Appendix B:
Biological Resources Supporting Information

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B.1 - Special-status Species Tables

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Table 1: Special-status Plant Species Evaluated

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale[5]	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Alopecurus aequalis var. sonomensis Sonoma alopecurus	FE		1B.1	Freshwater marshes and swamps, riparian scrub, and riparian banks, with other wetland species. Elevation: 5-360 m. Bloom period: May-July	**None.** The project site does not contain suitable freshwater marsh or swamp, riparian scrub, or riparian bank habitat to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Amsinckia lunaris bent-flowered fiddleneck			1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Found on gravelly slopes on serpentine. Elevation: 3-500 m. Bloom period: March-June	**Low.** The project site does contain marginally suitable grassland habitat to support this species. Nearest recorded occurrence is located 2 miles north of the project site. The project site does not contain gravely slopes or serpentine soils. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita			1B.1	Chaparral and cismontane woodland with rhyolitic substrate Elevation: 75-370 m. Bloom period: February-April	**None.** Project site does not contain suitable habitat or soils to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Balsamorhiza macrolepis big-scale balsamroot			1B.2	Chaparral, cismontane woodland and valley and foothill grassland. Sometimes occurs in serpentinite soils. Elevation: 45-1555 m. Bloom period: March-June.	**None.** The project site does not contain suitable habitat to support this species. Serpentinite soils are not present. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale[5]	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Blennosperma bakeri Sonoma sunshine	FE	SE	1B.1	Vernal pools, wet grasslands and swales. Elevation: 10-290 m. Bloom period: March-May	**None.** Seasonal wetland is present on-site. Numerous recorded occurrences within 5 miles of the project site. However, project is isolated from nearby occurrences by existing urban development. The seasonal wetland on site does not provide suitable habitat. Hydrology is very limited, and there is a dense cover of non-native species present. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes
Brodiaea leptandra narrow-anthered brodiaea			1B.2	Broadleafed upland forest, chaparral, valley and foothill grasslands on volcanic substrates Elevation: 40-1,220 m. Bloom period: May- July	**None.** Project site does not contain suitable habitat or volcanic soils to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Ceanothus confusus Rincon Ridge ceanothus			1B.1	Volcanic slopes, chaparral, pine/oak woodland Elevation: 75-1100 m. Bloom period: February–April	**None.** Project site does not contain suitable habitat or conditions to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Chorizanthe valida Sonoma spineflower	FE	SE	1B.1	Annual and perennial grasslands, coastal sand dunes native to California. Prefers sandy soil. Elevation: 5-50 m. Bloom period: June-August	**None.** The project site does not contain sandy soils to support this species. Nearest occurrence is 5 miles to the east near the town of Sebastopol. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021. .	No
Cuscuta obtusiflora var. glandulosa Peruvian dodder			2B.2	Freshwater marshes and swamps. Elevation: 15-280 m. Bloom period: July-October	**None.** The project site does not contain suitable freshwater marshes to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale[5]	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Downingia pusilla dwarf downingia			2B.2	Vernal lake and pool margins with a variety of associates. In several types of vernal pools. Elevation: 1-490 m. Bloom period: March-May	**None.** Seasonal wetland is present on-site. Several occurrences of this species are recorded within 2.5 miles of the project site. However, project is isolated from nearby occurrences by existing urban development. The seasonal wetland on site does not provide suitable habitat for this species given the density of non-native species and limited hydrology This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes
Fritillaria liliacea fragrant fritillary			1B.2	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland. Often on serpentine; various soils reported though usually on clay, in grassland. Elevation: 3-385 m. Bloom period: February-April	**None.** The project site does not contain serpentine soils to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant			1B.2	Valley and foothill grassland. Grassy valleys and hills, often in fallow fields; sometimes along roadsides. Elevation: 5-520 m. Bloom period: April-November	**None.** The project site contains suitable grassland habitat to support this species. Several occurrences of this species are recorded northwest within 3-5 miles of the project site. However, project is isolated from nearby occurrences by existing urban development. The grassland present on-site is highly disturbed and nearly devoid of native species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes
Horkelia tenuiloba thin-lobed horkelia			1B.2	Broad-leafed upland forest, chaparral, valley and foothill grassland with sandy soils. Often found in mesic habitats. Elevation: 45-640 m. Bloom period: May-July (August)	**None.** The project site does not contain suitable mesic habitat and sandy soils to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale[5]	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Lasthenia burkei Burke's goldfields	FE	SE	1B.1	Occurs in mesic habitats including meadows and seeps and vernal pools. Elevation: 15 - 600 m. Bloom period: April-June	**None.** Seasonal wetland is present on-site. Multiple occurrences of this species are recorded within 5 miles of the project site. However, project is isolated from nearby occurrences by existing urban development. The seasonal wetland on site does not provide suitable habitat for this species given the density of non-native species and limited hydrology. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes
Lasthenia californica ssp. bakeri Baker's goldfields			1B.2	Closed-cone coniferous forest, coastal scrub, meadows and seeps, marshes and swamps. Often found in forest openings. Elevation: 60-520 m. Bloom period: April-October	**None.** The project site does not contain suitable forested habitat to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Layia septentrionalis Colusa layia			1B.2	Chaparral, woodland, or valley and foothill grassland on serpentine or sandy soils Elevation: 100-900 m. Bloom period: April-June	**None.** Project site does not contain suitable serpentine or sandy soils to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Legenere limosa legenere			1B.1	Vernal pools and in beds of vernal pools. Elevation: 1-1005 m. Bloom period: April-June	**None.** Seasonal wetland is present on-site. This species has been recorded 2.25 miles west of the project site. However, project is isolated from nearby occurrences by existing urban development. The seasonal wetland on site does not provide suitable habitat for this species given the density of non-native species and limited hydrology. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale[5]	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Lilium pardalinum ssp. pitkinense Pitkin Marsh lily	FE	SE	1B.1	Cismontane woodland, meadows and seeps, marshes and swamps. Saturated, sandy soils with grasses and shrubs. Elevation: 45-65 m. Bloom period: June-July	**None.** The project site does not contain suitable wetland habitat with sandy soils to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Limnanthes vinculans Sebastopol meadowfoam	FE	SE	1B.1	Swales, wet meadows and marshy areas in valley oak savanna; on poorly drained soils of clays and sandy loam. Elevation: 15 - 115 m. Bloom period: April – May	**None.** Seasonal wetland is present on-site. Dozens of occurrences of this species are recorded within 5 miles of the project site. However, project is isolated from nearby occurrences by existing urban development. The seasonal wetland on site does not provide suitable habitat for this species given the density of non-native species and limited hydrology. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes
Microseris paludosa marsh microseris			1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation: 3-610 m. Bloom period: April-June (July)	**None.** The project site does not contain suitable woodland habitat to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Navarretia leucocephala ssp. bakeri Baker's navarretia			1B.1	Cismontane woodland, meadows and seeps, vernal pools and swales on adobe or alkaline soils Elevation: below 1,700 m. Bloom period: April-July	**None.** Seasonal wetland is present on-site. Several occurrences of this species are recorded within 3.5 miles of the project site. However, project is isolated from nearby occurrences by existing urban development. The seasonal wetland on site does not provide suitable habitat for this species given the dense cover of non-native annual grasses, limited hydrology, and the lack of typical associates for this taxa .This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale[5]	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Potentilla uliginosa Cunningham Marsh cinquefoil			1A	Freshwater, permanent oligotrophic wetlands, marshes and swamps. Elevation: 30-40 m. Bloom period: May-August	**None.** The project site does not contain suitable permanent wetland habitat to support this species. Species may be extirpated from local area. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Rhynchospora californica California beaked-rush			1B.1	Bogs and fens, open marshes and swamps, lower montane coniferous forest, meadows and freshwater seeps. Elevation: 45-270 m. Bloom period: May-July	**None.** The project site does not contain suitable permanent wetland habitat to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Trifolium amoenum two-fork clover	FE		1B.1	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite) Elevation: 5-415 m. Bloom period: April–June	**None.** Onsite habitat is not suitable for this species given the highly disturbed grassland present. Nearest occurrence of this species is 2 miles northwest of the project site. However, project is isolated from nearby occurrences by existing urban development. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes
Trifolium buckwestiorum Santa Cruz clover			1B.1	Broadleafed upland forest, cismontane woodland and coastal prairies. Often found along gravelly road margins. Elevation: 105-610 m. Bloom period: April-October	**None.** The project site does not contain suitable woodland habitat to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Trifolium hydrophilum saline clover			1B.2	Marshes and swamps, mesic or alkaline valley and foothill grassland and vernal pools at elevations between Elevation: 1 - 335 m. Bloom period: April–June	**None.** Onsite habitat is not suitable for this species given the highly disturbed grassland and the lack of alkaline soils. Nearest occurrence of this species is less than a mile west of the project site. However, project is isolated from nearby occurrences by existing urban development. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	Yes

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale[5]	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Triquetrella californica coastal triquetrella			1B.2	Coastal bluff scrub, coastal scrub. Grows within 30 miles from the coast in coastal scrub, grasslands and in open gravels on roadsides, hillsides, rocky slopes, and fields. On gravel or thin soil over outcrops. Elevation: 20-1175 m. Bloom period: N/A (bryophyte)	**None.** The project site does not contain suitable coastal bluff or rocky slope habitat to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No
Viburnum ellipticum oval-leaved viburnum			2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation: 215-1400 m. Bloom period: May-June	**None.** The project site does not contain suitable woodland habitat to support this species. This species was not observed during Prunuske & Chatham, Inc. botanical surveys in 2020 or 2021.	No

Code Designations

[1] Federal Status: 2020 USFWS Listing

- **ESU** = Evolutionary Significant Unit is a distinctive population.
- **FE** = Listed as endangered under the FESA.
- **FT** = Listed as threatened under the FESA.
- **FC** = Candidate for listing (threatened or endangered) under FESA.
- **FD** = Delisted in accordance with the FESA.
- **FPD** = Federally Proposed to be Delisted.
- **MBTA** = protected by the Migratory Bird Treaty Act
- **—** = Not federally listed

[2] State Status: 2020 CDFW Listing

- **SE** = Listed as endangered under the CESA.
- **ST** = Listed as threatened under the CESA.
- **SSC** = Species of Special Concern as identified by the CDFW.
- **FP** = Listed as fully protected under FGC.
- **CFG** = FGC =protected by FGC 3503.5
- **CR** = Rare in California.
- **—** = Not state listed

[3] CNPS: 2020 CNPS Listing

- **Rank 1A** = Plants species that presumed extinct in California.
- **Rank 1B** = Plant species that are rare, threatened, or endangered in California and elsewhere.
- **Rank 2** = Plant species that are rare, threatened, or endangered in California, but more common elsewhere.
- **Rank 3** = Plants about which we need more information—A Review List
- **Rank 4** = Plants of limited distribution—A Watch List

Blooming period: Months in parentheses are uncommon.

[4] **Habitat Description**: Habitat description adapted from CNDDB[1] and CNPS online inventory[2] or other specified source*

[5] **Potential to Occur and Rationale**: Location of recorded species occurrences determined by geospatial information from BIOS 5[3] or other specified source*

[1] California Department of Fish and Wildlife (CDFW). 2020. CNDDB RareFind 5 California Natural Diversity Database Query for Special-Status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed November 23, 2020.

[2] California Native Plant Society (CNPS). 2020. California Native Plant Society Rare and Endangered Plant Inventory. Website: http://www.rareplants.cnps.org/. Accessed November 23, 2020.

[3] California Department of Fish and Wildlife (CDFW). 2020. Biogeographic Information and Observation System (BIOS 5). Website: https://map.dfg.ca.gov/bios/. Accessed November 23, 2020.

Table 2: Special-status Wildlife Species Evaluated

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Habitat Description[3]	Potential to Occur and Rationale[4]	Included in Impact Analysis
Amphibians					
Ambystoma californiense California tiger salamander	FE	ST WL	Needs underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	**None.** Historically, the site may have supported CTS. However, the project site is isolated from known breeding populations with partial and full migration barriers between the project site and potential breeding ponds. The project site is also located in area of high density development; it does not provide upland habitat, because CTS migration to the site is extremely limited. The project site supports a seasonal wetland, but the wetland does not provide suitable breeding habitat. The nearest potential breeding site is located 0.75 mile (3,960 feet) from the project site (Prunuske Chatham 2021).[4]	Yes
Rana boylii foothill yellow-legged frog		SE SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in forests, chaparral, and woodlands. Needs at least some cobble-sized substrate for egg-laying.	**None.** The flood control channel west of the project site does not contain suitable breeding habitat to support this species. Moreover, no dispersal corridors from known breeding habitat are present on-site.	No
Rana draytonii California red-legged frog	FT	SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	**Low.** The flood control channel west of the project site does contain marginally suitable breeding and foraging habitat to support this species. However, the nearest recorded occurrence is located approximately 3.5 miles east of the project site.	Yes

[4] Prunuske Chatham, Inc. (PCI). 2021. California Tiger Salamander Site Assessment 2965 Dutton Avenue, City of Santa Rosa, California. June.

Scientific Name Common Name	Status USFWS[1]	 CDFW[2]	Habitat Description[3]	Potential to Occur and Rationale[4]	Included in Impact Analysis
Birds					
Accipiter cooperii Cooper's hawk		WL	Prefers woodland habitat, chiefly of open, interrupted or marginal type, including cismontane woodlands, riparian forests/woodlands and upper montane coniferous forest. May also occur near parks and residential areas. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	**Moderate.** The project site itself does not contain suitable nesting habitat, however suitable habitat can be found in the vicinity of the project site in form of parks and riparian habitat. Species has been recorded less than 1.5 miles north of the project site.	Yes
Agelaius tricolor tricolored blackbird		ST SSC	Forages in open habitats such as farm fields, pastures, cattle pens, large lawns. Breeds in large freshwater marshes, dense stands of hydrophytic vegetation (cattails, bulrushes, etc.). Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California.	**Low.** The project site does not contain suitable wetland breeding habitat with dense stands of hydrophytic vegetation to support this species. Nearest recorded occurrence is located 5 miles east of the project site.	No
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT	SE	Nests in riparian forest along the broad lower flood-bottoms of larger river systems. Found in riparian jungles of willow, often mixed with cottonwoods; understory consists of blackberry, nettles, and wild grape.	**None.** The project site does not contain dense stands of riparian vegetation to support this species. Nearest recorded occurrence is located 3 miles to the south.	No
Coturnicops noveboracensis yellow rail		SSC	Occurs in wet meadows, shallow marshes, and agricultural fields with grassy cover or heavy stubbles with fairly short vegetation. Often nest among sedges of the genus *Carex*.	**None.** The project site does not contain suitable wetland habitat to support this species.	No
Elanus leucurus white-tailed kite		FP	Found in rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Requires open grasslands, meadows, or marshes for foraging close to the isolated, dense-topped trees for nesting and perching.	**Moderate.** The project site contains suitable foraging habitat for this species. Suitable nesting habitat can be found within the vicinity of the project site, however the project site does not contain a suitable nesting tree. Species has been recorded a quarter of mile north of the project site.	Yes
Invertebrates					
Bombus occidentalis western bumble bee		CE	Formerly found in large parts of California but has been reduced in abundance and is now mostly restricted to high meadows or coastal environments. Species requires floral resources, and undisturbed nest and overwintering sites.	**None.** The project site does not contain suitable high meadows or coastal environments, floral resources and undisturbed nest sites to support this species.	No
Mammals					

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Habitat Description[3]	Potential to Occur and Rationale[4]	Included in Impact Analysis
Taxidea taxus American badger		SSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Requires sufficient food sources (rodents), friable soils, and open, uncultivated ground. Digs large burrows.	**None.** No suitable habitat is present on site. The adjacent flood control channel is fenced with a chain link fence. No suitable burrows were observed during the survey and no dispersal corridors from known sites are present on-site.	No
Reptiles					
Emys marmorata western pond turtle		SSC	This species is a thoroughly aquatic turtle found in ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation below 6000 feet elevation. Requires basking sites and suitable upland habitat (sandy banks or grassy open fields) up to 0.5 km from water for egg-laying.	**None.** No suitable habitat is present on site. The adjacent flood control channel is enclosed with a chain link fence precluding this species from utilizing the site.	No

Code Designations

[1] Federal Status: 2020 USFWS Listing		[2] State Status: 2020 CDFW Listing	
ESU	= Evolutionary Significant Unit is a distinctive population.	**SE**	= Listed as endangered under the CESA.
FE	= Listed as endangered under the FESA.	**ST**	= Listed as threatened under the CESA.
FT	= Listed as threatened under the FESA.	**SSC**	= Species of Special Concern as identified by the CDFW.
FC	= Candidate for listing (threatened or endangered) under FESA.	**FP**	= Listed as fully protected under FGC.
FD	= Delisted in accordance with the FESA.	**CFG**	= FGC =protected by FGC 3503.5
FPD	= Federally Proposed to be Delisted.	**CE**	= Candidate endangered under the CESA.
MBTA	= protected by the Migratory Bird Treaty Act	**—**	= Not state listed
—	= Not federally listed		

[3] **Habitat Description**: Habitat description adapted from CNDDB[5] or other specified source*.
[4] **Potential to Occur and Rationale**: Location of recorded species occurrences determined by geospatial information from BIOS 5[6] or other specified source*.

[5] California Department of Fish and Wildlife (CDFW). 2020. CNDDB RareFind 5 California Natural Diversity Database Query for Special-Status Species. Website: https://map.dfg.ca.gov/rarefind/view/RareFind.aspx. Accessed November 23, 2020.
[6] California Department of Fish and Wildlife (CDFW). 2020. Biogeographic Information and Observation System (BIOS 5). Website: https://map.dfg.ca.gov/bios/. Accessed November 23, 2020.

B.2 - CNDDB Search Results

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Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Santa Rosa (3812246) OR Healdsburg (3812257) OR Mark West Springs (3812256) OR Calistoga (3812255) OR Sebastopol (3812247) OR Kenwood (3812245) OR Two Rock (3812237) OR Cotati (3812236) OR Glen Ellen (3812235))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Allium peninsulare var. franciscanum Franciscan onion	PMLIL021R1	None	None	G5T2	S2	1B.2
Alopecurus aequalis var. sonomensis Sonoma alopecurus	PMPOA07012	Endangered	None	G5T1	S1	1B.1
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S3	SSC
Amorpha californica var. napensis Napa false indigo	PDFAB08012	None	None	G4T2	S2	1B.2
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G3	S3	1B.2
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S2	
Anomobryum julaceum slender silver moss	NBMUS80010	None	None	G5?	S2	4.2
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos densiflora Vine Hill manzanita	PDERI040C0	None	Endangered	G1	S1	1B.1
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita	PDERI041G4	None	None	G3T1	S1	1B.1
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus claranus Clara Hunt's milk-vetch	PDFAB0F240	Endangered	Threatened	G1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Balsamorhiza macrolepis big-scale balsamroot	PDAST11061	None	None	G2	S2	1B.2
Blennosperma bakeri Sonoma sunshine	PDAST1A010	Endangered	Endangered	G1	S1	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Brodiaea leptandra narrow-anthered brodiaea	PMLIL0C022	None	None	G3?	S3?	1B.2
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Caecidotea tomalensis Tomales isopod	ICMAL01220	None	None	G2	S2S3	
Calamagrostis crassiglumis Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
Calystegia collina ssp. oxyphylla Mt. Saint Helena morning-glory	PDCON04032	None	None	G4T3	S3	4.2
Campanula californica swamp harebell	PDCAM02060	None	None	G3	S3	1B.2
Castilleja uliginosa Pitkin Marsh paintbrush	PDSCR0D380	None	Endangered	GXQ	SX	1A
Ceanothus confusus Rincon Ridge ceanothus	PDRHA04220	None	None	G1	S1	1B.1
Ceanothus divergens Calistoga ceanothus	PDRHA04240	None	None	G2	S2	1B.2
Ceanothus foliosus var. vineatus Vine Hill ceanothus	PDRHA040D6	None	None	G3T1	S1	1B.1
Ceanothus purpureus holly-leaved ceanothus	PDRHA04160	None	None	G2	S2	1B.2
Ceanothus sonomensis Sonoma ceanothus	PDRHA04420	None	None	G2	S2	1B.2
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G3T2	S2	1B.2
Chorizanthe valida Sonoma spineflower	PDPGN040V0	Endangered	Endangered	G1	S1	1B.1
Clarkia imbricata Vine Hill clarkia	PDONA050K0	Endangered	Endangered	G1	S1	1B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4?	SH	2B.2
Delphinium luteum golden larkspur	PDRAN0B0Z0	Endangered	Rare	G1	S1	1B.1
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eryngium constancei Loch Lomond button-celery	PDAPI0Z0W0	Endangered	Endangered	G1	S1	1B.1
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Horkelia tenuiloba thin-lobed horkelia	PDROS0W0E0	None	None	G2	S2	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G2?	S2?	
Hydroporus leechi Leech's skyline diving beetle	IICOL55040	None	None	G1?	S1?	
Hysterocarpus traskii pomo Russian River tule perch	AFCQK02011	None	None	G5T4	S4	SSC
Lasiurus blossevillii western red bat	AMACC05060	None	None	G5	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia burkei Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1
Lasthenia californica ssp. bakeri Baker's goldfields	PDAST5L0C4	None	None	G3T1	S1	1B.2
Lavinia symmetricus navarroensis Navarro roach	AFCJB19023	None	None	G4T1T2	S2S3	SSC
Layia septentrionalis Colusa layia	PDAST5N0F0	None	None	G2	S2	1B.2
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Leptosiphon jepsonii Jepson's leptosiphon	PDPLM09140	None	None	G2G3	S2S3	1B.2
Lilium pardalinum ssp. pitkinense Pitkin Marsh lily	PMLIL1A0H3	Endangered	Endangered	G5T1	S1	1B.1
Limnanthes vinculans Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lupinus sericatus Cobb Mountain lupine	PDFAB2B3J0	None	None	G2?	S2?	1B.2
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2	1B.2
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis volans long-legged myotis	AMACC01110	None	None	G5	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Navarretia leucocephala ssp. plieantha many-flowered navarretia	PDPLM0C0E5	Endangered	Endangered	G4T1	S1	1B.2
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Northern Vernal Pool Northern Vernal Pool	CTT44100CA	None	None	G2	S2.1	
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2	
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Penstemon newberryi var. sonomensis Sonoma beardtongue	PDSCR1L483	None	None	G4T3	S3	1B.3
Plagiobothrys strictus Calistoga popcornflower	PDBOR0V120	Endangered	Threatened	G1	S1	1B.1
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Poa napensis Napa blue grass	PMPOA4Z1R0	Endangered	Endangered	G1	S1	1B.1
Potentilla uliginosa Cunningham Marsh cinquefoil	PDROS1B4A0	None	None	GX	SX	1A
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Rhynchospora alba white beaked-rush	PMCYP0N010	None	None	G5	S2	2B.2
Rhynchospora californica California beaked-rush	PMCYP0N060	None	None	G1	S1	1B.1
Rhynchospora capitellata brownish beaked-rush	PMCYP0N080	None	None	G5	S1	2B.2
Rhynchospora globularis round-headed beaked-rush	PMCYP0N0W0	None	None	G4	S1	2B.1
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sidalcea hickmanii ssp. napensis Napa checkerbloom	PDMAL110A6	None	None	G3T1	S1	1B.1
Sidalcea oregana ssp. valida Kenwood Marsh checkerbloom	PDMAL110K5	Endangered	Endangered	G5T1	S1	1B.1
Spergularia macrotheca var. longistyla long-styled sand-spurrey	PDCAR0W062	None	None	G5T2	S2	1B.2
Syncaris pacifica California freshwater shrimp	ICMAL27010	Endangered	Endangered	G2	S2	
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trifolium amoenum two-fork clover	PDFAB40040	Endangered	None	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 107

B.3 - CNPS Inventory Results

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CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

90 matches found. *Click on scientific name for details*

Search Criteria
Found in Quads 3812257, 3812256, 3812255, 3812247, 3812246, 3812245, 3812237 3812236 and 3812235;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Federal Listing Status	State Listing Status	CA Rare Plant Rank	Habitats	Lowest Elevation	Highest Elevation	Blooming Period
Allium peninsulare var. franciscanum	Franciscan onion	Alliaceae	perennial bulbiferous herb			1B.2	• Cismontane woodland • Valley and foothill grassland	52 m	305 m	(Apr)May-Jun
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Poaceae	perennial herb	FE		1B.1	• Marshes and swamps (freshwater) • Riparian scrub	5 m	365 m	May-Jul
Amorpha californica var. napensis	Napa false indigo	Fabaceae	perennial deciduous shrub			1B.2	• Broadleafed upland forest (openings) • Chaparral • Cismontane woodland	120 m	2000 m	Apr-Jul
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb			1B.2	• Coastal bluff scrub • Cismontane woodland • Valley and foothill grassland	3 m	500 m	Mar-Jun
Anomobryum julaceum	slender silver moss	Bryaceae	moss			4.2	• Broadleafed upland forest • Lower montane coniferous forest • North Coast coniferous forest	100 m	1000 m	
Arctostaphylos densiflora	Vine Hill manzanita	Ericaceae	perennial evergreen shrub		CE	1B.1	• Chaparral (acid marine sand)	50 m	120 m	Feb-Apr

Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	Ericaceae	perennial evergreen shrub			1B.1	• Chaparral (rhyolitic) • Cismontane woodland	75 m	370 m	Feb-Apr(May)
Astragalus breweri	Brewer's milk-vetch	Fabaceae	annual herb			4.2	• Chaparral • Cismontane woodland • Meadows and seeps • Valley and foothill grassland (open, often gravelly)	90 m	730 m	Apr-Jun
Astragalus claranus	Clara Hunt's milk-vetch	Fabaceae	annual herb	FE	CT	1B.1	• Chaparral (openings) • Cismontane woodland • Valley and foothill grassland	75 m	275 m	Mar-May
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb			1B.2	• Chaparral • Cismontane woodland • Valley and foothill grassland	45 m	1555 m	Mar-Jun
Blennosperma bakeri	Sonoma sunshine	Asteraceae	annual herb	FE	CE	1B.1	• Valley and foothill grassland (mesic) • Vernal pools	10 m	110 m	Mar-May
Brodiaea leptandra	narrow-anthered brodiaea	Themidaceae	perennial bulbiferous herb			1B.2	• Broadleafed upland forest • Chaparral • Cismontane woodland • Lower montane coniferous forest • Valley and foothill grassland	110 m	915 m	May-Jul
Calamagrostis bolanderi	Bolander's reed grass	Poaceae	perennial rhizomatous herb			4.2	• Bogs and fens • Broadleafed upland forest • Closed-cone coniferous forest • Coastal scrub • Meadows and seeps (mesic) • Marshes and swamps (freshwater) • North Coast coniferous forest	0 m	455 m	May-Aug
	Thurber's	Poaceae	perennial			2B.1	• Coastal	10 m	60 m	May-Aug

Calamagrostis crassiglumis	reed grass		rhizomatous herb		scrub (mesic) • Marshes and swamps (freshwater)			
Calamagrostis ophitidis	serpentine reed grass	Poaceae	perennial herb	4.3	• Chaparral (open, often north-facing slopes) • Lower montane coniferous forest • Meadows and seeps • Valley and foothill grassland	90 m	1065 m	Apr-Jul
Calandrinia breweri	Brewer's calandrinia	Montiaceae	annual herb	4.2	• Chaparral • Coastal scrub	10 m	1220 m	(Jan)Mar-Jun
Calochortus uniflorus	pink star-tulip	Liliaceae	perennial bulbiferous herb	4.2	• Coastal prairie • Coastal scrub • Meadows and seeps • North Coast coniferous forest	10 m	1070 m	Apr-Jun
Calystegia collina ssp. oxyphylla	Mt. Saint Helena morning-glory	Convolvulaceae	perennial rhizomatous herb	4.2	• Chaparral • Lower montane coniferous forest • Valley and foothill grassland	279 m	1010 m	Apr-Jun
Campanula californica	swamp harebell	Campanulaceae	perennial rhizomatous herb	1B.2	• Bogs and fens • Closed-cone coniferous forest • Coastal prairie • Meadows and seeps • Marshes and swamps (freshwater) • North Coast coniferous forest	1 m	405 m	Jun-Oct
Castilleja ambigua var. ambigua	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	4.2	• Coastal bluff scrub • Coastal prairie • Coastal scrub • Marshes and swamps • Valley and foothill grassland • Vernal	0 m	435 m	Mar-Aug

							pools margins			
Castilleja uliginosa	Pitkin Marsh paintbrush	Orobanchaceae	perennial herb (hemiparasitic)		CE	1A	• Marshes and swamps (freshwater)	240 m	240 m	Jun-Jul
Ceanothus confusus	Rincon Ridge ceanothus	Rhamnaceae	perennial evergreen shrub			1B.1	• Closed-cone coniferous forest • Chaparral • Cismontane woodland	75 m	1065 m	Feb-Jun
Ceanothus divergens	Calistoga ceanothus	Rhamnaceae	perennial evergreen shrub			1B.2	• Chaparral (serpentinite or volcanic, rocky)	170 m	950 m	Feb-Apr
Ceanothus foliosus var. vineatus	Vine Hill ceanothus	Rhamnaceae	perennial evergreen shrub			1B.1	• Chaparral	45 m	305 m	Mar-May
Ceanothus gloriosus var. exaltatus	glory brush	Rhamnaceae	perennial evergreen shrub			4.3	• Chaparral	30 m	610 m	Mar-Jun(Aug)
Ceanothus purpureus	holly-leaved ceanothus	Rhamnaceae	perennial evergreen shrub			1B.2	• Chaparral • Cismontane woodland	120 m	640 m	Feb-Jun
Ceanothus sonomensis	Sonoma ceanothus	Rhamnaceae	perennial evergreen shrub			1B.2	• Chaparral (sandy, serpentinite or volcanic)	215 m	800 m	Feb-Apr
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	annual herb			1B.2	• Chaparral • Coastal prairie • Meadows and seeps • Marshes and swamps (coastal salt) • Valley and foothill grassland (vernally mesic)	0 m	420 m	May-Nov
Chorizanthe valida	Sonoma spineflower	Polygonaceae	annual herb	FE	CE	1B.1	• Coastal prairie (sandy)	10 m	305 m	Jun-Aug
Clarkia breweri	Brewer's clarkia	Onagraceae	annual herb			4.2	• Chaparral • Cismontane woodland • Coastal scrub	215 m	1115 m	Apr-Jun
Clarkia imbricata	Vine Hill clarkia	Onagraceae	annual herb	FE	CE	1B.1	• Chaparral • Valley and foothill grassland	50 m	75 m	Jun-Aug
Cordylanthus tenuis ssp. brunneus	serpentine bird's-beak	Orobanchaceae	annual herb (hemiparasitic)			4.3	• Closed-cone coniferous forest • Chaparral • Cismontane woodland	305 m	915 m	Jul-Aug

Cordylanthus tenuis ssp. capillaris	Pennell's bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	FE	CR	1B.2	• Closed-cone coniferous forest • Chaparral	45 m	305 m	Jun-Sep
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	Convolvulaceae	annual vine (parasitic)			2B.2	• Marshes and swamps (freshwater)	15 m	280 m	Jul-Oct
Cypripedium montanum	mountain lady's-slipper	Orchidaceae	perennial rhizomatous herb			4.2	• Broadleafed upland forest • Cismontane woodland • Lower montane coniferous forest • North Coast coniferous forest	185 m	2225 m	Mar-Aug
Delphinium luteum	golden larkspur	Ranunculaceae	perennial herb	FE	CR	1B.1	• Chaparral • Coastal prairie • Coastal scrub	0 m	100 m	Mar-May
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb			2B.2	• Valley and foothill grassland (mesic) • Vernal pools	1 m	445 m	Mar-May
Erigeron biolettii	streamside daisy	Asteraceae	perennial herb			3	• Broadleafed upland forest • Cismontane woodland • North Coast coniferous forest	30 m	1100 m	Jun-Oct
Erigeron serpentinus	serpentine daisy	Asteraceae	perennial herb			1B.3	• Chaparral (serpentinite, seeps)	60 m	670 m	May-Aug
Eriophorum gracile	slender cottongrass	Cyperaceae	perennial rhizomatous herb (emergent)			4.3	• Bogs and fens • Meadows and seeps • Upper montane coniferous forest	1280 m	2900 m	May-Sep
Eryngium constancei	Loch Lomond button-celery	Apiaceae	annual / perennial herb	FE	CE	1B.1	• Vernal pools	460 m	855 m	Apr-Jun
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb			1B.2	• Cismontane woodland • Coastal prairie • Coastal scrub • Valley and foothill grassland	3 m	410 m	Feb-Apr
Gilia capitata ssp. tomentosa	woolly-headed gilia	Polemoniaceae	annual herb			1B.1	• Coastal bluff scrub • Valley and	10 m	220 m	May-Jul

							foothill grassland			
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb		CE	1B.2	• Marshes and swamps (lake margins) • Vernal pools	10 m	2375 m	Apr-Aug
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Asteraceae	annual herb			1B.2	• Valley and foothill grassland	20 m	560 m	Apr-Nov
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb			4.2	• Valley and foothill grassland (mesic, clay) • Vernal pools (shallow)	0 m	505 m	Mar-Jun
Horkelia tenuiloba	thin-lobed horkelia	Rosaceae	perennial herb			1B.2	• Broadleafed upland forest • Chaparral • Valley and foothill grassland	50 m	500 m	May-Jul(Aug)
Hosackia gracilis	harlequin lotus	Fabaceae	perennial rhizomatous herb			4.2	• Broadleafed upland forest • Coastal bluff scrub • Closed-cone coniferous forest • Cismontane woodland • Coastal prairie • Coastal scrub • Meadows and seeps • Marshes and swamps • North Coast coniferous forest • Valley and foothill grassland	0 m	700 m	Mar-Jul
Iris longipetala	coast iris	Iridaceae	perennial rhizomatous herb			4.2	• Coastal prairie • Lower montane coniferous forest • Meadows and seeps	0 m	600 m	Mar-May
Lasthenia burkei	Burke's goldfields	Asteraceae	annual herb	FE	CE	1B.1	• Meadows and seeps (mesic) • Vernal pools	15 m	600 m	Apr-Jun
Lasthenia californica ssp.	Baker's goldfields	Asteraceae	perennial herb			1B.2	• Closed-cone coniferous	60 m	520 m	Apr-Oct

bakeri							forest (openings) • Coastal scrub • Meadows and seeps • Marshes and swamps			
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	annual herb	FE		1B.1	• Cismontane woodland • Playas (alkaline) • Valley and foothill grassland • Vernal pools	0 m	470 m	Mar-Jun
Layia septentrionalis	Colusa layia	Asteraceae	annual herb			1B.2	• Chaparral • Cismontane woodland • Valley and foothill grassland	100 m	1095 m	Apr-May
Legenere limosa	legenere	Campanulaceae	annual herb			1B.1	• Vernal pools	1 m	880 m	Apr-Jun
Leptosiphon acicularis	bristly leptosiphon	Polemoniaceae	annual herb			4.2	• Chaparral • Cismontane woodland • Coastal prairie • Valley and foothill grassland	55 m	1500 m	Apr-Jul
Leptosiphon jepsonii	Jepson's leptosiphon	Polemoniaceae	annual herb			1B.2	• Chaparral • Cismontane woodland • Valley and foothill grassland	100 m	500 m	Mar-May
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	annual herb			3	• Broadleafed upland forest • Coastal scrub • Lower montane coniferous forest • Valley and foothill grassland	15 m	305 m	Jun-Oct
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Liliaceae	perennial bulbiferous herb	FE	CE	1B.1	• Cismontane woodland • Meadows and seeps • Marshes and swamps (freshwater)	35 m	65 m	Jun-Jul
Lilium rubescens	redwood lily	Liliaceae	perennial bulbiferous herb			4.2	• Broadleafed upland forest • Chaparral • Lower montane coniferous forest • North Coast	30 m	1910 m	Apr-Aug(Sep)

							coniferous forest • Upper montane coniferous forest			
Limnanthes vinculans	Sebastopol meadowfoam	Limnanthaceae	annual herb	FE	CE	1B.1	• Meadows and seeps • Valley and foothill grassland • Vernal pools	15 m	305 m	Apr-May
Lomatium repostum	Napa lomatium	Apiaceae	perennial herb			4.3	• Chaparral • Cismontane woodland	90 m	830 m	Mar-Jun
Lupinus sericatus	Cobb Mountain lupine	Fabaceae	perennial herb			1B.2	• Broadleafed upland forest • Chaparral • Cismontane woodland • Lower montane coniferous forest	275 m	1525 m	Mar-Jun
Micropus amphibolus	Mt. Diablo cottonweed	Asteraceae	annual herb			3.2	• Broadleafed upland forest • Chaparral • Cismontane woodland • Valley and foothill grassland	45 m	825 m	Mar-May
Microseris paludosa	marsh microseris	Asteraceae	perennial herb			1B.2	• Closed-cone coniferous forest • Cismontane woodland • Coastal scrub • Valley and foothill grassland	5 m	355 m	Apr-Jun(Jul)
Monardella viridis	green monardella	Lamiaceae	perennial rhizomatous herb			4.3	• Broadleafed upland forest • Chaparral • Cismontane woodland	100 m	1010 m	Jun-Sep
Navarretia cotulifolia	cotula navarretia	Polemoniaceae	annual herb			4.2	• Chaparral • Cismontane woodland • Valley and foothill grassland	4 m	1830 m	May-Jun
Navarretia heterandra	Tehama navarretia	Polemoniaceae	annual herb			4.3	• Valley and foothill grassland (mesic) • Vernal pools	30 m	1010 m	Apr-Jun
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb			1B.1	• Cismontane woodland • Lower	5 m	1740 m	Apr-Jul

							montane coniferous forest • Meadows and seeps • Valley and foothill grassland • Vernal pools			
Navarretia leucocephala ssp. plieantha	many-flowered navarretia	Polemoniaceae	annual herb	FE	CE	1B.2	• Vernal pools (volcanic ash flow)	30 m	950 m	May-Jun
Penstemon newberryi var. sonomensis	Sonoma beardtongue	Plantaginaceae	perennial herb			1B.3	• Chaparral (rocky)	700 m	1370 m	Apr-Aug
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	Apiaceae	perennial herb			4.2	• Broadleafed upland forest • Chaparral • Coastal prairie • Valley and foothill grassland • Vernal pools	0 m	610 m	Jun-Oct
Plagiobothrys strictus	Calistoga popcornflower	Boraginaceae	annual herb	FE	CT	1B.1	• Meadows and seeps • Valley and foothill grassland • Vernal pools	90 m	160 m	Mar-Jun
Pleuropogon hooverianus	North Coast semaphore grass	Poaceae	perennial rhizomatous herb		CT	1B.1	• Broadleafed upland forest • Meadows and seeps • North Coast coniferous forest	10 m	671 m	Apr-Jun
Pleuropogon refractus	nodding semaphore grass	Poaceae	perennial rhizomatous herb			4.2	• Lower montane coniferous forest • Meadows and seeps • North Coast coniferous forest • Riparian forest	0 m	1600 m	(Mar)Apr-Aug
Poa napensis	Napa blue grass	Poaceae	perennial herb	FE	CE	1B.1	• Meadows and seeps • Valley and foothill grassland	100 m	200 m	May-Aug
Potentilla uliginosa	Cunningham Marsh cinquefoil	Rosaceae	perennial herb			1A	• Marshes and swamps	30 m	40 m	May-Aug
Puccinellia simplex	California alkali grass	Poaceae	annual herb			1B.2	• Chenopod scrub • Meadows and seeps	2 m	930 m	Mar-May

							• Valley and foothill grassland • Vernal pools			
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)			4.2	• Cismontane woodland • North Coast coniferous forest • Valley and foothill grassland • Vernal pools	15 m	470 m	Feb-May
Rhynchospora alba	white beaked-rush	Cyperaceae	perennial rhizomatous herb			2B.2	• Bogs and fens • Meadows and seeps • Marshes and swamps (freshwater)	60 m	2040 m	Jun-Aug
Rhynchospora californica	California beaked-rush	Cyperaceae	perennial rhizomatous herb			1B.1	• Bogs and fens • Lower montane coniferous forest • Meadows and seeps (seeps) • Marshes and swamps (freshwater)	45 m	1010 m	May-Jul
Rhynchospora capitellata	brownish beaked-rush	Cyperaceae	perennial herb			2B.2	• Lower montane coniferous forest • Meadows and seeps • Marshes and swamps • Upper montane coniferous forest	45 m	2000 m	Jul-Aug
Rhynchospora globularis	round-headed beaked-rush	Cyperaceae	perennial rhizomatous herb			2B.1	• Marshes and swamps (freshwater)	45 m	60 m	Jul-Aug
Sidalcea hickmanii ssp. napensis	Napa checkerbloom	Malvaceae	perennial herb			1B.1	• Chaparral	415 m	610 m	Apr-Jun
Sidalcea oregana ssp. valida	Kenwood Marsh checkerbloom	Malvaceae	perennial rhizomatous herb	FE	CE	1B.1	• Marshes and swamps (freshwater)	115 m	150 m	Jun-Sep
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Caryophyllaceae	perennial herb			1B.2	• Meadows and seeps • Marshes and swamps	0 m	255 m	Feb-May(Jun)
Trifolium amoenum	two-fork clover	Fabaceae	annual herb	FE		1B.1	• Coastal bluff scrub • Valley and foothill	5 m	415 m	Apr-Jun

					grassland (sometimes serpentinite)			
Trifolium buckwestiorum	Santa Cruz clover	Fabaceae	annual herb	1B.1	• Broadleafed upland forest • Cismontane woodland • Coastal prairie	105 m	610 m	Apr-Oct
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	1B.2	• Marshes and swamps • Valley and foothill grassland (mesic, alkaline) • Vernal pools	0 m	300 m	Apr-Jun
Triquetrella californica	coastal triquetrella	Pottiaceae	moss	1B.2	• Coastal bluff scrub • Coastal scrub	10 m	100 m	
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	2B.3	• Chaparral • Cismontane woodland • Lower montane coniferous forest	215 m	1400 m	May-Jun

Suggested Citation

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B.4 - Programmatic Biological Opinion for U.S. Army Corps of Engineers

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United States Department of the Interior

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

In Reply Refer To:
81420-2008-F-0261

NOV 09 2007

Ms. Jane Hicks
Regulatory Branch Chief
San Francisco District
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, California 94103-1398

Subject: Programmatic Biological Opinion (Programmatic) for U.S. Army Corps of Engineers (Corps) Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California (Corps File Number 223420N)

Dear Ms. Hicks:

This is in response to your November 1, 2007, request to re-initiate formal consultation with the U.S. Fish and Wildlife Service (Service) for permits, enforcement actions and mitigation banks that are under the Corps jurisdiction. This document represents the Service's biological opinion on the effects of the action on the endangered Sonoma County Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*), Burke's goldfields (*Lasthenia burkei)*, Sonoma sunshine (*Blemnosperma bakeri)* and Sebastopol meadowfoam (*Limnanthes vinculans*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

This biological opinion is based on information provided by the following facts, communications and documents:

1. The November 1, 2007letter from the Corps re-initiating formal consultation;
2. The December 1, 2005 Santa Rosa Plain Conservation Strategy;
3. The May 16, 2006 Interim Mitigation Guidelines authored by the Service and CDFG (http://www.fws.gov/sacramento/es/santa_rosa_conservation.html);
4. References cited in this Biological Opinion; and
5. Other information available to the Service.

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Consultation History/Background

The Santa Rosa Plain is located in central Sonoma County and is characterized by vernal pools, seasonal wetlands, and associated grassland habitat, which support – among other flora and fauna – the endangered California tiger salamander and four endangered plant species: Burke's goldfields, Sonoma sunshine, Sebastopol meadowfoam, and many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*) (listed plants). These listed plants grow only in vernal pools; the California tiger salamander uses seasonal wetlands and vernal pools for breeding and metamorphosis, and the surrounding uplands for dispersal, feeding, growth, maturation and maintenance of the juvenile and adult population (upland habitat). The distribution of Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam is confined almost entirely to the Santa Rosa Plain. Many-flowered navarretia occurs mostly outside the Santa Rosa Plain, but its only Sonoma County population is present on the Santa Rosa Plain.

Urbanization and agricultural development on the Santa Rosa Plain has encroached into areas inhabited by the California tiger salamander and the listed plants discussed above. The loss of seasonal wetlands caused by development on the Santa Rosa Plain has led to declines in the populations of the listed plants and the California tiger salamander. Voters in the cities of Cotati, Rohnert Park, Santa Rosa, and Sebastopol, and the Town of Windsor have established urban growth boundaries (UGBs) for their communities. This is intended to accomplish the goal of city-centered growth, resulting in rural and agricultural land uses being maintained between the urbanized areas. Therefore, it can be reasonably expected that rural land uses will continue into the foreseeable future. There are also acreages of publicly owned property and preserves located in the Santa Rosa Plain, which will further contribute to conservation. Some of the areas within these UGBs, however, include lands inhabited by California tiger salamander and the listed plant species. Some agricultural practices have also disturbed and modified seasonal wetlands, California tiger salamander and listed plant habitat on the Santa Rosa Plain. Some agricultural practices, such as irrigated or grazed pasture, retain some California tiger salamander habitat value compared to more intensive development.

Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam were federally listed as endangered on December 2, 1991. The many-flowered navarretia was listed on June 18, 1997. These plants are also listed as endangered by the State of California. A Programmatic Biological Opinion covering the four listed plants was issued on July 17, 1998. On July 22, 2002, the Service listed the Sonoma County distinct population segment of the California tiger salamander as endangered under an emergency basis. The final rule was issued on March 19, 2003. The Service listed the species as threatened throughout its range on August 4, 2004, including the former Sonoma County distinct population segment (Federal Register 69:47211-47248). The listing of the California tiger salamander has caused a level of uncertainty for local jurisdictions, landowners, and developers about how the listing would affect their activities. Private and local public interests met with the Service to discuss possible cooperative approaches to protecting the species, while allowing planned land uses to occur within the range of the animal. The result of these discussions was the formation of the Santa Rosa Plain Conservation Strategy Team (Team). The Team included the following members: Service, CDFG, Corps, Environmental Protection Agency, North Coast Regional Water Quality Control Board, local governments, the Laguna de Santa Rosa Foundation, the environmental community, and the private landowner community. It was agreed that the Team would develop a conservation strategy for the Santa

Rosa Plain that conserves and enhances the habitat for the California tiger salamander and the listed plants, while considering the need for development pursuant to the general plans of the local jurisdictions. The Team held its first meeting on March 30, 2004, and continued to meet through August 2005, to prepare a Draft Santa Rosa Plain Conservation Strategy. The Team held a public meeting on September 12, 2005, and received numerous comments on the draft through September 16, 2005. In addition, the Draft Santa Rosa Plain Conservation Strategy was peer reviewed. The Team reviewed and considered all comments received, made modifications to the Draft Santa Rosa Plain Conservation Strategy where appropriate, and produced the Final Santa Rosa Plain Conservation Strategy (Conservation Strategy).

The Sonoma County distinct population segment for the California tiger salamander was reinstated and re-designated as endangered by court order on August 19, 2005. On December 14, 2005, the Service made a final determination to not designate critical habitat for the Sonoma County distinct population segment of the California tiger salamander. The Service analyzed whether the benefits of designating critical habitat were outweighed by the benefits of not designating critical habitat. It was determined that the interim conservation strategies and measures being implemented by those local governing agencies with land use authority over the area outweighed the benefits of listing critical habitat at this time. The California tiger salamander is not listed under the California Endangered Species Act at this time. It is currently a state species of special concern.

Conservation Areas

The Conservation Strategy identifies areas within the Santa Rosa Plain that should be conserved to benefit both the California tiger salamander and listed plants. Designation of an individual property as being within a conservation area does not change that property's land use designation or zoning, or otherwise restrict the use of that property. In addition, a property in a conservation area is not automatically suitable for listed species conservation.

The purpose of the conservation areas is to insure that preservation occurs throughout the distribution of the species. The designation of conservation areas is based upon the following factors: 1) known distribution of the California tiger salamander; 2) the presence of suitable California tiger salamander habitat; 3) presence of large blocks of natural or restorable land; 4) proximity to existing Preserves; and 5) known location of the listed plants. The designation of conservation areas also generally attempted to avoid future development areas established by UGBs and city general plans. Areas which are in the Laguna de Santa Rosa floodplain, areas above approximately 300 feet in elevation and characterized by oak woodland, or are adjacent to or surrounded by significant urban areas, generally have been excluded from the boundaries of the conservation areas, however these areas may still require mitigation if endangered species are adversely affected. The Southwest Santa Rosa Preserve System is within the urban growth boundary of the City of Santa Rosa.

The conservation area boundaries identify areas where mitigation for project-related impacts to the listed species should be directed. The listed plants also occur in the identified conservation areas, with the exception of the southwest Cotati and southeast Cotati Conservation Areas. However, the many-flowered navarettia is only known from one site in the Santa Rosa Plain.

Figures 1 through 3 in the Conservation Strategy identify areas important for protection of the California tiger salamander and listed plants on the Santa Rosa Plain as well as other pertinent information. Figures 4 through 13 in the Conservation Strategy describe each conservation area in detail (Service web page: http://www.fws.gov/sacramento/es/santa_rosa_conservation.html). Some lands within the conservation areas are excluded based on existing development and on their small size or on other factors that would make them unsuitable for conservation of listed species. Complete descriptions of the conservation areas are in the Conservation Strategy.

Introduction

The Conservation Strategy is the biological framework upon which this Programmatic is based. However, because the local agencies with interested stakeholders are currently developing mechanisms to implement the Conservation Strategy, this Programmatic will be based on the interim mitigation ratios described in the Conservation Strategy and described later in this opinion. This Programmatic will replace the July 17, 1998 programmatic biological opinion (Service, 1998) prepared for the listed plants. This Programmatic may be amended or a new one may be written after an Implementation Plan for the Conservation Strategy is completed by the local jurisdictions.

