum from ICF International dated August 19, 2015 (ICF International *in litt.* 2015). The memorandum states that SMART believes that the Sonoma California tiger salamander habitat loss that was identified in the Biological Assessment north of mile post (MP) 50.1 (0.15 mile south of Todd Road in the City of Santa Rosa, Sonoma County), totaling approximately 4.75 acres, should not be included in the effects reported in the biological opinion. The memorandum states that while designated critical habitat for the Sonoma California tiger salamander extends north to MP 53.3, suitable Sonoma California tiger salamander habitat terminates at MP 50.1 (ICF International *in litt.* 2015). According to SMART the proposed project footprint remains within critical habitat until MP 53.3 but is essentially surrounded by development after MP 50.1 and would not provide suitable habitat (ICF International *in litt.* 2015). For the reasons set out in the memorandum, SMART proposes that the biological opinion be changed to state that the total amount of Sonoma California tiger salamander habitat that will be permanently lost be reduced from 7.56 acres to 2.81 acres. The Sonoma California tiger salamander compensation ratio would remain 2:1. Therefore, SMART proposes that the total amount of Sonoma California tiger salamander habitat compensation be reduced from 15.12 acres to 5.62 acres. The compensation would be purchased from one of the approved mitigation banks within the Santa Rosa Plain Conservation Strategy Planning Area.

The Service does not agree with SMART's conclusion that the proposed project footprint for the NMP north of MP 50.1 does not provide suitable habitat for the Sonoma California tiger salamander. There are many known occurrences of the Sonoma California tiger salamander within between 0.1 mile and 0.5 mile of the NMP right-of-way north of MP 50.1 between Todd Road and Hearn Avenue (California Natural Diversity Database occurrence numbers 483, 725, 780, 786, 788, 790, 926, 1105, and 1134; California Department of Fish and Wildlife 2015). Orloff (2007) found that the majority of California tiger salamanders dispersed at least 0.5 mile from the breeding site, with a smaller number of salamanders appearing to move even farther—from 0.75 to 1.3 miles between breeding ponds and upland habitat. Therefore, the NMP right-of-way north of MP 50.1 is within dispersal distance of many known occurrences of the Sonoma California tiger salamander. The developed areas and roads surrounding portions of the NMP in this area do not create a barrier to Sonoma California tiger salamander dispersal across the NMP right-of-way. There are a number of areas immediately adjacent to the NMP right-of-way north of MP 50.1 that provide suitable upland refugia and dispersal habitat for the Sonoma California tiger salamander where small, open undeveloped parcels are present and generally contiguous with the NMP right-of-way. Therefore, the Service will not change the estimate of the amount of Sonoma California tiger salamander habitat that will be permanently lost by the proposed project. The total amount of Sonoma California tiger salamander habitat compensation will remain 15.12 acres.

Conclusion

The above changes to the biological opinion for the proposed SMART NMP Project Phase 1 do not change the Service's conclusion that the proposed SMART NMP Project Phase 1, as proposed, is not likely to jeopardize the continued existence of the salt marsh harvest mouse, California clapper rail, California red-legged frog, and Sonoma California tiger salamander.

The above changes to the biological opinion for the proposed SMART NMP Project Phase 1 do not change the Service's conclusion that the proposed SMART NMP Project Phase 1, as proposed, is not likely to destroy or adversely modify designated critical habitat for the Sonoma California tiger

salamander.

This concludes formal consultation on the SMART NMP Project Phase 1 in Sonoma and Marin Counties, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) 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; (c) 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 (d) if a new species is listed or critical habitat designated that may be affected by the identified action.

If you have questions concerning this reinitiation of the biological opinion for the SMART NMP Project Phase 1 in Sonoma and Marin Counties, California, please contact Joseph Terry, Senior Biologist, or Ryan Olah, Coast/Bay Division Chief, at the letterhead address, at telephone number (916) 414-6623, or email joseph_terry@fws.gov or ryan_olah@fws.gov.

Sincerely,



Jennifer M. Norris
Field Supervisor

cc:

Karen Weiss, California Department of Fish and Wildlife, Napa, California
Xavier Fernandez, San Francisco Bay Regional Water Quality Control Board, Oakland, California
Bill Gamlen, Sonoma-Marin Area Rail Transit District, Petaluma, California
Dan Logan, National Oceanic and Atmospheric Administration/National Marine Fisheries Service,
Santa Rosa, California
Bryan Matsumoto, U.S. Army Corps of Engineers, San Francisco, California
Michelle Tovar, Area West Environmental, Inc., Orangevale, California

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California Department of Fish and Wildlife. 2015. California Natural Diversity Database. RareFind version 5. Natural Heritage Division. Sacramento, California.

Orloff, S.G. 2007. Migratory movements of California tiger salamander in upland habitat – A five-year study, Pittsburg, California. Prepared for Bailey Estates LLC. 47 + pp.

In Litt.

ICF International. 2015. Letter from Leslie Allen, Project Manager, ICF International, San Francisco, California, to Tom Holstein, California Department of Transportation, District 4 Office of Local Assistance, Oakland, California, dated August 19, 2015. Subject: SMART Non-Motorized Pathway—Proposed reduction in California tiger salamander impacts and mitigation documented in current biological opinion.