This Programmatic is issued to the Corps for permits, enforcement actions or mitigation banks (Project(s)) that are under their jurisdiction. Projects that are appended to this Programmatic will be provided individual take authorization. This Programmatic will not cover the many-flowered navarretia because of its limited distribution. Also, projects that will impact occupied sites supporting Burke's goldfields and Sonoma sunshine, where surveys have documented 2,000 plants or greater in any year in the past 10 years may not be appended to this Programmatic, but will be evaluated on a case by case basis. The number for 2,000 plants was derived from comments provided by numerous technical experts and the Service's review of projects impacting plant populations. This Programmatic will expedite the process for project approval provided all information listed in the next section is provided by the project applicants. This Programmatic provides the framework for mitigation, conservation, translocation, and appropriate minimization measures. The Service and CDFG will track Project impacts, mitigation and other pertinent information.

Procedures for Appending Projects to the Programmatic Biological Opinion

The following information is required from the applicant and will be used by the Corps along with the California tiger salamander and Plant Designation Map (Enclosure 1) and Plant Mitigation Location Map (Enclosure 2) to evaluate whether a Project can be appended to this Programmatic:

1) Corps Permit Application including Assessors Parcel Number(s), UTM coordinates, and street address of the Project;

2) Corps-verified jurisdictional determination;

3) Biological Assessment including Service survey protocols (Survey protocols:

http://www.fws.gov/sacramento/es/santa_rosa_conservation.html) results, if needed, and proposed mitigation consistent with the ratios in this Programmatic;

4) Listed plant occurrence information on the Project and mitigation sites from the CDFG California Natural Diversity Database (http://www.dfg.ca.gov/biogeodata/cnddb/) and the 1994 report, *Seasonal Wetland Baseline Report for the Santa Rosa Plain, Sonoma County* (http://www.fws.gov/sacramento/es/Santa_Rosa_strategy_COE_programmatic_BO.htm) (Patterson *et al.* , 1994); and

5) Mitigation proposal including acres and location, credit sale receipt and any other pertinent information. If the proposed mitigation is a new Preserve, then the Preserve Establishment and Evaluation Criteria (Enclosure 3) will be used by the Applicants to provide the preliminary determination for Preserve selection.

The Corps will make one of the following determinations of effect for a project by reviewing Enclosure 1, Enclosure 2 and other information provided by the applicant and will take the identified action:

- No effect. No consultation with the Service is required for areas on Enclosure 1 identified as "No Effect".

- May affect listed plants, but would not likely affect California tiger salamander. Consult with the Service for concurrence for areas on Enclosure 1 identified as "May affect listed plants, but would not likely affect California tiger salamander". The Corps will forward to the Service all biological and other pertinent information and a letter requesting that the proposed Project to be appended to this Programmatic.

- May affect listed plants and would likely affect California tiger salamander. Consult with the Service for concurrence for areas on Enclosure 1 and Enclosure 2 identified as "May affect listed plants and would likely affect California tiger salamander". The Corps will forward to the Service all biological and other pertinent information and a letter requesting that the proposed Project to be appended to this Programmatic.
- May affect California tiger salamander, but no effect to listed plants. Consult with the Service for concurrence for areas on Enclosure 1 and identified as "May affect California tiger salamander, but no effect to listed plants". The Corps will forward to the Service all biological and other pertinent information and a letter requesting that the proposed project to be appended to this Programmatic.

The Service will review the proposed Project to evaluate whether it is appropriate to append the Project to this Programmatic based on the level of impacts, avoidance, minimization and mitigation measures. The Service may determine some projects require separate Section 7 consultation and will not be appended to this Programmatic. If the Service does not concur the project is appropriate to be appended to this Programmatic, the Service will notify the Corps in writing. Applicants who have had consultation initiated by the Corps prior to the date of this Programmatic may continue with that consultation or may request their Project be appended to this Programmatic.

BIOLOGICAL OPINION

Description of the Proposed Action

The proposed action is appending Projects to this Programmatic that are consistent with the Conservation Strategy and that the Service has determined to be appropriate for being appended to this Programmatic. For the purpose of this Programmatic, the action area is shown in Enclosure 1 as the "Santa Rosa Plain Conservation Strategy Study Area" (Study Area).

As stated above, Project sites where surveys have documented 2,000 plants or greater of Burke's goldfield or Sonoma sunshine in any year in the past 10 years may not be appended to this Programmatic. These sites may require an individual formal consultation. Certain linear projects as defined in the Conservation Strategy may be covered under this Programmatic if they follow the ratios described in this Programmatic. In addition, Projects in the Southwest Santa Rosa Preserve System (Conservation Strategy Team, 2005) will be evaluated individually and may not adhere to the ratios if the individual Project mitigation includes preserving corridors as described and shown on Figure 3 and Figure 12 in the Conservation Strategy. The corridors may not need to be exactly as depicted on Figure 3 and 12, but must provide similar or greater function as the Conservation Strategy intended.

Preserves

A "Preserve" includes mitigation and conservation banks and other mitigation and conservation sites. Parcels proposed for preservation under this Programmatic provide habitat for the California tiger salamander and/or listed plants. The Service and CDFG will evaluate the Applicant's proposed Preserve to determine its suitability. Preserve establishment guidance and evaluation criteria is provided in Enclosure 3. Other required mitigation components include management plans, long-term endowments, and other necessary requirements, all of which must be complete and approved by the Service and CDFG. Preserve enhancement or management associated with permits and enforcement actions that are appended to this Programmatic will be provided individual take authorization. It is anticipated that ground work associated with enhancing a Preserve will generally have a net benefit to the California tiger salamander and/or listed plants and would not need to adhere to the mitigation ratios.

To meet the biological goals and objectives as described in the Conservation Strategy, the following measures will be applied:

1) Preserves must ultimately have the listed species present and within a reasonable timeframe.

2) There will be at least one California tiger salamander breeding pool for every 20 acres of Preserves unless otherwise determined by the Service and CDFG;

3) Each Preserve will have at least one created or existing California tiger salamander breeding site, as defined in the Conservation Strategy, or the presence of listed plants;

4) Generally, seasonal wetlands will not exceed 30-35% of a Preserve;

5) Generally, pool size of individual pools will be under 0.25 acres and

6) Site specific design plans will be reviewed and approved by the Service and CDFG.

Mitigation

Mitigation ratios for the California tiger salamander were determined by considering the likely impacts to the species and its habitat. Adult California tiger salamanders have been observed up to 1.3 miles from breeding sites (S. Sweet, 1998). The graduated ratios were developed using an estimate of the amount of habitat needed to meet the required conservation goal based on the expected impacts of development projected to occur on the Santa Rosa Plain from 2005 through 2015. The graduated ratios were based on the proximity to known California tiger salamander breeding habitat and adult occurrences. These ratios will be used until the Conservation Strategy is implemented by the local jurisdictions. The expected impact areas and conservation areas were mapped by using existing land use plans, aerial photography, expert knowledge of the areas, and data on California tiger salamander and listed plants from the California Natural Diversity Database (CNDDB) and local experts.

Mitigation requirements will apply to the entire Project area, however, the mitigation requirement for Projects on parcels with existing hardscape will be removed from the calculation. Hardscape may include parking lots, compacted gravel surfaces, buildings, or other structures. In some cases, hardscape may provide some recognizable benefit to the species. Where the hardscape currently functions as a movement corridor between existing and/or proposed preserve habitat, measures must be included in the design of future development to maintain this function. For each Project, the Service and CDFG will determine if hardscape provides benefit to the species and if any mitigation is required.

Mitigation ratios and the Conservation Strategy are dependent on current information on both California tiger salamander distribution and development that is currently proposed. Reinitiation of this Programmatic may be required if the land use changes or if new information is discovered regarding the distribution of tiger salamander or listed plants within the Study Area. If new breeding sites or occurrences are found in the Study Area, then Enclosure 1 would be revised accordingly. Enclosure 1 will be updated at least annually by the Service and CDFG and will be provided to the Corps and posted on the Service's web page.

Mitigation for California tiger salamander or listed plants must be achieved at a Preserve which could include purchasing appropriate credits at a Service-approved bank or another type of Preserve as described above.

California tiger salamander Mitigation Ratios

The following ratios for required area of mitigation to area of impact will be used for this Programmatic:

Mitigation of 3:1 – For projects that are within 500 feet of a known breeding site.

Mitigation of 2:1 – For projects that are greater than 500 feet and within 2,200 feet of a known breeding site, and for projects beyond 2,200 feet from a known breeding site, but within 500 feet of an adult occurrence.

Mitigation of 1:1 – For projects that are greater than 2,200 feet and within 1.3 miles of a known breeding site.

Mitigation of 0.2:1 – For projects that are greater than 1.3 miles from a known breeding site and greater than 500 feet from an adult occurrence, but excluding the "No Effect" areas shown on Enclosure 1.

California Tiger Salamander Minimization Measures

Projects and other activities will incorporate measures to minimize their potential direct and indirect effects on the California tiger salamander. Minimization measures may vary based on environmental factors and site location as determined by the Service and CDFG. No mitigation or conservation bank may receive translocated California tiger salamanders until all the bank's credits have been sold (See Enclosure 4 for translocation guidance). The following activities will require measures to minimize take for California tiger salamander:

(1) An activity that impacts a California tiger salamander breeding site:

Prior to construction, salamanders will be collected and translocated (See Enclosure 4) to an appropriate breeding site as identified by the Service and CDFG.

(2) An activity that impacts California tiger salamander upland habitat:

Prior to construction, fencing will be installed to exclude California tiger salamander from entering the project site. Fences with ramps may be required to allow any California tiger salamander onsite to move into an adjacent habitat offsite. In these instances translocation may occur and would be determined on a case-by-case basis.

(3) An activity where wetlands are being established for listed plants, California tiger salamander breeding or for wetland mitigation that has an effect on California tiger salamander:

Prior to construction, fencing will be installed to exclude California tiger salamanders from entering the site.

The following minimization measures will be implemented unless otherwise waived by the Service in writing:

a.) A Service approved biological monitor will be on site each day during wetland restoration and construction, and during initial site grading of development sites where

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 project.

c.) Before the start of work each day, the biological monitor will check for animals 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 California tiger salamander. California tiger salamanders will be removed by the biological monitor and translocated as described in Enclosure 4 or as directed by the Service.

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, number and size of staging areas, 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 from the site every three days.

g.) No pets will be allowed on the project site.

h.) No more than a maximum speed limit of 15 mph will be permitted.

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 be conducted between April 15 and October 15, of any given year, depending on the level of rainfall and/or site conditions.

l.) Project areas temporarily disturbed by construction activities will be re-vegetated with locally-occurring native plants.

Plant Mitigation and Establishment

Seasonal wetlands within the range of the listed plants on the Santa Rosa Plain are considered suitable habitat for the listed plants (See Enclosure 5). If surveys conducted following Service protocols (http://www.fws.gov/sacramento/es/santa_rosa_conservation.html) document listed plants on a site, or if the site had listed plants in the past, then the site is considered occupied.

If surveys have been conducted according to Service protocols and no listed plants have been found, the seasonal wetlands on-site will be treated as suitable habitat. This Programmatic addresses effects and mitigation for this habitat type where the listed plants have not yet been observed because a persistent seed bank may be present even if the plants have not been detected.

Plant establishment is defined as the introduction of listed plant seeds, inoculum or seed bank to a Preserve resulting in the persistence of the species on the site and having met the success criteria. Success criteria for plant establishment is available on the Service's web page at http://www.fws.gov/sacramento/es/santa_rosa_conservation.html. Establishing plant populations may require translocation of seed, inoculum or other plant material, or a change of land management. Guidelines for plant translocation are described in Enclosure 4.

Plant Mitigation Ratios

Mitigation for adverse effects to occupied or suitable habitat for listed plants is calculated by the impacted acres of seasonal wetlands. The following table provides the mitigation ratios for the listed plants.

Table 1: Mitigation Ratios for the Listed Plants

Impact to:	**Occupied Habitat Compensation**	**Suitable Habitat Compensation**
Burke's goldfields OR Sonoma sunshine	3:1 occupied or established habitat (any combination) with success criteria met prior to groundbreaking at project site	1:1 occupied or established habitat (any combination) with success criteria met prior to groundbreaking at project site AND 0.5:1 established habitat with success criteria met prior to groundbreaking at project site
Sebastopol meadowfoam	2:1 occupied or established habitat (any combination) with success criteria met prior to groundbreaking at project site	1:1 occupied or established habitat (any combination) with success criteria met prior to groundbreaking at project site AND 0.5:1 established habitat with success criteria met prior to groundbreaking at project site

The distribution of the three listed plants does not completely overlap. Sebastopol meadowfoam is generally found south of Santa Rosa Creek. Therefore, Sebastopol meadowfoam cannot be established north of Santa Rosa Creek. Burke's goldfields and Sonoma sunshine cannot be established south of the Laguna de Santa Rosa (Enclosure 2).

Preserves for listed plants may be located north of Highway 116 and within the Santa Rosa Plain study area to the north near Windsor (North Area and South Area) as depicted in Enclosure 2.

For impact sites with suitable habitat north of Santa Rosa Creek, the Preserve must support Burke's goldfields and/or Sonoma sunshine and must be in the North Area or South Area.

For impact sites with suitable habitat south of Santa Rosa Creek, the Preserve must support Sebastopol meadowfoam, Burke's goldfields, and/or Sonoma sunshine and must be in the North Area or South Area.

For impacts to occupied habitat supporting Burke's goldfields, Sonoma sunshine and/or Sebastopol meadowfoam, the wetlands at a Preserve must support the impacted species and must be in the North Area or South Area.

Minimization and Mitigation Measures For Plants Required Prior to Ground Disturbance

Ground disturbance at a project site may begin when the following criteria are deemed completed by the Service and CDFG:

1) Seed/soil collection and salvage at the project site has been completed at sites that have been determined by the Service and CDFG as being occupied by one or more of the listed plants (Enclosure 4);

2) The applicant has completed one of the following: a) purchased appropriate plant credits at a Service and CDFG approved bank; or b) conserved occupied and established plant habitat at a location and number of acres approved by the Service and CDFG. The conserved land must also have a Service and CDFG – approved management plan and non-wasting endowment fund. Mitigation sites proposed under option b will be evaluated on a case by case basis.

A single project that needs to preserve habitat for both listed plants and the California tiger salamander may mitigate at a single location, if a preserve meets the mitigation requirements for all the impacted listed species.

Action Area

The action area is shown on Enclosure 1 as the Santa Rosa Plain Conservation Strategy Study Area. The action area for this Programmatic includes the geographic range of the Sonoma County Distinct population of California tiger salamander and the listed plants.

Status of the Species

Descriptions of the Status of the Species below include *Listing History*, *Historical and Current Distribution*, *Description*, *Habitat and Life History*, *Reasons for Decline and Threats to Survival*, and *Recovery Actions*.

California Tiger Salamander

Listing History. The Sonoma County Distinct Population Segment of the California tiger salamander was emergency listed as endangered on July 22, 2002 (67 **FR** 47726). The salamander was listed as endangered on March 19, 2003 (68 **FR** 13497). The California tiger salamander was listed as threatened on August 4, 2004 (69 **FR** 47212). This latter listing changed the status of the Santa Barbara and Sonoma county populations from endangered to threatened. On August 10, 2004, the Service proposed 47 critical habitat units in 20 counties. No critical habitat was proposed for Sonoma County. On October 13, 2004, a complaint was filed in the U.S. District Court for the Northern District of California (Center for Biological Diversity and Environmental Defense Council v. U.S. Fish and Wildlife Service *et al.*). On February 3, 2005, the District Court required the Service to submit for publication in the **Federal Register**, a final determination on the proposed critical habitat designation on or before December 1, 2005. On August 2, 2005, the Service noticed in the **Federal Register** a proposed critical habitat designation (70 **FR** 44301). On August 19, 2005, a court order was filed on the above complaint, which upheld the section 4(d) rule exempting grazing from Section 9 prohibitions, but vacated the downlisting of the Santa Barbara and Sonoma populations and reinstated their endangered distinct population segment status. On December 14, 2005, (70 **FR** 74138), we made a final determination to designate and exclude approximately 17,418 acres (7,049 hectares) of critical habitat for the Sonoma population. All of critical habitat was excluded based on interim conservation strategies and measures being implemented by those local governing agencies with land use authority over the area and also as a result of economic exclusions authorized under section 4(b)(2) of the Act. Therefore, no critical habitat was designated for the Sonoma County Distinct Population Segment of the California tiger salamander in Sonoma County, California.

Historical and Current Distribution. Historically, the California tiger salamander inhabited low elevation grassland and oak savanna plant communities of the Central Valley, and adjacent foothills, and the inner coast ranges in California (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species has been recorded from near sea level to approximately 3,900 feet (1188.7 meters) in the coast ranges and to approximately 1,600 feet (487.7 meters) in the Sierra Nevada foothills (Shaffer et al. 2004). Along the coast ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County.

The Sonoma County Distinct Population Segment of the California tiger salamander is discrete in relation to the remainder of the species. The population is geographically isolated and separate from other California tiger salamanders. The Sonoma County population is widely separated geographically from the closest populations, which are located in Contra Costa, Yolo, and Solano counties. These populations are separated from the Sonoma County population by the Coast Range, Napa River, and the Carquinez Straits, at a minimum distance of approximately 45 miles (72 kilometers). There are no known records of the California tiger salamander in the intervening areas (D. Warenycia, California Department of Fish and Game, personal communication with the Service, 2002). We have no evidence of natural interchange of individuals between the Sonoma County population and other California tiger salamander

populations.

Sonoma County Distinct Population Segment of the California tiger salamander inhabits low-elevation (below 500 feet [152 meters]) vernal pools and seasonal ponds, associated grassland, and oak savannah plant communities. The historic range of the Sonoma County population also may have included the Petaluma River watershed, as there is one historic record of a specimen from the vicinity of Petaluma from the mid-1800s (Borland 1856, as cited in Storer 1925).

Description. The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998). Tiger salamanders exhibit sexual dimorphism; males tend to be larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. As adults, California tiger salamanders tend to have the creamy yellow to white spotting on the sides with much less on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the dorsal surface. The larvae have yellowish gray bodies, broad fat heads, large feathery external gills, and broad dorsal fins extending well up their back and range in length from approximately 0.45 to 0.56 inches (1.14 to 1.42 centimeters) (Petranka 1998).

Habitat and Life History. The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae salamanders develop in the vernal pools and ponds in which they were born, they are otherwise terrestrial salamanders and spend most of their postmetamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Subadult and adult California tiger salamanders spend the dry summer and fall months of the year in the burrows of small mammals, such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Because they spend most of their lives underground, California tiger salamanders are rarely encountered, even in areas where they are abundant.

California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets and other invertebrates that provide likely prey for California tiger salamanders. Underground refugia also provides protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although California tiger salamanders are members of a family of "burrowing" salamanders, they are not known to create their own burrows. This may be due to the hardness of soils in the California ecosystems in which they are found. Tiger salamanders typically use the burrows of ground squirrels and gophers (Loredo *et a*l. 1996; Trenham 1998a). However, Dave Cook (Sonoma County Water Agency, personal communication with the Service, 2001) found that pocket gopher burrows are most often used by California tiger salamanders in Sonoma County. California tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo *et al.* 1996).

Upland burrows inhabited by California tiger salamanders have often been referred to as

"estivation" sites. However, "estivation" implies a state of inactivity, while most evidence suggests that California tiger salamanders remain active in their underground dwellings. A recent study has found that California tiger salamanders move, feed, and remain active in their burrows (Van Hattem 2004). Because California tiger salamanders arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving, researchers have long inferred that California tiger salamanders are feeding while underground. Recent direct observations have confirmed this (Trenham 2001; van Hattem 2004). Thus, "upland habitat" is a more accurate description of the terrestrial areas used by California tiger salamanders.

Once fall or winter rains begin, the salamanders emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993). Adult salamanders mate in the breeding ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Historically, the California tiger salamander utilized vernal pools, but the animals also currently breed in livestock stockponds. Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). In ponds with no or limited vegetation, they may be attached to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). After breeding, adults leave the pool and return to the small mammal burrows (Loredo *et al.* 1996; Trenham 1998a), although they may continue to come out nightly for approximately the next two weeks to feed (Shaffer *et al.* 1993). In drought years, the seasonal pools may not form and the adults can not breed (Barry and Shaffer 1994).

California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The peak emergence of these metamorphs is typically between mid-June to mid-July (Loredo and Van Vuren 1996; Trenham *et al.* 2000) but in some areas as early as late February or early March. The larvae are totally aquatic. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific treefrogs (*Pseudacris regilla*), Western spadefoot toads (*Spea hammondii*), and California red-legged frogs (*Rana aurora draytonii*)(J. Anderson 1968; P. Anderson 1968). California tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water column in deeper water. Young salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

The larval stage of the California tiger salamander usually last three to six months, as most seasonal ponds and pools dry up during the summer (Petranka 1998). Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left the breeding pools 60 to 94 days after the eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. The longer the ponding duration, the larger the larvae and metamorphosed juveniles are able to grow, and the more likely they are to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). The larvae will perish if a site dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1989) found a

strong positive correlation with ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 pools sampled supported larval California tiger salamanders, and 5 of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only six (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998). In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave them and enter upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Unlike during their winter migration, the wet conditions that California tiger salamanders prefer do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find temporary upland sites for the dry summer months, waiting until the next winter's rains to move further into suitable upland refugia. Once juvenile California tiger salamanders leave their birth ponds for upland refugia, they typically do not return to ponds to breed for an average of 4 to 5 years. However, they remain active in the uplands, coming to the surface during rainfall events to disperse or forage (Trenham and Shaffer, 2005).

Lifetime reproductive success for California and other tiger salamanders is low. Trenham *et al.* (2000) found the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in roughly 11 metamorphic offspring over the lifetime of a female. Two reasons for the low reproductive success are the preliminary data suggests that most individuals of the California tiger salamanders require two years to become sexually mature, but some individuals may be slower to mature (Shaffer *et al.* 1993); and some animals do not breed until they are four to six years old. While individuals may survive for more than ten years, many breed only once, and in some populations, less than 5 percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as from human caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population. Dispersal and migration movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). Following breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before breeding again (Trenham *et al.* 2000).

California tiger salamanders are known to travel large distances from breeding ponds or pools into upland habitats. Maximum distances moved are generally difficult to establish for any species, but California tiger salamanders in Santa Barbara County have been recorded to disperse 1.3 miles from breeding ponds (Sweet, *in litt.* 1998). California tiger salamanders are known to travel between breeding ponds; one study found that 20 to 25 percent of the individuals captured

at one pond were recaptured later at ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during migration to or dispersal from ponds, California tiger salamanders may reside in burrows that are far from ponds.

Although the observations above show that California tiger salamanders can travel far, typically they stay closer to breeding ponds. Evidence suggests that juvenile California tiger salamanders disperse further into upland habitats than adult California tiger salamanders. A trapping study conducted in Solano County during winter of 2002/2003 found that juveniles used upland habitats further from breeding ponds than adults (Trenham and Shaffer, 2005). More juvenile salamanders were captured at distances of 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Large numbers, approximately 20 percent of total captures, were found 1,312 feet from a breeding pond. Fitting a distribution curve to the data revealed that 95 percent of juvenile salamanders could be found within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Results from the 2003-04 trapping efforts detected juvenile California tiger salamanders at even further distances, with a large proportion of the total salamanders caught at 2,297 feet from the breeding pond (Trenham and Shaffer, 2005). During post-breeding emigration, radio-equipped adult California tiger salamanders were tracked to burrows 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders having depleted physical reserves post-breeding, or also due to the drier weather conditions that can occur during the period when adults leave the ponds.

In addition, rather than staying in a single burrow, most individuals used several successive burrows at increasing distances from the pond. Although the studies discussed above provide an approximation of the distances that California tiger salamanders regularly move from their breeding ponds, upland habitat features will drive the details of movements in a particular landscape. Trenham (2001) found that radio-tracked adults favored grasslands with scattered large oaks, over more densely wooded areas. Based on radio-tracked adults, there is no indication that certain habitat types are favored as corridors for terrestrial movements (Trenham 2001). In addition, at two ponds completely encircled by drift fences and pitfall traps, captures of arriving adults and dispersing new metamorphs were distributed roughly evenly around the ponds. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Several species have either been documented to prey or likely prey upon the California tiger salamanders including coyotes (*Canis latrans*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), egrets (*Egretta species*), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), bullfrogs (*Rana catesbeiana*), mosquito fish (*Gambusia affinis*), and crayfish (*Procrambus* species).

Reasons for Decline and Threats to Survival. The California tiger salamanders are imperiled throughout its range by a variety of human activities (Service 2004). Current factors associated with declining populations of the salamander include continued degradation and loss of habitat due to agriculture and urbanization, hybridization with non-native eastern tiger salamanders (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003), and introduced predators. Hybridization with non-native eastern tiger salamanders has not yet been identified

within the Sonoma County population. Fragmentation of existing habitat and agricultural activities that degrade and/or eliminate breeding pools may represent the most significant current threats to California tiger salamanders, although populations are likely threatened by more than one factor. Isolation and fragmentation of habitats within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). Other threats are predation and competition from introduced exotic species; disease; various chemical contaminants; road-crossing mortality; and certain unrestrictive mosquito and rodent control operations.

Burke's Goldfields

Listing History. Burke's goldfields was federally listed as endangered on December 2, 1991 (56 **FR** 61173). No critical habitat has been designated for this species.

Description. Burke's goldfields is an annual herb in the aster family (Asteraceae). Plants are typically less than 11.8 inches (30 centimeters) in height (Hickman 1993) and usually branched (California Native Plant Society (CNPS) 1977). Leaves are opposite, less than two inches (5 centimeters) in length, and pinnately lobed. Yellow, daisy-like inflorescences with separate involucre bracts (leaf-like structures beneath the flower head) appear from approximately April through June (Skinner and Pavlik 1994). Fruits are achenes (dry, one-seeded fruits) less than 0.06 inch (1.5 millimeters) in length. The fruits of Burke's goldfields can be distinguished from those of other goldfields by the presence of one long awn (bristle and numerous short scales) (Hickman 1993). Individual Burke's goldfields plants may exhibit some geographic variation in morphology (McCarten 1985 as cited in CH2M Hill 1995, Patterson et al. 1994). Patterson *et al.* (1994) report robust specimens from the southern Santa Rosa Plain near the Laguna de Santa Rosa and variation in the number of awns from a Lake County population. Burke's goldfields can be distinguished from smooth goldfields (*Lasthenia glaberrima*) because smooth goldfields have partly fused involucre bracts and a pappus (ring of scale-like or hair-like projections at the crown of an achene) of numerous narrowed scales. The linear leaves without lobes distinguish common goldfields (*Lasthenia californica*) from Burke's goldfields (Hickman 1993).

Historical and Current Distribution. Burke's goldfields is endemic to the central California Coastal Range region and has been reported historically from Mendocino, Lake, and Sonoma counties (CNPS 1977, Patterson et al. 1994). The type locality of Burke's goldfields is the only known occurrence from Mendocino County and is possibly extirpated. Two California Natural Diversity Database (CNDDB) occurrences are recorded from Lake County, at Manning Flat and at a winery on Highway 29. Both Lake County occurrences are presumed extant. The remaining occurrences are from Sonoma County (CNDDB 1998). Within Sonoma County, one occurrence is known from north of Healdsburg (Patterson et al. 1994). On the Santa Rosa Plain, Burke's goldfields is distributed primarily in the northwestern and central areas with two additional occurrences south of Highway 12 near the Laguna de Santa Rosa (CH2M Hill 1995). The core of the current range of Burke's goldfields is in the Santa Rosa Plain.

Habitat. Burke's goldfields grow in vernal pools and swales below 500 meters (m) (Hickman 1993). At the Manning Flat occurrence in Lake County, Burke's goldfields is found in a series

of claypan vernal pools on volcanic ash soils (56 **FR** 61173, CNDDB 1998). At this location, the species is associated with common goldfields and few-flowered navarretia (*Navarretia leucocephala pauciflora*) (CNDDB 1998). In Sonoma County, the vernal pools containing Burke's goldfields are on nearly level to slightly sloping loams, clay loams, and clays. A clay layer or hardpan approximately two to three feet (0.6 to 0.9 meters) below the surface restricts downward movement of water (56 **FR** 61173). Huichica loam is the predominant soil series on which Burke's goldfields is found on the northern part of the Santa Rosa Plain (Patterson et al. 1994, CNDDB 1998). Huichica loam is a fine textured clay loam over buried dense clay and cemented layers (Patterson et al. 1994). More southerly Burke's goldfields sites likely occur on Wright loam or Clear Lake clay (Patterson et al. 1994, CNDDB 1998). Wright loam is a fine silty loam over buried dense clay and marine sediments. Clear Lake clay is hard dense clay from the surface to many feet thick (Patterson et al. 1994). Burke's goldfields sometimes occurs along with Sonoma sunshine and Sebastopol meadowfoam (*Limnanthes vinculans*). These three federally listed species are all associated with other plants that commonly grow in vernal pools on the Santa Rosa Plain, including Douglas' pogogyne (*Pogogyne douglasii spp. parviflora*), Lobb's aquatic buttercup (*Ranunculus lobbii*), smooth goldfields, California semaphore grass (*Pleuropogon californicus*), maroonspot downingia (*Downingia concolor*), and button-celery (*Eryngium sp.*) (CNDDB 1998).

Life History. The flowers of Burke's goldfields are self-incompatible (Ornduff 1966, Crawford and Ornduff 1989) and insect-pollinated. Seed banks are of particular importance to annual plant species which are subject to uncertain or variable environmental conditions (Cohen 1966, 1967; Parker et al. 1989; Templeton and Levin 1979). Burke's goldfields fit this criterion; it is an annual species living in California's highly variable Mediterranean climate.

No information exists with respect to the seed life of Burke's goldfields. Circumstantial evidence suggests that Burke's goldfields successfully germinated from seed in soil collected from a previously developed portion of the Westwind Business Park (Building F) when the soil was translocated and deposited in created seasonal wetlands (C. Wilcox, CDFG, 2000 in litt.). As annual species, it is expected that Burke's goldfields and Sonoma sunshine will respond to environmental stochastic events, such as changes in vegetative composition, climate, and disturbance, by partial germination of its seed bank. Baskin and Baskin (1998) indicate that species (annuals) adapted to "risky environments" produce persistent seed banks to offset years of low reproductive success and to ensure the species can persist at a site without immigration. These characteristics can be attributed to Burke's goldfields. Considering the adaptations of these plants to a variable Mediterranean climate it is likely the seed of Burke's goldfields can persist as dormant embryos for an undetermined number of years. Therefore, it is likely that populations of these species may persist undetected for a period of years until conditions are favorable to allow germination. Although formal studies of seed viability have not been conducted for these species, it is reasonable to expect their seed banks may persist for extended periods without germination. Furthermore, it is not unlikely that the individual fruits of Burke's goldfields may be predisposed to variable germination requirements as a strategy for survival.

For species that develop long-lived seed banks, a census of plants growing above ground may not accurately reflect the total number of plants at the site (Rice 1989, Given 1994). Population sizes of California's vernal pool/swale annual plant species, including Burke's goldfields, may

fluctuate substantially between very high numbers in some years to very small numbers, or even absence in other years because of varying environmental conditions. Therefore, total extirpation cannot be assumed when above-ground plants of these species are not observed at a site. Furthermore, declines in population size over a few years may not necessarily indicate that habitat is unsuitable (Given 1994), merely that environmental conditions within a vernal pool or swale have not favored seed germination.

Reasons for Decline and Threats to Survival. Burke's goldfields is threatened with habitat loss, fragmentation, and degradation throughout all or part of its range by factors including urbanization, agricultural land use changes, alterations in hydrology, and erosion (CNPS 1977, 56 **FR** 61173, Patterson et al. 1994, CH2M Hill 1995, CNDDB 1998). The only known Mendocino County occurrence is presumably extirpated (CH2M Hill 1995). The Manning Flat occurrence, located on private land in Lake County, is the largest known occurrence of the species and is threatened by extensive gully erosion that is destroying the habitat (CH2M Hill 1995, CNDDB 1998). The second Lake County occurrence is on property owned by a winery. Recent reports suggest that some damage to this population has resulted from vineyard operations (R. Chan, University of California, Berkeley, 1998 in litt.). However, in the past the winery owners appeared willing to coordinate with the Service and the U.S. Army Corps of Engineers (Corps) to avoid and/or minimize further damage to the site (N. Haley, Corps, 1998 pers. comm.). On the Santa Rosa Plain, many Burke's goldfields locations have been extirpated due to urbanization and conversion of land to row crops. Formerly well-represented in the vicinity of Windsor, Burke's goldfields has now been nearly extirpated from the area (Patterson *et al.* 1994, CH2M Hill 1995).

Of the 48 known records of Burke's goldfields, 26 are presumed to remain extant, with a majority found on the Santa Rosa Plain. Four populations occur outside of the Santa Rosa Plain, of which only two populations, one in northern Healdsburg and one at the Ployes winery, are extant.

Sonoma Sunshine

Listing History. Sonoma sunshine was federally listed as endangered on December 2, 1991 (56 **FR** 61173). No critical habitat has been designated for this species.

Description. Sonoma sunshine is an annual plant in the aster family. Plants are less than 11.8 inches (30 centimeters) tall with alternate, linear leaves (CNPS 1977, Hickman 1993). The lower leaves are entire, and the upper leaves have one to three lobes that are 0.4 to 1.2 inches (1 to 3 centimeters) deep (Hickman 1993). The daisy-like flower heads of Sonoma sunshine are yellow. The ray flowers have dark red stigmas. The disk flowers have white stigmas and white pollen but are otherwise yellow. Achenes are 0.1 to 0.15 inches (3 to 4 millimeters) long with small rounded or conic proturbences (papillate) and 4 to 6 strongly angled edges (CNPS 1977, Hickman 1993). Sonoma sunshine could be confused with common stickseed (*Blennosperma nanum*); however, Sonoma sunshine has longer and fewer lobes on the leaves and is more robust (CNPS 1977).

Historical and Current Distribution. Sonoma sunshine occurs only in Sonoma County. In the

Cotati Valley, the species ranges from near the community of Fulton in the north to Scenic Avenue between Santa Rosa and Cotati in the south. Additionally, the species extends or extended from near Glen Ellen to near the junction of State Routes 116 and 121 in the Sonoma Valley. During 2001, two new natural populations were identified north and south of the City of Santa Rosa, increasing the number of previously identified CNDDB occurrences from 26 to 28. Of the 28 occurrences, 21 are presumed to be extant with a majority occurring on the Santa Rosa Plain and one occurring in Glen Ellen. In addition, Sonoma sunshine has been introduced to at least one site on Alton Lane during mitigation activities. Seven populations within or near the City of Santa Rosa have been extirpated.

Habitat. Sonoma sunshine grows in vernal pools and wet grasslands below 100 m (330 ft) (Hickman 1993). In the Sonoma and Cotati valleys, Sonoma sunshine occurs in vernal pools on nearly level to slightly sloping loams, clay loams, and clays, as described for Burke's goldfields (56 **FR** 61173). The two concentrations of Sonoma sunshine on the Santa Rosa Plain occur on different soil types (Patterson et al. 1994). Sonoma sunshine likely grows on Huichica loam north of Highway 12 and on Wright loam and Clear Lake clay south of Highway 12 (Patterson et al. 1994, CNDDB 1998). These soil series are briefly described in the discussion of Burke's goldfields habitat above.

Life History. Sonoma sunshine flowers from March to April. The flowers of Sonoma sunshine are self-incompatible, meaning that they can set seed only when fertilized by pollen from a different plant. The extent to which pollination of the species covered in this Programmatic depends on host-specific or more generalist pollinators is currently unknown.

Seed banks are thought to be of particular importance in annual species subject to uncertain or variable environmental conditions (Cohen 1966, 1967; Parker *et al.* 1989; Templeton and Levin 1979). The Sonoma sunshine also fit these criteria; they are annual species (Hickman 1993) living in an uncertain vernal pool environment (Holland and Jain 1977). In the absence of data to suggest otherwise, the presence of substantial seed banks for these species is a reasonable assumption.

Reasons for Decline and Threats to Survival. Sonoma sunshine is threatened with habitat loss, fragmentation, and degradation throughout all or part of its range by factors including urbanization, agricultural land use changes, and alterations in hydrology (Patterson et al. 1994, CH2M Hill 1995, CNDDB 1998). In the Sonoma Valley, two of five known occurrences have been extirpated. One was extirpated by habitat destruction in 1986, and the area is now a vineyard. At the second site, most habitat was destroyed by grading for home sites in 1980; the remainder was converted to vineyard or overtaken by weeds (CNDDB 1998). Of the presumed extant Sonoma Valley occurrences, one locality has been largely developed. A small area was retained by CDFG when the development took place, but Sonoma sunshine has not been recorded from this area since the subdivision was developed (Service files). A second Sonoma Valley locale is currently pasture. A portion of the occurrence may have been disced, and the landowners of a second portion want to convert the locale to vineyard (C. Wilcox, 1998, pers. comm., Service files). The third Sonoma Valley occurrence is in Sonoma Valley Regional Park, which is not managed for conservation (CNDDB 1998). On the Santa Rosa Plain, one locale has probably been extirpated by completion of a subdivision and one locale by major land alterations

on the locale (CNDDB 1998). Of the presumed extant locales, some support severely degraded habitat, are threatened by development, or have not supported confirmed populations of Sonoma sunshine in recent years (CH2M Hill 1995, CNDDB 1998).

Sebastopol Meadowfoam

Listing History. Sebastopol meadowfoam was federally listed as endangered on December 2, 1991 (56 **FR** 61173). No critical habitat has been designated for this species.

Description. Sebastopol meadowfoam is an annual herb with weak, somewhat fleshy, decumbent stems up to 11.8 inches (30 centimeters) long. The seedlings are unusual among *Limnanthes* species in that they have entire leaves. Leaves of mature plants are up to 3.9 inches (10 centimeters) long and have 3 to 5 leaflets that are narrow and unlobed with rounded tips. The leaves are borne on long petioles; petiole length, like stem length, appears to be promoted by submergence. Sebastopol meadowfoam has fragrant, white flowers that are borne in the leaf axils during April and May. The flowers are bell-shaped or dish-shaped, with petals 0.47 to 0.71 inch (12 to 18 millimeters) long. The sepals are shorter than the petals. The petals turn outward as the nutlets mature. The nutlets are dark brown, 0.12 to 0.16 inch (3 to 4 millimeters) long, and covered with knobby pinkish tubercles (Patterson et al. 1994).

Historical and Current Distribution. Historically, Sebastopol meadowfoam was known from 40 occurrences in Sonoma County and one occurrence (occurrence #39) in Napa County, at the Napa River Ecological Reserve. In Sonoma County, all but two occurrences were found in the central and southern portions of the Santa Rosa Plain. Occurrence #20 occurred at Atascadero Creek Marsh west of Sebastopol, and the second (#40) occurred in the vicinity of Knights Valley northeast of Windsor (CNDDB 2001).

The current condition of numerous Sebastopol meadowfoam occurrences is unclear, because many have not been visited in over 5 years. The southern cluster of occurrences extends 3 miles (5 kilometers) from Stoney Point Road west to the Laguna de Santa Rosa, and is bounded by Occidental Road to the north and Cotati to the south. The central cluster stretches 1.5 miles (2.41 kilometers) on either side of Fulton Road extending northwards from Occidental Road to River Road. Patterson et al. (1994) estimated that the Santa Rosa Plain occurrences represent only 10 hydrologically separate populations of Sebastopol meadowfoam. At least one occurrence (#21) has been extirpated from the Santa Rosa Plain (CNDDB 2002). Recent field surveys found that all three occurrences outside of the Santa Rosa Plain have probably been extirpated (CNDDB 2002).

Life History. The seeds of Sebastopol meadowfoam germinate after the first significant rains in fall, although late initiation of rains may delay seed germination. Sebastopol meadowfoam plants grow slowly underwater during the winter, and growth rates increase as the pools dry. Repeated drying and filling of pools in the spring favors development of large plants with many branches and long stems. Sebastopol meadowfoam begins flowering as the pools dry, typically in March or April. The largest plants can produce 20 or more flowers. Flowering may continue as late as mid-June, although in most years the plants have set seed and died back by then (Patterson et al. 1994). Each plant can produce up to 100 nutlets (Patterson et al. 1994).

Nutlets of Sebastopol meadowfoam likely remain dormant in the soil, as they do for other species of *Limnanthes* (Patterson et al. 1994). One case presents strong circumstantial evidence for persistent, long-lived seed banks in this species. In the late 1980's and early 1990's, a site in Cotati remote from other Sebastopol meadowfoam colonies was surveyed for several years by independent qualified botanists. None of these botanists identified flowering populations of Sebastopol meadowfoam on the project site. Conditions of the pools on the site were highly degraded by wallowing hogs (*Sus scrofa*) and subsequent eutrophication of the pools. Following several years of negative surveys 12 plants of Sebastopol meadowfoam emerged simultaneously in one pool in the first year following removal of hogs. The population expanded rapidly to 60 plants the next year and was larger in subsequent years (Geoff Monk, personal communication), all limited to one pool. Long-distance dispersal is an improbable explanation for the simultaneous emergence of multiple plants at one location, so seed banks are implicated in this case as well. This example also indicates that lack of Sebastopol meadowfoam during periods of adverse conditions (drought, heavy disturbance, etc.) does not necessarily mean the population is extirpated.

This species grows in Northern Basalt Flow and Northern Hardpan vernal pools (Sawyer and Keeler-Wolf 1995), wet swales and meadows, on the banks of streams, and in artificial habitats such as ditches (Wainwright 1984; CNDDB 2002). The surrounding plant communities range from oak savanna, grassland, and marsh in Sonoma County to riparian woodland in Napa County (CNDDB 2002). Sebastopol meadowfoam grows in both shallow and deep areas, but is most frequent in pools 10 to 20 inches (25 to 51 centimeters) deep (Patterson et al. 1994). The species is most abundant in the margin habitat at the edge of vernal pools or swales (Pavlik et al. 2000, 2001). Most confirmed occurrences of Sebastopol meadowfoam on the Santa Rosa Plain grow on Wright loam or Clear Lake clay soils (Patterson et al. 1994, CNDDB 2002). A few occurrences are on other soil types, including Pajaro clay loam, Cotati fine sandy loam, Haire clay loam (Patterson et al. 1994) and Blucher fine sandy loam (Wainwright 1984).

Reasons for Decline and Threats to Survival. Like Burke's goldfields and Sonoma sunshine, Sebastopol meadowfoam has been and continues to be threatened by habitat loss, habitat degradation, and small population size. Causes of habitat loss include agricultural conversion, urbanization, and road maintenance. Habitat degradation is caused by excessive grazing by livestock, alterations in hydrology, and competition from non-native species (in some cases, exacerbated by removal of grazing), off-highway vehicle use, and dumping (56 **FR** 61173, Patterson et al. 1994, CH2M Hill 1995, CNDDB 2002).

Recovery Actions

As discussed in the Background section of this Programmatic, the Conservation Strategy was developed by the Team. The purpose of the Conservation Strategy is threefold: (1) to establish a long-term conservation program sufficient to compensate potential adverse effects of future development on the Santa Rosa Plain, and to conserve and contribute to the recovery of the California tiger salamander and a select group of listed plants (Sonoma sunshine, Burke's goldfields, Sebastopol meadowfoam, and many-flowered navarretia) and the conservation of their sensitive habitat; (2) to accomplish the preceding in a fashion that protects stakeholders' (both public and private) land use interests, and (3) to support issuance of an authorization for

incidental take of California tiger salamanders that may occur in the course of carrying out a broad range of activities on the Santa Rosa Plain. The Conservation Strategy will not preserve the species unless implemented by the appropriate agencies. The Conservation Strategy provides the biological basis for a permitting process for projects that are in the potential range of listed species on the Santa Rosa Plain. This is intended to provide consistency, timeliness and certainty for permitted activities. The Conservation Strategy study area is comprised of the potential California tiger salamander range and the listed plant range within the Santa Rosa Plain. The Conservation Strategy establishes interim and long-term mitigation requirements and designates conservation areas where mitigation will occur. It describes how preserves will be established and managed. It also includes guidelines for translocation, management plans, adaptive management and funding. Finally, the document describes the implementation planning process.

The County of Sonoma, the Cities of Santa Rosa, Cotati, Rohnert Park, the Town of Windsor, Service, and CDFG have commenced a process to develop a plan for implementing the Conservation Strategy. An implementation committee has been formed that is comprised of elected and staff representatives of the local jurisdictions and representatives of the agricultural, development, and environmental communities. Staff representatives from the Service and CDFG provide technical assistance to the implementation committee. The implementation plan is expected to provide a mechanism for applying the Conservation Strategy to cover public and private projects, agricultural activities, and residential and commercial development.

The Service and CDFG are implementing interim mitigation guidelines (Service and CDFG, 2006 *in litt.*) for Federal and non-federal actions. This Programmatic has integrated many of the guidelines in the Conservation Strategy and interim mitigation guidelines in the Description of the Proposed Action.

The Service will also prepare a recovery plan for the Sonoma County Distinct Population Segment of the California tiger salamander and listed plants as required by the Act. The Conservation Strategy will be the foundation of the recovery plan; however, it does not preclude the obligation of the Service to develop a recovery plan.

Environmental Baseline

Prior to human settlement, it is believed the Santa Rosa Plain supported a vast network of seasonally wet swales and scattered pools within a matrix of grassland and oak savanna. The low-gradient terrain with underlying dense clay soil horizons and high clay soil surfaces, ample winter precipitation, and dry summer climate on the Santa Rosa Plain predisposed this area to the development of seasonal wetlands. The natural landscape historically consisted of numerous shallow depressions that would pond water during the rainy season (vernal pools), often connected by narrow swales. Much of the vernal pool ecosystem has since been lost or degraded through agricultural activities and development projects (Patterson *et al.*1994, CH2M Hill 1995). The Santa Rosa Plain is believed to have historically supported approximately 7,000 acres of seasonal wetlands, an estimated 84 percent of which had been lost due to land conversion as of 1994. The approximately 1,000 acres of seasonal wetlands that remained on the Santa Rosa Plain in 1994 were composed of both vernal pools (ponded) and swales (non-ponded) in roughly

equal proportions, and the swales had largely been invaded by exotic species, therefore it is believed the actual amount of vernal pool acreage had been reduced to less than a few hundred acres (Patterson *et al.*, 1994). Because the vernal pool ecosystem was once extensive over the Santa Rosa Plain, it is not difficult to find parcels on which vernal pools have been "smeared" into the landscape, resulting in degraded seasonal wetlands that may still retain the necessary qualities for supporting one or more of the listed plant species but may require considerable restoration to ensure long-term species viability (Patterson *et al.*1994, CH2M Hill 1995).

The loss of seasonal wetland habitat on the Santa Rosa Plain has largely resulted from urban and agricultural conversion (Patterson *et al.* 1994, CH2M Hill 1995, CNDDB 1998). Of 28,000 acres of the Santa Rosa Plain studied by Waaland *et al.* (1990 as cited in Patterson *et al.* 1994), 12,000 acres had been converted to urban, cropland, orchard or vineyard uses. The conversion most severely affected oak woodland/savanna-vernal pool habitat.

In addition, seasonal wetlands on the Santa Rosa Plain have been heavily impacted through stream channelization, filling and draining of wetlands, livestock grazing, and irrigation (Patterson *et al.* 1994, CH2M Hill 1995, Keeler-Wolf *et al.* 1997, CNDDB 1998). Each of these impacts is discussed briefly below.

Stream channelization for flood control, such as of Roseland and Colgan Creeks, has involved excavation through vernal pool terrain causing interruption of hydrological connections and filling of wetlands with dredge spoils. Pools have also been filled and drained for mosquito abatement and to create dry ground for livestock. Air photo analyses and reconnaissance surveys have revealed incidences of unauthorized low level backyard filling throughout the action area (Patterson *et al.* 1994).

Livestock grazing is another factor with historic and ongoing effects on the listed plant species of the Santa Rosa Plain. While light grazing may benefit habitat by reducing thatch and minimizing competitive grasses (this has been demonstrated to be an effective strategy for Burke's goldfields), heavier grazing can result in injurious trampling, direct plant consumption, local soil compaction, and detrimental effects resulting from the excessive contribution of manure (Patterson *et al.* 1994, 56 **FR** 61173).

Wastewater irrigation is a recently established factor affecting vernal pools on the Santa Rosa Plain. This practice began in the 1970s and has continued which has resulted in changing seasonal wetland plant composition. While the native seasonal wetland species are adapted to a summer-dry Mediterranean climate, summer irrigation results in perennial wetland conditions that are intolerable by native seasonal wetland species (Patterson *et al.* 1994). A 1996 draft Environmental Impact Report (EIR) addressed a proposed long-term wastewater project that would dispose of wastewater from the Laguna Wastewater Treatment Plant by irrigating fields on the Santa Rosa Plain. The draft EIR stated that wastewater irrigation would avoid impacts to sensitive biological resources (City of Santa Rosa and U.S. Army Corps of Engineers 1996). However, in February of 1998, the site supporting many-flowered navarretia had a sign stating wastewater was being used for irrigation on-site (Ellen Berryman, 1998 pers. obs.). Patterson *et al.* (1994) state, "the ongoing need to expand effluent irrigation acreage to keep pace with population growth will continue to jeopardize the existence of oak woodlands and vernal pools

on the Santa Rosa Plain unless other, less sensitive lands are found for irrigation or other means of disposal are found". The City has recently developed an EIR to look at additional wastewater storage and irrigation in the Santa Rosa Plain. The City of Santa Rosa is pursuing agreements with other wastewater facilities (Sonoma County Water Agency and Town of Windsor) to share irrigation and storage. The City of Santa Rosa is permitted to apply wastewater biosolids to lands within the Santa Rosa Plains. The RWQCB recently issued a renewed permit to Santa Rosa for wastewater discharges. The permit requires the City of Santa Rosa to study wastewater land application rates to ensure they are not over-irrigating. The permit recognized specific pollutants (including toxic pollutants) in the treated wastewater. The permit sets time schedules for these pollutants to be addressed prior to discharge to surface waters. Technically, the RWQCB regulations (Water Quality Control Plan for the North Coast Region) prohibit wastewater discharge to surface waters during the summer. The regulations however do not contemplate that wastewater would be used to irrigate vernal pools and other types of seasonal wetlands (J. Short, 2007 pers. comm.).

Burke's goldfields

1991 to 1998. Patterson *et al.* (1994) evaluated known Burke's goldfields sites on the Santa Rosa Plain, categorizing them as (1) in public ownership, (2) presumed extant and privately owned, and (3) extirpated or largely destroyed. Their data indicate that 33 percent of the acreage of known Santa Rosa Plain Burke's goldfields sites has been severely degraded or extirpated. As of 1998, the Service was aware of at least a dozen specific instances where ditching, draining, discing or overgrazing occurred on parcels containing Burke's goldfields. In many cases, the number of plants at those sites declined after the disturbance took place. In addition, the Service was aware of at least four instances of unauthorized discing that triggered Corps enforcement actions for sites where Burke's goldfields grew. Because of typically small parcel size, development projects that have proceeded since listing, such as Cobblestone and TMD Brown, have mitigated Burke's goldfields losses entirely off site. The few sites where plants were avoided in the course of development have failed to sustain viable populations (Service files).

The most severely impacted portion of the range of Burke's goldfields has been the northwestern portion of the Plain. The majority of the known sites severely degraded or extirpated are in the Windsor area (Patterson *et al.*1994, CH2M Hill 1995). Two of the largest known populations in the county occurred in this area and were considered extirpated by Patterson *et al.* (1994). The extirpations were thought to have resulted from urban and commercial development or agricultural land use changes. For example, one CNDDB occurrence in the area contained 11 colonies in 1984; by 1993, only two were extant (CNDDB 1998). A second occurrence had more than 20 vernal pools in 1985, but by 1994, only one colony of Burke's goldfields was present (CNDDB 1998). This property once contained 50,000 plants, but after repeated discing only about 100 plants remain (B. Guggolz, CNPS, 1998 pers. comm.). Only a few stable Burke's goldfields sites still exist in the Windsor area, and these are threatened by development (Patterson *et al.* 1994). The City of Windsor has already developed, or designated development, on every Burke's goldfields site within their general planning area (B. Guggolz, 1998 pers. comm.). Only a few stable Burke's goldfields sites still exist in the Windsor area, and these are threatened by development (Patterson *et al.* 1994). The City of Windsor has already developed,

or designated development, on every Burke's goldfields site within their general planning area (B. Guggolz, 1998 pers. comm.).

Since the time Burke's goldfields was listed in 1991, the species has continued to experience dramatic loss. The Service used data from 1994 (Patterson *et al.* 1994) to examine how numbers of Burke's goldfields plants changed at particular sites between the time of listing and the most recent surveys that had been conducted after listing. A site, as defined by Patterson *et al.* (1994), may be all or part of a CNDDB occurrence. After listing, the number of sites with many individuals decreased, and the number with very few individuals increased. Fifteen of the 28 sites for which we have both pre- and post-listing surveys decreased in size after the species was listed. The percentage of sites with fewer than 10 individuals increased by 30 percent, and the percentage of sites with 10,000 to 100,000 individuals decreased by 7 percent. As of 1994, no sites were recorded with more than 100,000 plants. Data from Patterson *et al.* (1994) also indicate that between the time of listing and 1994, 12 different sites were extirpated or largely destroyed. The data indicate large populations of Burke's goldfields are diminishing and nearly half of the sites may have populations either extirpated or are highly vulnerable to extirpation due to small population numbers (less than 10 individuals) (calculated from Patterson *et al.* 1994; CH2M Hill 1995).

Only about 15 percent of the acreage of Burke's goldfields sites on the Santa Rosa Plain had some preservation designation as of 1994 (calculated from data in Patterson *et al.* 1994). However, the species has not been observed since 1987 at Todd Road Preserve, the largest of the preservation sites (Patterson *et al.* 1994, CH2M Hill 1995). Excluding this site, the preserved acreage of Burke's goldfields sites is only 8 percent of acreage known in 1994 (calculated from data in Patterson *et al.* 1994). Since 1994, one preservation bank with Burke's goldfields has been established, but only a small portion of the site supports Burke's goldfields (Exhibit A, MOA for Wright Preservation Bank, 1997).

1998 to present. The 1998 programmatic consultation for the listed plants was designed to allow up to 50 acres of low-quality seasonal wetlands to be filled and no more than 30 acres could be occupied (or presumed to be occupied) by the listed plant species. Of the 30 impacted acres which are occupied or presumed occupied, no more than 6 acres would be on sites for which there are known records of the listed plants. Impacts to no more than 6 additional acres on sites for which there are known records of listed plants may be authorized under the 1998 programmatic consultation at the Service's discretion, based upon the Service's evaluation of the significance of impacts to the first 6 acres of known listed species habitat and / or upon substantial progress toward a comprehensive conservation program. Between the period of the 1998 programmatic consultation and the date of this Programmatic, less than 30 acres of low-quality seasonal wetlands were authorized to be filled under the 1998 programmatic. At this time, it is unknown how many of the 30 impacted wetland acres were occupied with one or more of the listed plants. The low-quality seasonal wetlands were to be mitigated for with preservation and creation of listed plant habitat as outlined in the 1998 programmatic.

Sonoma sunshine

1991 to 1998. Patterson *et al.* (1994) estimated less than 12 biologically separate populations

remain. Of the sites they examined, 17 percent (nearly one-third) had been extirpated, and 17 percent (nearly one-sixth) had not been confirmed recently. An additional 17 percent (one-sixth) were believed to be extant but threatened by development as of 1994 (Patterson *et al.* 1994). A site, as defined by Patterson *et al.* (1994), may be all or part of a CNDDB occurrence. At one CNDDB occurrence, 12 Sonoma sunshine colonies were observed in 1989. By 1993, only six remained (CNDDB 1998). The Service is aware of at least five specific Sonoma sunshine sites that have been developed or isolated by surrounding development or vineyards on the Santa Rosa Plain since the time of listing, including Cobblestone and TMD Brown. Other sites have been used as wastewater irrigated pastures, damaged by ORV use, heavily grazed, or been subject to land conversion activities (CNDDB 1998, Service files). In addition, Sonoma sunshine is known from at least one of the Burke's goldfield sites mentioned above that were disced without authorization and that triggered Corps enforcement actions (Service files).

The Service used data from 1994 (Patterson *et al.* 1994) to examine how numbers of Sonoma sunshine plants at particular sites changed between the time of listing and the most current surveys that had been performed after listing. After listing, the number of sites with many individuals decreased, and the number with less than 10 individuals increased. The percentage of sites with fewer than 10 individuals increased by 15 percent between the time of listing and 1994.

Approximately 8 percent of the acreage of Sonoma sunshine sites known from the Santa Rosa Plain had some protection as of 1994 (calculated from data in Patterson *et al.* 1994). Of the 120 acres designated as preserve (excludes areas under conservation easement), the amount of habitat containing the species is estimated to be only 2 acres (Guggolz 1995 as cited in CH2M Hill 1995). Since 1994, one preservation bank with Sonoma sunshine has been established, but only 15 individual plants have been observed in recent surveys at the site (M. Waaland, 1998 pers. comm.).

1998 to present. The 1998 programmatic consultation was designed to allow up to 50 acres of low-quality seasonal wetlands to be filled and no more than 30 acres could be occupied (or presumed to be occupied) by the listed plant species. Of the 30 impacted acres which are occupied or presumed occupied, no more than 6 acres would be on sites for which there are known records of the listed plants. Impacts to no more than 6 additional acres on sites for which there are known records of listed plants may be authorized under the 1998 programmatic consultation at the Service's discretion, based upon the Service's evaluation of the significance of impacts to the first 6 acres of known listed species habitat and / or upon substantial progress toward a comprehensive conservation program. Between the period of the 1998 programmatic consultation and the date of this Programmatic, less than 30 acres of low-quality seasonal wetlands were authorized to be filled under the 1998 programmatic. At this time, it is unknown how many of the 30 impacted wetland acres were occupied with one or more of the listed plants. The low-quality seasonal wetlands were to be mitigated for with preservation and creation of listed plant habitat as outlined in the 1998 programmatic.

Sebastopol Meadowfoam

1991 to 1998. Patterson *et al.* (1994) estimated only 10 hydrologically separate populations of

Sebastopol meadowfoam exist. Of the sites they examined, nearly 10 percent were considered erroneous, 18 percent were extirpated, 18 percent were extant but threatened by development, and 36 percent were extant but may not be large enough to qualify as high-quality preserve lands (Patterson *et al.* 1994). A site, as defined by Patterson *et al.* (1994), may be all or part of a CNDDB occurrence. According to Service records, significant Sebastopol meadowfoam sites are within southwest Santa Rosa. Other sites have been extensively fragmented by development, leaving parts of larger vernal pool complexes interspersed with homes. Repeated discing and land conversion activities have damaged some sites as well (Service files).

Excluding easements, eight Sebastopol meadowfoam sites comprising approximately 170 acres were preserved as of 1994 (Patterson *et al.* 1994). However, only a small portion of this acreage is considered actual Sebastopol meadowfoam habitat (CH2M Hill 1995). These eight sites comprised approximately 11 percent of the acreage of Sebatopol meadowfoam sites known from the Santa Rosa Plain in 1994 (calculated from data in Patterson *et al.* 1994). Since 1994, two preservation banks with Sebastopol meadowfoam have been established (MOA for Wright Preservation Bank 1997, MOA for Southwest Santa Rosa Vernal Pool Preservation Bank 1997).

1998 to present. The 1998 programmatic consultation was designed to allow up to 50 acres of low-quality seasonal wetlands to be filled and no more than 30 acres could be occupied (or presumed to be occupied) by the listed plant species. Of the 30 impacted acres which are occupied or presumed occupied, no more than 6 acres would be on sites for which there are known records of the listed plants. Impacts to no more than 6 additional acres on sites for which there are known records of listed plants may be authorized under the 1998 programmatic consultation at the Service's discretion, based upon the Service's evaluation of the significance of impacts to the first 6 acres of known listed species habitat and / or upon substantial progress toward a comprehensive conservation program. Between the period of the 1998 programmatic consultation and the date of this Programmatic, less than 30 acres of low-quality seasonal wetlands were authorized to be filled under the 1998 programmatic. At this time, it is unknown how many of the 30 impacted wetland acres were occupied with one or more of the listed plants. The low-quality seasonal wetlands were to be mitigated for with preservation and creation of listed plant habitat as outlined in the 1998 programmatic.

California Tiger Salamander

2001 to present. Between 2001 and 2002, five breeding sites for Sonoma County Distinct Population Segment of the California tiger salamander were destroyed. Loss of real and potential salamander breeding sites, upland refugia, dispersal, and foraging habitat continues to occur in the Santa Rosa Plain. To date (prior to this biological opinion), there have been 21 biological opinions (*i.e.*, section 7 formal consultations) authorizing incidental take to all individuals inhabiting 493.222 acres of California tiger salamander habitat since the emergency listing on July 22, 2002. Three of these 21 biological opinions address adverse and beneficial effects associated with the construction of seasonal wetlands and creation of California tiger salamander breeding habitat and establishment of Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine populations. These three sites are known as the Hazel Mitigation Bank, Wright Preservation Bank and the Slippery Rock Conservation Bank. The temporary ground disturbance associated with these Banks includes approximately 149.06 acres; therefore there has

been 344.222 acres of permanent California tiger salamander habitat loss permitted by the Service through section 7 consultations. The other 18 biological opinions have integrated in their project proposals to conserve a total of 471.865 acres of California tiger salamander habitat at Service approved locations within Sonoma County via the purchase of mitigation or conservation credits, recording conservation easements, or offering fee title to the CDFG or another Service approved entity.

As of October 15, 2007, there are approximately 730 acres of *existing* Preserves that support occupied California tiger salamander habitat within conservation areas. Some of these existing preserves also support the listed plants. There are also approximately 165 acres (187 hectares) of *pending* Preserves within conservation areas that are anticipated to be protected in perpetuity.

Effects of the Proposed Action

The following effects analysis is based on the effects of Projects to the California tiger salamander, Sebastopol meadowfoam, Sonoma sunshine and Burke's goldfields. This may encompass all types of projects in which the Corps issues permits, conducts enforcement actions and/or development of mitigation banks. These effects are expected to be in the form of direct and indirect effects as a result of urbanization and agricultural development related Project(s) and to a lesser degree restoration and enhancement of habitat. Project(s) appended to this Programmatic must adhere to the mitigation and minimization measures described in the *Description of the Proposed Action*. Implementation of the mitigation and minimization measures may have some adverse effects but will likely have greater beneficial effects as a result of creation, restoration and enhancement of habitat for these species.

CaliforniaTiger Salamander

The effects analysis for the California tiger salamander is primarily based on the location of the Project(s) impacts relative to a known individual salamander observation and/or breeding site(s). Those effects based on distance are differentiated and classified in Table 2 below and assumes the permanent or temporary loss of habitat. The interim mitigation guidelines do not differentiate between temporary and permanent effects. The interim mitigation guidelines are described on page 46 of the Conservation Strategy (Conservation Strategy Team, 2005), in a letter from the Service and CDFG to the Santa Rosa Plain Conservation Strategy Implementation Committee (Service and CDFG, 2006 *in litt.)* and in the *Description of the Proposed Action* of this Programmatic.

The majority of anticipated effects to the California tiger salamander will likely be within the urban growth boundaries of the Cities of Santa Rosa, Cotati and Rohnert Park (shaded red in Figure 3 of the Conservation Strategy). These estimated acres are based on a ten year timeframe from December 2005 to December 2015. Some smaller amount of California tiger salamander impacts may occur outside of the urban growth boundaries within the Study Area (Figure 3 of the Conservation Strategy) in the form of agricultural, rural residential and ministerial projects as defined by Sonoma County. In addition, the Town of Windsor supports approximately 137 acres of potential California tiger salamander that may be adversely affected and may require approximately 27.4 acres of mitigation (i.e. 137 acres x 0.2 = 27.4).

Table 2. Predicted Tiger Salamander Habitat Loss Within City Urban Growth Boundaries

	Santa Rosa (acres)	**Cotati** (acres)	**Rhonert Park** (acres)	**Estimated Mitigation** (acres)
0 - 500 feet of a California tiger salamander breeding occurrence	190.4	21	0	**634.2**
501 - 2200 feet of a California tiger salamander breeding site	761.4	132.2	13.9	**1815**
2201 feet - 1.3 miles of a known California tiger salamander breeding site	411.7	6.7	166.6	**585**
500 feet of a California tiger salamander non-breeding occurrence	177	43.3	22.3	**485.2**
Total	**1540.5**	**203.2**	**202.8**	**3519.4**

Anticipated permanent acreage loss of California tiger salamander habitat within city UBG's within a 10 year timeframe was compared with the acreage needed to conserve habitat and maintain viable populations within identified conservation areas. This comparison was used to calculate the ratio of mitigation for project impacts in order to meet conservation goals in the conservation areas. Additional analysis of the Conservation Strategy took into account several assumptions which in part, support justification for the interim mitigation ratios. These assumptions are summarized in the following paragraphs.

Development of the Conservation Strategy was based on the following assumptions about expected development in a ten-year time frame: 1) the effect of that development on the species, 2) how the Preserves would offset those effects and 3) the compatibility of existing land uses with California tiger salamander and listed species conservation. In addition, there are other factors that were used in developing the conservation areas:

- Existing agricultural and rural land uses outside the UGBs will not change appreciably
- Urban development within the UGBs may occur based on general plans of the municipalities
- Limited urban development may occur outside of the UGBs based on the Sonoma County General Plan
- Voter-approved UGBs will remain in place for at least 10 years and will likely continue into the foreseeable future
- Based on aerial photography and site visits, potential habitat for the California tiger salamander exists in locations where surveys have not been conducted
- Urban development will eliminate some California tiger salamander habitat
- Small Preserves in an urban environment are difficult to manage, and will not likely sustain viable California tiger salamander populations

The analysis performed in the Conservation Strategy was used to develop appropriate mitigation ratios and is anticipated to aid in conserving appropriate levels of habitat to support viable populations of California tiger salamanders in perpetuity. The mitigation and minimization measures as described in this Programmatic is expected to contribute to recovery of the California tiger salamander by preserving occupied, restored and created habitat. Adaptive management and monitoring which will be supported with endowment funds is expected to assist in the maintenance of viable populations.

Sebastopol Meadowfoam, Sonoma Sunshine and Burke's Goldfields

As described in the Status of the Species and Environmental Baseline, above, habitat for the listed plant species has been severely impacted on the Santa Rosa Plain as a result of urban and agricultural development. These species, which are naturally rare, narrow endemics, have become extremely vulnerable due to decreases in population size, habitat fragmentation, and chronic habitat degradation. The long-term survival and recovery of these species requires the establishment of a viable regional preserve system that includes restoration of degraded habitat to enhance overall population size and viability.

Projects such as 404 permitting authorized under this Programmatic is expected to result in direct and indirect impacts to seasonal wetlands which may be occupied (or assumed occupied) by the listed plants. These impacts will further reduce the size and numbers of the listed plant populations, and could reduce the extent of the range for each of the listed plant species on the Santa Rosa Plain. Projects authorized under this consultation are also likely to result in fragmentation and edge effects to existing habitat. The loss of seasonal wetlands where the listed plants have not been found is expected to reduce opportunities for habitat restoration and enhancement of listed plant populations, thereby potentially affecting the species long-term survival and recovery.

Restoration projects as result of Corps enforcement actions or mitigation banks authorized under this Programmatic are expected to benefit the listed plants by restoring their destroyed or altered habitat by establishing endangered plant populations. Impacts to seasonal wetlands, both in habitat currently suitable for the listed plant species and in restorable habitat, will be limited and mitigated to allow for the species long-term survival and recovery.

Impacts to seasonal wetlands allowed under this Programmatic could result in loss of habitat where the plant species have not been detected for a number of years, but where viable seed banks persist on-site. However, any habitat with historic records of the species will be mitigated for in the same manner as habitat known to be currently occupied. This mitigation is expected to reduce the level of impacts to important suitable and restorable sites with historic records of listed plants by preserving currently occupied or established sites.

Impacts to occupied Burke's goldfields and Sonoma sunshine habitat will be mitigated through 3:1 of occupied or established habitat (any combination) with success criteria met prior to groundbreaking. Impacts to suitable Burke's goldfields and Sonoma sunshine habitat will be mitigated with 1:1 occupied or established habitat (any combination) with success criteria met AND 0.5:1 of established habitat prior to groundbreaking. The mitigation land will be preserved

and managed in perpetuity.

Impacts to occupied Sebastopol meadowfoam habitat will be mitigated with 2:1 occupied or established habitat (any combination) with success criteria met prior to groundbreaking. Impacts to suitable Sebastopol meadowfaom habitat will be mitigated with 1:1 occupied or established habitat (any combination) with success criteria met AND 0.5:1 of established habitat prior to groundbreaking. The mitigation land will be preserved and managed in perpetuity.

Mitigation for impacts to occupied and suitable habitat will be in the form of preserving occupied sites or established sites with the same impacted species. The location of the mitigation may be anywhere within the North Area or South Area as depicted in Enclosure 2 as long as the site supports the target endangered plant(s). Sites with suitable habitat are sites that have not been observed to flower during botanical surveys but may have viable seeds in the soil and have additional biological, hydrological and topographic attributes as described in Enclosure 5, *Description of Suitable Habitat*. Mitigation of impacts to suitable habitat must support one of the target species based on the location of the impacts. The species that must be mitigated for will be determined by the location of the project impacts to the suitable habitat. As described in the *Environmental Baseline*, the majority of Burke's goldfields and Sonoma sunshine populations are north of Santa Rosa Creek and the majority of Sebastopol meadowfoam populations are south of Santa Rosa Creek. Therefore, impacts to suitable habitat north of Santa Rosa Creek (i.e. North Area) will mitigate with occupied or established Burke's goldfields or Sonoma sunshine. Impacts to suitable habitat south of Santa Rosa Creek (i.e. South Area) will mitigate with Burke's goldfields, Sonoma sunshine or Sebastopol meadowfoam. Mitigation of occupied and suitable habitat will minimize the effects to the listed plants by ensuring sites will actually support the species. Adaptive management plans and endowment funding will also increase the probability of the plant populations to be viable in the long term and will be protected in perpetuity.

Projects that will impact occupied sites supporting Burke's goldfields and Sonoma sunshine, where surveys have documented 2,000 plants or greater in any year in the past 10 years may not be appended to this Programmatic, but will be evaluated on a case by case basis. The number for 2,000 plants was derived from comments provided by numerous technical experts and the Service's review of projects impacting plant populations.

The most common method of project proponents mitigating for their impacts will be by purchasing mitigation credits at Service and CDFG – approved Preserves. These Preserves often have extant natural populations of the plants and/or established or restored populations and are located within their historical range.

Cumulative Effects

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

Cumulative effects to the California tiger salamander include continuing and future conversion of suitable California tiger salamander breeding, foraging, sheltering, and dispersal habitat resulting from urban development. Additional urbanization can result in road widening and increased traffic on roads that bisect breeding and upland sites, thereby increasing road-kill while reducing in size and further fragmenting remaining habitats.

California tiger salamanders probably are exposed to a variety of pesticides and other chemicals throughout their range. California tiger salamanders also could die from starvation by the loss of their prey base. Hydrocarbon and other contamination from oil production and road runoff; the application of numerous chemicals for roadside maintenance; urban/suburban landscape maintenance; and rodent and vector control programs may all have negative effects on California tiger salamander populations. In addition, California tiger salamanders may be harmed through collection by local residents.

A commonly used method to control mosquitoes, used in Sonoma County (Marin/Sonoma Mosquito and Vector Control District, internet website 2002), is the application of methoprene, which increases the level of juvenile hormone in insect larvae and disrupts the molting process. Lawrenz (1984) found that methoprene (Altosid SR 10) retarded the development of selected crustacea that had the same molting hormones (*i.e.*, juvenile hormone) as insects, and anticipated that the same hormone may control metamorphosis in other arthropods. Because the success of many aquatic vertebrates relies on an abundance of invertebrates in temporary wetlands, any delay in insect growth could reduce the numbers and density of prey available (Lawrenz 1984).

Threats to Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam such as unauthorized fill of wetlands, urbanization, increases in non-native species, and expanded irrigation of pastures with recycled wastewater discharge, are likely to continue with concomitant adverse effects on these species resulting in additional habitat loss and degradation; increasingly isolated populations (exacerbating the disruption of gene flow patterns); and further reductions in the reproduction, numbers, and distribution of these species which will decrease their ability to respond to stochastic events.

Some activities that do not require a 404 permit could occur that may negatively impact the listed plant species, including excessive grazing and wastewater irrigation. On-going grazing on the Santa Rosa Plain appears to be occurring at a low enough level that it may actually benefit the species by controlling competitive, non-native plant species, but grazing could increase to a detrimental level in the future. The cessation of grazing might also have a negative effect on the species, since non-native competitors have invaded the species' habitat and grazing may currently play an essential role in controlling these competitors.

As stated in the Conservation Strategy, urban and rural growth on the Santa Rosa Plain has taken place for over one hundred years, and for the past twenty years urban growth has encroached into areas inhabited by the California tiger salamander and the listed plants. The loss of seasonal wetlands caused by development on the Santa Rosa Plain has led to declines in the populations of California tiger salamander and the listed plants. Voters in the cities of Cotati, Rohnert Park, Santa Rosa, and Sebastopol, and the Town of Windsor have established urban growth boundaries for their communities. This is intended to accomplish the goal of city-centered growth, resulting

in rural and agricultural land uses being maintained between the urbanized areas. Therefore, it can be reasonably expected that rural land uses will continue into the foreseeable future. There are also areas of publicly owned property and preserves located in the Santa Rosa Plain, which will further protect against development. Some of the areas within these urban growth boundaries, however, include lands inhabited by California tiger salamanders and the listed plant species. Agricultural practices have also disturbed seasonal wetlands, California tiger salamanders and listed plant habitat on the Santa Rosa Plain. Some agricultural practices, such as irrigated or grazed pasture, have protected habitat from intensive development.

The Conservation Strategy was designed to plan for future cumulative effects from federal and non-federal actions to the California tiger salamander and listed plant habitat within the Santa Rosa Plain. The Conservation Strategy and the interim guidelines are intended to benefit the California tiger salamander and the listed plants by providing a consistent approach for mitigation vital to habitat preservation and the long-term conservation of the species. They are also intended to provide more certainty and efficiency in the project review process. The Conservation Strategy and the interim guidelines provide guidance to focus mitigation efforts on preventing further habitat fragmentation and to establish, to the maximum extent possible, a viable preserve system that will contribute to the long-term conservation and recovery of these listed species.

The County of Sonoma, the Cities of Santa Rosa, Cotati, Rohnert Park, the Town of Windsor, Service, and CDFG have commenced a process to develop a plan for implementing the Conservation Strategy. An implementation committee has been formed that is comprised of elected and staff representatives of the local jurisdictions, staff representatives of Service and CDFG, and representatives of the agricultural, development, and environmental communities. The implementation plan is expected to provide a mechanism for applying the Conservation Strategy to cover public and private projects, agricultural activities, and residential and commercial development. Eventual implementation of the Conservation Strategy by the local cities and Sonoma County is expected to reduce potential increases of these cumulative effects.

Conclusion

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that projects which meet the qualifications for this Programmatic are not likely to jeopardize the continued existence of the California tiger salamander, Burke's goldfields, Sonoma sunshine or Sebastopol meadowfoam. This determination is based on the *Description of the Proposed Action*, Enclosures 3, 4 and 5 which provides numerous conservation measures that would be implemented to minimize adverse effects of Projects on the California tiger salamander and the three listed plants. Critical habitat has not been designated for these species, therefore, none will be affected.

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 recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibilities for these species.

1. As the Santa Rosa Plain Recovery Plan is developed, the Corps should assist the Service in the implementation of the interim mitigation guidelines for projects on the Santa Rosa Plain.

2. The Corps should work with the Service to encourage the local jurisdictions of the Santa Rosa Plain to develop an implementation plan for the Conservation Strategy.

3. The Corps should work with the Service to identify grant opportunities to support restoration efforts, research, surveys and public outreach opportunities that aid in the recovery of the four species discussed in this Programmatic.

REINITIATION – CLOSING STATEMENT

This concludes formal consultation on the actions described in this opinion. 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) 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; (2) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (3) a new species is listed or critical habitat is designated that may be affected by the action. If the Corps discovers that the conditions of the permit have not been followed, the Corps should review its responsibilities under section 7 of the Act and reinitiate formal consultation with the Service. We appreciate the cooperation and active participation of the Corps throughout this consultation process.

If you have any questions regarding this biological opinion, please contact Vincent Griego, Ryan Olah or Cay Goude of my staff at the letterhead address or (916) 414-6625.

Sincerely,

Susan K Moore

Susan K. Moore
Field Supervisor

cc: Chuck Regalia, City of Santa Rosa, California
David Woltering, City of Cotati, California
Rob Bendorff, City of Rohnert Part, California
Pete Chamberlin, Town of Windsor, California
Pete Parkinson, Sonoma County, California
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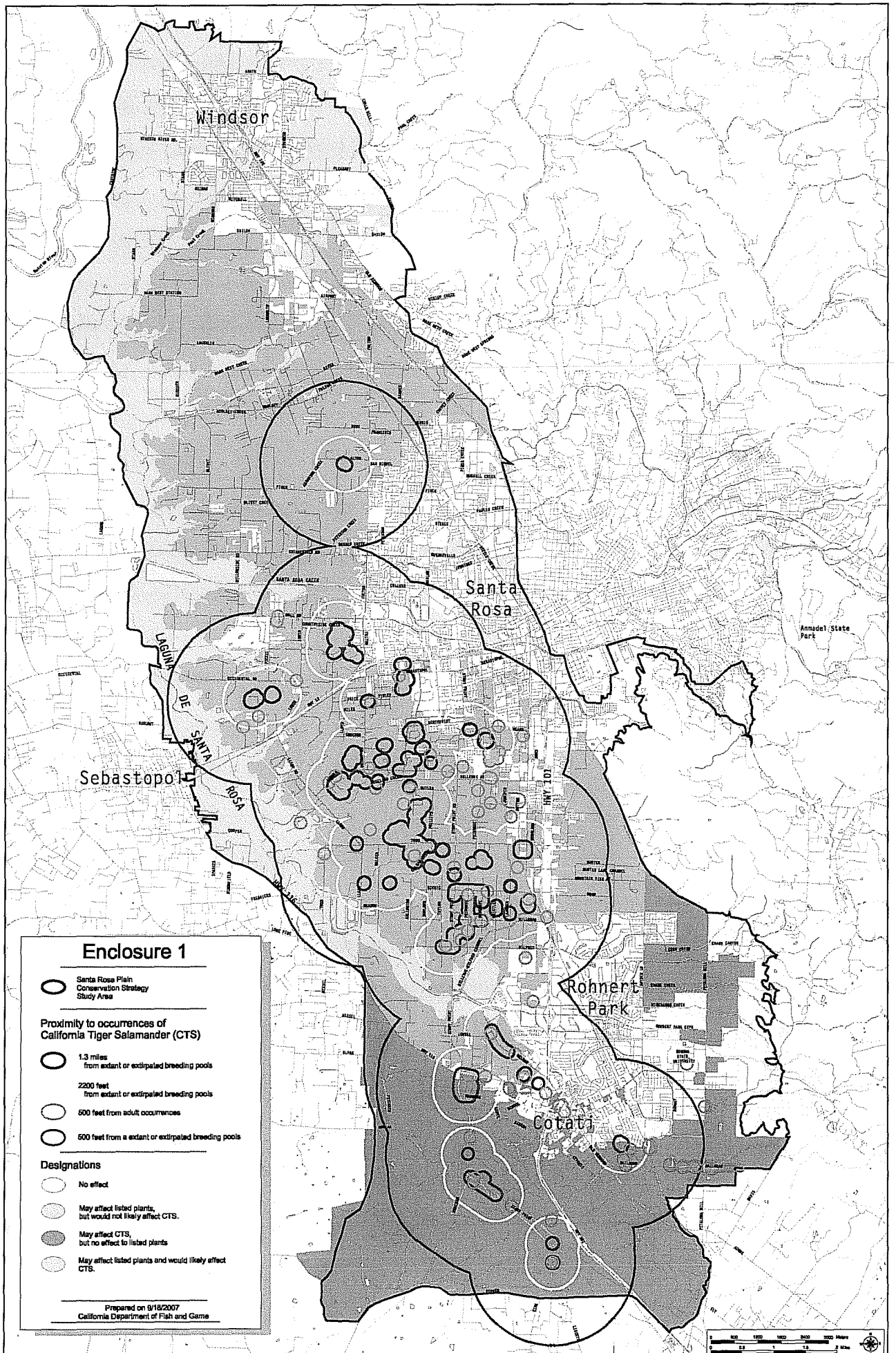
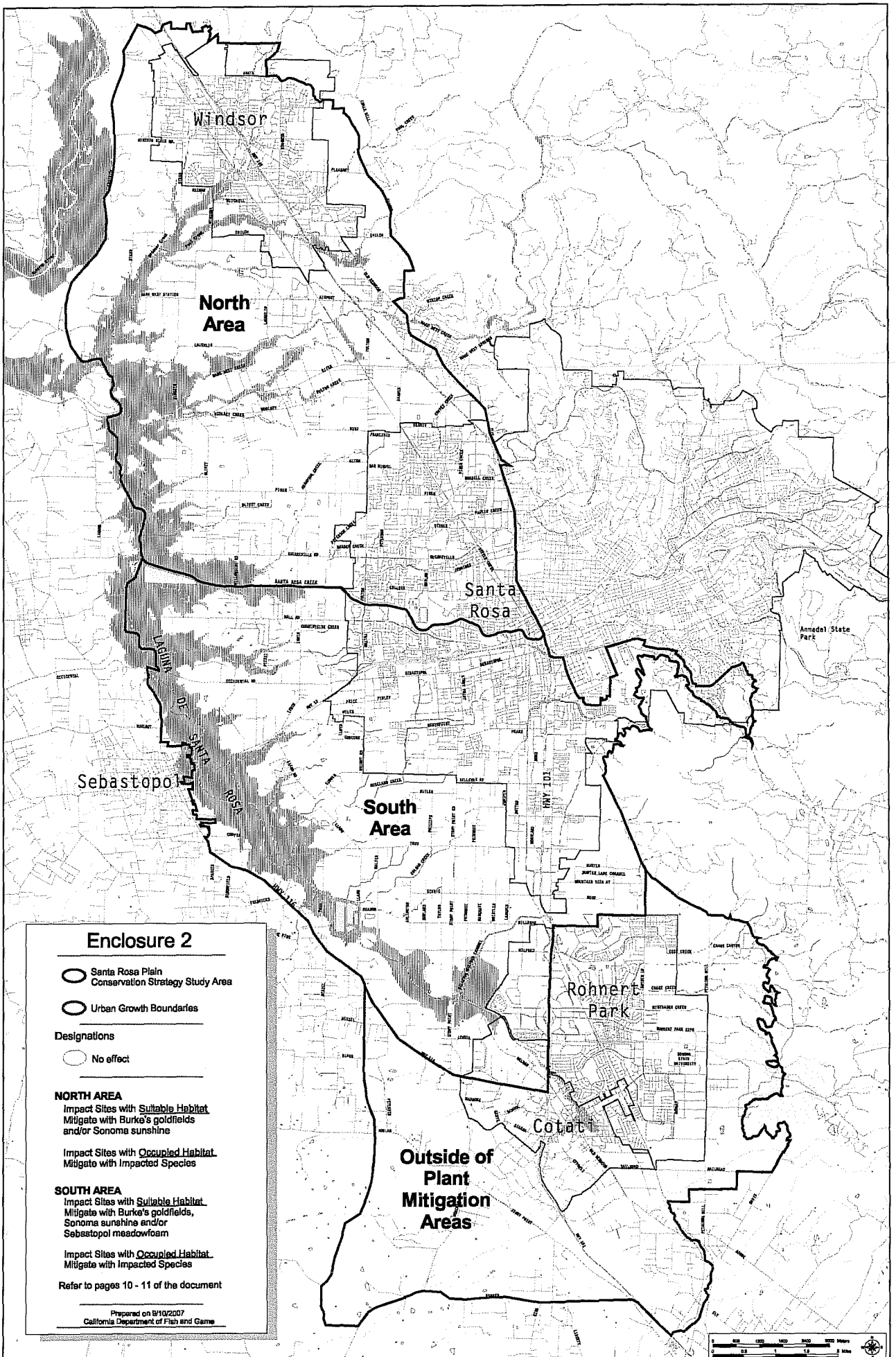

Windsor
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Annadel State Park
LAGUNA DE SANTA ROSA
HWY 101
Enclosure 1
Santa Rosa Plain Conservation Strategy Study Area
Proximity to occurrences of California Tiger Salamander (CTS)
1.3 miles from extant or extirpated breeding pools
2200 feet from extant or extirpated breeding pools
500 feet from adult occurrences
500 feet from a extant or extirpated breeding pools
Designations
No effect
May affect listed plants, but would not likely affect CTS.
May affect CTS, but no effect to listed plants
May affect listed plants and would likely affect CTS.
Prepared on 9/18/2007
California Department of Fish and Game


Windsor
North Area
Santa Rosa
Annadel State Park
Laguna de Santa Rosa
Sebastopol
South Area
Rohnert Park
Cotati
Outside of Plant Mitigation Areas
Enclosure 2
Santa Rosa Plain Conservation Strategy Study Area
Urban Growth Boundaries
Designations
No effect
NORTH AREA
Impact Sites with Suitable Habitat
Mitigate with Burke's goldfields and/or Sonoma sunshine
Impact Sites with Occupied Habitat
Mitigate with Impacted Species
SOUTH AREA
Impact Sites with Suitable Habitat
Mitigate with Burke's goldfields, Sonoma sunshine and/or Sebastopol meadowfoam
Impact Sites with Occupied Habitat
Mitigate with Impacted Species
Refer to pages 10 - 11 of the document
Prepared on 9/10/2007
California Department of Fish and Game

Enclosure 3 - Preserve Establishment and Evaluation Criteria

Preserves shall meet the following minimum requirements:

- The site must be preserved in perpetuity for the benefit of the affected species through dedication of fee title or a conservation easement to an appropriate resource management agency or organization.
- The site must have a habitat enhancement plan, if California tiger salamander and/or listed plant habitat is to be created, restored or established on the site.
- The site must have a management and monitoring plan including management actions necessary to manage, enhance, and protect the resources protected and created on the site, and monitoring actions to determine the success of created or restored wetlands and the status of the protected resources and effectiveness of specified management actions.
- The site must have a Service and CDFG – approved funding mechanism to assure long-term management and monitoring.

Preserve Evaluation Criteria

This Preserve Evaluation Criteria is used to determine if parcels proposed as Preserves provide suitable habitat for the California tiger salamander and/or listed plants. This describes the process for evaluating, and approving individual properties or parcels for preservation.

The preserve evaluation criteria will be used by the Service and CDFG in guiding both mitigation and mitigation bank development. These criteria are to aid and help expedite the selection of preserves.

To be considered acceptable as a preserve, a proposed property or properties must meet all the following criteria:

For California tiger salamander:

(1) Be within the boundary of one of the Conservation Areas designated by the Conservation Strategy, unless otherwise approved by the Service and CDFG.

(2) Contain known, occupied California tiger salamander breeding, upland, or dispersal habitat; or represent potential California tiger salamander habitat. With respect to potential California tiger salamander habitat, the site must exhibit, in the judgment of the Service and CDFG, reasonable potential for habitat restoration or enhancement. Preserves must ultimately have the listed species present within a reasonable time frame.

(3) Be free of excessive land surface features such as roads, parking lots, other hardened surfaces, buildings or other structures, or extensive hardscape that cause a significant portion of the site to be unsuitable as California tiger salamander habitat. Generally, for purposes of this criterion, no more than 15% of the land surface of any potential preserve site may include or be covered by such features unless it is to be restored as part of the preservation action.

(4) Not isolated from other nearby California tiger salamander habitats (preserve or non-preserve) by incompatible land uses (e.g., hardscape) or other significant barriers to California tiger salamander movement and dispersal, such as Highway 101.

(5) Not inhabited by fish and bullfrogs or other non-native predatory species, unless, in the judgment of the Service and CDFG, such species can be effectively removed or eradicated.

(6) Not within the Laguna de Santa Rosa 100-year floodplain.

(7) Exhibit no history or evidence of the presence (storage or use) of hazardous materials on the surface of the site unless proof of removal or remediation can be provided.

For Burke's Goldfields, Sonoma sunshine, and Sebastopol meadowfoam

(1) Preservation of the listed plant species in appropriate locations within the Plain, as previously described in *Plant Mitigation and Establishment* section of the *Description of the Proposed Action.*

(2) Contain known population(s) of listed plants or represent potential plant habitat. With respect to potential plant habitat, the site must exhibit, in the judgment of the Service and CDFG, reasonable potential for habitat restoration, and establishment of listed plant population(s).

(3) Be free of excessive land surface features such as roads, parking lots, other hardened surfaces, buildings or other structures, or extensive hardscape that cause a significant portion of the site to be unsuitable as plant habitat. Generally, for purposes of this criterion, no more than 15% of the land surface of any potential preserve site may include or be covered by such features unless it is to be restored as part of the preservation action.

(4) If establishing populations of Sebastopol meadowfoam, the location is to be located south of Santa Rosa Creek. If establishing populations of Sonoma sunshine and/or Burke's goldfields, the location is to be north of the Laguna de Santa Rosa (See Enclosure 2).

(5) Plant preserves should be a minimum of ten acres. Smaller plant preserves may be established to protect extant populations of Sonoma sunshine and Burke's goldfield, where the site characteristics would assure long-term viability or there is an opportunity to protect important population of these two species.

(6) From a management perspective, preserves should include the entire watershed of the pool(s) and swale(s) being protected, and the ratio of perimeter to area should be minimized.

(7) In general, establishment of plant population(s) should not occur in areas where preservation of any natural population(s) occur unless it can be demonstrated that no adverse effects would occur to the natural population(s) as a result of establishing plant populations.

Enclosure 4 - Translocation

Listed plants and California tiger salamander adult, larvae and juveniles present within an area planned for development will be translocated by appropriate means as approved by the Service and CDFG. In all cases where translocation occurs, authorization must be given by the Service and CDFG.

Translocation would be undertaken for the following reasons:

1) Where salvage of species is required as a permit condition by the Service and CDFG when the removal of occupied habitat will occur (performance criteria and monitoring is required for the salvage and translocation) and/or;
2) To establish or enhance a new population or an existing population where all the conditions are present (including a management and monitoring program) to achieve success of the population. Such collections would be accomplished in a manner as to not to adversely impact an existing population.

California tiger salamander Translocation

The following guidelines apply to required California tiger salamander translocations.

- No mitigation or conservation bank may receive translocated California tiger salamanders until all the bank's credits have been sold and California tiger salamander credits will not be provided as a result of California tiger salamander translocation.
- California tiger salamanders will be translocated to receptor sites that are within the same conservation area as the donor site or, where this is not possible, to the nearest conservation area.
- California tiger salamanders will be translocated only to sites with suitable Califoria tiger salamander breeding habitat.
- California tiger salamander larvae will not be translocated where resulting larval densities would exceed one per square meter.
- The costs of translocation will be the responsibility of the project proponent.
- Translocation will occur only to conservation areas and will not create any new mitigation obligations beyond what already exists.

Plant Translocation

Prior to collection of seeds, approval of the Service and CDFG to address site-specific conditions is required.

Collection at an impact site with occupied habitat

Collection of seeds shall occur from all occupied sites prior to development of the Project. Collection methodology must be approved by the Service and CDFG. The seeds must be translocated to a Service and CDFG--approved Preserve with successful establishment according to Service and CDFG – approved performance, management and monitoring criteria. If a suitable Preserve is not available to accept translocated seeds within one year, the seeds must be deposited at a Service and CDFG – approved seed storage facility for future translocation to a Preserve.

If a project proponent is attempting to establish plants at a mitigation site but is unsuccessful, then remediation would be necessary or an alternative site must be selected and must have successful establishment. If additional seeds are needed to reach performance criteria, they may salvaged from a Service and CDFG – approved site and/or be obtained from a Service and CDFG – approved seed storage facility with prior written authorization from the Service.

Collection at an impact site with suitable habitat

Collection of seeds may be warranted depending on site conditions including the native plant components.

Collection at a Preserve

Collection is limited to a portion of the population that would not affect population viability. Generally not more than 5% of the plant population at a preserve could be collected. Seed and soil removal shall occur only when pools are dry.

The following guidelines apply to plant translocation:

1. The establishment location will be as close to the collection site as possible.
2. The establishment location must have suitable or occupied habitat.
3. Collect seeds after seeds have set or collect the seed bank after seeds have set and when there is no standing water.
4. Establishment will occur when seasonal wetlands are dry and before the rainy season begins.
5. Material will be used within 1 year. Seeds must be stored inside in a dry and cool place.
6. If seeds cannot be used within 1 year, the seeds must be submitted to a Service and CDFG – approved storage facility.

Enclosure 5 - Description of Suitable Habitat for Sebastopol Meadowfoam, Sonoma Sunshine and Burke's Goldfields

Suitable habitat for the listed plant species can be characterized as having the following topographic, hydrologic, and geographic conditions.

Topographic and Hydrologic Conditions

A) One or more of the following topographic or hydrologic conditions must exist for the site to be considered suitable habitat:

1. The wetland contains surface (standing or flowing) water during the rainy season in a normal rainfall year for 7 or more consecutive days.

2. The wetland has an outlet barrier (is a pool) or occurs in depressional terrain (i.e. is a swale or drainage feature).

B) The following conditions indicate that a site is not suitable habitat:

1. The wetland occurs on sloping ground (not the slopes of a swale or pond) and is not a swale or swale-related drainage feature, such that no ponding or flooding occurs.

2. The wetland is irrigated, and contains standing water of natural or artificial origin, and the soils are saturated, for more than 60 days between June 1 and October 1.

Geographic Conditions

The site is located within the North Area or South Area as depicted in Enclosure 2.

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B.5 - Botanical Survey Report 2020

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PRUNUSKE CHATHAM, INC.

M E M O

Date: May 11, 2020

To: Canine Companions for Independence (CCI)

From: Joan Schwan, Vegetation Ecologist

Subject: 2965 Dutton Avenue – Follow-up Botanical Survey

I visited CCI's property at 2965 Dutton Avenue on April 23, 2020 to determine whether any special-status plant species are present or likely to occur. None were found, and none are likely to occur based on the conditions I observed.

The site consists primarily of disturbed annual grassland, with one small depressional seasonal wetland as described by PCI in our February 2020 Jurisdictional Delineation Report. Because the property is located within the Santa Rosa Plain, where several state- and federally-listed plant species are known to occur within vernal pools (depressional, often isolated seasonal wetlands), I reviewed the site to see if any of these species were present. These species include Sebastopol meadowfoam [*Limnanthes vinculans*], Sonoma sunshine *[Blennosperma bakeri*], Burke's goldfields [*Lasthenia burkei*], and many flowered navarretia [*Navarretia leucocephala* ssp. *plieantha*].

The wetland is densely vegetated with a mixture of common native and non-native facultative wetland species, as well as some common upland species. Soil in the wetland area was completely dry at the surface at the time of my visit; this appears to be a very shallow, short-inundated feature. Dominant species in the wetland area included non-native soft chess (*Bromus hordeaceus*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), and Italian rye (*Festuca perennis*). Other species observed were curly dock (*Rumex crispus*), ripgut brome (*Bromus diandrus*), cutleaf geranium (*Geranium dissectum*), brome fescue (*Festuca bromoides*), bindweed (*Convolvulus arvensis*), wild oat (*Avena* sp.), spinyfruit buttercup (*Ranunculus muricatus*), and Harding grass (*Phalaris aquatica*). The only native species observed were occasional small patches of meadow barley (*Hordeum brachyantherum*), creeping spikerush (*Eleocharis macrostachya*), and individuals of miniature lupine (*Lupinus bicolor*).

Based on the high cover of non-native species, lack of open soil on which the listed species tend to occur, and apparently very limited length of inundation/saturation, none of the listed species are likely to occur here. No further rare plant surveys are recommended.

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B.6 - California Tiger Salamander Site Assessment Report

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California Tiger Site Assessment and USFWS Programmatic Biological Opinion Evaluation
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa, Sonoma County
September 2018
Revised June 2021

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1 Introduction

Canine Companions for Independence (Canine Companions) owns and manages an existing facility at 2965 Dutton Avenue, Santa Rosa, Sonoma County (APN # 043-135-031). The 12.87-acre parcel currently supports the Northwest Training Center providing services to northern California, northern Nevada, Oregon, Washington, Idaho, Montana, Alaska, and Wyoming. The center houses the administrative offices and an extensive indoor and outdoor training facility. The majority of the parcel is developed with the exception of approximately 2.8 acres at the northern edge of the site. Canine Companions plans to develop this area at a future date.

As part of project planning, Canine Companions requested Prunuske Chatham, Inc. (PCI) complete a Sonoma County Distinct Population Segment of the California tiger salamander (CTS, *Ambystoma californiense*) site assessment to determine the likelihood that CTS may be occupying the site and using either aquatic or upland habitat. As outlined in *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Findings of the California Tiger Salamander*, the site assessment must address three elements to determine the potential for CTS occurrence (USFWS 2003). These include: is the project within the range of CTS; what are the known localities of CTS within the project site and within 3.1 miles of the project boundaries; and what the habitats within the project site and within 1.24 miles of the project boundaries? This report summarizes a field survey and background review and addresses the three elements noted above.

2 Methods

Field Survey. A biological field survey of the project site was completed on August 14, 2018, by Jennifer Michaud, PCI's Senior Wildlife Biologist, who is familiar with the region's flora and fauna. Ms. Michaud holds a U.S. Fish and Wildlife Service Recovery Permit 10(a)(1)(A) and a California Department of Fish and Wildlife Scientific Collecting Permit with amendments for California tiger salamander.

The primary purposes of the field assessment were to characterize biological communities and habitat conditions within the project site and to help determine whether or not suitable habitat for California tiger salamander is present. The potential for presence of CTS and their habitat was determined based on habitat conditions, presence or absence of unique habitat features, proximity of the project site to reported occurrences, and geographic ranges of relevant species.

During the survey, an inventory of all plant and wildlife species observed was compiled. Conditions during the survey were sunny with a light breeze (0-5 mph) with 0% cloud cover. The air temperature was 62° F at 9:30 a.m. The survey was conducted with the aid

of binoculars (Swarovski™ 10 x 42). Visual cues, calls, songs, and direct observations were used to identify wildlife species. The project site was examined for presence of birds, mammals, amphibians, reptiles, and invertebrates. No aquatic sampling was completed as part of the assessment. The survey consisted of walking meandering transects through the entire site to provide adequate coverage across the area. No formal jurisdictional delineation of wetlands and waters was performed during the CTS evaluation.

Background Review. A background literature and database search was conducted to help determine the potential for CTS to occur on or adjacent to the project site. The search focused on reported occurrences for the Cotati 7 ½' USGS quadrangle where the project is located. It also included occurrences within a 3.1-mile buffer around the project site. The California Natural Diversity Database (CNDDB[1]; CDFW 2018, 2021) and background CTS documents were reviewed (USFWS 2005, 2106, 2020, 2021). An updated background review was completed in June 2021 to determine if additional CTS sightings had been reported near the project site since 2018. The City of Santa Rosa planning department was also consulted to discuss findings of other CTS assessment on nearby parcels (Nicholson 2018).

Figure 1 shows the project location and regional context. Figures 2 and 3 illustrate the reported occurrences of California tiger salamander within 3.1 and 1.3 miles, respectively (CDFW 2018, 2021). Figure 4 shows habitat conditions within and near the project site. Representative photographs taken during the field survey are provided at the end of this report.

[1] The California Natural Diversity Data Base (CNDDB), maintained by the California Department of Fish and Wildlife (CDFW), is a repository of information on sightings and collections of rare, threatened, or endangered plant and animal species within California. CNDDB reports occurrences of special-status species that have been entered into the database and does not generally include inventories of more common animals or plants. The absence of a species from the database does not necessarily mean that they do not occur in the area, only that no sightings have been reported. In addition, sightings are subject to observer judgment and may not be entirely reliable as a result.

3 Setting

The project site is located within a 2.86 acres of a 12.87-acre parcel owned by Canine Companion; see Figure 1. The site is located at the southern edge of Santa Rosa and within the city limits. The site is located at the edge of a highly industrialized area to the west of Highway 101 and south of Highway 12. Remnant patches of undeveloped land are scattered among the commercial and residential development in the area. The site is accessed from Bellevue Avenue to Dutton Avenue; Dutton Avenue dead ends at the project site. The Colgan Creek Flood Control Channels borders the project site which flows into the Laguna de Santa Rosa 4 miles to the west, the Russian River, and then the Pacific Ocean.

4 California Tiger Salamander Biology

California tiger salamanders spend the majority of their lives underground where they take up residence in primarily small mammal burrows. Adults emerge from underground burrows with the onset of winter rains and migrate to breeding sites. Breeding occurs in ponds and vernal pools, typically between November and January in Sonoma County (Cook et al. 2005). Adults remain at the breeding ponds for several days to weeks and then travel back to their upland habitats during or shortly after rain events. All movements occur at night; this along with their underground habits make CTS a particularly elusive species. CTS eggs hatch after approximately 2 weeks. CTS larvae develop in ponds over a period of several months. Emergence from ponds occurs as early as March or April (Cook et al. 2005). Ponds that remain inundated throughout winter and into spring and early summer are vital to aquatic larval development. California tiger salamanders can undertake long-distant migrations. Although the majority of salamanders disperse within 0.5 miles of their breeding sites, some individuals have been documented traveling much further distances—0.75 to 1.3 miles. As a result, CTS require a relatively larger buffer area around breeding ponds to support aestivation and movement.

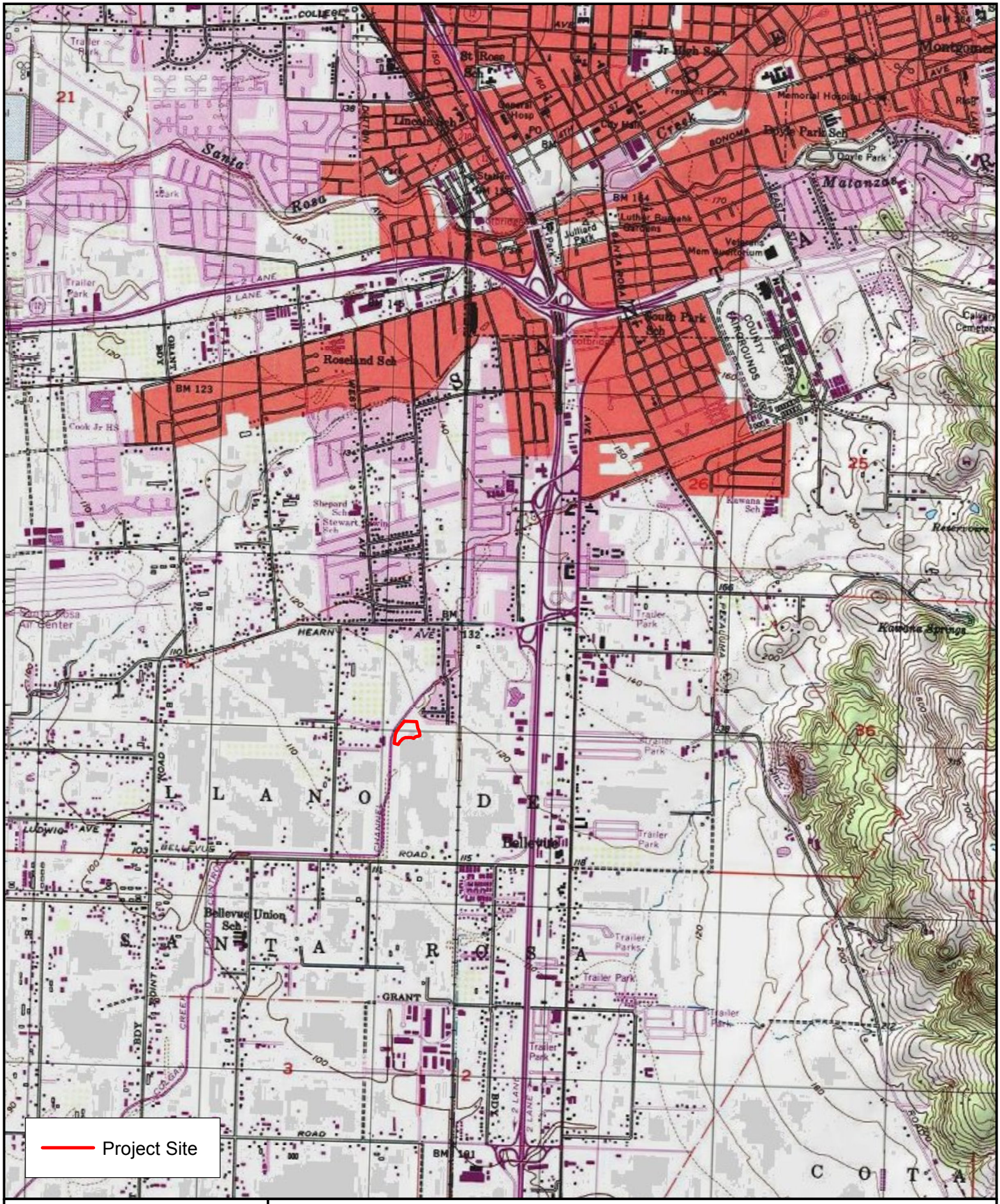

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Figure 1. Project Location
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

08/30/2018

5 Results

Element 1. Is the project site within the range of the CTS?

The project site is located within the range of the Sonoma County Distinct Population Segment of the California tiger salamander, and within 1.3 miles of a known or extirpated breeding pool as shown on Figure 2. Sonoma County's California tiger salamander occurs exclusively in the county and is isolated from all other populations in the state.. Historically, their habitat included 100,000 acres within the Santa Rosa Plain and Petaluma lowlands. The current range is 18,000 to 20,000 acres of fragmented habitat focused in southwest Santa Rosa and south Cotati (USFWS 2016). The largest concentration of CTS in Sonoma County is located to the west and southwest of Santa Rosa in the lowlands between the Laguna de Santa Rosa and the city limits. The project site is located along the eastern edge of the salamanders range adjacent to Santa Rosa, and it is located within designated CTS Critical Habitat; see Figure 2.

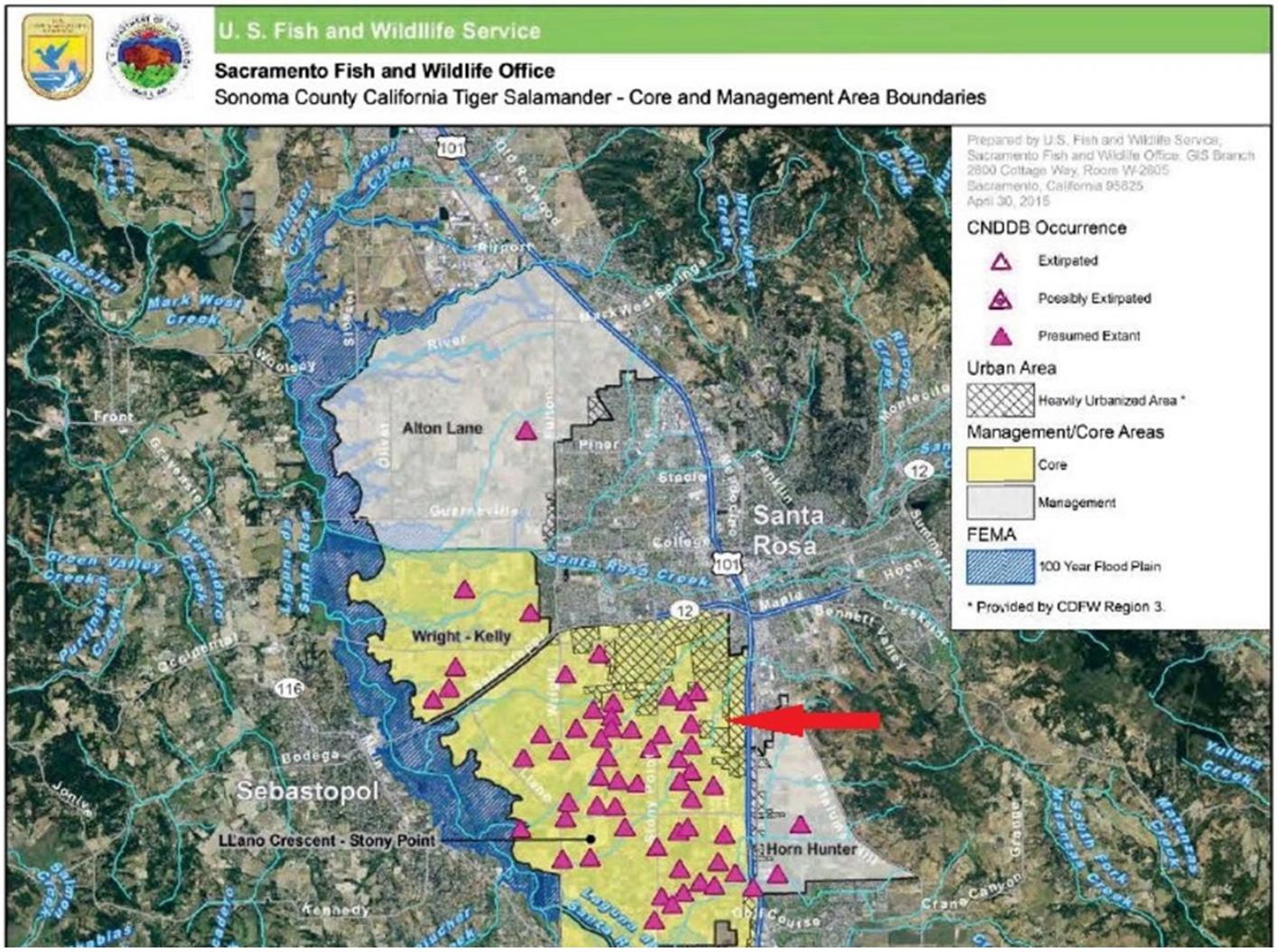
Within the Sonoma County California tiger salamander recovery area there are three core areas (the Wright-Kelly Core Area, Llano Crescent-Stony Point Core Area, and West Cotati Core Area), and four bounded management areas (the Alton Lane, Horn-Hunter, Americano-Stemple, and East Cotati Management Areas) that have been identified as possible areas for recovery. These recovery areas comprise the heart of the CTS range within the Santa Rosa Plain, and areas where it is either known to occur, or is believed to occur, based on habitat conditions and survey information at the time. The recovery area is generally the same geographic footprint as the final critical habitat designation except for areas where Sonoma County CTS were documented as of 2013.

According to the *Santa Rosa Conservation Strategy Final* (see below excerpt; USFWS 2005, rev. 2007), the project site is located within an area intended for future development. Based on USFWS's recently updated Programmatic Biological Opinion (PBO, USFWS 2020) for the California tiger salamander and the three listed plants of the Santa Rosa Plain, the project site is outside of the Recovery Plan area (Core or Management Areas) for all three plant species but within CTS management area (USFWS 2021).

According to the *Recovery Plan for the Santa Rosa Plain*, the project site is located within the Llano Crescent – Stony Point Core Area; this includes one of three core areas that have been identified (USFWS 2016). "Core areas comprise the heart of the species historical (and current) range and represent central blocks of contiguously occupied habitat that function to allow for dispersal, genetic interchange between populations, and metapopulation dynamics." (USFWS 2016).

The Llano Crescent – Stony Point Core Area "is bounded on the north by Highway 12, to the west by the 100-year flood plain of the Laguna de Santa Rosa, to the east by the urbanized areas of Santa Rosa, and to the south by the Laguna de Santa Rosa and the

urbanized area of northwest Cotati. This core area contains the Llano Crescent (1,705 ac) and Stony Point Conservation Areas (1,684 ac), where 382-900 acres and 329-750 acres, respectively, are targeted for habitat acquisition" (USFWS 2016). The project site is located along the eastern edge of this core area and not within any conservation areas or along any CTS corridors identified on either USFWS Recovery Plan Figure 7 – Santa Rosa Plain Conservation Strategy – Llano Conservation Area or Figure 8 – Santa Rosa Plain Conservation Strategy – Stony Point Conservation Area. The northern extent of the Stony Point Conservation Area is located approximately 1.5 miles south of the project site, and the Llano Crescent Conservation Area is located approximately 1 mile west. Neither maps illustrate migration corridors towards the proposed project site. The heavily urbanized areas shown on map below are located immediately east of the project site.



Project site (red arrow) within the Llano Crescent – Stony Point Core Area (USFWS 2016). Image is an excerpt from Figure 13 in the Recovery Plan.

Element 2. What are the known localities of CTS within the project site and within 3.1 miles of the project boundaries?

According to the CNDDB, the project site is located within 3.1 miles of multiple documented occurrences of CTS within Sonoma County (CDFW 2018, 2021). There are 54[2] reported occurrences of CTS within a 3.1-mile buffer area surrounding the project site; see Figure 2. As noted above, the largest concentration of CTS in Sonoma County is located to the west and southwest of Santa Rosa in the lowlands between the Laguna de Santa Rosa and the city limits. The project site is located along the eastern edge of this central population. There has been extensive monitoring of the Santa Rosa Plain population and the large number of sightings reflects the efforts of local biologists to monitor CTS in the region.

Included below is a summary table of the reported occurrences of CTS within 1.3 miles around the project site; see Table 1 and Figure 3. This distance is the documented maximum migration distance for CTS moving to and from breeding sites and uplands (Searcy and Shaffer 2011). The sightings listed in Table 1 are within 1.3 miles of the proposed project site. Based on a 2021 review of the CNDDB, there are no new processed or unprocessed CTS sightings within 1.3 miles of the project site (CDFW 2021).

The nearest documented breeding occurrence for CTS is approximately 0.4 miles to the northwest of the project site at Southwest Community Park off Hearn Avenue; see Occurrence Number 483. Historically, a single pond at the site supported successful CTS breeding (Cook and Meisler 2016). However, the areas surrounding the pond have become developed and suitable upland habitat is limited. Surveys of Southwest Community Park have been completed since 1998, CTS larvae were found to be present until 2010 (Cook 2018 and 2021). No CTS larvae were documented at the pond in 2011-2017 and they are believed to be extirpated from the site (Cook 2021).

To the northwest of the project site, within 0.7 miles, there is a drainage ditch at the corner of Hearn Avenue and Stony Point Road that supported CTS breeding in 2002-2003; see Occurrence Number 653. The site is surrounded by development and the ditch is not a viable long-term breeding site. The site still appears to be undeveloped (Google Earth™ 2018). There was an additional potential breeding pond noted approximately 1 mile from the site, but it is not confirmed; see Occurrence Number 787. This site is on the east side of Stony Point Road and to the west of Elise Allen High School. Migration from Occurrence Number 653 to the proposed project site would be similar to the conditions described for the extirpated pond at Southwest Community Park, since the 2002-2003 breeding site is located west of the community Park. Migration routes from Occurrence Number 787 to

[2] In comparison, there are approximately 80 reported occurrences of CTS in Sonoma County (CDFW 2018).

the proposed project site is limited with the presence of Elsie Allen High School and several subdivisions and an industrial site. The Colgan Creek Flood Control Channel is a migration barrier from both these sites to the project site.

Three additional breeding sites are reported to the southwest (1 and 1.5 miles) and west (1.25 miles) of the project site; see Occurrence Numbers 232, 1111, and 650. These breeding ponds are outside or at the edge of the documented mobility distance for CTS. Each pond is located to the west of Stony Point Road. Stony Point Road is a major road way and alternative route for Highway 101 travelers. It would be a formidable barrier for any CTS using uplands to the east of Stony Point Road and traveling west over the road to breeding ponds.

In addition to the reported occurrences of breeding sites within 1.3 miles of the project sites, there are nine other reported occurrences of adult CTS in the area. These sightings are reported from 2001 through 2010; see Table 1. All but one of the reported occurrences are located west, northwest, or southwest of the proposed project site. A single occurrence (Occurrence Number 788, 0.97 miles) is located to the south. No occurrences are noted east of the proposed project site, as illustrated on Figure 2.

The project site is located adjacent to two properties whose owners have completed CTS site assessments and/or protocol surveys. Directly across the street from the project site, at the cul-de-sac, is 2920 Dutton Avenue. This property is owned by Manor Development Company. According the Manor Development Company, Vollmar Natural Lands Consulting out of Berkeley completed a CTS site assessment of the parcel and found no suitable habitat or potential for CTS to use the site based on the surrounding land use and existing site conditions (Manor Development Company 2018).

Directly to the southeast of the project site, at 2960-2970 Dutton Avenue, the property owner completed two years of presence/negative findings surveys for CTS with protocol drift-fence sampling. The surveys were completed from 2005-2007 (Monk & Associates 2015 citing Fawcett 2007). No CTS were found during the survey period. USFWS concluded this project would not result in take of CTS (Monk & Associates 2015).

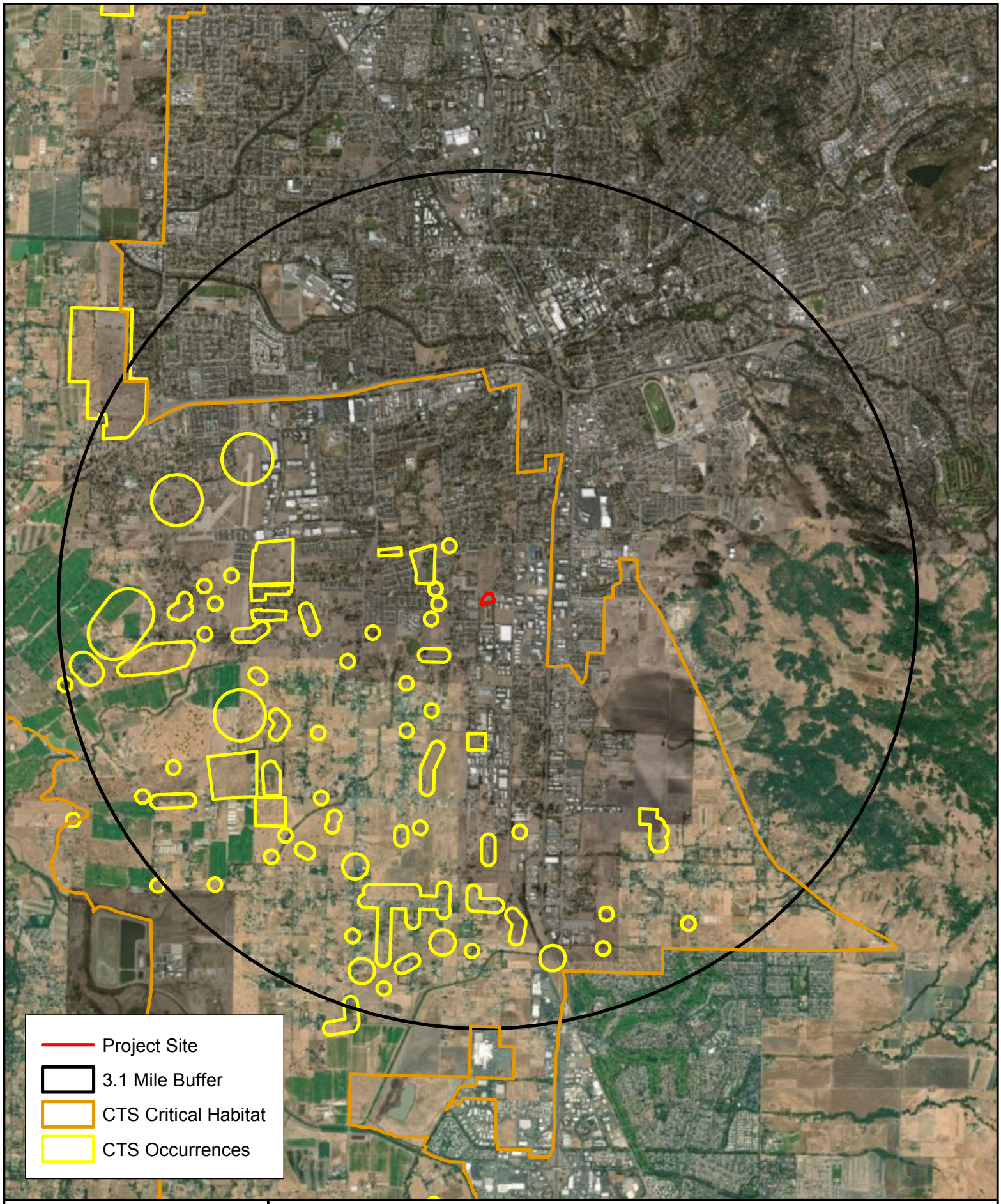


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Figure 2. Reported Occurrences of CTS within 3.1 Miles
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

0 0.25 0.5 1 Miles

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8/30/2018

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Figure 3. Reported Occurrences of CTS within 1.3 Miles
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

0 0.125 0.25 0.5 Miles

N

08/30/2018 - revised 06/2021

Table 1. Reported Occurrences of CTS within 1.3 Miles of the Project Site

Occurrence Number	Location/Habitat	Species Description/Site Conditions	Distance to Project Site
Breeding Ponds/Larval Observations			
483	Southwest Community Park/ pond surrounded by housing, grassland, and park	Adults and larvae, CTS larvae last seen in spring 2010, no CTS found between 2011-2017, breeding pond assumed to be extirpated based on monitoring data and site development	0..4 miles to northwest
653	Intersection of Hearn and Stony Point Road/remnant wetland	Larvae caught in ditch, males observed (2002-2003)	0.7 miles to northwest
787	East side of Stony Point Road, 0.2 miles north of Bellevue Road/annual grassland with pond next door (potential breeding site)	Two males observed in 2002	0.75 miles to west
232	Southwest of intersection with Stony Point Road and Ludwig Avenue/grassland and breeding site	Unknown captured in 1992, larvae captured in 2006; west of Stony Point Road	1 miles to southwest
1111	East side of Phillips Avenue/large vernal pool swale complex	Larvae observed in 2011; used for breeding; west of Stony Point Road	1.5 miles to southwest
650	Between Ludwig Avenue and Yuba Avenue/Grassland with vernal pools	Adults and larvae observed in 2001-2002; used for breeding; west of Stony Point Road	1.25 miles to west
Adult Sightings			
1105	Hearn Avenue between Westwood Drive and Dutton Meadow Road/ road	Gravid female found along road, December 2003	0.4 miles to northwest
1243	Maureen Drive, 1 mile west of Morgan Creek Street/ historically grassland	Adult detected in 2006, site has since been developed	0.3 miles to west
786	0.15 west of Dutton Meadows Road and 0.3 miles north of Bellevue Road/ grassland within floodplain	Adult females observed in 2002 and 2007, site planned for development in 2008, CTS relocated from site	0.35 miles to west
725	West of Dutton Meadows Road and 0.3 miles north of Bellevue Road/Colgan Creek Flood Control Channel/ pasture with seasonal wetland	One adult observed in pit fall traps in 2002, another adult observed in 2002; no CTS larvae observed in seasonal wetland on site in 2002	0.4 miles to southwest
789	Along west side of Primrose Avenue/ grassland used for motor cross	Male observed in 2003	0.75 miles to southwest
790	0.2 east of Primrose Avenue and 0.4 miles south of Bellevue Road/grassland used for motor cross	Males observed in 2003	0.8 miles to southwest

Occurrence Number	Location/Habitat	Species Description/Site Conditions	Distance to Project Site
649	Primrose Avenue/grasslands and wetland	Dead adult found along rural road in 2001	1 miles to southwest
788	South side of West Robles Road/Grassland	Males and females observed in 2002	0.95 miles to south
1134	North side of Todd Road/grassland	Males and females caught in pit fall traps in 2010	15 miles to southwest

Element 3. What are the habitats within the project site and within 1.24 miles of the project boundaries?

Project Site

The project site is dominated by grassland (ruderal) habitat. There is a 0.14 acre seasonal wetland that has been delineated within the site (PCI 2020). The site was also surveyed for the presence of rare plant species, but none were found (PCI 2021). The site is highly disturbed and appears to have been graded in the past based on the site topography and artificial drainage patterns. The site was recently mown and vegetation was fairly low growing during the time of the assessment. It is a flat parcel and elevations range from approximately 116 to 120 feet.

The site is dominated by non-native grassland and herbaceous species typical of disturbed/ ruderal sites. The dominate species present at the time of the August survey were oat grass (*Avena* sp.), chicory (*Cichorium intybus*), Queen anne's lace (*Daucus carota*), bristly ox-tongue (*Helminthotheca echiodes*), Harding grass (*Phalaris aquatica*), and wild radish (*Raphanus sativus*).

As noted above, there is seasonal wetland in the eastern portion of the site; see Figure 4. This area is dominated by non-native upland grasses and curly dock (*Rumex crispus*); a facultative wetland plant. Curly dock was present elsewhere on the project site, but was more abundant in the wetland area. The site was completely dry at the time of the assessment. The wetland appears to be a very shallow feature that only fills briefly and only in normal or wet rainfall years. It does not support significant native plant diversity (PCI 2021). Dominant species in the wetland at the time of the rare plant surveys included non-native soft chess (*Bromus hordeaceus*), Mediterranean barley (*Hordeum marinum ssp. gussoneanum*), and Italian rye grass (*Festuca perennis*). These form dense cover throughout the seasonal wetland. The only native species observed were occasional small patches of meadow barley (*Hordeum brachyantherum*), creeping spikerush (*Eleocharis macrostachya*) at low relative cover, and individuals of miniature lupine (*Lupinus bicolor*).

The primary source of hydrology for the wetland is direct precipitation and surface runoff from immediately surrounding areas. Since the site is fairly flat and comprised of heavy clay soils, drainage from the site is likely minimal with most water ponding on the site and draining slowly to the southwest. The wetland itself occurs in a very shallow depression (PCI 2021).

Soils on the project site are mapped as Clear Lake clay, ponded, 0-2% slopes; and Clear Lake clay, 0-2% slopes (NRCS 2021). Site assessments during the rare plant surveys during 2020 and 2021 determined the wetland is located on the area mapped as Clear Lake Clay, ponded; this area shows visual indicators of the soil type, including deep cracks in the dry

season. No surface hydrology indicators were noted, and based on the wetland topography and observed conditions, it is ephemeral feature. It does not appear to support hydrologic characteristics (water depths and longevity) suitable for CTS breeding.

Within the project site, small mammal burrows were evident. These included Botta's pocket gopher burrow and potentially broad-footed mole tunnels, but moles could not be confirmed. Fissures were noted in the desiccated clay soils; these fissures are typically of soils that shrink and swell with the weather cycle. CTS use mammal burrows and large cracks in the soil as upland habitat if they are within the migration range of a breeding pond. However, the closest reported pond at Southwest Community Park is considered extirpated and numerous migration barriers exist between the pond and the project site; see below discussion. Although small mammal burrows are present, the project site is not accessible for CTS from known or potential breeding ponds.

Wildlife observed by PCI in 2018 within and surrounding the site included American crow, American goldfinch, American kestrel, Anna's hummingbird, black phoebe, California towhee, Canada goose, green heron, house finch, northern mockingbird, turkey vulture, western bluebird, western scrub-jay, and white-tailed kite.

Contiguous Habitats

The project site is bordered directly to the south by the Canine Companion facility; see Figure 4. The facility supports extensive buildings, pathways, and turf areas. CTS are unlikely to use any of the developed lands within the existing facility given the development and the use of the site. The parcel directly north of the project site supports the same grassland and ruderal habitat as is present within the project site. A seasonal drainage ditch is present along the property boundary that separates the project site and the parcel directly to the north.

To the west is a service road and the Colgan Creek Flood Control Channel. The channel is dominated by scattered trees of coast live oak (*Quercus agrifolia*), willow (*Salix* sp.), Oregon ash (*Fraxinus latifolia*), and black walnut (*Juglans californica*). The understory is very well developed and includes thickets of Himalayan blackberry (*Rubus aremeniacus*), poison hemlock (*Conium maculatum*), and Harding grass. Where visible the channel bottom is lined with water plantain (*Alisma* sp.). The channel is deeply incised and stabilized with small rock; see below discussion. The channel experiences significant flows during the rainy season, which coincides with the CTS migration. The incised, rocked banks, impenetrable vegetation, and high flows pose a significant barrier to CTS movement.

To the east of the site is Dutton Avenue and further to the east is an undeveloped lot, which supports similar disturbed ruderal (weedy) habitat; see discussion above and Figure

4. To the southeast, at the corner of Dutton Avenue and Duke Court, is small commercial building. Further to the southeast is the proposed development at 2960-2970 Dutton Avenue; see discussion above and Figure 4. This site supports ruderal (weedy) habitat with pockets of seasonal wetland. Surveys for the development concluded no CTS are on the site.

Nearby Habitats

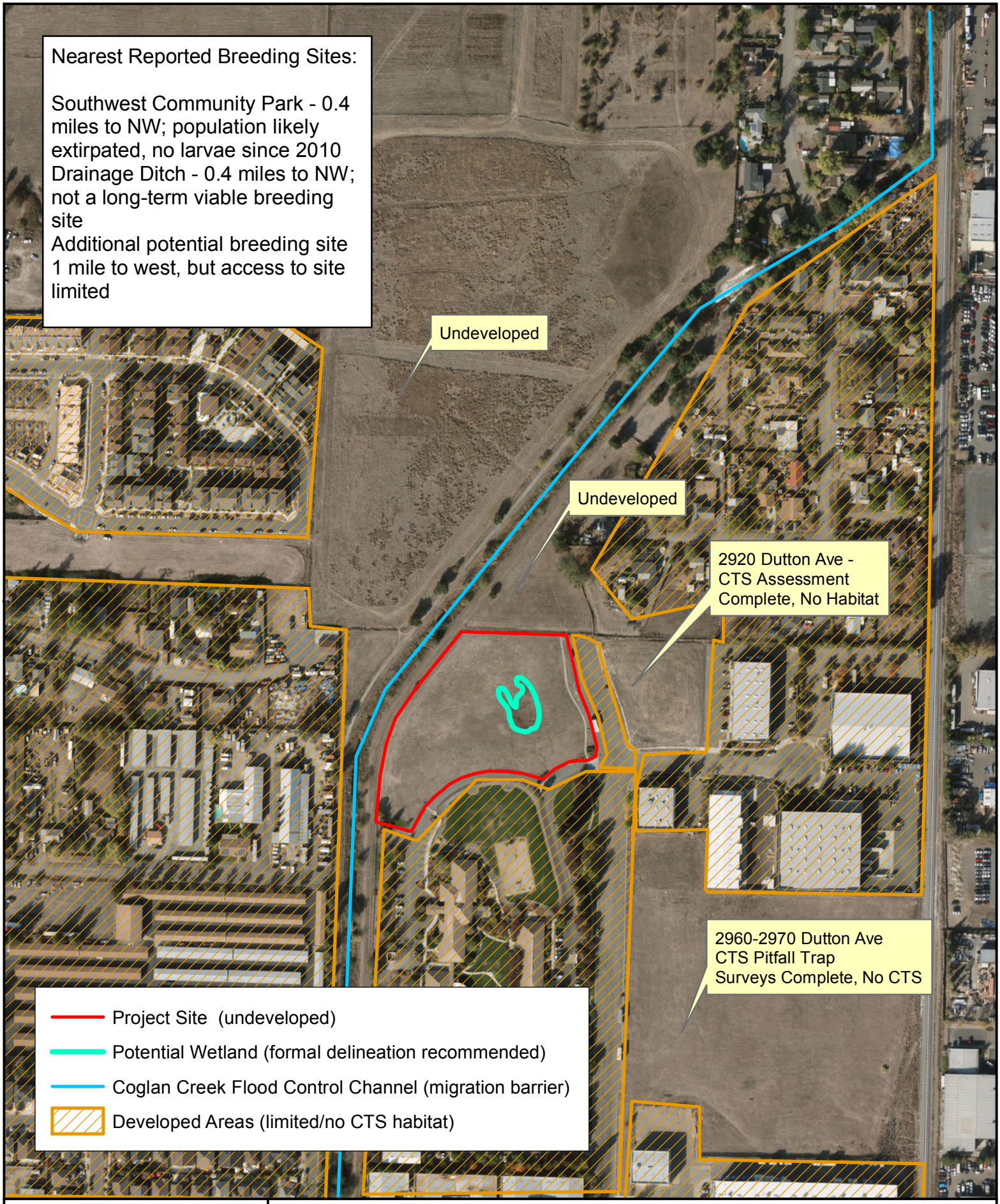
The project site is located in an area with extensive, high density development. Figure 3 shows the level of development surrounding the project site. Commercial, industrial, and residential development encompass much of the land in the Dutton Avenue area. To the north of the site, there are some parcels that remain undeveloped, but CTS movement to and from these sites is constrained by the presence Colgan Creek Flood Control Channel. Further to the east is the SMART train tracks and beyond that is Highway 101. The site is also surrounded by major road ways that experience high traffic volumes (e.g., Bellevue Avenue, Dutton Avenue, and Stony Point Road further to west). Beyond the developed areas, there are still some locations that remain undeveloped, but these are fairly disconnected and isolated from the project site.

CTS Movement

Migration from the pond at the Southwest Community Park would be difficult for CTS. Housing developments border the pond on both the west and south sides. The community park and heavily used soccer fields surround the pond to the north and east. Meadow View Elementary School is adjacent to the community park on the eastern edge and further east of the school is a subdivision and open grassland.

USFWS Endangered and Threatened Wildlife and Plants; Emergency Rule to List the Santa Barbara County Distinct Population of the California Tier Salamander as Endangered; Rule and Proposed Rule (Federal Register 50 CFR Part 17, 2000) notes that curbs and berms as low as 9 to 12 cm (3.5 to 5 in) allow salamanders to climb onto roadways but they restrict or prevent CTS movements off road and they effectively lead to CTS mortality. Roads can reduce or block CTS movement and separate nearby ponds, if they include physical barriers such as solid road dividers and storm drains (and vertical curbs) (Ford et al. 2013). Hearn Avenue, Dutton Meadows, Dutton Avenue, and Bellevue Avenue surround the project site. These roadways include curb and gutters in some locations, which, as noted above, can block migration to the grasslands at the project site. Subdivisions west of the project site have curb and gutters on all roadways, and the industrial area to the south of the project site also have curb and gutters around them. The roadways, curbs, and gutters are a formidable barrier for CTS migrating to and from the project site; thereby, making the site unavailable for CTS.

The grassland immediately west of the project site abuts the Colgan Creek Flood Control Channel. The engineered flood control channel is approximately 60 feet wide at the top of bank with heights ranging from 7 to 8 feet. The channel side slopes range from 34 to 40% and supports partially vegetated side slopes (pers. com 2021). The flood control channel has steep side slopes and forms a formidable barrier to CTS migration to and from the project site because of CTS have limited climbing ability. David Cook, Senior Environmental Specialist at Sonoma Water and local CTS expert, stated that CTS are not typically associated with creek habitats for both breeding and movement corridors (Cook 2018). In addition, USFWS determined the flood control channel near the project area does not support CTS habitat and it identified "no effect" location (USFWS 2021). No CTS sightings are documented at the project site or any location east of the flood control channel as shown on Figure 3.



PRUNUSKE CHATHAM, INC.

Figure 4. Habitats Within and Near the Project Site
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

0 125 250 500 Feet

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08/30/2018

6 Conclusions

The project site is located within the range Sonoma County Distinct Population Segment of the California tiger salamander. Historically, the site may have support CTS. However, the project site is isolated from known breeding populations with partial and full migration barriers between the project site and potential breeding ponds. The project site is also located in area of high density development; it does not provide upland habitat, because CTS migration to the site is extremely limited. . The project site supports a seasonal wetland, but the wetland does not provide suitable breeding habitat. The following is a summary of the site assessment findings:

- The site is bordered directly to the south by the Canine Companions facility. The site supports extensive buildings, pathways, and turf areas.
- The project site supports a seasonal wetland. The wetland is fairly shallow and indistinct from the surrounding habitat. It does not appear to support the appropriate depths or inundation periods to support successful CTS breeding.
- The site is bordered by the Colgan Creek Flood Control Channel to the west. The incised, rocked banks, impenetrable vegetation, and high flows within the channel pose a significant barrier to CTS movement to/from the site. All nearby documented breeding sites are located across the channel (west of); CTS would have to cross the channel to migrate to the project site for use as upland habitat.
- An undeveloped parcel is located directly to the east across Dutton Avenue (2920 Dutton Avenue). A site assessment was completed on this parcel and no suitable CTS habitat was identified.
- An undeveloped parcel is located directly to the southeast across Dutton Avenue (2960-2970 Dutton Avenue). Two years of presence/negative findings surveys for CTS were completed on this parcel and no CTS were observed.
- An undeveloped parcel is located directly to the north of the project site, but it does appear to support breeding habitat. Additional undeveloped parcels are located to the north of the channel, but the project site is isolated from these parcels by the Colgan Creek Flood Control Channel.
- The nearest breeding sites are 0.4 miles to the northwest at Southwest Community Park and a nearby drainage ditch. No larvae have been documented at Southwest Community Park since 2010. This site is believed to be extirpated and movement from this pond is extremely limited given the density of roads, traffic volumes, and presence of movement barriers. Larval observations for the ditch were reported in 2002-2003, but this is not likely to be a viable breeding site. It is also a likely extirpated breeding site. Another potential breeding site is located approximately 1 mile from the site near Stony Point Road. It is unlikely that CTS would be able to navigate from the project site to this location given the density of development in the area.

- Three additional breeding sites are reported within 1-1.5 miles from the project site. These sites are located to the west of Stony Point Road. CTS are unlikely to successfully cross this road and migrate to the project site for use as upland habitat.

7 USFWS Programmatic Biological Opinion and Compensatory Mitigation

USFWS updated the *Programmatic Biological Opinion* (PBO) in response to a request to reinitiate formal consultation on Issuance of Clean Water Act, Section 404 Permits by the U.S. Army Corps of Engineers (Corps) on the Santa Rosa Plain (USFWS 2020). The new PBO carries over conservation for impacts to from the 2007 PBO (USFWS 2007), and it identifies a methodology tailored to new observations of Sonoma County California tiger salamanders. The PBO continues to address fill of wetlands and modification/loss of adjacent uplands, and it identifies mitigation ratios to offset adverse effects to CTS habitat. The mitigation ratios are expressed as acres to be conserved to acres of impact. The PBO notes compensation is required for filling of wetland and modification or removal of adjacent uplands to build homes, industrial units, roads, and infrastructure.

Compensatory mitigation rates in the 2020 PBO are based on a project site distance from a breeding site. The categories are identified in Table 2 below:

Mitigation Ratio	Sonoma County California tiger salamander
3:1	Project sites that are within 500 feet of a breeding site
2:1	• Project sites that are greater than 500 feet and within 2,200 feet of a breeding site • Project sites beyond 2,200 feet from a breeding site, but within 500 feet of a non-breeding occurrence
1:1	Project sites that are greater than 2,200 feet and within 6,864 feet (1.3 miles) of a breeding site.
0.2:1	Projects sites that are greater than 6,864 feet (1.3 miles) from a breeding site and greater than 500 feet from a non-breeding occurrence.

The 2007 and the 2020 PBO include a series of maps and an interactive database to evaluate potential impacts of projects on a site-specific, parcel-by-parcel basis. The 2005 Recovery Plan, 2020 PBO, and USFWS interactive maps identify the project parcel (APN 043-135-031) as within the greater than 2,200 feet (0.417 miles) and within 6,864 feet (1.3 miles) of a breeding site category. The closest breeding site was identified at Southwest Community Park (0.4 miles away). As discussed in detail above, the pond at

Southwest Community Park has been monitored for CTS since 1998. Monitoring results indicate no CTS breeding has occurred at the site since 2010 and is considered extirpated.

The project site is located greater than 500 feet from a non-breeding occurrence. The closest occurrences of a non-breeding site range between 0.3 and 0.4 miles to the west and northwest. The adult siting 0.3 miles away was identified in 2006, and since that time, the site has been developed. An individual CTS was identified 0.35 miles west in 2002 and 2007, and individual CTS were relocated before site development in 2008. The third closest siting occurred 2002 at a seasonal wetland; however, further investigation the same year did not identify CTS larvae. All other occurrences of individual CTS were greater than 0.75 miles from the project site.

Results of this assessment do not indicate a need to revise the boundary of the 2,200 feet and within 6,864 feet of a breeding site category shown in the Recovery Plan, 2020 PBO, and 2007 PBO. The closest breeding occurrence is 0.4 miles (2,112 feet) at Southwest Community Park. The pond is within the 2,200 feet threshold to move the mitigation ratios for the project from 1:1 mitigation rates to 2:1; however, the condition of the extirpated pond and the proximity of the project to the 2,200 boundary identified in the mitigation ratio table do not support a change to a higher mitigation ratio.

The closest potential breeding pond identified in this evaluation is 0.75 miles to the south at Occurrence Number 787. Although this site is located within 0.75 miles, the landscape between the project site and the occurrence is highly developed with little available migration routes and upland habitat to the north; see Figure 3. Upland habitat is available to the west and south towards the Llano Cascade and Stony Point Conservation Areas. The non-native grasslands at the project site do not provide upland habitat for the CTS from any of the surrounding extirpated or potential breeding sites.

The specific site analysis could lead to a lower compensatory mitigation ratio due to the distance between the project site and potential breeding ponds, the migration barriers from potential breeding ponds, and the lack of upland habitat on the project site.

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9 Photographs

All photos taken on August 14, 2018.

Site looking south towards existing facility; taken from northern edge (above) and looking west (below).

Looking east at site from adjacent access road (above)
and northern portion of the site (below).

Central portion of site looking south at existing facility (above) and potential wetland at eastern edge of site (below).

Undeveloped lot (2920 Dutton Avenue) and existing development to the east across Dutton Avenue (above) and Dutton Avenue directly to east of site (below).

Existing facility to the south of the site (above) and open field to the north (below).

Access road adjacent to Colgan Creek Flood Control Channel directly to west of the site; looking south (above) and looking north (below).

Colgan Creek Flood Control Channel adjacent to the site.

B.7 - Jurisdictional Delineation Report

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Jurisdictional Delineation Report
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa, Sonoma County
February 2020

Prepared for:
Canine Companions for Independence
P.O. Box 446
Rohnert Park, CA 95402

Prepared by:
Prunuske Chatham, Inc.
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Sebastopol, CA 95472

PRUNUSKE CHATHAM, INC.

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Table of Contents

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1 Introduction

Canine Companions for Independence (Canine Companions) owns and manages an existing facility at 2965 Dutton Avenue, Santa Rosa, Sonoma County (APN # 043-135-031). The 12.87-acre parcel currently supports the Northwest Training Center providing services to northern California, northern Nevada, Oregon, Washington, Idaho, Montana, Alaska, and Wyoming. The center houses the administrative offices and an extensive indoor and outdoor training facility. The majority of the parcel is developed with the exception of approximately 3 acres at the northern edge of the site. Canine Companions plans to develop this area at a future date.

As part of project planning, Canine Companions requested Prunuske Chatham, Inc. (PCI) complete a delineation of U.S. Army Corps of Engineers (Corps) and State Water Resources Control Board (State Water Board) jurisdictional wetlands on the undeveloped portion of the site. This report summarizes PCI's wetlands determination.

2 Study Area

The Study Area is located within a portion of a 12.87-acre parcel owned by Canine Companion; see Figure 1. The site is located at the southern edge of Santa Rosa and within the city limits. The site is located at the edge of a highly industrialized area to the west of Highway 101 and south of Highway 12. Remnant patches of undeveloped land are scattered among the commercial and residential development in the area. The site is accessed from Bellevue Avenue to Dutton Avenue; Dutton Avenue dead ends at the site. The Colgan Creek Flood Control Channels borders the site which flows into the Laguna de Santa Rosa 4 miles to the west, the Russian River, and then the Pacific Ocean.

3 Climate and Precipitation

The Study Area is characterized by cool, wet winters and mild summers with rainfall primarily between October and April. The annual average rainfall for the nearest reported climate station is 32.62 inches (Prism Climate Group 2020). The mean maximum annual air temperate is 82.8^{o}F, and mean minimum annual air temperate is 38.2^{o}F. The warmest temperatures occur between July and September and the coolest temperatures between December and January.

Precipitation data for February 2020 and the 3-month period (November 2019 – January 2020) preceding the delineation were evaluated to determine if the site received normal rainfall (Prism Climate Group 2020). Climate records were also evaluated to determine if the Study Area was subject to drought conditions during the previous water year. Drought conditions and low rainfall can influence wetland parameters such as plant growth and hydrology indicators.

- Short-term (1 month): February 2020 was drier than normal, site conditions appeared dry during the delineation. The Study Area received 0 inches of rainfall (2/1/2020 – 2/11/2020) during the ten days preceding the delineation, which represents below-average rainfall for the month of February to date. The 29-year average for rainfall in February is 6.06 inches.

- Mid-term (3 months): Rainfall was below a normal range. The Study Area received 12.42 inches of rain from November 2019 through January 2020. The average rainfall for this period is 16.36 inches.

Prior Months	Average Rainfall[1] (in.)	Measured Rainfall[1] (in.)
January 2020	6.12	2.56
December 2019	6.29	8.85
November 2019	3.59	1.01
Totals	16 in.	12.42 in.

[1] Data from Prism Climate Group (2020)

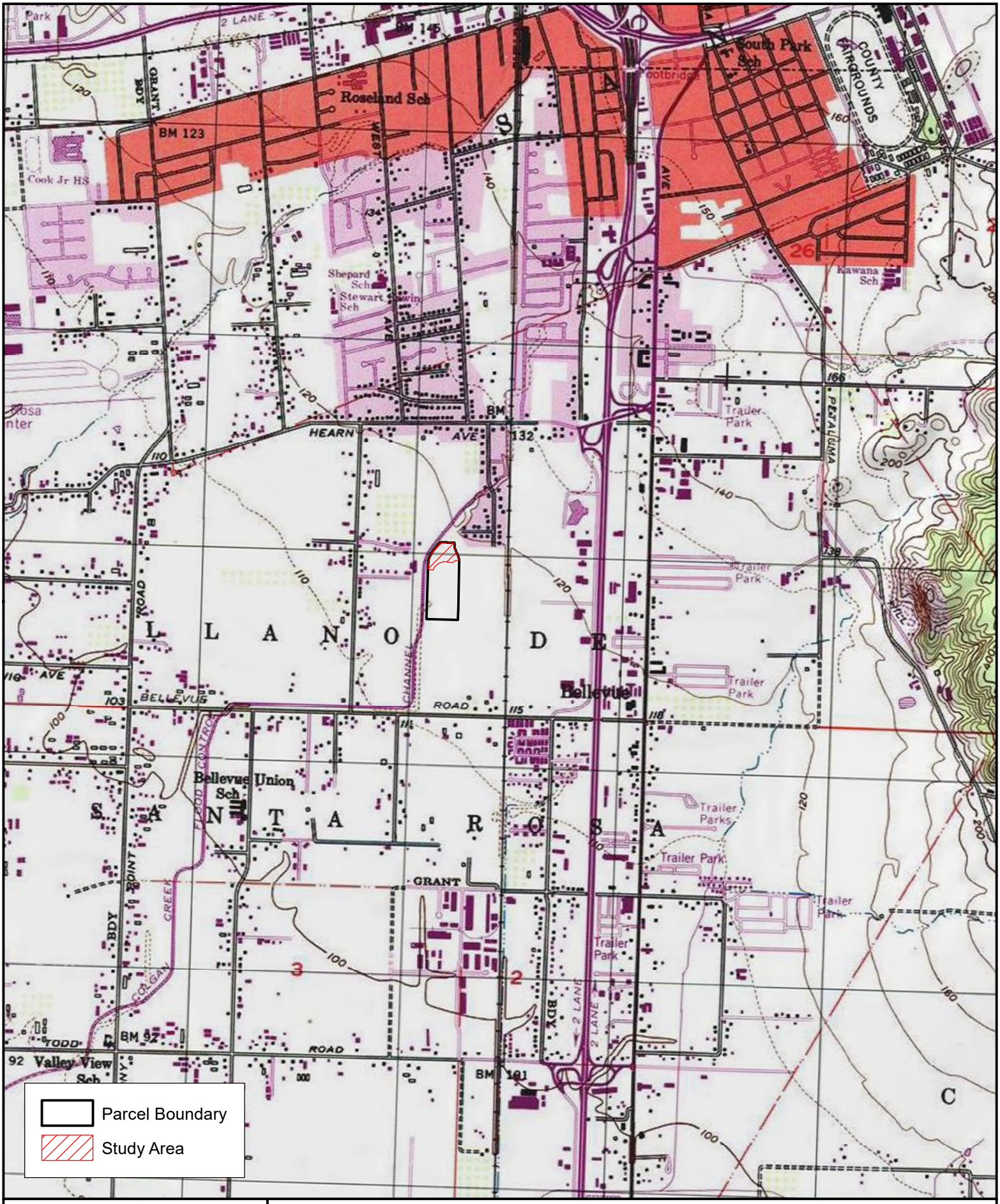
- Long-term (1 year): Normal growing conditions were present from early 2019 through December 2019. The Palmer Drought Severity Index was consulted for the period of January 2019 - December 2019 (NOAA 2020). During January 2019, the region was under moderate drought, May was moderately moist, and all other months were within mid-range (average).

4 Topography

The Study Area ranges in elevation from 121 to 125 feet. It is located on a flat parcel with a history of site grading based on the unnatural contours and elevated mounds on the site. The southwest corner of the site is the lowest point within the Study Area. The wetland is located in a shallow depression along the eastern edge of the site. Surrounding lands are also fairly flat.

5 Hydrology

The primary source of hydrology within the Study Area is direct precipitation and surface runoff from surrounding areas. Since the site if fairly flat and comprised of heavy clay soils, drainage from the site is likely minimal with most water ponding on the site and draining slowly to the southwest. The Study Area drains to the Colgan Creek Flood Control Channel which flows into the Laguna de Santa Rosa, the Russian River, and then the Pacific Ocean.



PRUNUSKE CHATHAM, INC.

Figure 1. Project Location
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

February 2020

6 Soils

Soils within the Study Area are mapped as Clear Lake clay, ponded 0-2% slopes (CfA) and sandy substratum, drained 0-2% slopes (CeA) (NRCS 2020; see below map).

Clear Lake clay, ponded is alluvium derived from sedimentary rock. The typical profile is clay from 0 to 60 inches. Clear Lake clay, sandy substratum, drained is basin alluvium derived from volcanic and sedimentary rock over fan alluvium derived from volcanic and sedimentary rock. The typical profile is clay from 1 to 52 inches, clay loam from 52 to 60 inches, and fine sandy loam to 72 inches. Clear Lake clay is poorly drained and the runoff class is high. The depth to the water table is 36 to 60 inches. The soil is subject to frequent ponding. Clear Lake clay is considered a hydric soil. Within the Study Area, Clear Lake clay, ponded occupies most of the site. Clear Lake clay, sandy substratum drained occurs along the northern edge of the Study Area.

7 Field Survey Methods

A preliminary delineation of U.S. Army Corps of Engineers (Corps) and State Water Resources Control Board (Water Board) jurisdictional wetlands within the Study Area was conducted on February 11, 2020; see Figure 1.

The wetland delineation followed protocols described in the *Corps of Engineers' Wetland Delineation Manual* (Corps 1987), Version 2.0 of the *Regional Supplement for the Arid West Region* (Corps 2008), and *California Wetland and Riparian Area Protection Policy Technical Memorandum No. 4: Wetland Identification and Delineation* (State Water Board 2012). Wetland determinations were made at each sample point for Corps and State Water Board jurisdiction. Wetland jurisdiction is based on a three-parameter definition; a site must meet criteria for hydrology, hydric soils, and hydrophytic vegetation to be considered a wetland (Corps 1987, 2008).

Prior to the field investigations, current aerial photographs and soil map for the area (NRCS 2020) were reviewed. PCI assessed 10 locations in the field and collected formal data at 6 sample points. At each sample point, vegetation, soils, and hydrology were assessed. A hand-held Trimble TDC 150 GPS was used to acquire sub-meter data at each sample point and along wetland feature boundaries. Data was collected on field datasheets. GPS data were downloaded in the office and superimposed onto aerial imagery using ArcGIS software. Representative photos of the wetland features were taken during the delineation and are included at the end of this report. *Table 1. Delineation Plots and Preliminary Determinations*, provides a summary of the diagnostic features present for each wetland sample point and final determinations.

Evaluation of vegetation entailed identifying plant species within an approximately 10' radius surrounding each sample location. All dominant species within each stratum present were recorded. A visual estimate of cover was made for each species, and the wetland indicator status[1] was recorded. Wetland indicator status was based on the National Wetland Plant List website (Corps 2018). Cover values and wetland indicator statuses were then used to calculate dominance and prevalence of hydrophytic vegetation using Corps methods (Corps 2008).

[1] **Wetland Indicator Status**
OBL = Obligate Wetland Plant (estimated probability of occurring in wetlands >99%)
FACW = Facultative Wetland Plant (estimated probability >67% to 99%)
FAC = Facultative Plant (estimated probability 33% to 67%)
FACU = Facultative Upland Plant (estimated probability 1% to <33%)
UPL = Obligate Upland Plant (estimated probability <1%)
NL = Not Listed (indicated upland plant)

Soils evaluation entailed digging pits approximately 14 inches deep by 8 inches wide at each sample point. The hue, value, and chroma were evaluated using Munsell Soil Color Charts (Macbeth 1992). Soil texture was recorded. Location, type, and color of mottles were also characterized if present. This data was then reviewed to determine whether any hydric soil indicators (such as the presence of a depleted matrix or redox dark surface) were present (Corps 2008, NRCS 2018).

At each sample point, hydrology was also assessed, and presence of any indicators of wetland hydrology were noted (Corps 2008). The most common indicator was oxidized rhizospheres along living roots.

In addition to sample points, visual observations were made of vegetation composition in surrounding areas to help identify wetland extents and boundaries. Within the wetland and adjacent uplands, test soil pits and visual observations of vegetation confirmed that wetland traits there matched conditions seen in formal wetland sample locations.

This report is a preliminary determination of jurisdictional Corps and State Water Board wetlands with the Study Area and meant to guide the project design and mitigation planning. Wetland jurisdiction should be verified directly with the Corps' regional office and North Coast Regional Water Quality Control Board.

8 Results

The Study Area is dominated by grassland (ruderal) habitat with a small depression wetland along the eastern edge on the site. The Study Area is highly disturbed and appears to have been graded in the past based on the site topography and drainage patterns.

Uplands with the Study area are dominated by non-native grassland and herbaceous species typical of disturbed/ ruderal sites. The dominate upland species include annual grasses [e.g., oat grass (*Avena* sp., FACU), soft chess (*Bromus hordeaceus*, FACU), Italian rye grass (*Festuca perennis*, FAC)], cutleaf geranium (*Geranium dissectum*, NL), bristly ox-tongue (*Helminthotheca echioides*, FAC), dandelion (*Taraxacum officinale*, FACU), subterranean clover (*Trifolium subterraneum*, NL), Harding grass (*Phalaris aquatica*), and wild radish (*Raphanus sativus*, NL).

The small depression wetland is approximately 0.14 acres in size. It is a circular feature measuring approximately 70 feet wide by 120 feet long. It has a fairly flat and uniform topography and it located between two elevated berms to the west and east. The wetland is dominated by common spikerush (*Eleocharis macrostachya*, OBL) and curly dock (*Rumex crispus*, FAC) with additional cover provided by bristly ox-tongue, Italian rye grass, and soft chess.

Soils observed in both wetlands and uplands were consistently clay in texture. The soil texture is likely a result of the underlying parent material that consists of Clear Lake clay. Wetland soils were dark in color (primarily 10YR3/2) and contained redoximorphic mottles (primarily 10YR5/6), comprising 5% or more of the soil volume. The dark color and redoximorphic features comprises the Corps' "redox dark surface" hydric soil indicator and was the primary hydric soil indicator seen within the Study Area. Uplands soils had a matrix of 10YR4/2 and did not contain redoximorphic features. The presence of wetland hydrology at wetland sample points was indicated by oxidized rhizospheres along living roots. The site was completely dry as the delineation occurred during February with no measurable rainfall in the preceding weeks; see *Climate and Precipitation* above. All upland sample points lacked positive hydrology indicators.

Table 1. Delineation Plots and Preliminary Determinations

Sample Point	Paired Point	Preliminary Corps and State Water Board Determination	Hydrophytic Vegetation?	Hydric Soils?	Hydrology?
1	2	Wetland	Yes	Yes	Yes
2	1	Upland	No	No	No
3	4	Wetland	Yes	Yes	Yes
4	3	Upland	No	No	No
5	6	Wetland	**Yes**	Yes	Yes
6	5	Upland	No	No	No

PRUNUSKE CHATHAM, INC.

Figure 2. Preliminary Jurisdictional Determinations
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

0 25 50 100 Feet

February 2020

N

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10 Study Area Photographs – February 11, 2020

Looking northwest (above) and northeast (below) at delineated wetland. Light orange plant is common spikerush, a wetland obligate plant.

Upland areas along western edge (above) and central portion (below) of the Study Area.

Wetland soils with oxidized rhizopheres along living root channels (above) and common spikerush dominated wetland (below).

Upland soil (above) and upland sample point (below).

11 Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 2965 Dutton Avenue City/County: Santa Rosa, Sonoma Sampling Date: 2/11/2020

Applicant/Owner: Canine Companions for Independence State: CA Sampling Point: 1

Investigator(s): J. Michaud and J. Schwan Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): C - Mediterranean California Lat: 38.408609 Long: -122.724496 Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: low rainfall for February

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Eleocharis macrostachya (palustris?)	40	Y	OBL
2. Rumex crispus	15		
3. Allium sp (chives)	1		
4. Geranium dissectum	5		
5. Ranunculus sp	5		
6. Helminthotheca echioides	25	Y	FAC
7. Leontodon taraxacoides	5		
8.			
	96 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 4 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
12"	10YR 3/2	70	10YR 5/6	5	C	PL	clay	lots of rock fragments

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 2965 Dutton Avenue City/County: Santa Rosa, Sonoma Sampling Date: 2/11/2020

Applicant/Owner: Canine Companions for Independence State: CA Sampling Point: 2

Investigator(s): J. Michaud and J. Schwan Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): C - Mediterranean California Lat: 38.408609 Long: -122.724496 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Helminthotheca echioides	15		
2. Taraxacum officinale	30	Y	FACW
3. Trifolium subterraneum			
4. Annual grass - Bromus hordeaceus?	40	Y	FACW
5. Avena sp?	10		
6.			
7.			
8.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
12"	10YR 4/2	75	∅					lots of rock fragments

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 2965 Dutton Avenue City/County: Santa Rosa, Sonoma Sampling Date: 2/11/2020

Applicant/Owner: Canine Companions for Independence State: CA Sampling Point: 3

Investigator(s): J. Michaud and J. Schwan Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): C - Mediterranean California Lat: 38.408609 Long: -122.724496 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Eleocharis macrostachya	40	Y	OBL
2. Rumex crispus	20	Y	FAC
3. Taraxacum officinale	5		FACU
4. annual grass Bromus hordeaceus?	20	Y	FACU
5.			
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12"	10YR3/2	70	10YR5/6	5	C	PL	clay	lots of rock fragments

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 2965 Dutton Avenue City/County: Santa Rosa, Sonoma Sampling Date: 2/11/2020

Applicant/Owner: Canine Companions for Independence State: CA Sampling Point: 4

Investigator(s): J. Michaud and J. Schwan Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): C - Mediterranean California Lat: 38.408609 Long: -122.724496 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Bromus hordeaceus	70	Y	FACW
2. Vicia sp.	2		
3. Geranium dissectum	2		
4. Festuca perennis	20	Y	FAC
5. Taraxacum officinale	4		
6.			
7.			
8.			
	98 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
12"	10YR 4/2	75	Ø					

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 2965 Dutton Avenue City/County: Santa Rosa, Sonoma Sampling Date: 2/11/2020

Applicant/Owner: Canine Companions for Independence State: CA Sampling Point: 5

Investigator(s): J. Michaud and J. Schwan Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): C - Mediterranean California Lat: 38.408609 Long: -122.724496 Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** ✓ **Yes** _____ **No** _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Lactuca sp.	5		
2. Eleocharis macrostachya	30	Y	OBL
3. Festuca perenne	20	Y	FAC
4. Bromus hordeaceus	20	Y	FACU
5. Rumex crispus	5		
6. Helminthotheca echioides	10		
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** _____

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
12"	10YR 3/2	70	10YR 5/6	5	C	PL	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 2965 Dutton Avenue City/County: Santa Rosa, Sonoma Sampling Date: 2/11/2020

Applicant/Owner: Canine Companions for Independence State: CA Sampling Point: 6

Investigator(s): J. Michaud and J. Schwan Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): C - Mediterranean California Lat: 38.408609 Long: -122.724496 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Bromus hordeaceus	50	Y	FACU
2. Geranium dissectum	10		
3. Avena sp.	40	Y	UPL
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
12"	10YR 4/2	75					clay	rock fragments

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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B.8 - Plant Survey Protocols

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APPENDIX D

Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed Plants on the Santa Rosa Plain

(modified from the September 23, 1996 Service Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants)

These guidelines describe protocols for conducting botanical surveys for federally listed plant species on the Santa Rosa Plain. They also describe minimum standards for reporting results of the surveys. The federally listed plant species occurring on the Santa Rosa Plain are Sonoma sunshine (*Blennosperma bakeri*), Burke's goldfields (*Lasthenia burkei*), Sebastopol meadowfoam (*Limnanthes vinculans*), and many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*). The Service will use, in part, the information outlined below in determining whether the project under consideration may affect these plants, and in determining the direct, indirect, and cumulative effects.

Field inventories should be conducted by a qualified botanist in a manner that will locate listed species that may be present. With the exception of developed agricultural lands, the entire project area should be surveyed. Acceptable survey protocols are as follows:

1. A minimum of three visits must be made to the project site during the growing season. Site visits must correspond to times when at least one of the four Santa Rosa Plain listed plant species is accurately identifiable on a local reference site. Reference sites used must be acceptable to the Service. Site visits must span a period during which all four of the listed plants have been observed (not necessarily at the same time) and are identifiable on reference sites during a specific growing season. More visits to the site or the adjacent area may be needed to determine when each species is blooming in a given year. Inventories will include all potential habitats at the project site.

2. A minimum of two years of negative survey data performed according to the specifications in #1 is necessary to substantiate a negative finding for future permitting actions. For cases in which negative survey data do not conform to the standards outlined in these guidelines, the Service will make the assumption that all four listed plant species are present on the project site.

3. List every species observed and compile a comprehensive list of vascular plants for the entire project site. Vascular plants need to be identified to a taxonomic level which allows rarity to be determined.

4. Survey documentation must include:

    a. identification of reference sites visited, which listed species were ,phenological stage of the listed species observed, and similarity of physiographic control between reference sites and surveyed sites (general water depth, extent of pooling, etc.)

b. a description of the biological setting at the project site, including plant community, topography, soils, potential habitat of target species, and environmental conditions, such as timing or quantity of rainfall, which may influence the performance and expression of target species

c. a map of project location showing scale, orientation, project boundaries, parcel size, and map quadrangle name

d. survey dates and survey methodology(ies)

e. a comprehensive list of all vascular plants occurring on the project site for each habitat type, to characterize and document site quality

f. a description of current and historical land uses of the habitat(s) and degree of project site alteration

g. a description of the presence of listed species off-site on adjacent parcels, if known

h. an assessment of the biological significance or ecological quality of the project site in a local and regional context

5. If listed species is (are) found on the project site, report results that additionally include:

a. a map showing the distribution of the listed species distribution relative to the proposed project

b. a description of the direction and integrity of flow of surface hydrology. If listed species is (are) affected by adjacent off-site hydrological influences, describe these factors.

c. the listed species phenology and microhabitat, an estimate of the number of individuals of each listed species per unit area; identify areas of high, medium and low density of listed species over the project site, and provide acres of occupied habitat of listed species. Investigators should provide color slides, photos or color copies of photos of listed species or representative habitats to support information or descriptions contained in reports.

d. the degree of impact(s), if any, of the proposed project as it relates to the potential unoccupied habitat of listed species.

6. Document findings of target species by completing California Native Species Field Survey Form(s) and submit form(s) to the Natural Diversity Data Base. Documentation of determinations and/or voucher specimens may be useful in cases of taxonomic ambiguities, habitat or range extensions.

7. Report as an addendum to the original survey, any change in abundance and distribution of listed plants in subsequent years. Project sites with inventories older than 3 years from the current date of project proposal submission will likely need additional survey. Investigators need to assess whether an additional survey(s) is (are) needed.

8. Guidance from California Department of Fish and Game (CDFG) regarding plant and plant community surveys can be found in Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities, 1984. Please contact the CDFG Regional Office for questions regarding the CDFG guidelines and for assistance in determining any applicable State regulatory requirements.

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B.9 - California Tiger Salamander Field Survey Guidelines

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Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander
October 2003

The Santa Barbara County population of the California tiger salamander (*Ambystoma californiense*) was federally listed as endangered on September 21, 2000 (65 **FR** 57242). The Sonoma County Distinct Population Segment (DPS) of the California tiger salamander was listed as endangered on July 22, 2002 (67 **FR** 47727). The Central California DPS of the California tiger salamander was proposed for listing as threatened on May 23, 2003 (68 **FR** 28648). The Santa Barbara and Sonoma County DPSs were proposed for reclassification from endangered to threatened, on May 23, 2003 (68 **FR** 28648). The California Department of Fish and Game (Department) considers the California tiger salamander throughout its entire range to be a species of special concern (Special Animals List July 2003 http://www.dfg.ca.gov/whdab/html/lists.html).

The Service and Department have received numerous requests for guidance in planning for the protection of the California tiger salamander (CTS) at the sites of proposed and existing land use activities. This document provides interim guidance for two procedures to accurately assess the likelihood of CTS presence in the vicinity of a project site, including: (1) an assessment of CTS locality records and potential CTS habitat in and around the project area; and (2) focused field surveys of breeding pools and their associated uplands to determine whether CTS are likely to be present.

Because CTS use aquatic and upland habitats during their life cycle, they may be present in either or both habitats on a given property. For sites with suitable breeding habitat, two consecutive seasons of negative larval surveys and a negative upland drift fence study in the intervening fall/winter are recommended to support a negative finding. For sites with no suitable aquatic breeding habitat, but where suitable upland habitat exists, two consecutive seasons of negative upland drift fence studies are recommended to support a negative finding.

If the following Guidance is followed completely, the results of these site assessments and field surveys will be considered valid by the Service and Department.
Results of the site assessments and field surveys should be reported to the appropriate Service's Field Office, if appropriate the Service's Regional Office in Portland, Oregon pursuant to the terms and conditions of the permittee's section 10(a)(1)(A) recovery permit, and to the Department and other agencies or offices as required. Details regarding the recommended content and/or format of reports are provided throughout the remainder of this document.

Surveyors must obtain permission of the landowner before implementing any surveys or research on the CTS. **In locations where the CTS is federally listed surveyors should obtain a Recovery Permit for this species pursuant to section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended, prior to implementing the guidance.** For surveys that may ultimately be used in support of a negative finding, it is recommended that surveyors consult with Service biologists on their study design before beginning work. If surveyors are working in areas with other federally listed species that are likely to be captured incidentally during CTS

surveys, surveyors should also possess a valid 10(a)(1)(A) permit for these species (e.g., California red-legged frog, vernal pool tadpole shrimp, *etc*.). **For all locations, the surveyor should hold an active Scientific Collecting Permit from the Department that specifically names CTS surveys as an authorized activity. Authorization Number 9, without explicit permission for handling CTS, is not adequate for CTS surveys.**

Site Assessment for the California tiger salamander

Available information about CTS and their habitats in the vicinity of the project should be used to determine the likelihood that CTS may occur there and if field surveys are appropriate. The project proponent should compile and submit to the Service and the Department the following information:

Element 1. Is the project site within the range of the CTS?

The surveyor should review the attached maps or referenced weblink to determine if the project site is within the range of the CTS. For Sonoma County, refer to the attached county map. For Santa Barbara County, refer to http://ventura.fws.gov/Images/CTS_Range.jpg. For Monterey, San Benito, and San Luis Obispo counties, contact the Ventura Fish and Wildlife Office at the address provided below. For all other areas, refer to the attached map of California.

Element 2. What are the known localities of CTS within the project site and within 3.1 miles (5.0 kilometers) (km) of the project boundaries? This is to place the project site in a regional perspective.

The surveyor should consult the California Natural Diversity Data Base (CNDDB) maintained by the Department to determine known localities of the CTS. The Sacramento or Ventura Fish and Wildlife Offices should be contacted for localities within their respective jurisdictions. Other information sources on local occurrences of CTS should be consulted. These sources may include, but are not limited to, biological consultants, local residents, amateur herpetologists, resources managers and biologists from municipal, state, and Federal agencies, environmental groups, and herpetologists at museums and universities. The surveyor should note in their report all known CTS localities within the project site and within 3.1 miles of the project boundaries; if there are no localities within 3.1 miles, the nearest locality should be noted.

Element 3. What are the habitats within the project site and within 1.24 miles (2 km) of the project boundaries? This distance is based on the observed mobility of the species.

Describe the upland and aquatic habitats within the project site and within 1.24 miles of the project boundaries. Characteristics of the site that should be recorded include acreage, elevation, topography, plant communities, presence and types of water bodies, fossorial mammal species and their burrows, current land use, a description of adjacent lands, and an assessment of potential barriers to CTS movement. Use of aerial photographs is necessary to characterize potential breeding habitats that are not part of the project site under consideration. The aquatic habitats should be mapped and characterized (*e.g.*, natural vernal pools, stockponds, drainage ditches, creeks, types of vegetation, surface area, depth, approximate drying date). Suitable upland habitat, including locations of underground refugia, for CTS should be mapped as well, with a focus on areas where small mammal burrows are located or are most dense.

Reporting and interpretation of the site assessment

Site assessments should include, but are not limited to, the following information: (1) photographs of the project site(s); (2) survey dates and times; names of evaluator(s); (3) a description of the site assessment methods used; (4) a list of CTS localities, as requested above; and (5) a map of the site(s) showing habitat as requested above. Maps should be of similar nature to a U.S. Geological Survey (USGS) 7.5-minute (1:24,000) topographic maps -or- Geographic Information System (GIS) data depicting the site(s) and the area within 5 kilometers (3.2 miles) of its boundaries. The report should be provided to the appropriate Service field office and Department regional office prior to initiating field surveys.

After completing items 1-3 of the site assessment (as above), send a report to the appropriate Service field office and Department regional office. Based on the information provided from the site assessment, the Service and Department will provide recommendations as to the appropriateness of field surveys. **Surveys should not be initiated until recommended by the Service and Department.**

Interim Presence/Negative Finding Survey Guidance for the California Tiger Salamander

Biological field surveys should be conducted for all sites with potential CTS habitat. Due to its unique life history, the CTS can be difficult to detect depending on weather and time of year. Aquatic sampling for larvae during spring months can be the most effective way to determine if CTS are present in a given area. However, especially if environmental conditions are unfavorable, CTS may not breed successfully in a given year. After metamorphosis CTS spend most of each year on land, emerging from refugia only occasionally, usually on rainy nights. CTS have been observed on land 1.24 miles from any potential breeding pool.

At sites that contain both upland habitat and potential breeding habitat (*i.e.*, pools that contain standing water continuously for at least 10 weeks, extending into April), aquatic sampling during two breeding seasons and a drift fence study in the intervening winter should be conducted to support a negative finding. At sites that contain appropriate upland habitat only, but where there is a known or potential breeding site accessible within 1.24 miles, a two-year drift fence study should be conducted.

In years with little rainfall, upland emergence may be reduced and CTS may not breed. Field surveys conducted in years with at least 70% of average rainfall between September 1 and April 1, at the nearest National Oceanic and Atmospheric Administration climate station are most reliable. Data from survey seasons not meeting this criterion will also be considered; surveyors should provide strong justification that their data are reliable including but not limited to local climate (*e.g.*, daily rainfall totals, pond filling date, pond drying date) and biological survey data (*e.g.*, other species captured during each sampling interval).

Aquatic larval sampling

1. Aquatic larval surveys of potential breeding pools should be repeated three times each season. Surveys should be conducted once each in March, April, and May, with at least 10 days between surveys. **If pools are likely to dry prior to the completion of three surveys, the sampling schedule should be shifted accordingly.**

2. Captured CTS should remain in nets for the minimum amount of time necessary, but no longer than 5 minutes. During this time, larvae should not be kept out of water for more than 30 seconds. Photographs should document a representative sample of captured CTS.

3. Disruption to the pond's bottom should be minimized. Shallow areas where young larvae may occur should be traversed in the most direct and least disturbing manner possible.

4. Sampling should cease once presence has been determined to minimize disturbance of pool flora and fauna. If CTS are detected at a pond, subsequent visits to that pond are not necessary.

5. Ponds should be initially sampled using D-shaped or similar, long-handled dipnets with 1/8th inch (3.2mm) or finer mesh. If CTS larvae are not captured in the first 50 dipnet sweeps, covering representative portions of the pond, seines should be used.

6. <u>If dipnetting has been unsuccessful</u>, seines should be used to sample 100% of the surface area of ponds smaller than 1 acre and at least 30% of the surface area of larger pools, including a representative sample from different water depths and vegetated and non-vegetated areas. One eighth inch (3.2 mm) or finer mesh minnow seines with weights along the bottom and floats along the top edge should be used, with dowling or PVC pipe attached to the end of the seine so the bottom edge can be dragged along the bottom of the pool. Whenever possible, the seine should be pulled from one edge of the pond to the other.

7. Use of minnow traps will be considered on a case-by-case basis. Minnow trapping for CTS larvae should only be conducted in habitats that are too deep to adequately survey with dipnets and seines, or in which dense vegetation impedes normal dipnetting/seining activities. **In these cases the surveyor should submit to the Service a written minnow trap sampling design based on the requirements detailed below.** No minnow trapping should be conducted in ponds known to support state or federally threatened or endangered animals (*e.g.,* California red-legged frogs (*Rana aurora draytonii*)). In areas where California red-legged frogs may occur, minnow trapping should be preceded by negative surveys following the Service guidelines for this species. To conduct minnow trap sampling in pools known to contain California red-legged frogs, surveyors must possess a valid Recovery Permit for this species pursuant to section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended.

   Minnow trapping should be conducted in the following manner:

   a. Minnow traps should be monitored for three three-day intervals between March 1 and May 15 (for a total of nine days of trapping per site). Trapping intervals should be separated by at least ten days. Minnow trap surveys should immediately cease if CTS presence is determined.

b. Minnow trapping should be avoided during warm periods when air temperatures reach 80 degrees Fahrenheit or when water temperatures reach 70 degrees Fahrenheit or warmer, to prevent the possibility of mortality due to reduced oxygen availability.

c. Minnow traps should be deployed overnight and checked frequently enough to ensure that larvae are not killed or injured. Traps should be checked at least once per day.

d. A minimum of four traps should be placed in each pond. For larger ponds, traps should be distributed along the shoreline with no more than 75 ft (23 m) between traps. Each trap should be clearly marked with the name, telephone number, and State and Federal permit number of the surveyor. Traps should be anchored to stakes set near the shoreline. Steel braided fishing line or heavy cord works well for this purpose; galvanized wire and stainless steel wire should not be used because these wires may kink and break. If livestock are present, we recommend that the surveyor devise a method to anchor the trap in a manner to prevent entanglement of livestock. Brightly colored flagging should be affixed to each anchor point. For extra security, a float attached to each trap can aid in detection. If a minnow trap is lost, every effort should be made to recover it to avoid the possibility of leaving behind a trap that can kill a variety of species over time.

e. Traps should be deployed to the deepest parts of ponds and in shoreline areas with aquatic vegetation growth.

9. Data regarding the type and quality of each pool sampled should be recorded. At a minimum, these data should include the date and time, location, type of water body (*e.g.*, vernal pool, seasonal wetland, artificial impoundment, etc.), dimension and depth of pond, water temperature, turbidity, presence of aquatic vegetation (submergent and emergent), and dominant invertebrates and all vertebrates observed. Photographs of pools and adjacent upland areas are helpful and copies should be included in the final report.

10. Surveyors should follow guidance below for disinfecting equipment and clothing after surveying a pond and before entering a new pond, unless the two ponds are hydrologically connected to one another. These recommendations are adapted from the Declining Amphibian Population Task Force's Code which can be found in their entirety at: http://www.mpm.edu/collect/vertzo/herp/daptf/fcode.html.

a. All dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, should be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water. Cleaned items should be rinsed with clean water before leaving each study site.

b. Boots, nets, traps, *etc.*, should then be scrubbed with either a 70 % ethanol solution, a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water), QUAT

128 (quaternary ammonium, use 1:60 dilution), or a 6% sodium hypochlorite 3 solution and rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of a pond or wetland should be avoided. Care should be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.

c. When working at sites with known or suspected disease problems, disposable gloves should be worn and changed between handling each animal.

d. Used cleaning materials (liquids, *etc*.) should be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

Upland Habitat Survey Methods

A drift fence study conducted during fall and winter is the primary method used to study CTS in upland habitats. To support a negative finding, an upland drift fence study should be included. Although less intrusive methods (see below) may also be used to determine presence of the CTS, these methods are less reliable and thus cannot be used to support a negative finding.

Because CTS have been observed to make breeding migrations of at least 0.6 miles (1 km), the project proponent or the Service may assume presence of CTS if a known breeding pond lies within 1 km and no significant barriers exist. Examples of significant physical barriers include high-density residential or urban development and Interstate Highways, while features such as golf courses, disked fields, and most paved roads are not considered barriers.

For sites with at least one accessible potential breeding pool, we recommend that a one-year drift fence study be conducted during the winter between two consecutive seasons of aquatic larval surveys (if presence of CTS was not established during the first season of aquatic sampling). We recommend that a two year drift fence study be conducted if: 1) a site has suitable upland habitat and a potential breeding pool lies within 1.2 miles (2 km); 2) on-site ponds cannot be adequately sampled using aquatic methods (*e.g*., deep impoundments with known presence of California red-legged frogs); or 3) if non-native predators or poor water quality may preclude detection of CTS during larval sampling (*i.e*., due to mortality of the larvae).

1. We recommend that a proposal to conduct a drift fence study be submitted in writing to the Service and the Department. The results of studies not approved by the Service and Department may not be accepted in support of a negative finding. The proposal should include an aerial photograph of the study site indicating all potential on- and off-site breeding locations identified in the site assessment and an overlay with the proposed drift fence study design clearly delineated. We recommend that drift fence study designs incorporate the following:

    a. For sites with at least one suitable breeding pond (*i.e*., ponds that contain standing water for at least 10 continuous weeks in most years), the ponds should be surrounded by drift fences installed 10 - 50 ft from the high water line.

Sections of drift fence should be spaced regularly around the pond, focusing on areas where salamanders are most likely to be captured. We recommend that each section of fence be at least 30 ft (9.2 m) long, and that the total distance between fence sections be no greater than the total length of installed fence (i.e., >50% of the circumference fenced). There should be no more than 33 ft (10 m) between pitfall traps, and drift fences should be constructed such that during periods when traps are closed, openings at least every 66 ft (20 m) allow animal passage.

b. **For all sites**, we also recommend upland drift fences. Unless a strong rationale can be presented, drift fence equaling at least 90% of the site perimeter should be installed. The exact placement of fences should be selected to maximize the probability of capturing CTS (*e.g.*, in grassland areas with high densities of mammal burrows; along site boundaries closest to identified potential breeding pools; with pitfalls situated away from areas where flooding is likely). Pitfalls should be spaced less than 33 ft apart. To the extent possible drift fences and pitfalls should be placed to minimize the number of flooded buckets. Each section of fence should be a minimum of 30 ft (9.2 m) long, unless topography, property lines, or other circumstances dictate. Upland drift fences should be constructed such that during periods when traps are closed, openings at least every 66 ft (20 m) allow animal passage.

2. Arrays should be approved and constructed by 15 October. Beginning on or before October 15, pitfall buckets should be opened before sunset if there was any rain during the day or if at 2 PM rain is forecast for the remainder of the day or subsequent night with 70% or greater probability (based on the nearest National Weather Service forecast - available at http://www.wrh.noaa.gov/Sacramento/). Traps should be open each night and checked each morning until no rain has fallen within the preceding 24 hours. Nights of high relative humidity (greater than 75% relative humidity) should be considered equivalent to rain events once onsite or nearby seasonal wetlands have become inundated with standing water, regardless of its depth, surface area, or duration. The above guidance should be followed until 20 nights of surveying under the proper conditions has been conducted. After 20 nights of surveying is completed, and until March 15, pitfall buckets should be opened before sunset if there was any rain during the day, or if at 2 PM rain is forecast for the remainder of the day or subsequent night with 70% or greater probability. Traps will be checked the next morning, and unless it is still raining or more rain is forecast, the traps can be closed until the next rain event.

3. Drift fences should be constructed from a material that is durable, weather resistant, and **appropriate for the area in which it will be installed; proposals should describe the materials to be used**. Examples include aluminum flashing, silt fencing, untreated wood particle board, shade cloth, window screen, Vexar plastic mesh, *etc*. Hardware cloth may be useful for short segments of fence that experience heavy overland water flow. Drift fences should be buried at least 3 inches (8 cm) underground and extend at least 1 ft (31 cm) above the ground. All drift fences require regular inspections and maintenance, especially after each significant storm event. If drift fences are installed incorrectly

and/or have insufficient maintenance this may call into question the reliability of the data. Unless special authorization is received from the Service and Department to maintain drift fences through non-sampling months, drift fencing should be disassembled by April 1.

4. Pitfall traps should not be placed in a manner that will disturb or destroy rodent burrows or other refugia that could be used by CTS.

5. Excessive pitfall flooding may invalidate a study. To avoid flooding traps should be placed preferentially in slightly elevated locations where flooding is less likely. Pitfalls in locations likely to flood should be free of holes. If ground saturation forces a pitfall out of the soil it can be weighted down with cement, gravel or other suitable materials.

6. All pitfall traps should have a rigid lid that closes securely. When not in use, traps should be closed in a manner that precludes entry by CTS and other animals.

7. Pitfall traps should be cylindrical, non-galvanized, metal or plastic containers. They should be at least 2-gallons in size and 8 in (20 cm) deep.

8. Each pitfall trap should contain noncellulose sponges or other nontoxic absorbent material which should be kept moist at all times.

9. Each pitfall trap should have a rigid cover with legs one to two inches high to provide shade and shed water during extreme rain events.

10. When in use, pitfall traps should be checked as often as necessary, but at a minimum one time a day, with one of these checks occurring between one hour before sunrise and noon. Whenever possible, traps should be opened just before dark and checked and closed the following morning.

11. When not in use, the drift fence and pitfall traps should be inspected weekly to ensure the system has not been disturbed by vandals, wildlife, fallen trees, wind, *etc.* Repairs to fences should be completed prior to the next night of sampling.

12. Pitfall traps should be placed as far as possible from ant nests. If an ant nest develops within 10 feet of an existing pitfall trap, the pitfall trap should be moved, removed from the field, or closed.

13. Captured CTS should be released as near as possible to the point of capture, in a manner that maximizes their survival. CTS should be released into the mouth of a small mammal burrow or other suitable refugia. CTS should be watched after release to be sure that they are in a safe location and are not susceptible to increased predation risk.

14. Once a CTS is captured, all traps and drift fences should be emptied and removed within 24 hours, and holes in the ground which contain traps should be filled in.

15. In addition, to minimize mortality of small mammals that may become trapped during surveys, each pitfall trap should also incorporate either jute twine, as described in Karraker (2001; http://www.fs.fed.us/psw/rsl/projects/wild/karraker/karraker4.pdf), a rodent safe-house as described in Padgett-Flohr and Jennings (2001), or other material as approved by the Service and Department.

16. Each pitfall trap should be marked with the name, telephone number, and Department permit number.

Other methods

Other methods, such as visual egg surveys, night driving, nocturnal surveys, fiber optic scoping and cover-boards, may be used to determine presence of the CTS, but these techniques may not be accepted in support of a negative finding. Deviations from this guidance may be approved on a case-by-case basis if a strong rationale can be presented.

Reporting

If one or more CTS are captured or detected a representative sample of the embryo(s), larva(e), or transformed salamander(s) should be photographed. The Service and the Department should be contacted by telephone within 3 working days if CTS are captured. If any mortality of California tiger salamander occurs, specimens should be collected, preserved by freezing, and the Service and the Department contacted by telephone within 1 work day.

For each survey location, a final report detailing the survey results should be submitted to the Service and the Department within one month of the last site visit. The written report should include, but is not be limited to, the following information: names of surveyors and copies of permits and authorizations, a description and map at the appropriate resolution of the type and quality of upland and aquatic habitats and land uses at the site; a map indicating the location of water bodies sampled for larvae; a map indicating the location of drift fences and pitfalls. The survey report also should include survey methods used, the dates and times of surveys, rainfall totals by date, nightly minimum temperatures, number and length of dipnet sweeps made, number of passes with seine, total estimated area seined, records of upland and aquatic animals captured, and pond water temperature, turbidity, and maximum depth at each aquatic sampling. If CTS are detected on the site, the report should include a map indicating the precise location of all CTS observations and captures, the number of CTS egg masses, larvae, sub-adults and adults observed, and photographic verification of CTS from the site. Site photographs may also be helpful in interpreting survey results. For the Department, survey reports should also include CNDDB field locality forms. Locality information should be in the form of UTM or latitude/longitude (degree, minute, second) coordinates.

In the case of a negative finding including a season with <70% of average rainfall, additional information (*e.g.*, pond filling/drying dates, quantity and timing of rainfall during each sampling interval, temperatures) supplied by the surveyor, may assist the Service and the Department in their decision whether or not to accept the data.

Contact Information:

U.S. Fish and Wildlife Service

For an application or guidance on how to obtain a Federal permit or for reporting, please contact:

For areas within the Great Valley hydrobasin:

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
Attn: Permit Coordinator
2800 Cottage Way, W-2605
Sacramento, California 95825
(916) 414-6547

For hydrobasins south of and including Santa Cruz County:

U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office
Attn: Permit Coordinator
2493 Portola Road, Suite B
Ventura, California 93003
(805) 644-1766

http://endangered.fws.gov/permits/

Please refer to http://ventura.fws.gov/VFWO_area.htm for a map showing U.S. Fish and Wildlife Office jurisdictions.

California Department of Fish and Game

For Department reporting or questions regarding land use activity guidance, a map of regional offices and telephone numbers is available at http://www.dfg.ca.gov/regions/regions.html

For State of California Scientific Collecting permit applications and information, please contact:

California Department of Fish and Game
License and Revenue Branch
3211 S Street
Sacramento, California 95816
(916) 227-2271

For additional State permit information, please refer to:

http://www.dfg.ca.gov/licensing/pdffiles/fg1547.pdf (How to Obtain a Scientific Collecting Permit)

http://www.dfg.ca.gov/hcpb/ceqacesa/rsrchpermit/mou/whenneedmou.shtml (When is the MOU Required?)

http://www.dfg.ca.gov/licensing/pdffiles/fg1476.pdf (Scientific Collecting Regulations)

http://www.dfg.ca.gov/licensing/pdffiles/fg1379e.pdf (Scientific Collecting Permit Attachment)

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B.10 - Programmatic Biological Opinion Update 2020

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

In Reply Refer to:
81420-2008-F-0261-R002

June 11, 2020

Regulatory Division Chief
San Francisco District
U. S. Army Corps of Engineers
450 Golden Gate Avenue, 4th Floor, Suite 0134
San Francisco, California 94102-3406
Sahrye.E.Cohen@usace.army.mil
CESPN-Regulatory-Info@usace.army.mil

Subject: Reinitiation of Formal Consultation on Issuance of Clean Water Act, Section 404 Permits by the U.S. Army Corps of Engineers (Corps) on the Santa Rosa Plain, Sonoma County, California

Dear Regulatory Division Chief:

This letter is in response to the U.S. Army Corps of Engineer's (Corps) April 21, 2017, request to reinitiate formal consultation with the U.S. Fish and Wildlife Service (Service) on the Issuance of Clean Water Act, Section 404 Permits on the Santa Rosa Plain, Sonoma County, California. Your request was received by the Service on April 26, 2017. At issue are the adverse effects on the endangered Sonoma County Distinct Population Segment (DPS) of the California tiger salamander (Sonoma County California tiger salamander) (*Ambystoma californiense*) and its critical habitat, Burke's goldfields (*Lasthenia burkei*), Sebastopol meadowfoam (*Limnanthes vinculans*), and Sonoma sunshine (*Blennosperma bakeri*). Critical habitat for the Sonoma County tiger salamander was not designated at the time of issuance of the November 9, 2007 Programmatic Biological Opinion. Critical habitat was designated on August 31, 2011, and you have requested reinitiation of the Programmatic Biological Opinion to analyze the effects of the proposed action on critical habitat for the Sonoma County California tiger salamander. This programmatic biological opinion was prepared under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The federal actions on which we are consulting are the issuance of Clean Water Act, Section 404 Permits by the Corps for the fill of waters of the United States associated with projects in the Santa Rosa Plain. The following sources of information were used to develop this programmatic biological opinion: (1) the Designation of Critical Habitat for the Sonoma County California Tiger Salamander (Service 2011); (2) the Santa Rosa Plain Conservation Strategy (Conservation Strategy) (Conservation Strategy Team 2005); (3) the Interim Mitigation Guidelines authored by the Service and California Department of Fish and Wildlife (CDFW), dated May 16, 2006; (4) the *Programmatic Biological Opinion (Programmatic) for U.S. Army Corps of Engineers (Corps) Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California (Corps File Number 223420N),* (2007 Programmatic Biological Opinion) dated November 9, 2007 (Service file number 81420-2008-F-0261) (Service 2007); (5) the *Recovery Plan for the Santa Rosa Plain* (Recovery Plan)

(Service 2016); (6) emails, phone conversations between representatives of the Service, the Corps, CDFW, and consulting biologists; and (7) other information available to the Service.

Projects anticipated to adversely affect occurrences of Burke's goldfields, Sebastopol meadowfoam, or Sonoma sunshine recorded in the California Natural Diversity Database (CNDDB) do not qualify for coverage under this programmatic biological opinion and will need to have case specific biological analysis and separate biological opinion issued because appropriate conservation for loss or degradation of the sites is case specific. However, projects anticipated to adversely affect suitable habitat of Burke's goldfields, Sebastopol meadowfoam, or Sonoma sunshine are covered in this programmatic biological opinion.

Consultation History

July 17, 1998:	The Service issued a programmatic biological opinion to the Corps for Clean Water Act, Section 404 permitting actions in the Santa Rosa Plain that addressed the effects of Corps permitting on the Sonoma sunshine, Sebastopol meadowfoam, Burke's goldfields, and the many-flower navarretia (*Navarretia leucocephala ssp. plieantha*) (Service file number 1-1-98-F-0053)(Service 1998).
December 1, 2005:	The federal listing of the Sonoma County California tiger salamander led to the development of a Conservation Strategy (Conservation Strategy Team 2005). The purpose of the Conservation Strategy for listed species in the Santa Rosa Plain was to coordinate development with the conservation needs of the species.
November 9, 2007:	The Service issued a new programmatic biological opinion to incorporate the Conservation Strategy (Conservation Strategy Team 2005) and the Sonoma County California tiger salamander, and removed the many-flower navarretia because of its limited distribution in the Santa Rosa Plain (Service 2007).
April 13, 2009:	The Service amended the 2007 programmatic biological opinion to clarify plant surveys are required if projects are in areas that may affect listed plants.
April 26, 2017:	The Corps requested to reinitiate consultation to include critical habitat for the Sonoma County California tiger.

INTRODUCTION

This programmatic biological opinion replaces the 2007 Programmatic Biological Opinion and is intended to streamline section 7 consultations for projects that implement the conservation measures herein. The Conservation Strategy, 2007 Programmatic Biological Opinion, Recovery Plan, and other information helped guide the conservation framework and conservation measures in this programmatic biological opinion. These documents are discussed in more detail in the *Status of the Species and Environmental Baseline* section.

The Corps and CDFW provided guidance and technical assistance in the preparation of this programmatic biological opinion. The California tiger salamander, Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine are also protected under the California Endangered Species Act (CESA), and separate authorization from the CDFW for impacts to these species may be needed. Please visit CDFW's CESA Permits webpage for more information (https://www.wildlife.ca.gov/Conservation/CESA). CDFW habitat impacts and compensation

requirements may differ from this document in order to fully mitigate the impacts under CESA. Integrating CDFW's permit conditions or recommendations can help the Corps and Service append projects to this Programmatic Biological Opinion. Providing CDFW's Incidental Take Permit, application, or other correspondence with CDFW regarding the project will aid in coordination and appending projects. If California tiger salamander or plant surveys are proposed, include CDFW's written approval of the survey methodology.

ADMINISTRATION OF THE PROGRAMMATIC BIOLOGICAL OPINION

This programmatic biological opinion covers Clean Water Act, Section 404 permitting actions by the Corps that may affect the Sonoma County California tiger salamander and/or its critical habitat and Burke's goldfields, Sebastopol meadowfoam, or Sonoma sunshine in the Santa Rosa Plain. The Corps should refer to Figures 1-6 to help make an effect determination.

Initial Rollout

The Corps will partner with the Service to provide an initial rollout of this programmatic biological opinion for staff of both agencies to ensure that the specifics of the programmatic biological opinion are considered at the onset of each project, and incorporated into all phases of permit process review, and that any constraints are resolved early on.

Corps Review

The Corps can request that the Service append a project to this programmatic biological opinion after review of Figures 1-6 and providing the following information:

1. Corps permit application including the Applicant's full name, mailing address, electronic mail address, telephone number, Assessor's Parcel Number(s), Universal Transverse Mercator (UTM) coordinates or latitude and longitude, and street address of the project.

2. Corps-verified jurisdictional determination.

3. Biological Assessment including:

    a. Proposed conservation consistent with the conservation framework in this programmatic biological opinion.

    b. Anticipated effects to the species and critical habitat.

    c. Description, quantity, and effects to the Sonoma County California tiger salamander upland and aquatic habitat and primary constituent elements for critical habitat.

    d. Description, quantity, and effects to Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine wetland and pollinator habitats.

4. Survey report(s):

    a. Plant surveys are required if proposed projects are in areas of suitable habitat for listed plants. Plant surveys are not needed if the site does not support suitable habitat.

b. Sonoma County California tiger salamander surveys are not required. However, surveys may be requested by the Corps, Service, or Applicant on a case by case basis to assist planning for avoidance, minimization, and/or compensation measures. Coordination between all parties should occur prior to requesting a project to be appended to this programmatic biological opinion.

c. Survey guidelines and reporting requirements: https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines.

5. Compensation proposal including acres and location of the conservation bank, relocation or translocation plan (described under Minimization Measures), and any other pertinent information.

6. Maps showing Sonoma County California tiger salamander breeding site(s) and occurrences, known listed plant occurrences, and conservation banks within a 2-mile radius of the project site. Maps of the project site, project boundary, project impacts, staging areas, species occurrences, and species habitat. Please provide Geographic Information System (GIS) shapefiles if possible. The preferred projection is Universal Transverse Mercator, Zone 10, North American Datum of 1983. Metadata must accompany the file(s) and be compliant with Federal Geographic Data Committee (FGDC) standards (http://www.fgdc.gov).

The Corps will determine whether a proposed project will adversely affect the Sonoma County California tiger salamander and/or its critical habitat, Burke's goldfields, Sebastopol meadowfoam, or Sonoma sunshine. Figures 1-6 and an interactive map (located at www.fws.gov/sacramento/es/Consultation/Programmatic-Consultations) are intended to assist in the evaluation. The Corps will review and forward to the Service all biological and other pertinent information.

The Corps may request a project to be appended to this programmatic biological opinion if there are likely to be adverse effects to the Sonoma California tiger salamander and critical habitat or the three listed plants. The Corps should not request a project be appended to this programmatic biological opinion if there are anticipated effects to an occurrence of any of the three listed plants. The Service considers that one or more of the listed plants is adversely affected when suitable habitat (defined in the Conservation Framework section below) is lost or degraded by activities associated with a Corps' permit, including direct and indirect alteration of wetland hydrology. Projects that may be requested to be appended must include the minimization and conservation measures in the *Description of the Proposed Action* within this programmatic biological opinion.

a. **Electronic Notification.** Once the Corps makes a determination that project inclusion under this Program is appropriate, the Corps will submit information to the Service at CoastBayDivision@fws.gov. The Service will determine if the information submitted by the Corps is complete within 15 working days and append the project within 30 working days. The information may be requested in hardcopy by the Service on a case-by-case basis.

Reporting

1. Pre- and Post - Construction Compliance Reports

For each Corps action appended to this programmatic biological opinion, the Corps will submit a pre - and post-construction compliance report prepared by the Service-approved biologist to the

Sacramento Fish and Wildlife Office (SFWO).

a. The pre-construction compliance report is due within 15 calendar days of scheduled staging and groundbreaking. This report will detail the status of minimization and conservation measures required prior to staging and ground breaking. The Service will confirm compliance or identify outstanding minimization and mitigation measures prior to staging or groundbreaking through electronic mail.

b. The post-construction compliance report is due within 30 calendar days of the date of the completion of construction activity. This report will detail: (1) dates that construction occurred; (2) photo documentation of construction and applicable minimization measures; (3) pertinent information concerning the success of the project in meeting conservation measures and an explanation of failure to meet such measures, if any; (4) documentation of employee environmental education; (5) recommendations to improve minimization measures in future similar projects; and (6) other pertinent information. Refer to additional monitoring and reporting requirements in the Incidental Take Statement below.

2. Capture and Relocation Reporting

For those components of the action that will require the capture and relocation of any listed species, the Corps via the applicant's Service-approved biologist(s) shall immediately contact the SFWO at (916) 414-6623 to report the action. If capture and relocation need to occur after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day.

3. Annual Report

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

c. For each project appended to this programmatic biological opinion that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated, the Corps via the applicant's Service-approved biologist(s) will provide prompt updates to the Service with an accounting of the total acreage of habitat impacted by the project appended to this programmatic biological opinion. The total acreage of habitat impacted by the project shall be compared to the acreage authorized in the Corps permit(s) and appendage to this programmatic biological opinion. The Corps will provide annual updates to the Service with an accounting of the total acreage of habitat impacted by the projects appended to this programmatic biological opinion.

d. For each project appended to this programmatic biological opinion that may result in direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harm, injury, or death is anticipated, the Corps via the applicant's Service-approved biologist(s) shall report the encounter(s) as described in the Description of the Proposed Action section. If encounter occurs after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day. When injured or killed individuals of the listed species are found, the Corps shall follow the steps outlined in the Salvage and Disposition of Individuals section below.

Time Period

This programmatic biological opinion is effective for a period of 10 (ten) calendar years from the date of its issuance and can be extended if deemed appropriate by both agencies. The Service will review this programmatic consultation, as appropriate, to ensure that its application is consistent with the minimization and conservation measures outlined in the *Description of the Proposed Action*.

Revocation or Termination

The Corps may end the Program at any time or reinitiate consultation if it determines the Program is not being implemented as intended. Similarly, USFWS may recommend reinitiation of this consultation if the Corps, or the permittees if applicable, fails to provide all applicable notification, reports, etc.

CONSERVATION FRAMEWORK

The minimization and conservation measures in this programmatic biological opinion are based on information from the 2005 Conservation Strategy, 2007 Programmatic Biological Opinion, and 2016 Recovery Plan.

Sonoma County California Tiger Salamander:

The conservation framework is carried over from the 2007 Programmatic Biological Opinion. However, number 2 below is a methodology tailored to new observations of Sonoma County California tiger salamanders.

1. The Conservation Framework is based on Preserve Goals in the Conservation Strategy (Conservation Strategy Team 2005, Table 1, page 6) in anticipation of the amount of habitat expected to be developed (primarily within the urban growth boundaries of the cities of Santa Rosa, Cotati, Rohnert Park, and Windsor).

Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine:

Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine seed banks can remain dormant in the soil for many years, in natural and disturbed habitats. Some CNDDB occurrences have been considered extirpated but then subsequently plants have been observed several years later and are now considered extant (CNDDB 2018). Endangered plant surveys in suitable habitat may not detect flowering plants during the 2 year survey protocol timeframe, although there can be a seedbank present. Suitable habitat includes: 1) wetland(s) containing surface water (standing or flowing) during the rainy season in a normal rainfall year for 7 or more consecutive days; or 2) wetland(s) that have an outlet barrier (i.e. is a pool) or occur in depressional terrain (i.e. is a swale or drainage feature); and 3) seasonal wetlands located within a Core or Management Area (Service 2007 and 2016). The conservation framework for Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine is the following.

1. Conservation for impacts to suitable habitat where a seed bank may be present is carried over from the 2007 Programmatic Biological Opinion and applies when the conservation occurs in the same Core Area (Recovery Plan 2016) as where the impacts occur. However, a higher ratio will apply when conservation is located in a different Core Area because the goal for recovery is to maintain the geographic distribution of the range of these species within

the Santa Rosa Plain (Figures 3 – 5). The applicable ratio will be as described in Table 3 herein.

BIOLOGICAL OPINION

This programmatic biological opinion provides the framework for the Corps to meet its Endangered Species Act Section 7(a)(2) requirements for permitting projects that adversely affect Burke's goldfields, Sebastopol meadowfoam, Sonoma sunshine, Sonoma County California tiger salamander and Sonoma County California tiger salamander critical habitat. It is intended to provide a mechanism for the Corps to permit projects that cause incidental take (i.e., Sonoma County California tiger salamander), and result in habitat loss, fragmentation, and degradation of habitat for Burke's goldfields, Sebastopol meadowfoam, Sonoma sunshine, Sonoma County California tiger salamander, and Sonoma County California tiger salamander critical habitat. This in turn will allow the goals, objectives, and recovery criteria of the Recovery Plan to be achieved, and ensure that Sonoma California tiger salamander critical habitat will maintain its conservation value. After reviewing the proposed action with programmatic actions as proposed by the Corps, the Service has determined that the proposed actions presents a programmatic action, as defined in 50 CFR § 402.2.

Description of the Proposed Action

The federal action on which we are consulting is the Corps' issuance of Clean Water Act, Section 404 permits in the Santa Rosa Plain *Action Area* (Figure 1). These permits are issued for projects such as residential and commercial development projects, rural residential, road improvements, and other miscellaneous infrastructure and ground disturbing activities.

Fill of Wetlands and Modification/Loss of Adjacent Uplands

We expect the majority of projects will be within the urban growth boundaries of the Cities of Santa Rosa, Cotati and Rohnert Park (Table 1) (Conservation Strategy Team 2005). They will consist of filling wetlands and modifying and removing adjacent uplands to build homes, industrial units, roads, and infrastructure. Some smaller projects involving wetland fill and modification/loss of adjacent uplands may occur outside of the urban growth boundaries within the *Action Area* due to rural residential, road, and other miscellaneous projects within Sonoma County jurisdiction. The acreages in Table 1 below were developed with the assistance of staff from each city during the development of the Conservation Strategy.

Table 1. Estimated Development Within City Urban Growth Boundaries

	Santa Rosa (acres)	**Cotati** (acres)	**Rohnert Park** (acres)	**Estimated Mitigation** (acres)
0 - 500 feet of a California tiger salamander breeding occurrence	190.4	21	0	**634.2**
501 - 2200 feet of a California tiger salamander breeding site	761.4	132.2	13.9	**1815**
2201 feet - 1.3 miles of a known California tiger salamander breeding site	411.7	6.7	166.6	**585**
500 feet of a California tiger salamander non-breeding occurrence	177	43.3	22.3	**485.2**
Total	**1540.5**	**203.2**	**202.8**	**3519.4**

Anticipated permanent loss of Sonoma County California tiger salamander habitat within city urban growth boundaries was compared with the acreage needed to conserve habitat and maintain viable populations within identified Conservation Areas of the Conservation Strategy (Conservation Strategy Team 2005). This comparison was used to calculate the ratio of mitigation for project impacts in order to meet conservation goals (Conservation Strategy Team 2005). These estimates were anticipated to occur within a 10 year time period (i.e., 2005 - 2015) (Conservation Strategy Team 2005), however due to the economic downturn beginning around 2008, the estimated development did not occur as anticipated. It is difficult to know exactly when this build out will occur.

Suitable wetland habitat for Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine exists within the areas expected to be impacted by development in Table 1 but has not been quantified. The habitat is expected to be developed, fragmented, and degraded by activities associated with Corps permits. The amount of suitable wetland habitat that will be affected by a Corps permit action/proposed project will be determined on a project by project basis by the Corps.

Minimization Measures and Best Management Practices

Several of the minimization measures contained in the Conservation Strategy (Conservation Strategy Team. 2005) and in the 2007 Programmatic Biological Opinion (Service 2007) have been updated herein to reflect current knowledge and more effectively minimize adverse effects of project activities. Projects that qualify to be appended to this programmatic biological opinion must incorporate the following Conservation Measures as part of the Project Description. The Corps proposes to implement the following measures which can be modified or waived by the Service in writing on a case by case basis.

Burke's Goldfields, Sebastopol Meadowfoam and Sonoma Sunshine

1. Construction Worker Training. A qualified biological monitor will conduct a training session for all construction workers before work is started on the project. The training program is for all construction personnel including contractors and subcontractors. The training will include, at a minimum, a description of the Sonoma County California tiger salamander, and the applicable listed plant(s) and their habitat within the *Action Area*; an explanation of the species' status and protection under state and federal laws; the avoidance and minimization measures to be implemented to reduce loss of these species; and communication and work stoppage procedures in case a listed species is observed within the *Action Area*. A fact sheet conveying this information will be prepared and distributed to all construction personnel. The Applicant shall provide interpretation for non-English speaking workers.

2. Work Area. Access routes, number and size of staging areas, 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. Environmentally Sensitive Areas (ESA's) containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed will be clearly delineated using high visibility orange fencing. The final project plans will depict all locations where ESA fencing will be installed and will provide installation specifications. The bid solicitation package will include special provisions and clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material and equipment storage, access roads and other surface-disturbing activities within ESAs. The ESA fencing will remain in place throughout the duration of the proposed action, while construction activities

are ongoing, and will be regularly inspected and fully maintained at all times. The orange fencing will be removed promptly after project completion.

3. Equipment. All equipment will be maintained such that there will be no leaks of automotive fluids such as gasoline, oils, or solvents. Spill response kits will be on hand and utilized immediately in the case of mechanical failures resulting in gasoline or oil spills.

4. Reduce Spread of Invasive Species. A qualified biologist shall ensure that the spread or introduction of invasive non-native plant species, via introduction by arriving vehicles, equipment, and other materials will be prevented, by thoroughly cleaning equipment and vehicles prior to start of use. Any new piece of equipment brought in, or any piece of equipment taken off site and then returned to the site, will also be washed. When practicable, invasive non-native plants in the project area shall be removed and properly disposed of in a manner that will not promote their spread. Invasive non-native plant species include those identified in the California Invasive Plant Council's (Cal-IPC) Inventory Database, accessible at: www.cal-ipc.org/ip/inventory/index.php. Areas subject to invasive non-native weed removal or disturbance will be replanted with appropriate mix of fast-growing native species.

5. Hazardous Materials. 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.

6. Restoration Plan. Project areas temporarily disturbed by construction activities will be re-vegetated with locally-occurring native plants appropriate for the region and habitat communities on site. All temporarily affected areas shall be returned to original grade and contours to the maximum extent practicable and protected with proper erosion control materials. Seed from commercial nurseries will not be planted in vernal pools. A Restoration Plan with success criteria will be submitted to the Service for review and approval prior to ground disturbance.

7. Onsite Project Manager. The Corps through its Applicant will ensure the Onsite Project Manager or their designee will have full authority to implement and enforce all onsite Conservation Measures and Terms and Conditions of this programmatic biological opinion and appendage. The Onsite Foreman/Manager or their designee shall maintain a copy of this programmatic biological opinion and appendage onsite whenever construction is in progress. Their name(s) and telephone number(s) shall be provided to the Service at least 15 calendar days prior to groundbreaking at the project.

8. Biological Monitor Approval and Stop Work Authority. Qualified biological monitor(s) will possess a working wireless/mobile phone whose number will be provided to the Service prior to the start of construction and ground disturbance. The biological monitor(s) shall keep a copy of this programmatic biological opinion and appendage in his/her possession when onsite. Through the Onsite Project Manager or his/her designee, the biological monitor(s) shall be given the authority to communicate verbally, by telephone, email, or hardcopy with the applicant, project personnel, and any other person(s) at the project site or otherwise associated with the project to ensure that the Terms and Conditions of this programmatic biological opinion and appendage are met. The biological monitor(s) shall have oversight over implementation of the Terms and Conditions in this programmatic biological opinion and appendage, and shall have the authority to stop project activities if they determine any of the associated requirements are not being fulfilled. If the biological

monitor exercises this authority, the Service shall be notified by telephone and email within 24 hours. The Service contact is the Coast Bay Division Chief of the Endangered Species Program, Sacramento Fish and Wildlife Office at telephone number (916) 414-6623.

9. Stormwater Pollution Prevention Plan (SWPPP). A SWPPP will be prepared in full accordance with the State Water Resources Control Board, National Pollutant Discharge Elimination System Construction General Permit. The SWPPP will include Best Management Practices (BMPs) for controlling sediment, turbidity and the release of other pollutants into water courses during construction. The SWPPP will also include a rainy season erosion prevention and monitoring plan to ensure that surface runoff from the construction site meets Regional Water Quality Control Board (RWQCB) water quality standards and objectives for the Hydrologic Unit and Hydrologic Subunit in which the Project is located. The SWPPP is subject to the approval of the RWQCB prior to the start of work.

Sonoma County California Tiger Salamander

Implementation of these minimization measures may vary based on environmental factors and site location as determined by the Service.

1. Wildlife Exclusion Fencing (WEF). Prior to the start of construction, WEF will be installed at the edge of the project footprint in all areas where Sonoma County California tiger salamanders could enter the construction area. WEF with exit ramps, funnels, and cover boards may be required for one full rainy season to allow any Sonoma County California tiger salamander onsite to move into an adjacent habitat offsite and will be determined on a case by case basis.

   The location of the fencing shall be determined by the onsite project manager and the Service-approved biologist in cooperation with the Service prior to the start of staging or surface disturbing activities. A conceptual fencing plan shall be submitted to the Service for review and approval prior to WEF installation. The location, fencing materials, installation specifications, and monitoring and repair criteria shall be approved by the Service prior to start of construction. The applicant shall include the WEF specifications on the final project plans. The applicant shall include the WEF specifications including installation and maintenance criteria in the bid solicitation package special provisions. The WEF shall remain in place throughout the duration of the project and shall be inspected weekly and fully maintained. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion the WEF shall be completely removed, the area cleaned of debris and trash, and returned to natural conditions.

   An exception to the foregoing fencing measure is that for work sites where the duration of work activities is very short (e.g., 3 days or less) and during the dry season. If installation will result in more ground disturbance than project activities, then the boundaries and access areas and sensitive habitats may be staked and flagged by the biological monitor prior to disturbance and species monitoring would occur during all project activities at that site.

2. Relocation Plan. The Corps through its Applicant shall prepare and submit a Relocation Plan for the Service's written approval. The Relocation Plan shall be consistent with the Guidelines for the relocation of California tiger salamanders (*Ambystoma californiense*) (Shaffer et. al. 2008). The Relocation Plan shall contain the name(s) of the Service-approved biologist(s) to relocate Sonoma County California tiger salamanders, method of relocation (if

different than number 3 below), a map, and description of the proposed release site(s) and burrow(s), and written permission from the landowner to use their land as a relocation site. At various times, a conservation bank may be a desired location to relocate Sonoma County California tiger salamanders from a salvage site; however no conservation bank may receive relocated Sonoma County California tiger salamanders until all the bank's credits have been sold to prevent interfering with their performance criteria and credit release schedule.

3. Protocol for Species Observation, Handling, and Relocation. Only Service-approved biologists shall participate in activities associated with the capture, handling, relocation, and monitoring of Sonoma County California tiger salamanders. If a Sonoma County California tiger salamander is encountered, work activities within 50 feet of the individual shall cease immediately and the Onsite Project Manager and Service-approved biologist shall be notified. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the individual(s), it may be left at the location of discovery and monitored by the Service-approved biologist. All project personnel shall be notified of the finding and at no time shall work occur within 50 feet of the Sonoma County California tiger salamander without a Service-approved biologist present. If relocation of the species to another site has been approved by the Service and CDFW prior to the start of the Project, the following steps shall be followed:

    a. Prior to handling and relocation, the Service-approved biologist will take precautions to prevent introduction of amphibian diseases in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (Service 2003). Disinfecting equipment and clothing is especially important when biologists are coming to the *Action Area* to handle amphibians after working in other aquatic habitats. Sonoma County California tiger salamanders shall also be handled and assessed according to the Restraint and Handling of Live Amphibians (USGS National Wildlife Health Center 2001).

    b. Sonoma County California tiger salamanders shall be captured by hand, dipnet, or other Service-approved methodology, transported, relocated and released as soon as practicable the same day of capture. Individuals should be relocated to areas with one or more potential breeding pools and an active burrow system (unless otherwise with written approved by the Service). The Service shall be notified within 24 hours of all capture, handling, and relocation efforts.

    c. If an injured Sonoma County California tiger salamander is encountered and the Service-approved biologist determines the injury is minor or healing and the salamander is likely to survive, the salamander shall be released as soon as possible, in accordance with the Service-approved Relocation Plan. The relocated Sonoma County California tiger salamander shall be monitored until it is determined that it is not threatened by predators or other dangers.

    d. If the Service-approved biologist determines that the Sonoma County California tiger salamander has serious injuries as a result of project-related activities the Service-approved biologist shall immediately take it to a licensed veterinarian, the Sonoma County Wildlife Rescue, or another Service-approved facility. If taken into captivity the individual shall remain in captivity and not be released into the wild unless it has been kept in quarantine and the release is authorized by the Service. The Applicant shall bear any costs associated with the care or treatment of such injured individuals.

The circumstances of the injury, the procedure followed and the final disposition of the injured animal shall be documented in a written incident report.

e. Notification to the Service of an injured or dead Sonoma County California tiger salamander in the *Action Area* will be made within 2 calendar days of the finding. Written notification to the Service shall include the following information: the species, number of animals taken or injured, sex (if known), date, time, location of the incident or of the finding of a dead or injured animal, how the individual was taken, photographs of the specific animal, the names of the persons who observe the take and/or found the animal, and any other pertinent information. Dead specimens will be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen.

4. Biological Monitors. Qualified biological monitor(s) will be on site each day during all earth moving activities. The biological monitor(s) shall conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may displace, injure, or kill Sonoma County California tiger salamanders through contact with workers, vehicles, and equipment. All aquatic and upland habitat including refugia habitat such as small woody debris, refuse, burrow entries, etc., shall be duly inspected. Where feasible and only on a case-by-case basis, rodent burrows and other ground openings suspected to contain Sonoma County California tiger salamanders that would be destroyed from project activities may be carefully excavated with hand tools. Pre-soaking the area prior to ground disturbance may also increase emergence of the species for translocation. The Service will consider the implementation of specific project activities without the oversight of an on-site biological monitor on a case-by-case basis.

   Before the start of work each day, the biological monitor will check for animals under all 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 County California tiger salamanders. Sonoma County California tiger salamanders will be removed by the biological monitor and relocated according to the Relocation Plan. To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 6 inches deep will be covered with plywood (or similar materials) that leave no entry gaps at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. The Service-approved biologist shall inspect all holes and trenches at the beginning of each workday and before such holes or trenches are filled. All replacement pipes, culverts, or similar structures stored in the project footprint overnight will be inspected before they are subsequently moved, capped, and/or buried.

5. Biological Monitoring Records. The biological monitor(s) shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying the listed species encountered, including the time and location of the observation; (3) the time the specimen was identified and by whom and its condition; (4) the capture and release locations of each individual; (5) photographs and measurements (snout to vent and total length) of each individual; and (6) a description of any actions taken. The biological monitor(s) shall maintain complete records in their possession while conducting monitoring activities and shall immediately provide records to the Service upon request. All monitoring records shall be provided to the Service within 30 days of the completion of monitoring work.

6. Work Windows. Ground disturbance will be conducted between April 15 and October 15, of any given year, depending on the level of rainfall and/or site conditions. However, grading and other disturbance in pools and ponds, if unavoidable, shall be conducted only when dry, typically between July 15 and October 15. Work within a pool or wetland may begin prior to July 15 if the pool or wetland has been dry for a minimum of 30 days prior to initiating work. Any work in pools and wetlands that are holding water shall be subject to approval of the Service. If work must continue when rain is forecast (greater than 40 percent chance of rain), a Service-approved biologist(s) shall survey the Project site before construction begins each day rain is forecast. If rain exceeds 0.5 inches during a 24-hour period, work shall cease until National Weather Service forecasts no further rain. This restriction is not applicable for areas within 1.3 miles of potential or known Sonoma County California tiger salamander breeding sites once the Applicant encircles the site with Wildlife Exclusion Fencing.

7. Proper Use of Erosion Control Materials. Plastic or synthetic monofilament netting will not be used in order to prevent Sonoma County California tiger salamanders from becoming entangled, trapped, or injured. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers. Following site restoration, any materials left behind as part of the restoration, such as straw wattles, should not impede movement of this species.

8. Wildlife Passage Improvement. When constructing a road improvement, wherever possible, the Corps through the Applicant will enhance or construct wildlife passage for the Sonoma County California tiger salamander across roads, highways, or other anthropogenic barriers. This includes upland culverts, tunnels, and other crossings designed specifically for wildlife movement, as well as making accommodations in curbs, median barriers, and other impediments to terrestrial wildlife movement at locations most likely to provide a net benefit to wildlife.

9. Vegetation Removal. A Service-approved biologist will be present during all vegetation clearing and grubbing activities. Grasses and weedy vegetation should be mowed to a height no greater than 6 inches prior to ground-disturbing activities. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site. Prior to vegetation removal, the Service-approved biologist shall thoroughly survey the area for Sonoma County California tiger salamanders. Once the qualified biologist has thoroughly surveyed the area, clearing and grubbing may continue without further restrictions on equipment; however, the qualified biologist shall remain onsite to monitor for Sonoma County California tiger salamanders until all clearing and grubbing activities are complete.

10. Nighttime Activities. Construction and ground disturbance will occur only during daytime hours, and will cease no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Night lighting of Environmental Sensitive Areas should be avoided.

11. Avoidance of Entrainment. If a water body (e.g., pond or ditch) is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh smaller than 5 millimeters and intake placed within a perforated bucket or other method to attenuate suction to prevent Sonoma County California tiger salamander larvae from entering the pump system. Pumped water shall be stored in a manner that does not degrade water quality and then upon completion released back into the water body, or at an appropriate location in

a manner that does not cause erosion. No rewatering of the water body is necessary if sufficient surface or subsurface flow exists to fill it within a few days, or if work is completed during the time of year the water body would have dried naturally, or for predator control purposes. To avoid effects to eggs and larvae, work within breeding ponds should be conducted between August 31 and October 31, or when the pools have been dry at least 30 days. When working in breeding ponds, this measure is to be implemented after implementing the required Relocation Plan described in number 2 above.

12. Reduce Non-Native Aquatic Predators/Competitors. A qualified individual shall permanently remove, from within the project area, any individuals of non-native species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible. The Applicant shall have the responsibility to ensure that these activities are in compliance with the California Fish and Game Code. For long-term management of aquatic breeding habitat, avoid converting seasonal breeding aquatic habitat to perennial aquatic breeding habitat, to avoid colonization by predators and non-native tiger salamanders or hybrids. Creation of new perennial water bodies in the vicinity of Sonoma County California tiger salamander shall also be avoided.

13. Trash. All foods and food-related trash items will be enclosed in sealed trash containers at the end of each day, and removed from the site every three days.

14. Agency Access. If verbally requested before, during, or upon completion of ground disturbance and construction activities, the Applicant will ensure the Service can immediately and without delay, access and inspect the project site for compliance with the project description, Conservation Measures, and reasonable and prudent measures of this programmatic biological opinion and appendage, and to evaluate project effects to the Sonoma County California tiger salamander and its habitat.

MEETING CONSERVATION NEEDS OF LISTED SPECIES

The conservation framework in this programmatic biological opinion utilizes information from the 2005 Conservation Strategy, 2007 Programmatic Biological Opinion, and 2016 Recovery Plan. Projects that can be appended to this programmatic biological opinion will meet the following conservation goals prior to beginning project activities and ground disturbance.

Sonoma County California tiger salamander

The conservation strategy for the Sonoma California tiger salamander is carried over from the 2007 Programmatic Biological Opinion. The approach is based on ensuring that issuance of Corps permits does not preclude achieving the acreage goals in the Conservation Strategy which is generally based on a comparison of the amount of habitat expected to be developed (primarily within the urban growth boundaries of the cities of Santa Rosa, Cotati, Rohnert Park, and Windsor) and the Sonoma County California tiger salamander Preserve Goals (Conservation Strategy Team 2005, Table 1, page 19) within the defined Conservation Areas.

Development projects that can be appended to this programmatic biological opinion will provide the following to be consistent with the conservation framework for the Sonoma County California tiger salamander:

1. Mitigation Ratios. Conservation to offset adverse effects to Sonoma County California tiger salamander habitat will be in accordance to Table 2 and Figure 1. The mitigation ratios are

expressed as acres to be conserved to acres of impact. Ratios apply to the entire area subject to direct and indirect effects. Project sites that fall within more than one ratio will mitigate at the higher ratio in most cases, unless other conservation measures provide equal or greater conservation value. An interactive map is available to search by address or assessor parcel number (fws.gov/sacramento/es/Consultation/Programmatic-Consultations/).

Table 2. Mitigation Ratios for the Sonoma County California Tiger Salamander

Mitigation Ratio	Sonoma County California tiger salamander
3:1	Project sites that are within 500 feet of a breeding site.
2:1	• Project sites that are greater than 500 feet and within 2,200 feet of a breeding site. • Project sites beyond 2,200 feet from a breeding site, but within 500 feet of a non-breeding occurrence.
1:1	Project sites that are greater than 2,200 feet and within 6,864 feet (1.3 miles) of a breeding site.
0.2:1	Project sites that are greater than 6,864 feet (1.3) miles from a breeding site and greater than 500 feet from a non-breeding occurrence.

2. Conservation Bank Credits. Conservation for the Sonoma County California tiger salamander can be achieved by purchasing credits at a Service-approved conservation bank.

3. Conservation Bank Location. The selection of sites for mitigation will be consistent with the Recovery Plan as follows:

    a. For impacts to Sonoma County California tiger salamander located in a Core Area, conservation will be within the same Core Area as first priority in order to maintain the current geographic, elevational, and ecological distribution (Service 2016). Conservation at a different Core Area or Management Area can be considered on a case by case basis as a second option but must be coordinated and approved by the Corps and Service.

    b. For impacts to Sonoma County California tiger salamander located in a Management Area, conservation may be implemented within the same Management Area or the nearest Core Area.

Sonoma sunshine, Sebastopol meadowfoam, and Burke's goldfields

Conservation for Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine under this programmatic biological opinion is similar to the 2007 Programmatic Biological Opinion with one substantial change. This revised programmatic biological opinion does not cover projects that adversely affect CNDDB occurrences (Figures 3 – 5). However, this programmatic biological opinion covers adverse effects to suitable habitat where a seed bank is likely to be present. Suitable habitat includes: 1) wetland(s) containing surface water (standing or flowing) during the rainy season in a normal rainfall year for 7 or more consecutive days; 2) wetland(s) that have an outlet barrier (i.e., is a pool) or occurs in depressional terrain (i.e., is a swale or drainage feature); and 3) seasonal wetlands located within a Core or Management Area (Service 2007 and 2016).

Development projects that can be appended to this programmatic biological opinion will offset adverse effects to listed plant suitable habitat and will implement the following conservation measures:

1. Mitigation Ratios. Conservation for direct and indirect impacts to suitable habitat will be in accordance with Table 3. The ratios are expressed as acres of conservation to acres of impact.

Table 3. Mitigation Ratios for the Listed Plants

Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine	**Mitigation ratio Same Core Area as Impacts**	**Mitigation ratio Different Core Area as Impacts**
Impacts to suitable habitat	1.5 : 1	3 : 1

2. Conservation Bank Credits. Mitigation for Burke's goldfields, Sebastopol meadowfoam, or Sonoma sunshine can be achieved by purchasing credits at a Service-approved conservation bank.

3. Determining Which Species to Conserve. The plant species to be conserved will be determined as described below.

    a. Proximity to a Species Occurrence: Suitable habitat will be conserved for the species that occurs nearest to the project site based on CNDDB occurrences (Figures 3 – 5). For example, project sites near the Town of Windsor have numerous occurrences of Burke's goldfields. Therefore, Burke's goldfields would be the species chosen for conservation.

    b. Multiple Species Occurrences Within a Core Area: Conservation for impacts to suitable habitat located within the Core Area of more than one listed plant species must be equally apportioned between those listed plant species (e.g., If there will be 1 acre of impacts to suitable habitat located in Sonoma sunshine and Burke's goldfields Core Areas, then 0.5 acre of Sonoma sunshine and 0.5 acre of Burke's goldfields will be subject to conservation goals in Table 3). This latter conservation strategy equalizes conservation to best meet the conservation needs of the species as outlined in the Recovery Plan.

4. Conservation Bank Location. The selection of sites for conservation will be consistent with conservation objectives for each species in the Recovery Plan as follows:

    a. Project Sites in a Core Area: For impacts to suitable listed plant habitat located in a Core Area, conservation will be within the same Core Area as first priority in order to maintain the current geographic, elevational, and ecological distribution (Service 2016). Conservation in a different Recovery Plan Core or Management area can be considered on a case by case basis as a second option but must be coordinated with and approved by the Corps and Service.

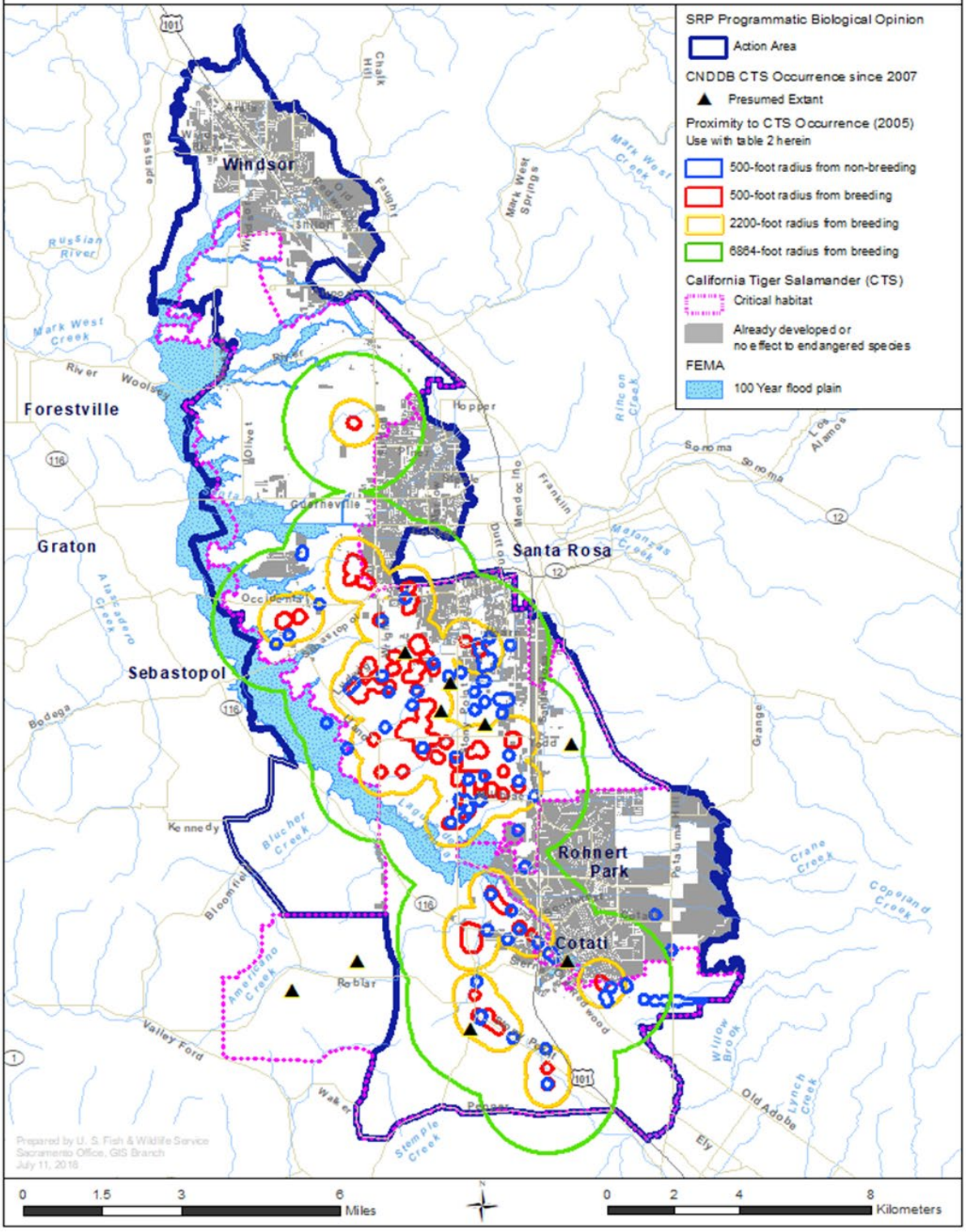
    b. Project Sites in a Management Area: For impacts to suitable listed plant habitat located in a Management Area, conservation may be implemented within the same Management Area or the nearest Core Area.

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 this programmatic

biological opinion, the *Action Area* includes an area of 66,899 acres on the Santa Rosa Plain as shown in Figure 1.

Figure 1: Santa Rosa Plain (SRP) Action Area



Analytical Framework for the Jeopardy Determination

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

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

Analytical Framework for the Adverse Modification Determination

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

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

The DAM analysis in this biological opinion relies on four components: (1) the *Status of Critical Habitat*, which describes the current rangewide condition of the critical habitat in terms of the key components (i.e., essential habitat features, primary constituent elements, or physical and biological features) that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the critical habitat overall for the conservation/recovery of the listed species; (2) the *Environmental Baseline*, which analyzes the current condition of the critical habitat in the *Action Area*, without the consequences to designated critical habitat caused by proposed action, the factors responsible for that condition, and the value of the critical habitat in the *Action Area* for the conservation/recovery of the listed species; (3) the *Effects of the Action*, which determines all consequences to designated critical habitat that are caused by the proposed federal action on the key components of critical habitat that provide for the conservation of the listed species, and how those impacts are likely to influence the conservation value of the affected critical habitat; and (4) *Cumulative Effects*, which evaluate the effects of future non-federal activities that are reasonably certain to occur in the *Action Area* on the key components of critical habitat that provide for the conservation of the listed species and how those impacts are likely to influence the conservation value of the affected critical habitat.

The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and in light of the status of critical habitat, the Service formulates its opinion as to whether the action is likely to destroy or adversely modify designated critical habitat. The Service's opinion evaluates whether the action is likely to impair or preclude the capacity of critical habitat in the *Action Area* to serve its intended conservation function to an extent that appreciably diminishes the rangewide value of critical habitat for the conservation of the listed species. The key to making that finding is understanding the value (i.e., the role) of the critical habitat in the *Action Area* for the conservation/recovery of the listed species based on the *Environmental Baseline* analysis.

Status of the Species and Environmental Baseline

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

Sonoma County California Tiger Salamander; Burke's Goldfields; Sebastopol Meadowfoam; and Sonoma Sunshine

Additional information on the status of these species beyond the *Action Area* covered in this document can be found in the Recovery Plan (Service 2016).

The *Action Area* is located in central Sonoma County, California, within the Santa Rosa Plain sub-basin of the Santa Rosa Valley and the Petaluma Valley. Prior to human settlement, it is believed the Santa Rosa Plain supported a vast network of seasonally wet swales and scattered pools within a matrix of grassland and oak savanna. The low-gradient terrain with underlying dense clay soil horizons and high clay soil surfaces, ample winter precipitation, and dry summer climate on the Santa Rosa Plain predisposed this area to the development of seasonal wetlands. The natural landscape historically consisted of numerous shallow depressions that would pond water during the rainy season (vernal pools), often connected by narrow swales. Much of the vernal pool ecosystem has since been lost or degraded through agricultural activities and development projects (Patterson et al.1994, CH2M Hill 1995). The Santa Rosa Plain is believed to have historically supported approximately 7,000 acres of seasonal wetlands, an estimated 84 percent of which had been lost due to land conversion as of 1994. The approximately 1,000 acres of seasonal wetlands that remained on the Santa Rosa Plain in 1994 were composed of both vernal pools (ponded) and swales (non-ponded) in roughly equal proportions, and the swales had largely been invaded by exotic species, therefore it is believed the actual amount of vernal pool acreage had been reduced to less than a few hundred acres (Patterson et al., 1994). Because the vernal pool ecosystem was once extensive over the Santa Rosa Plain, it is not difficult to find parcels on which vernal pools have been smeared into the landscape, resulting in degraded seasonal wetlands that may still retain the necessary qualities for supporting one or more of the listed plant species but may require considerable restoration to ensure long-term species viability (Patterson et al.1994, CH2M Hill 1995).

The loss of seasonal wetland habitat on the Santa Rosa Plain has largely resulted from urban and agricultural conversion (Patterson et al. 1994, CH2M Hill 1995, CNDDB 1998). Of

28,000 acres of the Santa Rosa Plain studied by Waaland et al. (1990 as cited in Patterson et al. 1994), 12,000 acres had been converted to urban, cropland, orchard or vineyard uses. The conversion most severely affected oak woodland/savanna-vernal pool habitat.

During the past 40 years, the Santa Rosa Plain has changed from a primarily rural residential/agricultural area with large expanses of open space to a more urbanized and intensely agricultural area with less open space (Service 2016). Vernal pool habitat on the Santa Rosa Plain now occurs as often degraded remnants in a matrix of agriculture, development, and fragmented remains of valley oak woodland, grassland, and persistent wetland vegetation, and is vulnerable to invasion by non-native plants (City of Santa Rosa 2014). An undetermined amount of land use conversions and intensive and routine agricultural practices are not reviewed for environmental compliance under the federal permitting process. It is expected that some new intensive agriculture including vineyard, row crops, cannabis grows, recycled water spray irrigation, and their infrastructure will occur within the Action Area.

The Association of Bay Area Governments (ABAG) predicts that between 2010 and 2040 the nine-county San Francisco Bay Area region is projected to add 2.1 million people and 660,000 homes. During that time, the human population in Sonoma County, one of the Bay Area counties, is projected to increase by 24 percent and housing will increase by 16 percent, with 82 percent of the County's projected growth occurring within the jurisdictions in the Santa Rosa Plain, largely within urban growth boundaries of Cotati, Rohnert Park, Santa Rosa, and Windsor (ABAG 2013). Areas within the defined urban growth boundaries include lands currently inhabited by Sonoma County California tiger salamander, Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine. Urban growth continues to imperil the Sonoma County California tiger salamander and the three listed plant species with ongoing habitat loss and fragmentation.

Intensive and less intensive agriculture uses occur within the *Action Area*. Some of the intensive agriculture includes vineyards, row crops, orchards, dairies, and recycled water spray irrigation. There are approximately 6,571 acres of vineyards in the *Action Area* (Sonoma Veg Map 2013). Conversion of pastures to vineyards is a current threat to all four species (Service 2016).Vineyard project applicants within the Santa Rosa Plain are expected to develop biological assessments for review by Sonoma County environmental staff. Sonoma County was a partner in preparing the Conservation Strategy (2005) and are expected to conserve these species accordingly. The Sonoma County environmental review for vineyard and orchard development expanded in 2014 with the requirement that projects have a biological assessment completed and mitigate impacts to endangered species as well as sensitive aquatic habitats such as streams, wetlands and vernal pools (Sonoma County 2016).

Land uses within the *Action Area* are expected to continue to include urban, rural residential, intensive agriculture, endangered species compatible agriculture, transportation, and conservation. Conservation lands for Sonoma County California tiger salamander, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam, have been established on the Santa Rosa Plain since the plants were federally listed as endangered in 1991 and Sonoma County California tiger salamander in 2002. All are protected and have funding mechanisms such as endowment funds for the perpetual management of the habitat to ensure the survival of the listed species present. The conservation lands summarized in Table 4 of the Recovery Plan (Service 2016) are fairly small and interspersed with rural residential, vineyards, and other agriculture land uses. The majority are less than 50 acres in size (77 percent).

Voters in local municipalities have established urban growth boundaries for their communities. This is intended to accomplish the goal of city-centered growth, resulting in continuation of rural and agricultural land uses between the urbanized areas (Conservation Strategy Team 2005). Areas within

the defined urban growth boundaries include lands currently inhabited by Sonoma County California tiger salamander, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam. This urban growth continues to threaten occurrences of these listed species. Many of the parcels in the urban growth boundaries are small, have degraded uplands and wetlands, and are fragmented by development.

While it is reasonable to expect that rural land uses will continue into the foreseeable future outside of the urban growth areas, the nature of such use has bearing on habitat quality for the Sonoma County California tiger salamander, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam. While past and ongoing agricultural practices have disturbed seasonal wetlands on the Santa Rosa Plain, certain agricultural practices, such as grazed pasture, have protected habitat from intensive development and are compatible with persistence of these listed species.

A recovered species is one that no longer meets the Act's definition of threatened or endangered due to amelioration of threats. Because the main cause of the decline and the main current threat to all species in this biological opinion is the loss and degradation of habitat in the Santa Rosa Plain, previous conservation efforts including the Santa Rosa Vernal Pool Ecological Reserve System, Santa Rosa Plain Conservation Strategy, Programmatic Biological Opinions, Conservation Banks and Permittee Responsible Mitigation (Preserves), and the Recovery Plan focused upon ameliorating this threat. The Santa Rosa Plain is vital to the recovery of the Sonoma County California tiger salamander, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam where the majority of the CNDDB occurrences are found throughout their range.

The Conservation Strategy (2005) and Programmatic Biological Opinion (Service 2007) identified conservation measures to avoid, minimize, and compensate for adverse effects at project sites and guide the conservation of individuals, seedbank, and habitat. Preserves have been established within Conservation Areas identified in the Conservation Strategy and have contributed to the conservation of contiguous blocks of habitat.

The current understanding of the recovery needs of these species is that recovery is possible only through preserving high-quality habitat that provides essential connectivity, reduces fragmentation, and sufficiently buffers against encroaching development (Service 2016). The Santa Rosa Plain is essential to the survival and recovery of the Sonoma County California tiger salamander, Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine because it is where the majority of the current and historic range of each species exists. Conserving these species in the Santa Rosa Plain is necessary to maintain their geographic range to achieve recovery. The Recovery Plan (Service 2016) identifies actions to reduce the threats to these four species and ensure their long-term viability in the wild and allow for their removal from the list of threatened and endangered species.

Recovery Plan goals for these species are to:

1. Restore habitat conditions to sustain viable populations;

2. Maintain the current geographic, elevational, and ecological distribution;

3. Maintain the genetic structure and diversity of existing populations;

4. Protect and manage sufficient habitat to ensure that these species are able to adapt to unforeseen or unknown threats, such as climate change;

5. Re-introduce individuals to successfully establish new populations in historically occupied areas within the current distribution;

6. Minimize the effects of extant or potential threats;

7. Monitor species population trends across multiple years (and varied climatic conditions) to determine whether populations are sustainable; and

8. Manage occurrences on a case-by-case basis, with an emphasis on protections for identified Core Areas.

Sonoma County California tiger salamander

Much of the research on the biology and ecology of the California tiger salamander is from the Central DPS which is the same species as the Sonoma DPS but is separated geographically. Information presented herein is used interchangeably when life history, ecology, and biology may be shared between the Central DPS and Sonoma County DPS.

Description: The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998). Tiger salamanders exhibit sexual dimorphism; males tend to be larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. As adults, California tiger salamanders tend to have the creamy yellow to white spotting on the sides with much less on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the dorsal surface. The larvae have yellowish gray bodies, broad fat heads, large feathery external gills, and broad dorsal fins extending well up their back and range in length from approximately 0.45 to 0.56 inches (1.14 to 1.42 centimeters) (Petranka 1998).

Taxonomy: California tiger salamanders are endemic to the Santa Rosa Plain, the San Joaquin-Sacramento River valleys and bordering foothills, and the coastal valleys of Central California south to Santa Barbara. All California tiger salamanders are federally listed; however, they are listed as three unique entities: the Sonoma County DPS of California tiger salamander, the Santa Barbara DPS of California tiger salamander, and Central DPS of California tiger salamander. In our final listing rule, we determined that the Sonoma population of California tiger salamander is a DPS, as it is geographically isolated and genetically unique from the Santa Barbara and Central DPSs (Service 2003).

Habitat: The Sonoma County California tiger salamander inhabits vernal pools and seasonal ponds, associated grassland, and oak savannah plant communities (Service 2003). Sonoma County California tiger salamanders spend the majority of their lives underground in small mammal burrows in uplands, while ephemeral wetlands play a critical role because they are necessary for breeding.

California tiger salamanders depend on persistent small mammal (e.g., pocket gopher) activity to create, maintain, and sustain sufficient underground refugia (Loredo et al. 1996). These underground burrow systems are critical during the drier months of the year, though juveniles and adults use them throughout the year to grow and survive (Loredo et al. 1996; Pittman 2005; Seymour and Westphal 1994; Shaffer et al. 1993). California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Such underground refugia provide protection from the sun and wind associated with a dry California climate, which can otherwise desiccate (dry out) and kill amphibians in upland terrain.

Because they spend most of their lives underground, California tiger salamanders are rarely encountered, even in areas where they are abundant. Most evidence suggests that California tiger salamanders move, feed, and remain active in their underground dwellings (Trenham 2001;

Semonsen 1998; Van Hattem 2004). Adult California tiger salamanders are rarely seen except during nocturnal breeding migrations, which begin with the first seasonal rains, usually in November or December (Barry and Shaffer 1994).

Although historical breeding habitat for California tiger salamanders is natural vernal pools and ponds, they also use modified ephemeral or permanent ponds and manmade features such as constructed ponds or livestock ponds. This species is not known to breed in streams, rivers, or other flowing aquatic habitats (Cook et al. 2005). However, breeding individuals have been reported in roadside ditches in areas that contain seasonal wetlands. California tiger salamanders are sometimes found within permanent ponds; however these occupied permanent ponds do not typically have predatory fish or breeding bullfrog populations (Fisher and Shaffer 1996). Vernal pools and ephemeral ponds have been observed to better support larger populations than perennial wetlands, indicating that they provide higher-quality breeding habitat (Riley et al. 2003; Wang et al. 2011). Wang et al. (2011) studied Central California tiger salamander populations in both vernal pools and more permanent livestock ponds, and found that salamanders breeding in natural vernal pools had higher reproductive success and overall abundance than those breeding in livestock ponds. The absence of predatory fish species and non-native predators (e.g., bullfrogs) within the breeding pools plays a significant role in the reproductive success, as larvae are vulnerable to the predation (Shaffer et al. 1993). If these predator populations persist in the same habitat, they outcompete and prey upon salamander eggs and larvae. Thus, optimum breeding habitat holds water long enough to allow metamorphosis of salamanders from the larval stage into the air breathing juvenile lifestage (which takes at least three months every year), but not so long as to allow bullfrogs or non-native fish species to breed or survive (Petranka 1998). In Sonoma County, the available data suggest that most extant populations consist of relatively small numbers of breeding adults in the range of a few, to a few dozen pairs and populations that number above 100 breeding individuals are rare (CDFG 2010).

It is not evident whether the origin of the pool matters for habitat selection. Cook et al. (2005) studied Sonoma County California tiger salamander larvae capture rates and occupancy, and found that breeding activity was similar between constructed and natural vernal pools. Cook et al. (2005) did find that the probability of detecting Sonoma County California tiger salamander breeding activity was positively associated with pool depth, as years with higher annual rainfall amounts resulted in higher numbers of larvae. In drought years, ponds may not form at all, and the adults cannot breed (Barry and Shaffer 1994). Typically, breeding pools have moderate to high levels of turbidity. California tiger salamanders rarely use ponds with clear water (Bobzien and DiDonato 2007). The turbidity may help larvae and adults avoid predators.

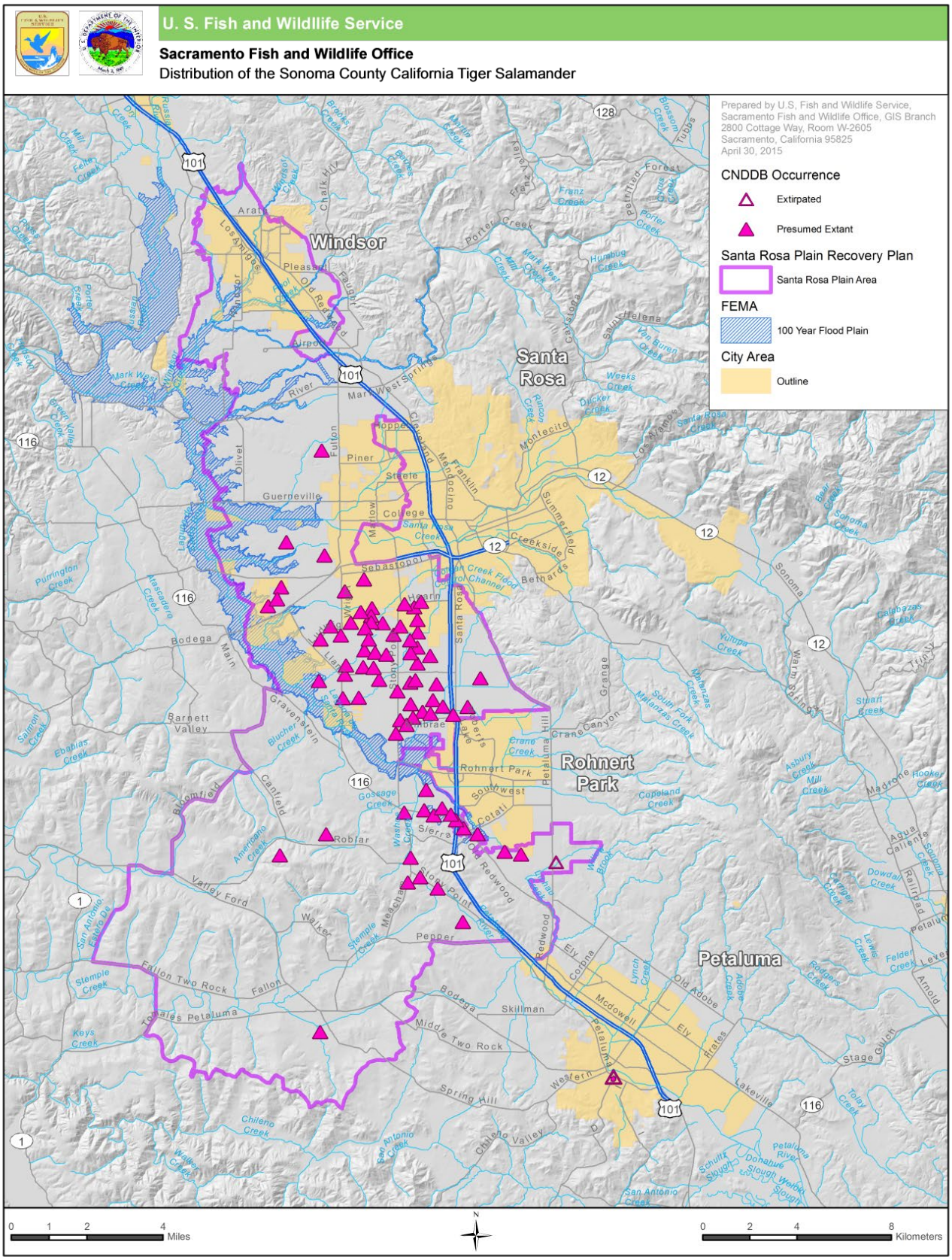
In addition to both upland and aquatic habitat that is essential to the Sonoma County California tiger salamander, maintaining connectivity between these two types of habitat is important for the long-term viability of the Sonoma County California tiger salamander. Connectivity can be maintained when there are large areas of upland habitat that contain multiple breeding wetlands within dispersal distance of each other.

Their home range ideally contains multiple breeding wetlands, which are necessary for the California tiger salamander to persist. If a local population becomes extinct due to unfavorable conditions, having connectivity between ponds is important to ensure that recolonization occurs at individual pond sites (Shaffer et al. 1993).

Distribution: The Sonoma County DPS is widely separated geographically from the closest Central DPS populations, which are located in Contra Costa, Yolo, and Solano counties. The Central DPS is separated from the Sonoma County DPS by the Coast Range, Napa River, and the Carquinez Straits, at a minimum distance of approximately 45 miles. No CNDDB occurrences of the Sonoma County

California tiger salamander exist in the intervening areas (CNDDB 2018). We have no evidence of natural interchange of individuals between the Sonoma County population and other California tiger salamander populations. The distribution is generally between Windsor and Petaluma (Figure 2).

Figure 2: Sonoma California Tiger Salamander Distribution



Within the *Action Area*, there is approximately 36,822 acres of low to high quality habitat (Figure 1) and the current core range of Sonoma County California tiger salamander encompasses approximately 18,000-20,000 acres of fragmented habitat (D. Cook, in literature, 2009). This distribution has been curtailed by urbanization, vineyard conversion, roads, and other development primarily in two areas in recent times: the Santa Rosa Air Center area (southwest Santa Rosa) where observations have decreased since the early 1990s; and in the south Cotati area, where salamanders were once commonly observed in the late 1980s to early 1990s (D. Cook, in literature, 2009).

The Recovery Plan delineated Core Areas and Management Areas. Core areas comprise the heart of the species historical (and current) range and represent central blocks of contiguously occupied habitat that functions to allow for dispersal, genetic interchange between populations, and metapopulation dynamics. Management Areas are occupied habitat peripheral to the species' core range (the Core Areas). However, the extent of the range is unknown due to poor survey coverage in peripheral areas. The delineation of Core Areas and Management Areas was based on known species ranges (based on CNDDB and Adopt Vernal Pool data), projections of potential species' range based on known habitat characteristics within adjacent areas (habitat in need of additional survey), or areas with the necessary conditions for potential restoration opportunities (Service 2016). Delineations have been made by geographic designators such as roads, creeks, or conservation area boundaries from the Strategy (Service 2016).

Threats: Threats to the Sonoma County California tiger salamander discussed in detail in the Recovery Plan are numerous and include the following (Service 2016):

1. Habitat Destruction and Loss
2. Habitat Alteration
3. Climate Change
4. Disease
5. Predation
6. Mortality from Road Crossings
7. Contaminants
8. Mosquito Control (Abatement)
9. Hybridization with Non-native Tiger Salamanders
10. Small Population Size

At the time of listing, we determined that the primary cause for the decline of the Sonoma County California tiger salamander was loss, degradation, and fragmentation of habitat as the result of urbanization (Service 2003). We still consider habitat loss and fragmentation to be the primary threat to the Sonoma County California tiger salamander (Service 2016).

Habitat Loss: It is estimated that, by 1990, 25 percent of the 28,000-acre range of the Sonoma County California tiger salamander within the Santa Rosa Plain had been converted to subdivisions, ranchettes, golf courses, and commercial buildings, while an additional 17 percent of this area had been converted to agricultural uses (Waaland *et al.* 1990). At the time of listing, five known breeding

sites had been destroyed in the previous 2 years (Service 2003). There were eight known remaining breeding sites distributed in the City of Santa Rosa and immediate associated unincorporated areas, an area approximately 8 km (5 mi) long by 6 km (4 mi) wide. At listing, we determined that all eight of these breeding sites were threatened by urbanization (Service 2003). A few new breeding sites have been discovered at the north end of Duer Road, within the Horn-Hunter Management Area of the Recovery Plan and southwest of Cotati within parts of the Americano Creek and Steple Creek watersheds (Service 2016). However, the latter is not included as part of the *Action Area*. An undetermined amount of land use conversions and intensive and routine agricultural practices are not reviewed for environmental compliance under the federal permitting process. It is expected that some new intensive agriculture including vineyard, row crops, cannabis grows, recycled water spray irrigation, and their infrastructure will occur within the Action Area.

Preserves: Since the Sonoma County California tiger salamander was listed, several Preserves have been established to offer credits or serve as compensation for the destruction or degradation of habitat. All are protected by conservation easements or owned by CDFW and have funding mechanisms for the perpetual management of the habitat. A summary of the majority of the sites is provided in the Recovery Plan (Service 2016).

Burke's Goldfields, Sebastopol Meadowfoam and Sonoma Sunshine

Threats: Threats to Burke's goldfields, Sonoma sunshine and Sebastopol meadowfoam discussed in detail in the Recovery Plan are numerous and include the following (Service 2016):

1. Urban development.

2. Conversion of habitat to incompatible agricultural uses.

3. Alteration of hydrology.

4. Encroachment of non-native plants.

5. Incompatible grazing levels and build-up of thatch.

6. Over-collection of seed and inoculum (soil containing seeds, plant parts, etc.) from extant locations for the purpose establishing additional new populations of the listed plants in Preserves.

7. Loss of genetic diversity and mixing from disrupted gene flow from habitat fragmentation and from inter-mixing gene pools as a result of moving seeds around the Santa Rosa Plain (Sloop *et al.* 2012b).

8. Reduction or loss of species-specific pollinators which could result in reduced seed production (Sloop *et al.* 2012b).

9. Increased potential for random or unpredictable extirpations of occurrences as a result of their isolation and already small size (Gilpin and Soule 1986, Patterson *et al.* 1994, CNDDB 2018).

10. Climate change that may result in overall warmer temperatures with greater unpredictability in rainfall (Field *et al.* 1999, Cayan *et al.* 2005, IPCC 2013).

Management: Cattle grazing may be an effective tool for maintaining species diversity and managing non-native plants (Hayes and Holl, 2003, Skaer *et al.*, 2013). Many native seasonal wetland plants are small and require an open environment to successfully germinate and reproduce; they compete for soil moisture and light resources with non-native grasses (Marty 2005). Cattle selectively forage on grasses which results in a more open canopy (Weiss 1999). However, since the time of listing, livestock grazing has been removed at many locations and cessation of cattle grazing has been found to exacerbate the negative effects of invasive nonnative plants on vernal pool inundation period. Where grazing has been removed, areas of bare soil can be quickly occupied by nonnative, invasive plants and develop layers of grass thatch that displace and inhibit germination of many vernal pool annual plants (Marty 2005). The CDFW is re-establishing appropriate grazing practices on some CDFW - owned Preserves to reduce thatch build-up and nonnative competitors to the three listed plants (e.g., Todd Road Unit Ecological Preserve).

Preserves: Since Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine were listed, several Preserves have been established to offer credits or serve as compensation for the destruction or degradation of habitat. All are protected by conservation easements or owned by CDFW and have funding mechanisms for the perpetual management of the habitat. A summary of the majority of the sites is provided in the Recovery Plan (Service 2016).

Burke's Goldfields

Description: Burke's goldfields is an annual herb that is typically less than 30 cm (11.8 in) tall (Ornduff 1993). It has hairy stems, which may be simple or branched. The narrow, opposite leaves are no more than 8 cm (3.1 in) long and may be lobed or not. From April to June, the end of each branch bears one daisy-like flower head approximately 1.5 cm (0.6 in) across. The fruits are achenes (dry, one-seeded fruits) less than 1.5 mm (0.06 in) in length. The fruits of Burke's goldfields can be distinguished from those of other goldfields by the presence of one long awn (bristle and numerous short scales) (Ornduff 1993). Individual Burke's goldfields plants may exhibit some geographic variation in morphology (McCarten 1985, Patterson *et al.* 1994).

Taxonomy: Ornduff (1966) published a comprehensive study of the genus *Lasthenia*, Burke's goldfields was then recognized as a distinct species and the name *Lasthenia burkei* was accepted widely. Continuing research indicated that Burke's goldfields, Fremont's goldfields, and Contra Costa goldfields (*Lasthenia conjugens*) form a closely related species group (Ornduff 1969*b*, Crawford and Ornduff 1989). However, Burke's goldfields was found to be genetically distinct from Fremont's and Contra Costa goldfields (Crawford and Ornduff 1989). *Lasthenia burkei* and its relatives are members of the aster family (Asteraceae).

Habitat: Burke's goldfields grows in vernal pools and wet meadows generally below 500 m (984 ft) (Chan and Ornduff 2012). In Sonoma County, the vernal pools containing Burke's goldfields are on nearly level to slightly sloping loams, clay loams, and clays. A clay layer or hardpan approximately 0.6 to 0.9 m (2 to 3 ft) below the surface restricts downward movement of water (Service 1991). Huichica loam is the predominant soil series on which Burke's goldfields is found on the northern part of the Plain (Patterson *et al.* 1994). Huichica loam is a fine textured clay loam over buried dense clay and cemented layers (Patterson *et al.* 1994). More southerly Burke's goldfields sites likely occur on Wright loam or Clear Lake clay (Patterson *et al.* 1994). Wright loam is a fine silty loam over buried dense clay and marine sediments. Clear Lake clay is hard dense clay from the surface to many feet thick (Patterson *et al.* 1994).

The primary habitats of Burke's goldfields are shallow vernal pools and wet swales within valley grassland and oak woodland habitats (CNDDB 2018). On the Plain, Burke's goldfields grows in the

bottoms of pools ranging from less than 25 cm (10 in) in depth to 50 cm (20 in) (Patterson 1990, Patterson *et al.* 1994, Patterson *in litt.* 2000). Burke's goldfields grows in naturally-occurring pools that range in surface area from approximately 2 square m (21.5 square ft) to 0.3 ha (0.75 ac (Patterson *in litt.* 2000). Most of the vernal pools where Burke's goldfields grows are loosely classified as northern vernal pools (Keeler-Wolf *et al.* 1998), but the Manning Flat occurrence in Lake County is in a northern volcanic ash flow vernal pool (Sawyer and Keeler-Wolf 1995). Burke's goldfields also has been observed occasionally in artificially-created depressions such as drainage ditches and in disturbed sites such as orchards and disked fields (Patterson 1990, Patterson *et al.* 1994) that formerly supported vernal pools.

Burke's goldfields grows at a wide range of elevations, which vary by region. The lowest-elevation occurrences are found between 27 and 46 m (90 to 150 ft.) on the Plain, and in the Alexander Valley, where it occurs at 52 m (170 ft.). The Ukiah occurrence is intermediate in elevation at 188 m (620 ft.). The Lake County occurrences are at the highest elevations, with one at 427 m (1,400 ft.) and the Manning Flat occurrence at 579 m (1,900 ft.) (CNDDB 2018).

Reproduction and Ecology: Burke's goldfields is an annual. Burke's goldfields typically germinates in autumn following heavy rains, although late initiation of rains may delay seedling emergence (Ornduff 1969b). Plants that establish in autumn under natural conditions may tolerate prolonged submergence, but do not begin rapid stem growth until vernal pools and swales dry down during late winter or early spring (Ornduff 1969b, Patterson et al. 1994). Flowering occurs any time between late-March and mid-June, although the typical flowering period is from mid-April to mid-May (Greene 1886, Ornduff 1966, Ornduff 1977b, Patterson et al. 1994); early dry and warm conditions favor early flowering. Seed set, maturation, and dispersal may occur from late-April to June, and may be prolonged by late rains or cool temperatures. Plants usually become senescent by early summer unless late-spring rains prolong reproduction (Patterson et al. 1994). Seed dispersal mechanisms are not known. Pappus awns (needle-like appendages attached to the achene) may assist in windborne seed dispersal. Other seed dispersal mechanisms may include water or wildlife.

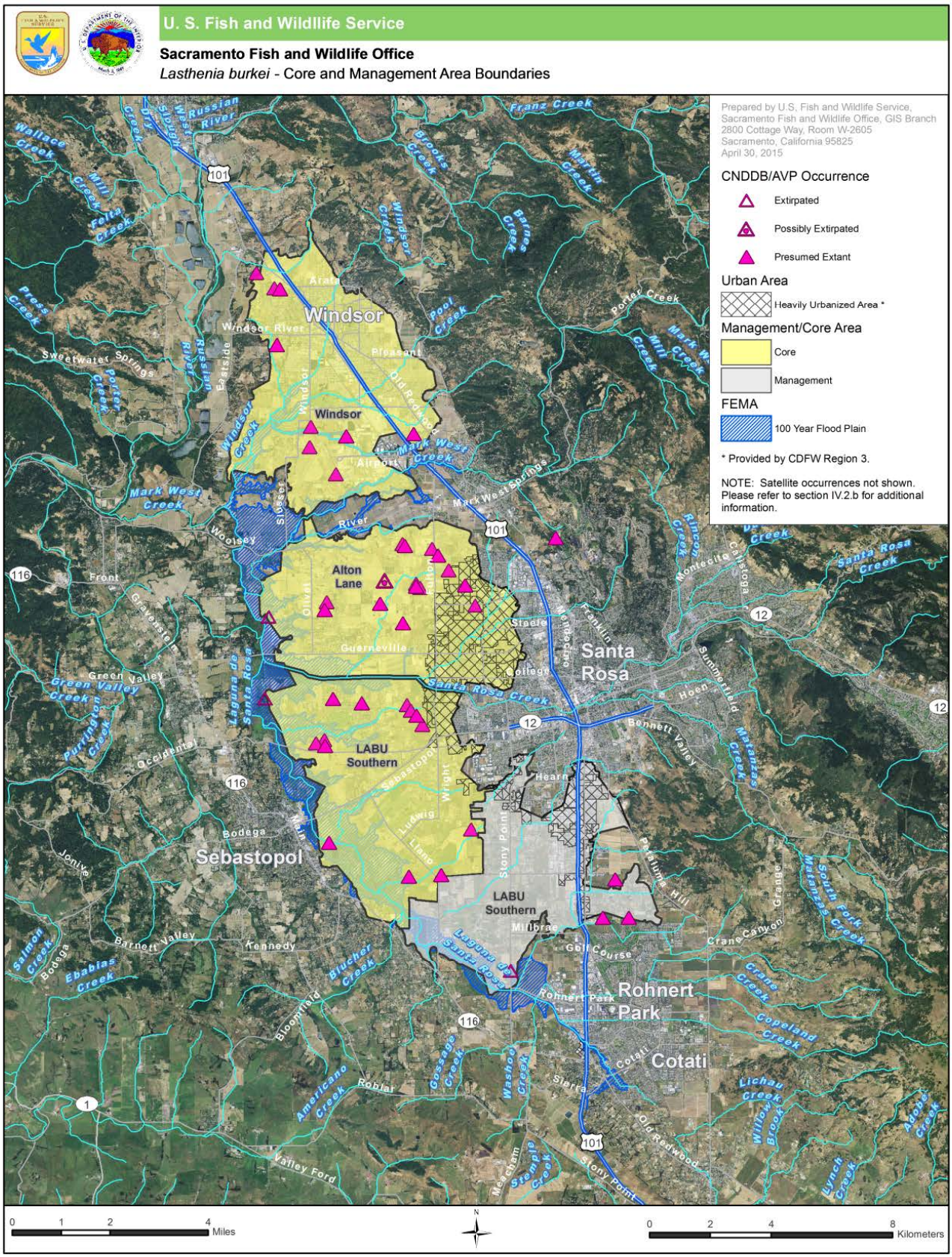
The flowers of Burke's goldfields are predominantly pollinated by outcrossing but they are capable of self-pollination (Sloop et al. 2012c). They are thought to be insect pollinated rather than wind-pollinated. Insects known to visit the flowers of the genus *Lasthenia* include butterflies, beetles, flies, true bugs, bees, and wasps (Thorp and Leong 1998). Most of these insects are generalist pollinators. All of the specialist pollinators of *Lasthenia* spp. are solitary bees (Thorp and Leong 1998). Gilmore, Sloop and Rank (2012) conducted a pollinator study of Burke's goldfields and found that although the solitary bee (*Andrena submoesta*) specializes on Burke's goldfields and is apparently dependent on it as a food source, the plant may not rely on *A. submoesta* for pollination (Gilmore et al. 2012). The Bombyliid fly (also called a bee fly), *Conophorus cristatus*, was found to be the dominant visitor of Burke's goldfields and may be its primary pollinator. Bee flies lay eggs near ground-nesting bees. Bee fly larvae are, depending on species, parasites of larvae of solitary bees and wasps, beetles, moths, grasshoppers, and other flies (Black et al. 2009). Syrphid flies (members of several genera in the family Syrphidae (hover flies) were also found to be an important part of the pollinator community for Burke's goldfields (Gilmore et al. 2012). Syrphid fly primary habitats are those with flowering plants, leaf litter, and soil within grasslands, rangelands, and meadows with limited tilling. Specifically, adult primary habitat are places with flowering plants. Overwintering larvae, pupae, and adults are found in leaf litter and soil and the larvae are generalist predators that feed on aphids (Hopwood et. al 2016). A variety of habitats including uplands, grasslands, and wetlands in the Santa Rosa Plain that support a diverse pollinator population and other flowering species for pollinators to visit are necessary for Burke's goldfields long term persistence.

Both the ray and disk flowers of all goldfields species produce achenes, increasing the potential for seed production per head. However, the reproductive output of individual plants is highly variable, depending on plant density and vigor, and probably on pollinator behavior as well. Each flower head can produce as many as 35 achenes, and the number of flower heads per plant can range from 1 to more than 20 (Patterson et al. 1994). Annual survival rates and other demographic parameters have not been investigated.

Burke's goldfields has also likely adapted to "risky environments" by producing a persistent seed bank. Some occurrences have reappeared after no plants were evident for 2 years, suggesting that viable seeds remained in the soil during that period (Patterson 1990).

Distribution: The core of the current range of Burke's goldfields is in the *Action Area* north of the community of Windsor to east of the city of Sebastopol with three occurrences south of Highway 12. The most current information from CNDDB, from survey data collected by the Adopt-a-Vernal Pool program, and from species experts is shown on Figure 3.

Figure 3: Burke's Goldfields Distribution



Most occurrences have been subjected to substantial loss or alteration of habitat (Service 2016) and are much smaller in area and numbers of plants than in the past (CNDDB 2018). Burke's goldfields occurrences continue to become increasingly fragmented in the area of the Town of Windsor and are now nearly extirpated from that area (P. Chamberlin pers. comm. 2008). It is unknown to what extent occurrences have been lost entirely due to development or other human-caused ground-disturbing activities because they were lost prior to being documented.

Occurrence sizes for Burke's goldfields and other vernal pool annuals are difficult to document by numbers of plants because they fluctuate greatly from year to year. The particular conditions that contribute to large occurrences in certain years are not well understood. Most Burke's goldfields occurrences contain a few hundreds or thousands of plants (CNDDB 2018). The largest known occurrences are at the Alton Lane Vernal Pool Preserve (Occurrence 25), with approximately 1.4 million plants in 2013; at the Wright Preservation Bank (Occurrence 28) where the occurrence has ranged from approximately 5.3 million to 1 million over the past 5 years; Slippery Rock Conservation Bank (Occurrence 28), where the occurrence has ranged from 15,059 in 2007 to over 3.1 million in 2015, and the occurrence east of Fulton Road near Piner Road (Occurrence 19), where the occurrence has ranged between 350 plants in 1998 to 18.5 million plants in 2009; 24,860 were found at this site in 2012 (CNDDB 2018).

Burke's goldfields growing at Alton Lane, Alton North Conservation Bank, Hale Mitigation Bank, Horn Mitigation Bank Phases 2 and 3, Slippery Rock Conservation Bank, Proposed Windmill mitigation site (former proposed Horn Mitigation Bank Phase 5), Woodbridge Preserve, and Wright Preservation Bank are introduced from other sites on the Santa Rosa Plain into restored vernal pool habitat. These efforts have increased the distribution in the Santa Rosa Plain or perhaps re-established the plants in those locations. A study is underway to gather genetic information and perform controlled transplant experiments to provide information to inform future decisions about seed translocation that will both preserve remaining genetic variation within Burke's goldfields while maximizing the success of populations that are introduced into created habitat (Emery 2016)

Sebastopol Meadowfoam

Description: Sebastopol meadowfoam is an annual herb of the false meadowfoam family(Limnanthaceae) with weak, somewhat fleshy, decumbent stems up to 30 cm (11.8 in) long (stems grow longest when the plant is submerged while actively growing). The seedlings are unusual among Limnanthes species in that they have entire leaves. Leaves of mature plants are up to 10 cm (3.9 in) long and have 3 to 5 leaflets that are narrow and unlobed with rounded tips. Although the first leaves are narrow and undivided, leaves on the mature plant have three to five undivided leaflets along each side of a long stalk (petiole). The length of the petiole also appears to be promoted by submergence. The shape of the leaves distinguishes Sebastopol meadowfoam from other members of the Limnanthes genus by having entire leaves as opposed to lobed leaves.

Sebastopol meadowfoam has fragrant, white flowers during April and May. The flowers are borne in the leaf axils (upper angle between leaf and stem), are bell- or dish shaped, with petals 12 to 18 mm (0.47 to 0.71 in) long. The sepals (green outermost whorl of flower parts that enclose the bud) are shorter than the petals, which turn outward as the nutlets (small, dry nuts) mature. The nutlets are dark brown, 3 to 4 mm (0.12 to 0.16 in) long, and covered with knobby pinkish tubercles (small wartlike projections) (Ornduff 1969a, Brown and Jain 1977, Hauptli et al. 1978, Wainwright 1984, Patterson et al. 1994, Ornduff and Morin 2012). The seeds of Sebastopol meadowfoam germinate after the first significant rains in fall. Repeated drying and filling of pools in the spring favors development of large plants with many branches and long stems.

Taxonomy: The earliest collection of Sebastopol meadowfoam was made in 1946 "between Bodega and Petaluma, south of Sebastopol" but this record most likely represents a site near Sebastopol (Wainwright 1984). The species was described in 1969 by Ornduff (1969a). The type locality for Sebastopol meadowfoam is Todd Road, just west of the intersection with Llano Road, which is near Sebastopol in Sonoma County (Ornduff 1969a).

Habitat: Sebastopol meadowfoam grows in northern basalt flow and northern hardpan vernal pools(Sawyer and Keeler-Wolf 1995), wet swales and meadows, on the banks of streams, and in artificial habitats such as ditches (Wainwright 1984; CNDDB 2018). Sebastopol meadowfoam grows in both shallow and deep areas, but is most frequent in pools 25 to 51 cm (10 to 20 in) deep (Patterson et al. 1994). The species is most abundant in the margin habitat at the edge of vernal pools or swales (Pavlik et al. 2000, 2001). Most confirmed occurrences of Sebastopol meadowfoam on the Santa Rosa Plain grow on Wright loam or Clear Lake clay soils (Patterson et al. 1994, CNDDB 20018). A few occurrences are on other soil types, including Pajaro clay loam, Cotati fine sandy loam, Haire clay loam (Patterson et al. 1994) and Blucher fine sandy loam (Wainwright 1984).

The surrounding plant communities range from oak savanna, grassland, and marsh in Sonoma County to riparian woodland in Napa County (CNDDB 2018). Sebastopol meadowfoam occurs at elevations of 15 to 41 m (50 to 135 ft) throughout most of its range, including Napa County. The Knights Valley occurrence, in Sonoma County, was at 116 m (380 ft) (CNDDB 2018).

Reproduction and Ecology: According to Patterson *et al.* (1994), the seeds of Sebastopol meadowfoam germinate after the first significant rains in fall, although late initiation of rains may delay seed germination. Sebastopol meadowfoam plants grow slowly underwater during the winter, and growth rates increase as the pools dry. Repeated drying and filling of pools in the spring favors development of large plants with many branches and long stems. Sebastopol meadowfoam begins flowering as the pools dry, typically in March or April. The largest plants can produce 20 or more flowers. Flowering may continue as late as mid-June, although in most years the plants have set seed and died back by then. Each plant can produce up to 100 nutlets.

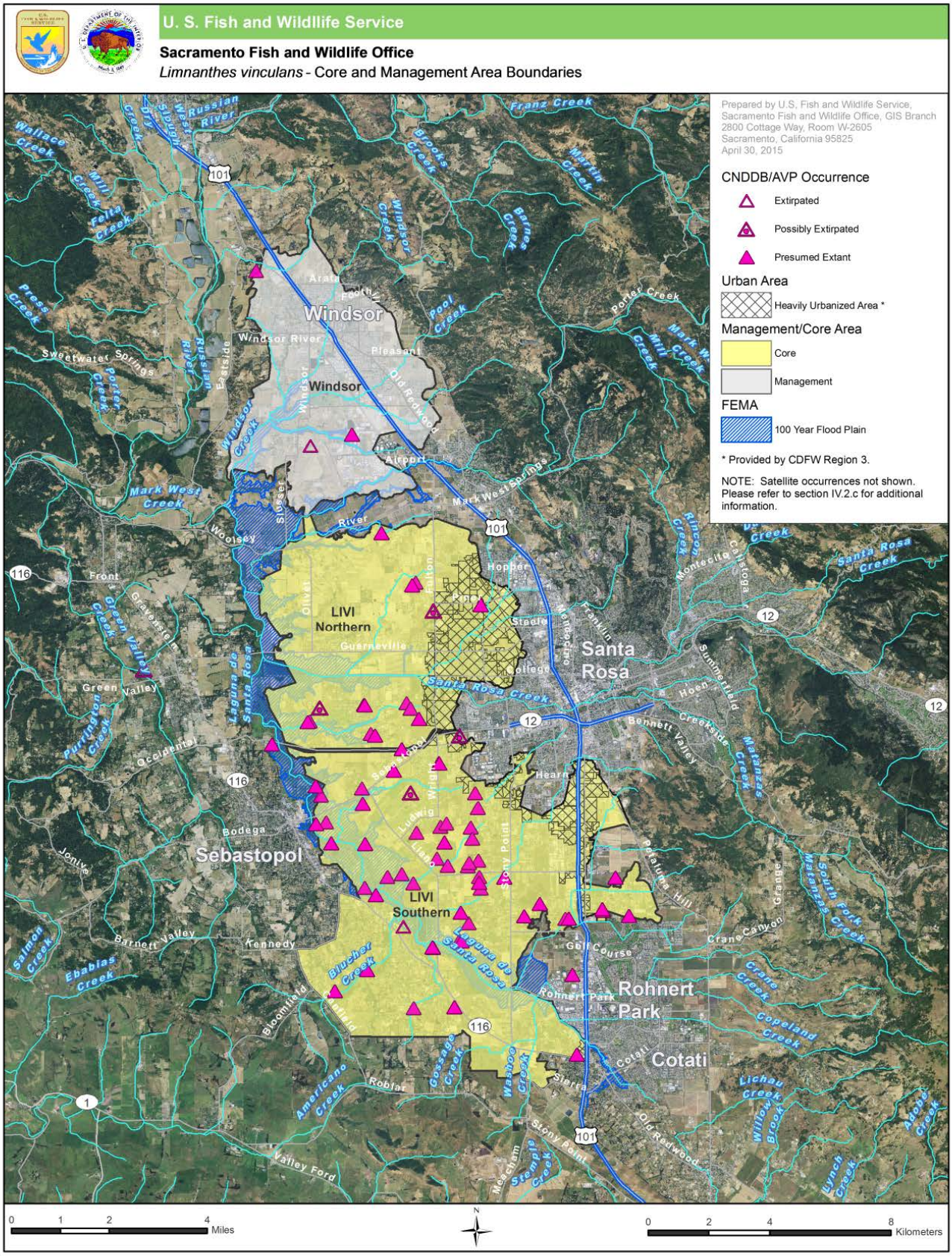
Nutlets of Sebastopol meadowfoam likely remain dormant in the soil, as has been noted in other species of *Limnanthes* (Patterson et al. 1994). For example, in the late 1980s and early 1990s, a site in Cotati remote from other Sebastopol meadowfoam occurrences was surveyed for several years by independent qualified botanists. None of these botanists identified flowering occurrences of Sebastopol meadowfoam on the project site. Conditions of the pools on the site were highly degraded by wallowing hogs (*Sus scrofa*) and subsequent eutrophication (over enrichment by nutrients) of the pools. Following several years of negative surveys, 12 plants of Sebastopol meadowfoam emerged simultaneously in one pool in the first year following removal of hogs.

A study by Gilmore et al. (2012) found that Sebastopol meadowfoam was visited most frequently by Bombyliid flies in the genus *Conophorus*. Bee flies lay eggs near ground-nesting bees. Bee fly larvae are, depending on species, parasites of larvae of solitary bees and wasps, beetles, moths, grasshoppers, and other flies (Black et al. 2009). Two species of Limnanthes specialist bees, *Panurginus occidentalis* and *Andrena pulverea* (*A. limnanthis* in older literature), pollinate Sebastopol meadowfoam. *Andrena pulverea* survives drought years, when few meadowfoams reach flowering, by remaining inactive for 2 years or more (Thorp 1990). A variety of habitats including uplands, grasslands, and wetlands in the Santa Rosa Plain that support a diverse pollinator population and other flowering species for pollinators to visit are necessary for Sebastopol meadowfoam long term persistence.

Jain (1984) determined that the rate at which Sebastopol meadowfoam flowers were fertilized by pollen from other Sebastopol meadowfoam flowers rather than self-pollination (outcrossing rate) was 10 to 50 percent. Mechanisms for dispersal of nutlets in this species have not been studied. Likely dispersal agents include water (Wainwright 1984), birds, and livestock (Jain 1978). Jain (1978) studied dispersal of nutlets similar to those of Sebastopol meadowfoam in two species of meadowfoam, *L. bakeri* (Baker's meadowfoam) and *L. striata* (striped meadowfoam). Nutlets of *L. bakeri* did not disperse beyond the point where they were placed. Nutlets of *L. striata* moved a short distance within the same pool where they were placed but did not disperse to other pools (Hauptli *et al.* 1978, Jain 1978).

Distribution: The current status of numerous Sebastopol meadowfoam occurrences is unknown; however, the most current information for this species in the Recovery Plan (Service 2016) indicates that there are 33 occurrences of Sebastopol meadowfoam that are presumed extant on the Santa Rosa Plain of which at least 3 have been introduced and 5 occurrences that are extirpated or possibly extirpated (Figure 4).

Figure 4: Sebastopol Meadowfoam Distribution



Although many occurrences have been surveyed in recent years, several others have not been visited in over 20 years in part due to lack of access to the sites. Occurrences are distributed throughout the Santa Rosa Plain, but most are south of Santa Rosa Creek. As with the two other listed plants species, occurrences of Sebastopol meadowfoam can vary greatly in area and numbers of plants from year to year. In summary, Sebastopol meadowfoam inhabits the *Action Area* based on the recent observations, the biology and ecology of the species, and the presence of suitable habitat.

Sonoma Sunshine

Description: Sonoma sunshine plants are less than 30 centimeters (cm) (11.8 inches (in)) tall with alternate, linear leaves (Ornduff 1977*a*, Baldwin 2012). The leaves have smooth margins and are 5.1 to 15.2 cm (2.0 to 6.0 in) long with zero to five lobes (Baldwin 2012).

From March to May, the plants have a butter-yellow, daisy-like flower head at the tip of each branch. Each flower head is less than 1.5 cm (0.6 in) across. The 6 to 15 outer petals are 5 to 7 millimeters (mm) (0.20 to 0.28 in) long. Occasionally the flowers may be white instead of yellow. The pollen is white.

The flowers produce tapered achenes (dry, one-seeded fruits) that are 3 to 4 mm (0.12 to 0.16 in) long and have 4 to 6 sharp angles along the sides. The achenes are covered with tiny bumps and become slimy when wet giving the species one of its common names, "Baker's sticky seed" (Ornduff 1963, Munz and Keck 1968, Ornduff 1977*a*, Baldwin 2012).

Taxonomy: Sonoma sunshine is an annual plant in the aster family. It has been known by the scientific name Sonoma sunshine (Heiser) since it was first described by Heiser (1947). Two other species are recognized in the genus Blennosperma; *B. nanum* (dwarf blennosperma) grows in California and *B. chilense* (Chilean blennosperma) occurs in Chile (Baldwin 2012).

Habitat: Sonoma sunshine grows in vernal pools, the grassy margins of swales (shallow channels that connect vernal pools), and seasonally wet grasslands at elevations ranging from 21 to 43 m (70 to 140 ft) on the Santa Rosa Plain (Baldwin 2012, CNDDB 2018). The vernal pools supporting Sonoma sunshine are of two types: northern hardpan (Sawyer and Keeler-Wolf 1995) and an unclassified type loosely referred to as northern vernal pools (Keeler-Wolf et al. 1998). On the Santa Rosa Plain, vernal pools and swales are found within valley oak woodlands and north coastal prairie grasslands (CH2M Hill 1995). Sonoma sunshine typically grows in shallow vernal pools, 30 to 50 cm (12 to 20 in) deep, and in swales (Patterson 1991, Patterson et al. 1994, CNDDB 2018). It may occur in swale bottoms, but more commonly grows near the upper edges (margins) or high-water lines of vernal pools. This pattern could be due to competition or dispersal patterns. This species typically is more abundant in portions of vernal pools and swales which lack dense cover of nonnative plants, matted leaf litter, or algal mats.

Throughout its range, Sonoma sunshine occurs in vernal pools on nearly level to slightly sloping loams, clay loams, and clays. A clay or hardpan layer typically occurs 0.6 to 0.9 m (2 to 3 ft) below the surface and restricts downward movement of water (Service 1991). The two disjunct groupings of Sonoma sunshine occurrences on the Santa Rosa Plain occur on different soil types (Patterson et al. 1994). Sonoma sunshine primarily grows on Huichica loam north of Highway 12 and on Wright loam and Clear Lake clay south of Highway 12 (Patterson et al. 1994). Huichica loam is a fine-textured clay loam over buried, dense clay and cemented layers. Wright loam is a fine silty loam over buried, dense clay and marine sediments. Clear Lake clay is hard, dense clay extending downwards from the surface (Patterson et al. 1994).

Reproduction and Ecology: Sonoma sunshine is an annual; its entire life cycle from seed germination to seed set is completed in a single growing season. In nature, Sonoma sunshine seeds germinate in the fall following heavy rains, and the plants can grow even when submerged (Patterson *et al.* 1994). The specific conditions that trigger seed germination in nature are not known, but Sonoma sunshine seeds can germinate in as little as 3 days after wetting in the greenhouse. Seeds that were collected on the Santa Rosa Plain in 1989 and 1990, and maintained in cold storage, germinated readily when they were covered with a thin layer of soil and moistened (Mistretta *in litt.* 1991). A large percentage of seed (78 percent to 98 percent) germinated in such tests. This species usually blooms before other vernal pool plants such as *Limnanthes* spp. (meadowfoam), *Downingia* spp. (downingia), and *Lasthenia* spp. (goldfields) (Thorp and Leong 1998).

Sonoma sunshine typically flowers in March and April (Munz and Keck 1968, Ornduff 1977*a*) but has been observed in flower as early as December (Ashley and Waaland 1990) and as late as mid-May (Patterson *et al.* 1994). The achenes probably mature by early summer (May and June) as adult plants die, as is true for the closely related dwarf blennosperma (*B. nanum*) (Ornduff 1963). Dispersal mechanisms for the achenes have not been studied.

Like many other plants native to vernal wetlands, Sonoma sunshine likely forms a persistent soil seed bank. Small populations of Sonoma sunshine (those with fewer than 500 adult plants) are likely to remain dormant in the seed bank, and therefore undetected, during years of unfavorable conditions. For example, an occurrence located 5 miles south of El Verano in Sonoma Valley was considered to be extirpated in 2008; however, plants were observed at the site in 2011 and the occurrence is now considered extant (CNDDB 2018). Therefore, caution should be used before declaring that an occurrence of this species has been extirpated. The longevity of dormant Sonoma sunshine seeds is not known. In a seedbank study of Sonoma sunshine and Sebastopol meadowfoam by Sloop and Brown (2012a), Sonoma sunshine seed was found from the soil surface to a depth of 7.6 cm (3 in).

A pollinator study by Gilmore *et al.* (2012) showed that Sonoma sunshine has a diverse pollinator community due to the higher number of generalist native bees visiting the plants. A diverse pollinator community benefits a plant species by reducing the risk of insufficient pollination and seed set as a result of pollinator loss (Gilmore *in litt.*, 2014). The most abundant native pollinator of Sonoma sunshine was the solitary bee, *Andrena blennospermatis*. Solitary bees are mostly native bees that do not form colonies. Each female bee constructs its own nest most commonly in tunnels in the ground. Other pollinators that visited Sonoma sunshine included *Apis mellifera* (European honeybee), four species of generalist native bees, and syrphid flies. In the vernal pools that supported Sonoma sunshine, solitary bees were more abundant in natural vernal pools than in created pools (Gilmore *et al.* 2012). Syrphid flies (members of several genera in the family Syrphidae (hover flies) were also found to be an important part of the pollinator community for Sonoma sunshine (Gilmore et al. 2012). Syrphid fly primary habitats are those with flowering plants, leaf litter, and soil within grasslands, rangelands, and meadows with limited tilling. Specifically, adult primary habitat are places with flowering plants. Overwintering larvae, pupae, and adults are found in leaf litter and soil and the larvae are generalist predators that feed on aphids (Hopwood et. al 2016). A variety of habitats including uplands, grasslands, and wetlands in the Santa Rosa Plain that support a diverse pollinator population and other flowering species for pollinators to visit are necessary for Sonoma sunshine long term persistence.

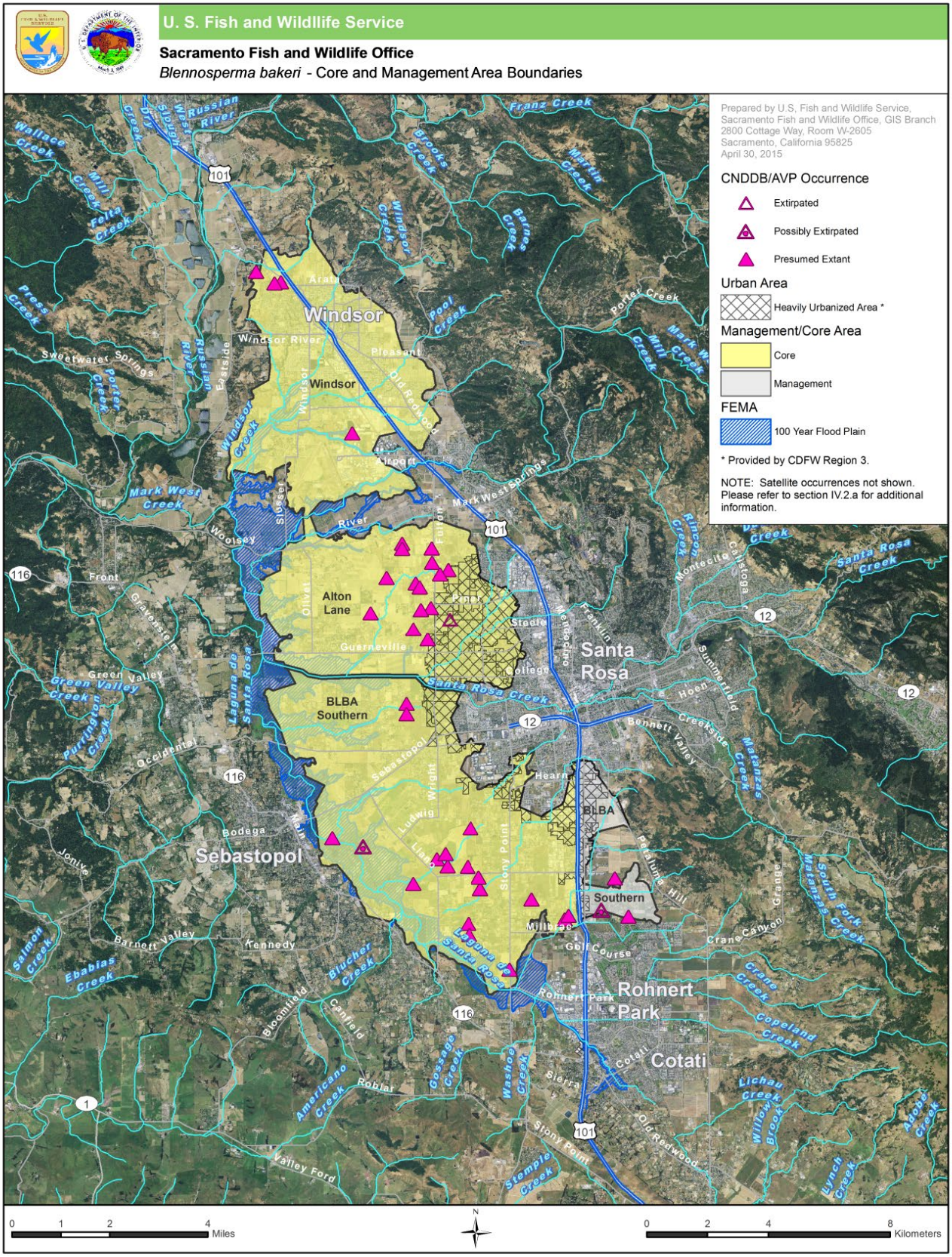
Only certain aspects of the demography of Sonoma sunshine have been studied. The total number of achenes produced per plant varies because the number of flower heads is not consistent. Under dry conditions, or in dense populations, Sonoma sunshine may bear only a single flower head per plant (Patterson *et al.* 1994), thus producing a maximum of 15 achenes. However, when pools dry

and fill repeatedly in a single growing season, each plant may produce as many as 20 flower heads (Patterson *et al.* 1994), with potential for 300 achenes per plant. Seed dispersal mechanisms are not known.

As an annual species, it is expected that Sonoma sunshine will respond to stochastic environmental events, such as changes in vegetative composition, climate, and disturbance, by partial germination of its seed bank. Baskin and Baskin (1998) indicate that species that are adapted to "risky environments" produce persistent seed banks to offset years of low reproductive success and to ensure the species can persist at a site without immigration. Considering the adaptations of these plants to a variable Mediterranean climate, it is likely that the seed of Sonoma sunshine can persist in the seed bank for an undetermined number of years. Although formal studies of seed viability have not been conducted for this species, it is reasonable to expect its seed bank may persist for extended periods without germination until conditions are favorable to allow germination. Seeds of this species have been stored artificially for up to 6 years with little loss of viability, but those stored for 10 or more years have not germinated (Patterson *in litt.* 2000). The maximum duration of viable seed in the soil is not known, however, smaller seeds, such as those produced by Sonoma sunshine, tend to withstand longer periods of dormancy than larger seeds (Service 2016).

Distribution: Sonoma sunshine occurs only in Sonoma County with the majority on the Santa Rosa Plain. In the Santa Rosa Plain, the species ranges from near the community of Windsor in the north to Rohnert Park in the south. Sonoma sunshine has been introduced to at least 12 sites during mitigation activities or to establish conservation banks within the historical range of the species. The most current occurrence information for this species in the Recovery Plan (Service 2016) indicates the presence of 18 extant occurrences and five extirpated or possibly extirpated occurrences (Figure 5).

Figure 5: Sonoma Sunshine



Some occurrences have been fragmented into multiple locations. Populations exhibit extreme fluctuations in size among years, often varying by one or two orders of magnitude (CNDDB 2018). Individual occurrence sizes ranged over time from fewer than 100 plants to more than 1.5 million plants (CNDDB 2018). Collection of annual abundance data has been sporadic; therefore, determination of population trends is difficult.

Status and Environmental Baseline of Sonoma California Tiger Salamander Critical Habitat

The Service published a notice in the Federal Register to propose critical habitat for the Sonoma County California tiger salamander DPS (Service 2009). On August 31, 2011, approximately 47,383 acres were designated as critical habitat (Service 2011). Approximately 252 acres of Graton Rancheria trust lands were excluded based on the benefits of a finalized management plan that provides for the long-term protection of Sonoma California tiger salamander habitat. Approximately 42,041 acres of designated critical habitat are within the *Action Area* (Figure 1).

Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection and; (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.l2(b). The Service is required to list the known PCEs together with the critical habitat description. Such physical and biological features include, but are not limited to, the following:(1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, or dispersal and; (5) generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the following PCEs are essential to the conservation of the Sonoma County California tiger salamander:

- PCE 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/early spring and hold water for a minimum of 12 consecutive weeks in a year of average rainfall);

- PCE 2: upland habitats adjacent and accessible to and from breeding ponds that contain small mammal burrows or other underground refugia that Sonoma County California tiger salamanders depend upon for food, shelter, and protection from the elements and predation; and

- PCE 3: accessible upland dispersal habitat between occupied locations that allow for movement between such sites.

A single unit was designated as critical habitat for the Sonoma County California tiger salamander (Service 2011). The Santa Rosa Plains Unit is located 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 were 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 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. 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. Designated critical habitat excludes the urbanized centers of Santa Rosa, Bennett Valley, Rohnert Park, and Cotati. These urban centers consist almost exclusively of hardened, developed landscapes. The remnant natural habitat within these areas is limited to small, isolated parcels within a matrix of urban development. These areas are not included in the final rule because developed areas (lands covered by buildings, pavement, and other structures) lack the physical or biological features essential to the conservation of the species, according to section 3(5)(A) of the Act. We also do not consider the remnant open space within these city centers as essential for the conservation of the Sonoma County California tiger salamander. However some of these areas have been left inside the critical habitat boundaries shown on the maps of the final rule due to the mapping, but have been excluded by text in the final rule, and are not designated as critical habitat. This includes approximately 636 acres east of Stony Point Road and following the urban growth boundary east along Bellevue Avenue and south along Juniper Avenue to the intersection of Scenic Avenue and Highway 101.

The recovery role of critical habitat in the *Action Area* includes opportunities for providing suitable aquatic and upland habitat that supports one or more life stages of the Sonoma County California tiger salamander. With the designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the PCEs sufficient to support the life-history functions of the species. Not all life-history functions require all the PCEs and not all areas designated as critical habitat will contain all the PCEs. Refer to the final designation of critical habitat for Sonoma County California tiger salamander for additional information.

The *Action Area* includes the Santa Rosa Plains Unit for the Sonoma DPS of the California tiger salamander. The critical habitat unit was known to be occupied by Sonoma County California tiger salamanders at the time of listing. This unit is currently occupied by, and contains the following aquatic and associated upland features that are essential for the conservation of the species: vernal pool complexes and manmade ponds that are currently known to support breeding Sonoma County California tiger salamanders (PCE 1), upland habitats with underground refugia (PCE 2), and upland dispersal habitat allowing movement between occupied sites (PCE 3). Some areas already have anthropogenic stressors associated with intensive agricultural uses such as vineyards, urban and rural development, or disking for fire prevention. Approximately 1,418 acres of Preserves exist within designated critical habitat.

Effects of the Action

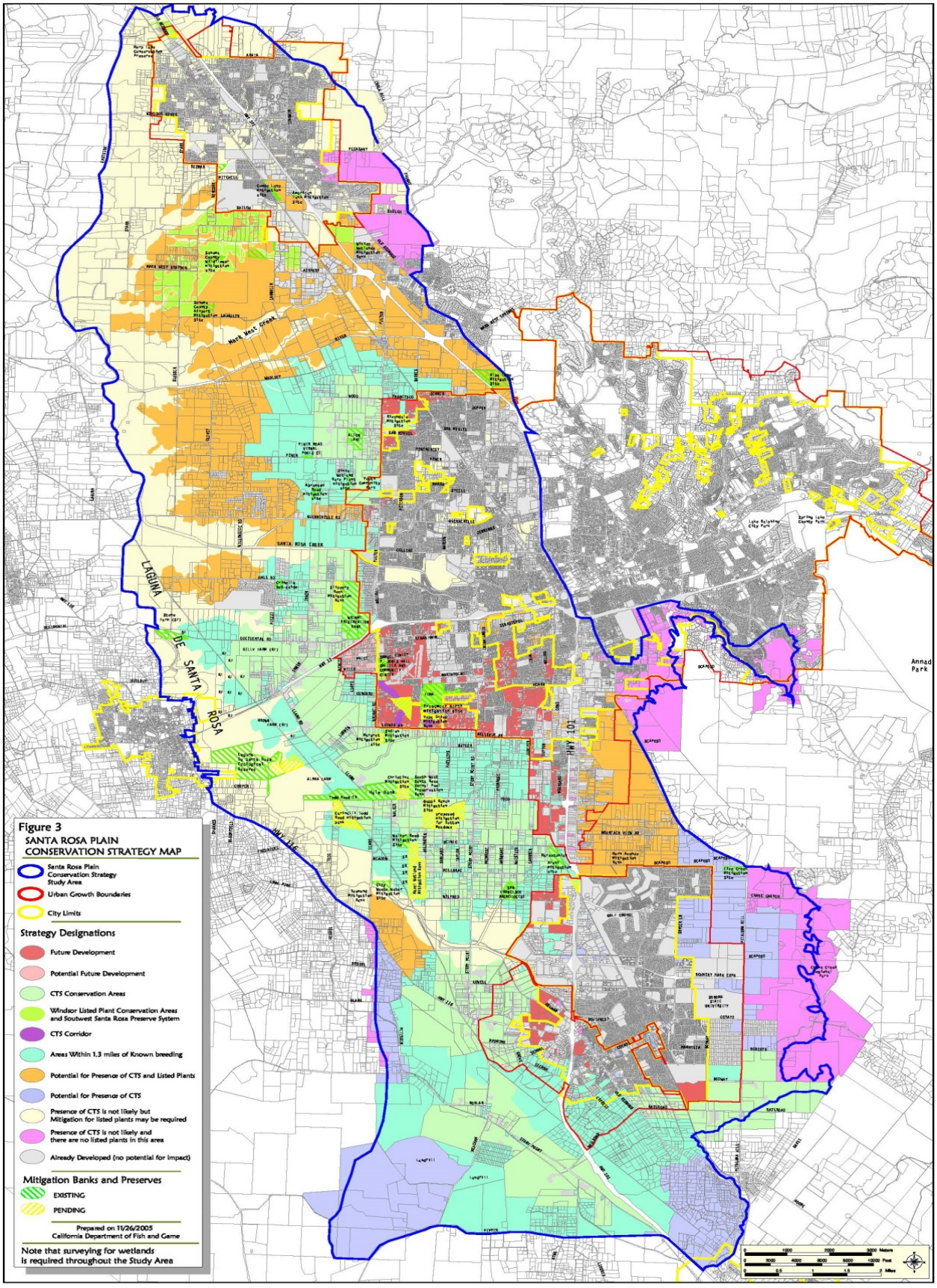
Adverse effects to the Sonoma County California tiger salamander and its critical habitat, and to Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine are expected to be caused primarily from urbanization related projects such as developing homes, industrial units, roads, and infrastructure. Project(s) appended to this programmatic biological opinion must adhere to the conservation measures described in the *Description of the Action* and are anticipated to protect and conserve the Sonoma County California tiger salamander, Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine.

Effects to Sonoma County California Tiger Salamander

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

Sonoma County California tiger salamanders within the Action Area of each project appended to this biological opinion will be subject to injury and death due to project activities. The majority of projects that adversely affect Sonoma County California tiger salamander and its habitat will likely be within the urban growth boundaries of the Cities of Santa Rosa, Cotati and Rohnert Park (Table 1 and Figure 6) (Conservation Strategy Team 2005). Some smaller projects may occur outside of the urban growth boundaries (Figure 6) within the Action Area due to rural residential, road, and other miscellaneous projects within Sonoma County jurisdiction. The area in which Sonoma County California tiger salamanders will be subject to injury and death is approximately 1,541 acres in Santa Rosa, 203 acres in Cotati, 203 acres in Rohnert Park, and 27 acres in the Town of Windsor.

Figure 6: Santa Rosa Plain Conservation Strategy Map



Injury and Mortality of Individuals

Ground Disturbance and Construction: Ground disturbance and construction activities associated with developing homes, industrial units, roads, and infrastructure will cause temporary and permanent loss of water bodies utilized by the species for breeding and maturation of larvae to metamorphs capable of living in the uplands, and also cause a loss of upland habitat used for dispersal, refugia, and foraging. Sonoma County California tiger salamanders that are using small mammal burrows or cracks in the soil within the construction footprint of the proposed action, are likely to be injured or killed during grading and ground compaction activities as burrows are crushed or as inhabitants of burrows are entombed or crushed. Sonoma County California tiger salamanders may be killed or injured from inadvertent trampling by workers and operation of construction equipment during construction activities. Construction activities will cause noise and vibration and will disturb Sonoma County California tiger salamanders causing them to leave their upland refugia and increase their exposure to desiccation and predation. Sonoma County California tiger salamanders will on occasion become trapped in open excavations or construction trenches, making them vulnerable to desiccation, starvation, and predation. While these effects are reasonably likely, they will be minimized by the conservation measures described in the *Minimization Measures and Best Management Practices* section above.

Roads: After initial ground disturbance for widening or building new roads, injury and mortality will occur when Sonoma County California tiger salamander attempt to cross new or widened roads during dispersal and migration in the fall and winter. Injury and mortality is expected to increase as a result of increased traffic. Road widening, new roads, or the placement of curbs at road edges, and constructed barriers within medians and along roadways which impede salamander movement will cause individuals more vulnerable to being run over by a vehicle (D. Cook, in literature, 2009). Injury and mortality of Sonoma California tiger salamander on roads in the Santa Rosa Plain is well documented (Cook 2008). Wildlife passages constructed as a minimization measure for some authorized projects will provide for movement of Sonoma County California tiger salamanders across roads, highways, or other anthropogenic barriers and will allow individuals to disperse into upland refugia and breeding habitat preventing road strikes (Cook 2008, Baine et. al. 2017).

Exposure to Contaminants: The construction of buildings and roadways, as well as the repair and use of roadways can expose Sonoma County California tiger salamanders to chemical contaminants. Substances used in road building materials or to recondition roads can drift or wash off into nearby habitat. Vehicles may leak hazardous substances such as motor oil and antifreeze. Sonoma California tiger salamanders may come into contact with these substances while migrating. Sonoma California tiger salamanders will absorb these contaminants through their skin, causing sickness and death, reducing fitness for the local population. Implementation of conservation measures related to managing stormwater runoff, fueling, storage of hazardous materials; having a spill containment plan in place; and informing project personnel of the importance of these measures, will reduce the potential for adverse effects from contaminants.

Habitat Loss, Degradation and Fragmentation

Ground Disturbance and Construction: Ground disturbance and construction activities associated with developing homes, industrial units, roads, and infrastructure in the Santa Rosa Plain will fill in, modify, and degrade wetlands causing permanent losses of wetlands utilized by the species for breeding and maturation of larvae to metamorphs. Grading within uplands and subsequent construction of homes, industrial units, roads, and infrastructure will cause a loss of upland habitat used for dispersal, refugia, and foraging. Much of the permitted housing development projects in recent years have been within the urban growth boundary of Santa Rosa and we expect a similar

trend in the next 5 to 10 years. Development will likely be a combination of infill projects causing a varied mix of habitat loss, degradation and fragmentation as the area within the urban growth boundary becomes built out. Sonoma County California tiger salamander habitat loss is estimated at approximately 1,541 acres in Santa Rosa, 203 acres in Cotati, 203 acres in Rohnert Park, 27 acres in the Town of Windsor in an area that has various levels of fragmented and isolated habitat. Some projects causing habitat loss may be authorized to occur outside of the urban growth boundaries and are not expected to compromise contiguous land with Sonoma County California tiger salamander wetland and upland habitat.

Homes, Industrial Units, Roads, and Infrastructure: Habitat fragmentation is an effect of habitat loss and occurs when remaining populations are isolated because the links between habitat patches have been destroyed. Habitat fragmentation also plays a role in reducing Sonoma County California tiger salamander abundances. California tiger salamanders require a large amount of barrier-free landscape for successful migration (Shaffer *et al.* 1993; Loredo *et al.* 1996). Urbanization can create permanent barriers that can isolate California tiger salamanders and prevent them from moving to new breeding habitat, or prevent them from returning to their breeding ponds or underground burrow sites. Roads and highways also create permanent physical obstacles and increase habitat fragmentation (Service 2003).

Permitted homes, industrial units, roads, and infrastructure will form barriers between habitats preventing Sonoma County California tiger salamander individuals from dispersing and migrating successfully to breeding wetlands. The effect will likely reduce breeding success in isolated breeding sites and prevent recolonization of those breeding sites from migrating salamanders. This will drive local populations to extinction and may happen within a short amount of time. One example is the Southwest Community Park breeding pool that is now surrounded by housing development and separated from uplands within dispersal distance. These factors can quickly drive a local population to extinction (Service 2016). Large, contiguous vernal pool complexes containing multiple breeding ponds are ideal to ensure that recolonization occurs at individual pond sites (Shaffer *et al.* 1993). We expect most of the wetland and upland habitat loss and fragmentation to be within the urban growth boundaries where the species is not likely to have viable populations in a long time period; however, some projects may occur outside of the urban growth boundaries.

Wildlife passages constructed as a minimization measure will provide for safer movement of Sonoma County California tiger salamanders across roads, highways, or other anthropogenic barriers. Although the method is experimental to date and adapted to the topography and other infrastructure constraints, they will allow individuals to disperse between upland and breeding habitat that would otherwise succumb to vehicle strikes (Cook 2008, Baine et. al. 2017). Improved movement of Sonoma County California tiger salamanders in some places will reduce the risk for local extirpation and allow for recolonization of habitat where breeding pools may only produce progeny in above average rainfall years.

Applicants for projects that will be appended to this programmatic biological opinion will purchase credits from conservation banks to minimize the effects of their projects. Conservation banks contain vernal pools, upland, and dispersal habitat. We expect using conservation banks to protect listed species and their habitat to have beneficial effects to the Sonoma County California tiger salamander. Conservation banks are protected with conservation easements, management plans, and endowments to protect and manage Sonoma County California tiger salamanders and their habitat in perpetuity. Conservation banks help establish essential connectivity, reduce fragmentation, and buffer against encroaching development. The wetland and upland habitat at conservation banks are protected and managed in perpetuity, eliminating many threats to the species. Conservation will improve protection for the Sonoma County California tiger salamander and habitats, improve

habitat quality, maintain or increase breeding and population size, increase extent of contiguous habitat, and increase connectivity between occupied areas. Implementation of management plans at Conservation Banks will ensure conservation values are maintained to provide optimal habitat conditions for the Sonoma County California tiger salamander over time as environmental conditions vary. Conservation banks are located in the Santa Rosa Plain and will help maintain the current geographic, elevational, and ecological distribution of the Sonoma County California tiger salamander, all goals of the Recovery Plan. Up to 3,519 acres of conservation banks will be protected in perpetuity within Sonoma County California tiger salamander habitat if full build out occurs within the urban growth boundaries as summarized in Table 1.

Effects to Critical Habitat for the Sonoma County California Tiger Salamander

The *Action Area* encompasses 41,045 acres (42,041 acres minus 636 acres) of Sonoma County California tiger salamander designated critical habitat. Approximately 636 acres in the urban growth boundary of Southwest Santa Rosa are not designated critical habitat as described in the *Status and Environmental Baseline of Sonoma California Tiger Salamander Critical Habitat* section above.

Implementation of development projects appended to this programmatic biological opinion will destroy, alter, fragment, and degrade up to 1,912 acres of designated Sonoma County California tiger salamander critical habitat within the *Action Area* comprised of a combination of PCE 1, PCE 2, and PCE 3. Therefore, approximately 39,133 acres of the 41,045 designated critical habitat within the *Action Area* will not be affected by projects appended to this programmatic biological opinion.

Sonoma County California tiger salamanders require both aquatic and terrestrial environments and migrate between the two habitat types. Grading and construction of homes, industrial units, roads, and infrastructure will fill, destroy, and modify vernal pools and manmade ponds that support breeding Sonoma California tiger salamanders (PCE1). The function of breeding habitat will be lost and unavailable to salamanders migrating in search of breeding habitat during the rainy season when wetlands typically fill up with rainwater. Grading land and constructing homes, industrial units, roads, and infrastructure will modify and remove upland habitats with underground salamander refugia (PCE 2) and upland habitat allowing salamander movement between occupied sites (PCE 3). New homes, industrial units, roads, and infrastructure will create new barriers to movement of Sonoma California tiger salamanders between these aquatic and terrestrial habitats. Isolation and fragmentation of the aquatic and upland habitats will reduce the recovery role of critical habitat that normally support the life stages of the Sonoma County California tiger salamander.

These adverse effects to critical habitat functions will primarily occur within the urban growth boundaries of Cotati, Rohnert Park, Santa Rosa, and Windsor where the habitat is currently more fragmented and subject to various anthropogenic stressors associated with residential and commercial activities. The development impacts associated primarily with houses and commercial buildings are likely to reduce the function and conservation value of the affected critical habitat by removing up to 1,912 acres of PCE's 1, 2, and 3. Some small development projects outside of the urban growth boundaries within Sonoma County may be appended to this programmatic biological opinion. Some of these areas already have anthropogenic stressors associated with intensive agricultural uses such as vineyards, rural development, or disking used in agriculture. Additional similar new activities may be appended to this programmatic biological opinion during the 10 (ten) year timeframe of this programmatic biological opinion. The conservation value of critical habitat will remain largely intact in the remaining 39,133 acres where the landscape is much more contiguous with open space, rural and pasture land, and conservation banks.

Similar to development projects that will potentially be appended to this programmatic biological opinion, approximately up to 3,519 acres of conservation banks will be established and protected in perpetuity within designated critical habitat of the Sonoma County California tiger salamander. These areas will have a combination of created, restored, or preserved aquatic breeding (PCE 1), upland refugia (PCE 2), and upland dispersal (PCE 3) habitat within land that is much more contiguous than the land within the urban growth boundaries of Cotati, Rohnert Park, Santa Rosa, and Windsor. Sonoma County California tiger salamander Preserves will contain vernal pools, upland refugia, and upland dispersal habitat to sustain populations of this species. The conservation banks will ensure preservation, enhancement, and management of the primary constituent elements. These conservation banks will assist in conserving contiguous habitat and linkages to other conserved areas for the Sonoma County California tiger salamander. The conservation will be in areas with reduced land use conflicts where the species can persist. These conservation banks are likely to enhance the conservation value of critical habitat in a highly beneficial manner by protecting critical habitat from any future development or incompatible activities. The protected critical habitat will be managed to benefit populations of the Sonoma County California tiger salamander. The location of new conservation banks will be strategically located adjacent or as close as possible to existing conservation banks to have the most impactful positive value to critical habitat as possible.

Effects to Burke's Goldfields, Sebastopol Meadowfoam, and Sonoma Sunshine

We expect the majority of projects to be within the urban growth boundaries of the Cities of Santa Rosa, Cotati and Rohnert Park (Figure 6) (Conservation Strategy Team 2005). They will consist of filling wetlands with suitable habitat and modifying or removing adjacent uplands to build homes, industrial units, roads, and infrastructure. Some smaller projects involving wetland fill and modification/loss of adjacent uplands may occur outside of the urban growth boundaries (Figure 6) within the *Action Area* due to rural residential, road, and other miscellaneous projects within Sonoma County jurisdiction.

Fill of Wetlands and Modification/Loss of Adjacent Uplands

Development projects will permanently fill Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine suitable habitat with soil, concrete, pavement and buildings resulting in a decrease in numbers, reproduction potential, and distribution of these species. The destruction or ground disturbance of surrounding uplands will destroy or remove habitat for pollinator species that nest in the ground. This effect could result in reduced seed production of Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine to other occupied wetlands within pollinator's dispersal distance.

We expect projects analyzed under this programmatic biological opinion may cause additional fragmentation and edge effects such as disking land to remove vegetation for fire prevention and off-road vehicle use. Disking can move soil into wetlands and make them shallower especially after repeated treatments. Fragmentation can make it more difficult for pollinators to find flowering plants or adversely affect hydrology between pools as further discussed below.

Alteration of Hydrology

Grading and ground disturbance to build homes, industrial facilities, and other structures will cut off or alter hydrology of nearby wetlands that may have a seed bank (whether increasing or decreasing). Disking can also change natural wetland hydrology. These types of disturbances can have cascading effects on the habitat and species because vernal pool plants are sensitive to variations in the timing and duration of vernal pool inundations (Bauder 2000). Repeated drying and filling of pools in the

spring favors development of Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine. It is expected that disruption of connectivity between pools and destruction of hardpan will reduce pool inundation capabilities making the habitat unsuitable for seed germination and development. These effects are expected to occur where projects sites have wetland complexes that continue onto adjacent parcels.

It is also expected that created berms, walls, homes, and altered hydrology will in some cases cause seasonal wetlands to fill for extended periods of time during spring and summer months, which is typically not favorable to these vernal pool species. Extended inundation conditions will be favorable to plant species adapted to longer inundation periods and outcompete annual vernal pool plants.

Fill of Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine suitable habitat will occur within an area of approximately 1,541 acres in Santa Rosa, 203 acres in Cotati, 203 acres in Rohnert Park, and 27 acres in the Town of Windsor (Table 1). The amount of wetlands with suitable habitat will be assessed and determined on a project-by-project site basis.

Conservation Measures

Applicants will purchase credits from conservation banks to minimize the effects of their projects. We expect using conservation banks to protect listed species and their habitat to have net beneficial effects for all these listed plant species. Conservation banks are protected with conservation easements, management plans, and endowments to protect and manage Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine and their habitat in perpetuity. The conservation banks have habitat of sufficient size with wetland habitat and uplands suitable for pollinators, provide connectivity to other Preserves and reduce the current threat of fragmentation. Conservation banks protect Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine and will provide future opportunities for replication. Implementation of management plans at Conservation Banks will ensure conservation values are maintained to provide optimal habitat conditions for Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine over time as environmental conditions vary. Conservation banks are located in the Santa Rosa Plain and will help maintain the current geographic, elevational, and ecological distribution of these species, all goals of the Recovery Plan.

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* are considered in this programmatic biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section; they require separate consultation pursuant to Section 7 of the Act. Seasonal wetlands are extensive in the Santa Rosa Plain and receives around 30 inches of rain during the rainy season. Most projects are likely to require a Corps permit and thus will have a federal nexus for consultation under Section 7 of the Act. However, an undetermined amount of future land use conversions and intensive and routine agricultural practices frequently are not reviewed for environmental compliance under the federal permitting process. It is expected that some new intensive agriculture including vineyard, row crops, cannabis grows, recycled water spray irrigation, and their infrastructure will occur within the *Action Area*. These activities are reasonably certain to occur in the future because they are ongoing.

Cumulative Effects to Sonoma County California Tiger Salamander

Cumulative effects to the Sonoma County California tiger salamander include conversion of breeding, foraging, sheltering, and dispersal habitat to human land uses such as vineyard, row crops, and cannabis grows. Approximately 40 acres of habitat have been adversely affected by cannabis activities over the last few years. Some methods to convert habitat may include clearing, grubbing, plowing, disking, or tilling with mechanical equipment. The mechanical equipment and soil movement and compaction will injure and kill adults and juveniles taking refuge underground such as in gopher burrows, other rodent holes, or soil desiccation cracks. The loss of enough individuals in an area will cause local extirpation depending on the ability for surviving individuals to disperse overland to breeding habitat and reproduce. The loss of any breeding habitat can have a significant effect on a population depending on the availability of other accessible breeding habitat for migrating adults in search of breeding habitat.

These intensive agriculture activities, their infrastructure and land management in the uplands or non-jurisdictional Corps wetlands will indirectly affect Sonoma California tiger salamanders. They will (1) reduce and fragment Sonoma California tiger salamander habitat; (2) interfere with the ability of salamanders to travel the distances necessary to reach breeding or upland habitat while rain or moisture conditions are suitable; (3) remove and reduce breeding habitat; (4) expose animals to potentially toxic levels of fertilizers, pesticides, fungicides, and herbicides; (5) reduce small mammal and their burrows that provide shelter; and (6) increase Sonoma County California tiger salamanders' susceptibility to predators and human activities.

Because the majority of existing vineyards are within the Alton Lane Management Area, we expect most new vineyards will occur within the Alton Lane Management Area. Sonoma California tiger salamanders have not been studied to determine the extent that individuals or populations persist in or near vineyards in the Santa Rosa Plain. Conversion of rural lands to vineyards can include creating permanent wetlands that are more suitable for bullfrogs, fish, and the eastern tiger salamander. If populations of these aquatic non-native species become established, they will negatively affect the Sonoma County California tiger salamander through predation and hybridization with the non-native eastern tiger salamander. Hybridization between the eastern tiger salamander is of great concern and can contaminate the native gene pool if eastern tiger salamanders reach populations in any of the Core Areas.

Recycled water spray irrigation is also anticipated to increase to some extent within breeding, foraging, sheltering, and dispersal habitat. This activity will modify the behavior of California tiger salamanders by spraying water in the dry summer months. The extent of the effects are not well understood and has not been studied, however, Sonoma County California tiger salamanders have been observed above ground in the uplands after the application of spraying for dust control when wetlands were being created at an established conservation bank. This will make individuals susceptible to desiccation, predation, or anthropogenic stressors if tiger salamanders emerge from their refugia during the hot summer months.

Cumulative Effects to Sonoma County California Tiger Salamander Critical Habitat

Cumulative effects to the Sonoma County California tiger salamander critical habitat include conversion of the PCE's 1, 2, and 3 to human land uses such as vineyard, row crops, and cannabis grows. Some methods to convert critical habitat may include clearing, grubbing, plowing, disking, or tilling with mechanical equipment. Conversion to these intensive agricultural uses will also destroy critical habitat where supporting structures and infrastructure are built. Since these effects will occur

absent of a federal nexus, we expect most of the effects to occur to PCE's 2 and 3. However, illegal cannabis grows are reasonably certain to adversely affect PCE 1, 2, and 3.

Because the majority of existing vineyards are within the Alton Lane Management Area, we expect most new vineyards will occur primarily within the Alton Lane Management Area.

Cannabis grows have been observed in most areas of the Santa Rosa Plain but are more frequently within the Llano Crescent – Stony Point Core Recovery Area of the Santa Rosa Plain Recovery Plan. Therefore, we expect the majority of future cannabis grows to occur within this area, although they will also likely continue to occur throughout the *Action Area*. We expect that a combination of education and enforcement efforts from the local and state jurisdictions will reduce the amount and frequency of adverse effects from cannabis grows.

Cumulative Effects to Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine

Cumulative effects to Burke's goldflields, Sebastopol meadowfoam, and Sonoma sunshine include conversion of suitable habitat and pollinator habitat to human land uses such as vineyard, row crops, and cannabis grows. Some methods to convert suitable habitat may include clearing, grubbing, plowing, disking, or tilling with mechanical equipment. The mechanical equipment and soil movement and compaction will modify or destroy suitable habitat and pollinator habitat. Plowing disking, or tilling in areas where there is a seed bank will distribute seed at varying depths in the soil. Seed buried in deeper soil will either not germinate as readily or at all; however research is needed to better understand the depth and soil conditions these species can tolerate.

Recycled water spray irrigation is also anticipated to continue within suitable habitat and pollinator habitat. This activity will modify the normal hydroperiod and create conditions more favorable to non-native vegetation that outcompete these endangered plants. While the native seasonal wetland species are adapted to a summer-dry Mediterranean climate, summer irrigation results in perennial wetland conditions that are intolerable by native seasonal wetland species (Patterson et al. 1994).

Conclusion

Sonoma County California tiger salamander, Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine

After reviewing the current status of the Sonoma County California tiger salamander, Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine, the environmental baseline for the *Action Area*, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that projects which meet the qualifications for this programmatic biological opinion are not likely to jeopardize the continued existence of the these listed species. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following: (1) Numerous conservation measures will be implemented to minimize adverse effects to the Sonoma County California tiger salamander, Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine; (2) the conservation banks are protected with conservation easements and include implementation of management plans that ensure conservation values will be maintained and provide optimal habitat conditions for Sonoma County California tiger salamander, Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine; (3) purchase of credits at conservation banks for Burke's goldfields, Sebastopol meadowfoam, and Sonoma sunshine suitable habitat will protect and manage native and established occurrences providing future opportunities for

replication which is important for recovery; and (4) implementing the conservation ensures more occupied habitat will be conserved than affected and we expect that the amount protected will ensure that issuance of Corps permits does not preclude the ability to meet the preservation goals in the Conservation Strategy and ensure these species will persist and maintain their current geographic distribution and maintain or increase reproduction and numbers.

Sonoma California Tiger Salamander Critical Habitat

After reviewing the current status of designated critical habitat for the Sonoma County California tiger salamander, the environmental baseline for the *Action Area*, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that projects which meet the qualifications for this programmatic biological opinion are not likely to destroy or adversely modify designated critical habitat. The Service reached this conclusion because the project-related effects to the designated critical habitat, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding the function of the Sonoma County California tiger salamander critical habitat to serve its intended conservation role for the species based on the following: (1) Approximately 40,129 acres of the 42,041 designated critical habitat within the *Action Area* will remain after 1,912 acres of designated critical habitat will be destroyed, altered, degraded, or further fragmented; and (2) up to 3,519 acres of designated critical habitat will be protected in perpetuity and managed to benefit the Sonoma County California tiger salamander habitat. The effects to Sonoma County California tiger salamander critical habitat are not expected to appreciably diminish the value of the critical habitat or prevent it from sustaining its role in the conservation of the Sonoma County California tiger salamander.

PROGRAMMATIC INCIDENTAL TAKE STATEMENT

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

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

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

Amount or Extent of Take

Sonoma County California tiger salamander

The specific amount or extent of incidental take of the Sonoma County California tiger salamander is unquantifiable at this time because this consultation has analyzed the proposed action at a programmatic level. The Corps will submit individual projects to the Service for specific review and analysis by the Service. If appropriate, incidental take will be authorized upon appendage of the specific project to this programmatic biological opinion. No exemption from section 9 of the Act is granted in this programmatic biological opinion.

Effect of the Take

No incidental take is authorized by this programmatic biological opinion for the Sonoma County California tiger salamander.

Reasonable and Prudent Measures

1. The Corps shall request appropriate specific projects permit actions that may adversely affect the Sonoma County California tiger salamander be appended to this programmatic biological opinion.

2. The Corps shall minimize adverse effects to the Sonoma County California tiger salamander by authorizing the permittee to implement the project description as described with the additional terms and conditions below.

Terms and Conditions

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

1. The following Term and Condition implements Reasonable and Prudent Measure One (1):

    a. The Corps shall ensure each project permit action submitted for appendage to this programmatic biological opinion meets the conditions and requirements in the project description of this document.

2. The following Term and Condition implements Reasonable and Prudent Measure two (2):

    a. The Corps shall include full implementation and adherence to the conservation measures as a condition of any permit issued for appended projects.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of programmatic incidental take that might otherwise result from the

proposed action. If, during the course of a project appended to this programmatic biological opinion, the level of incidental take described for the Sonoma County California tiger salamander is exceeded, such incidental take represents new information requiring review of the project, and, if appropriate, reinitiation of programmatic consultation and review of the reasonable and prudent measures provided. The Corps must provide an explanation of the causes of the take as soon as possible and review with the Service the need for possible review of the project, or modification of the reasonable and prudent measures.

Monitoring and Reporting Requirements:

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

a. For each project appended to this programmatic biological opinion that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated, the Corps via the applicant's Service-approved biologist(s) will provide prompt updates to the Service with an accounting of the total acreage of habitat impacted by the project appended to this programmatic biological opinion. The total acreage of habitat impacted by the project shall be compared to the acreage authorized in the Corps permit(s) and appendage to this programmatic biological opinion. The Corps will provide annual updates to the Service with an accounting of the total acreage of habitat impacted by the projects appended to this programmatic biological opinion.

b. For each project appended to this programmatic biological opinion that may result in direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harm, injury, or death is anticipated, the Corps via the applicant's Service-approved biologist(s) shall report the encounter(s) as described in the *Description of the Proposed Action* section. If encounter occurs after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day. When injured or killed individuals of the listed species are found, the Corps shall follow the steps outlined in the Salvage and Disposition of Individuals section below.

c. For those components of the action that will require the capture and relocation of any listed species, the Corps via the applicant's Service-approved biologist(s) shall immediately contact the SFWO at (916) 414-6623 to report the action. If capture and relocation need to occur after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day.

d. For each project appended to this programmatic biological opinion, the Corps shall provide pre- and post- construction compliance reports as described in the *Administration of the Programmatic Biological Opinion* section of this programmatic biological opinion.

Salvage and Disposition of Individuals:

Injured Sonoma County California tiger salamanders must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Notification must include the date, time, and precise location of the individual/incident clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. Dead individuals of any of these listed animal must be sealed in a zip-lock® 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. The Service contact persons are Ryan Olah, (916) 414-6623, (ryan_olah@fws.gov) or Vincent Griego, (916) 414-6493, (vincent_griego@fws.gov).

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. Assist the Service in implementing recovery actions identified within the most current Recovery Plan for the Santa Rosa Plain.

2. Report sightings of all listed and sensitive species to the CNDDB. A copy of the reporting form and a topographic map clearly marked with the location of the species 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 actions described in this programmatic biological opinion within the Santa Rosa Plain, Sonoma County, California. As provided in 50 CFR §402.16(a), reinitiation of consultation is required and shall be requested by the federal agency or by the Service where discretionary federal involvement or control over the action has been retained or is authorized by law, and:

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

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

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

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

If you have any questions regarding this programmatic biological opinion, please contact Ryan Olah, Coast Bay Division Chief, (ryan_olah@fws.gov), or at (916) 414-6623 or the letterhead address.

Sincerely,

Jennifer M. Norris, Ph.D.
Field Supervisor

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B.11 - Rare Plant Assessment

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Rare Plant Assessment
2965 Dutton Avenue, Santa Rosa, CA
Canine Companions for Independence

Sonoma County, California
May 2021

Prepared for:
Paige Mazzoni
Canine Companions for Independence
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Sebastopol, CA 95472

PRUNUSKE CHATHAM, INC.

Table of Contents

Figures

1. Introduction

Canine Companions for Independence (Canine Companions) owns and manages an existing facility at 2965 Dutton Avenue, Santa Rosa, Sonoma County (APN # 043-135-031; see Figure 1). The 12.87-acre parcel currently includes administrative offices and an indoor and outdoor training facility. The majority of the parcel is developed with the exception of approximately 3 acres at the northern edge of the site, where the expansion is proposed to be located. Construction of the expansion is scheduled to begin in 2021 if all entitlements, authorizations, and approvals are secured.

The project site is within the Santa Rosa Plain and is subject to the conditions in the U.S. Fish and Wildlife Service's (USFWS) 2005 Final Santa Rosa Plain Conservation Strategy. The project will result in filling one vernal pool of approximately 0.14 acre. Prunuske Chatham, Inc. (PCI) previously prepared a California tiger salamander site assessment (PCI 2018) and a jurisdictional wetland delineation report for the project (PCI 2020a). PCI evaluated the wetland for suitability to provide habitat for the listed plant species of Santa Rosa Plain vernal pools [(Sebastopol meadowfoam (*Limnanthes vinculans),* Sonoma sunshine *(Blennosperma bakeri),* and Burke's goldfields (*Lasthenia burkei*)] in April 2020, and results indicated that it does not provide habitat because of the lack of appropriate hydrology and other critical habitat elements (PCI 2020b).

First Carbon Solutions (FCS) is developing the California Environmental Quality Act (CEQA) document for the project, and determined that additional evidence was needed to support a determination that the listed species were not present. PCI was retained to complete one year of rare plant surveys for the expansion of the facility. This report details PCI's findings.

2. Methods

2.1. Field Surveys

Botanical field surveys of the project site were completed in spring 2021 by PCI's Principal Vegetation Ecologist, Joan Schwan, M.S., who is familiar with vernal pool habitat of the Santa Rosa Plain and the listed species. Ms. Schwan has over 25 years of experience in the assessment of California plants and vegetation types. Ms. Schwan studied vernal pool plant communities of the Santa Rosa Plain for her master's thesis, and worked as a consulting botanist monitoring local vernal pools and the listed species for three years.

Site visits were timed to coincide with the blooming period of the listed species, and were conducted on March 31, 2021, April 15, 2021, and April 30, 2021. The previous site visit for botanical assessment was conducted on April 23, 2020. Other PCI biology staff visits occurred on February 11, 2020 (Joan Schwan and Jennifer Michaud, Senior Wildlife Biologist, for jurisdictional wetland delineation) and August 14, 2018 (Ms. Michaud, CTS assessment).

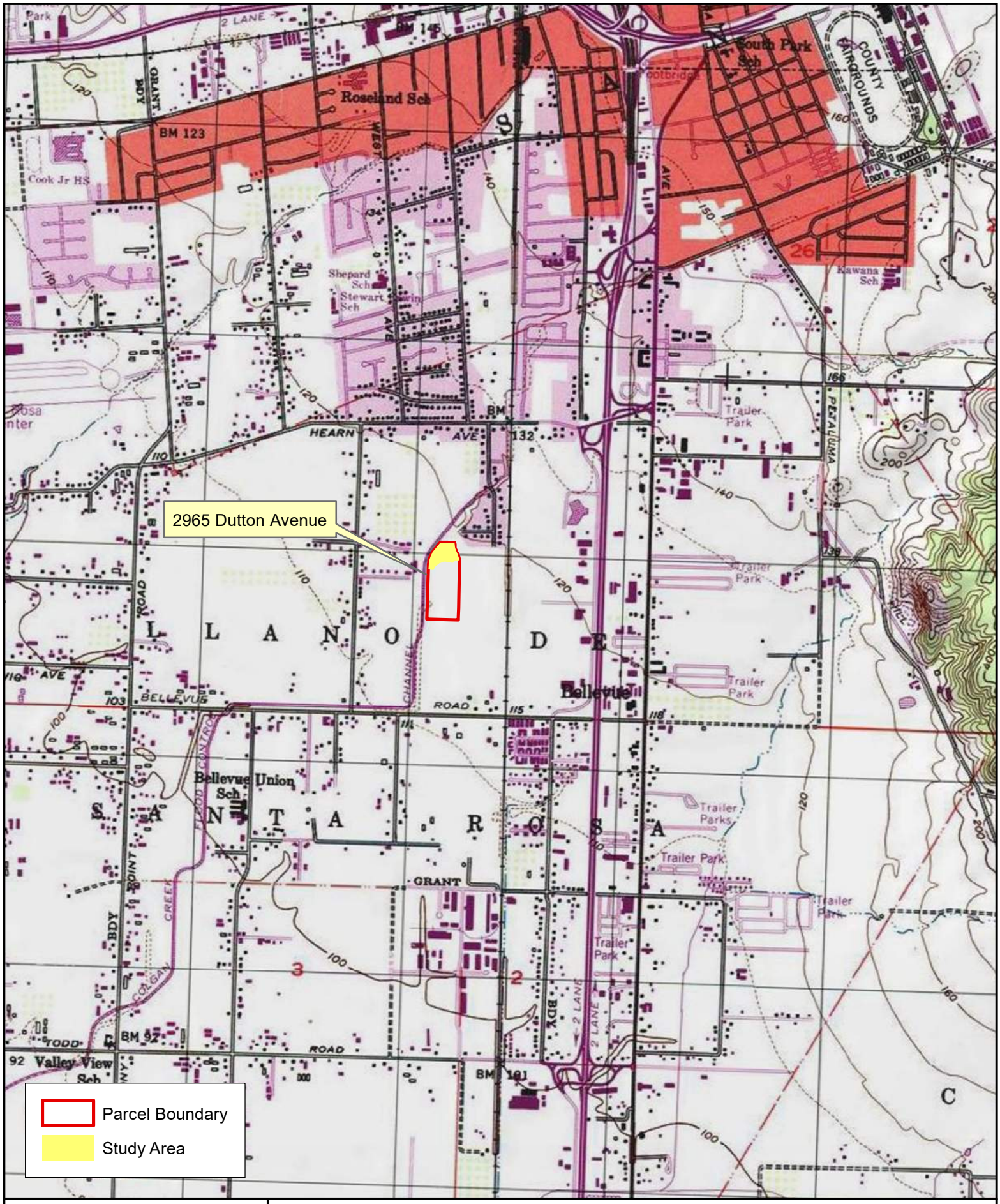

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Figure 1. Project Location
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

April 2021

Reference site locations for the rare plant assessment were provided to Ryan Olah, Coast Bay Division Supervisor, USFWS for approval; Mr. Olah approved use of the sites. Reference sites were the Alton Lane Preserve (privately owned, located on Alton Lane just west of Fulton Road) and Haroutunian South Preserve (owned by Sonoma Ag + Open Space, located on Scenic Avenue just west of Highway 101). Alton Lane Preserve supports all three of the listed species, and Haroutunian supports Sonoma sunshine. Ms. Schwan also visited the Balletto Easement on the Laguna de Santa Rosa, where Sebastopol meadowfoam was recently successfully reintroduced. Reference site visits occurred on the following dates:

- Alton Lane: 3/31/21, 4/15/21, 4/30/21
- Haroutunian: 3/31/21
- Laguna de Santa Rosa, Balletto Easement: 4/11/21

The project site field survey conformed to USFWS' Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed Plants on the Santa Rosa Plain [Appendix D of the 2005 Santa Rosa Plain Conservation Strategy (USFWS 2005)] and CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (2018).

An inventory of all species observed was compiled. During each survey all areas of potential disturbance were traversed on foot and all habitats were surveyed. All plants observed were identified using the *Jepson eFlora* (Jepson Flora Project 2020) to the taxonomic level necessary to determine whether or not they were rare. Botanical nomenclature follows the Jepson eFlora (2020). All species observed are identified in the Plant Communities section below. Vegetation types were identified based on visual assessment in the field and comparison with Manual of California Vegetation (CNPS 2021a) definitions; no detailed quantitative data was collected. Climatic conditions were dry in the 2021 season, as they had been in 2020, but based on review of the listed species conditions at reference sites, this is not expected to have prevented PCI from being able to detect rare species of concern. Based on the multiple site visits throughout the season, ability to inspect the very small pool closely, and availability of other recent botanical data for the site, the potential for underestimating a rare species' potential to occur (a "false negative botanical field survey") is low.

This biological resources assessment is specific to the project identified above; impacts beyond the project boundaries were not evaluated.

2.2. Background Research

A background literature and database search was conducted to determine the potential for occurrence of special-status species on the site. Review focused on the Santa Rosa 7.5' USGS quadrangle where the project is located and the three adjacent quads (Sebastopol, Two Rock, and Cotati). General references, including aerial photographs, were also consulted to evaluate

the potential for unique biological communities and special-status species. The review included the following sources:

- California Natural Diversity Database (CNDDB)[1] (CDFW 2021a)
- California Sensitive Natural Communities (CDFW 2021b)
- A Manual of California Vegetation Online (CNPS 2021a)
- CNPS Inventory of Rare and Endangered Vascular Plants of California (CNPS 2021b)
- Calflora database (Calflora 2021)
- Natural Resources Conservation Service Web Soil Survey (NRCS 2021)

3. Project Context and Existing Conditions

3.1. Location and Santa Rosa Plain Context

The project site is located at the southwestern edge of Santa Rosa, within city limits. The site is located at the edge of a highly industrialized area to the west of Highway 101 and south of Highway 12. Remnant patches of undeveloped land are scattered among the commercial and residential development in the area. The Colgan Creek Flood Control Channel borders the site and flows into the Laguna de Santa Rosa 4 miles to the west. The Laguna flows to the Russian River and then the Pacific Ocean. The site is on the eastern edge of the Santa Rosa Plain.

According to the Santa Rosa Conservation Strategy (Santa Rosa Plain Conservation Strategy Map Figure 3; USFWS 2005, rev. 2007), the project site is located within an area intended for future development. Based on USFWS's recently updated Biological Opinion (USFWS 2020) for the California tiger salamander and the three listed plants of the Santa Rosa Plain, the project site is outside of the Recovery Plan area (Core or Management Areas) for all three (USFWS 2021).

Per USFWS (2021), "suitable habitat includes: 1) wetland(s) containing surface water (standing or flowing) during the rainy season in a normal rainfall year for 7 or more consecutive days; 2) wetland(s) that have an outlet barrier (i.e., is a pool) or occurs in depressional terrain (i.e., is a swale or drainage feature); and 3) seasonal wetlands located within a Core or Management Area (Service [USFWS] 2007 and 2016)." The vernal pool on the project site meets the second criteria but not the third. The first criterion was not assessed by PCI. Further investigation would be needed to clarify whether USFWS means that "suitable habitat" must meet all three, or only

[1] The California Natural Diversity Data Base (CNDDB) is a repository of information on sightings and collections of rare, threatened, or endangered plant and animal species within California. It is maintained by CDFW. CNDDB reports occurrences of special-status species that have been entered into the database and does not generally include inventories of more common animals or plants. The absence of a species from the database does not necessarily mean that they do not occur in the area, only that no sightings have been reported. In addition, sightings are subject to observer judgment and may not be entirely reliable as a result.

some, of the three criteria. The wetland has an outlet barrier and is located in depressional terrain. The wetland is located outside a Core or Management Area.

3.2. Climate and Precipitation

The Study Area is typically characterized by cool, wet winters and mild summers with rainfall primarily between October and April. The annual average rainfall for the nearest reported climate station, for the period from 1980-2010, is 32 inches (Prism Climate Group 2021). To date, rainfall for the 2020-2021 rain season has been approximately 12", 38% of normal.

3.3. Topography

The Study Area ranges in elevation from 121 to 125 feet. It is located on a flat parcel with a history of site grading based on the unnatural contours and elevated mounds on the site. The southwest corner of the site is the lowest point within the Study Area. The wetland is located in a shallow depression along the eastern edge of the site. Surrounding lands are also fairly flat.

3.4. Hydrology

The primary source of hydrology for the wetland is direct precipitation and surface runoff from immediately surrounding areas. Since the site is fairly flat and comprised of heavy clay soils, drainage from the site is likely minimal with most water ponding on the site and draining slowly to the southwest. The vernal pool itself occurs in a very shallow depression. The Study Area drains to the Colgan Creek Flood Control Channel which flows into the Laguna de Santa Rosa, the Russian River, and then the Pacific Ocean.

3.5. Soils

Soils on the project site are mapped as Clear Lake clay, ponded, 0-2% slopes; and Clear Lake clay, 0-2% slopes (NRCS 2021). See Figure 2.

Clear Lake clay soils are formed from alluvium derived from sedimentary rock. The typical profile is clay from 1 to 52 inches, clay loam from 52 to 60 inches, and fine sandy loam to 72 inches. Clear Lake clay is poorly drained. The depth to the water table is 36 to 60 inches. The soil is subject to frequent ponding, especially in the ponded sub-type. Clear Lake clay is considered a hydric soil.

The vernal pool is located on the area mapped as Clear Lake clay, ponded; this area shows visual indicators of the soil type, including deep cracks in the dry season.

3.6. Plant Communities

The project area supports non-native annual grassland and disturbed vernal pool plant communities. See Figure 3.

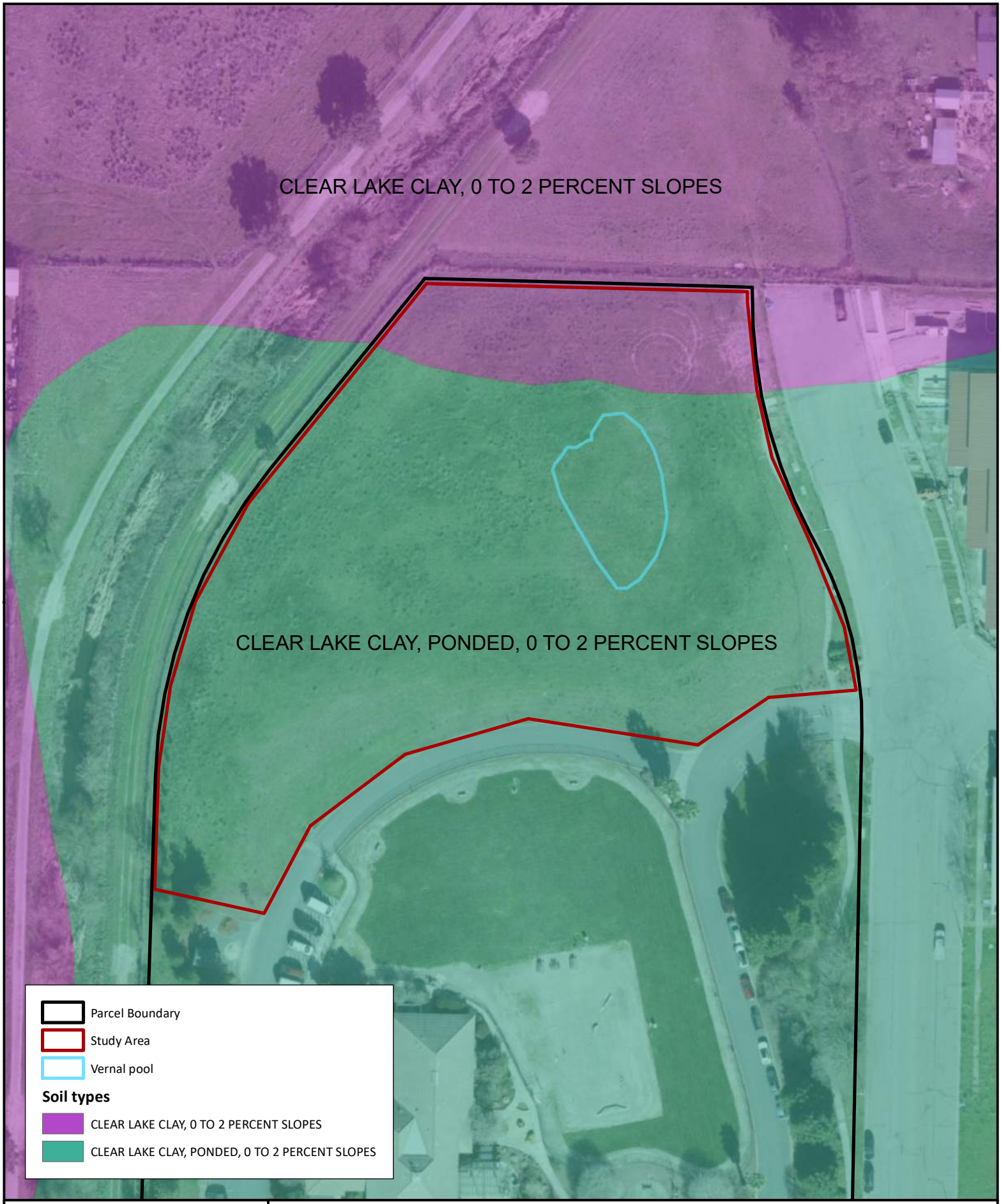

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Figure 2. Soil Types
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

0 50 100 200 Feet

N

April 2021
Soils: SSURGO

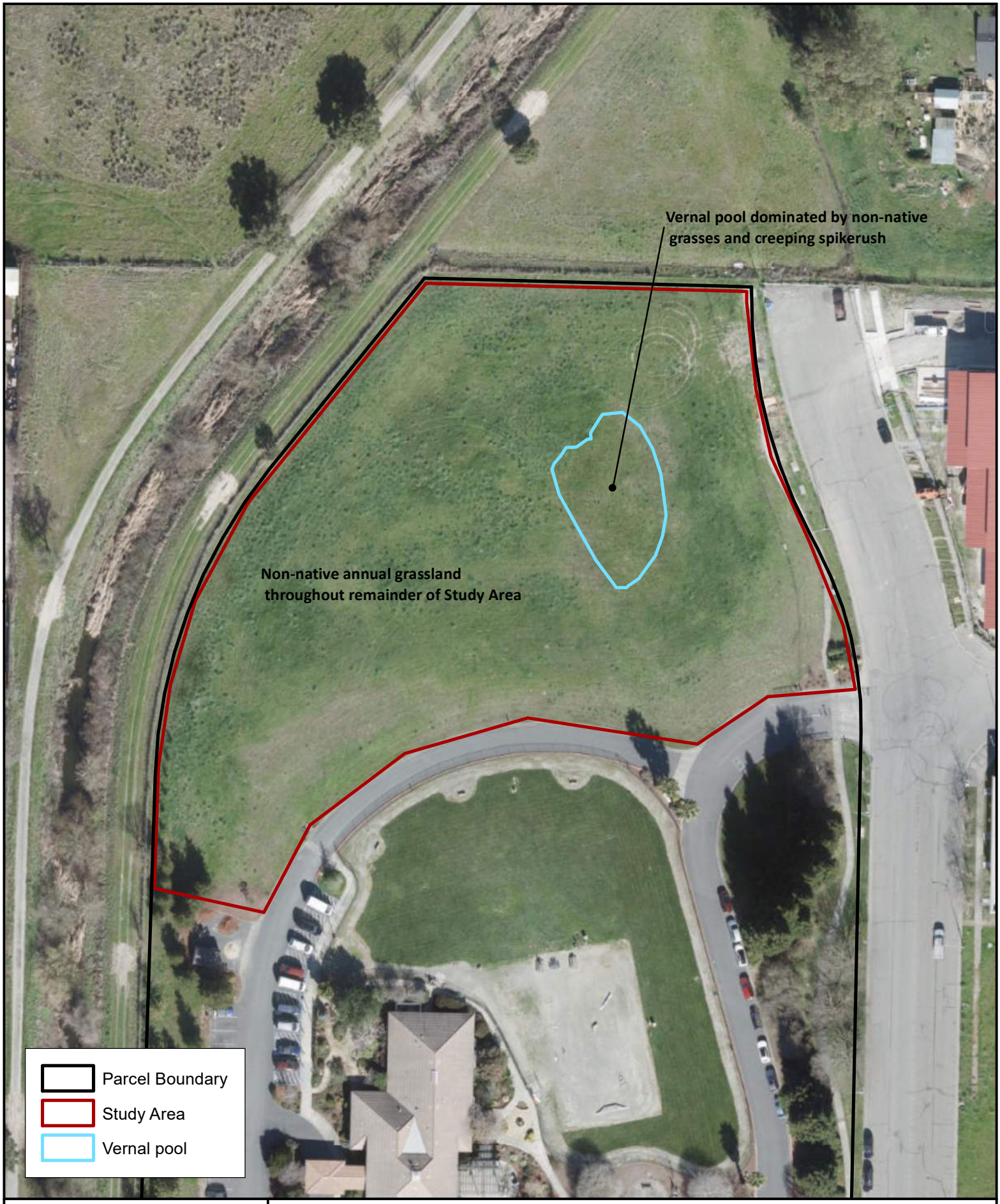

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Figure 3. Vegetation Types
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

0 50 100 200 Feet

N

April 2021

3.6.1. Grassland Vegetation

Annual grassland in the uplands surrounding the vernal pool is dominated by common non-native species including oat grass (*Avena* sp.), soft chess (*Bromus hordeaceus*), Italian rye grass (*Festuca perennis*)], cutleaf geranium (*Geranium dissectum*), dandelion (*Taraxacum officinale*), subterranean clover (*Trifolium subterraneum*), Harding grass (*Phalaris aquatica*), and wild radish (*Raphanus sativus*).

3.6.2. Vernal Pool Vegetation

The vernal pool is densely vegetated with a mixture of common facultative wetland and upland species. Soil in the wetland area was completely dry at the surface at the time of all of PCI's visits in 2020 and 2021 (i.e., August 2018, February and April 2020, and March-April 2021). The wetland appears to be a very shallow feature that only fills briefly and only in normal or wet rainfall years. It does not support significant native plant diversity.

Wetland indictor statuses[2] (Corps 2018) for plant species observed in the wetland are provided with species names in the following plant community composition discussion; most species are facultative or upland, but of the non-dominant species, two are facultative wetland indicators and one is an obligate wetland plant. Dominant species in the wetland at the time of the rare plant surveys included non-native soft chess (FACU), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum,* FAC), and Italian rye (FAC). These form dense cover throughout the vernal pool. The only native species observed were occasional small patches of meadow barley (*Hordeum brachyantherum*, FACW), creeping spikerush (*Eleocharis macrostachya,* OBL) at low relative cover, and individuals of miniature lupine (*Lupinus bicolor*, NL). Other species observed in the wetland were non-native grasses [ripgut brome (*Bromus diandrus*), Harding grass (FACU), wild oat (UPL), brome fescue (*Festuca bromoides*, FACU)], non-native forbs [curly dock (*Rumex crispus*, FAC), cutleaf geranium (NL), dandelion (FACU), bindweed (*Convolvulus arvensis*, NL), spinyfruit buttercup (*Ranunculus muricatus*, FACW), mallow (*Malva* sp., NL), vetch (*Vicia sativa*, FACU), wild garlic (*Allium vineale,* FACU), subterranean clover (NL), prostrate knotweed (*Polygonum aviculare,* FAC), burclover (*Medicago polymorpha*, FACU), bird's foot trefoil (*Lotus corniculatus,* FAC) and bristly ox-tongue (*Helminthotheca echioides*, FAC)].

Note that at the time of PCI's wetland delineation, in February 2020, creeping spikerush was considered one of the dominant species; in that season (late winter), it provided more relative

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[2] **Wetland Indicator Status**
OBL = Obligate Wetland Plant (estimated probability of occurring in wetlands >99%)
FACW = Facultative Wetland Plant (estimated probability >67% to 99%)
FAC = Facultative Plant (estimated probability 33% to 67%)
FACU = Facultative Upland Plant (estimated probability 1% to <33%)
UPL = Obligate Upland Plant (estimated probability <1%)
NL = Not Listed (indicated upland plant)

cover, as an established perennial species, compared to the non-native annual grasses which were just germinating or small-statured at that time. Based on the Manual of California Vegetation, the plant community in the vernal pool is intermediate between the perennial (Italian) rye grass fields alliance and the spikerush marsh alliance.

3.7. Reference Site Findings

The primary purposes of reference site visits for this study were to confirm the appropriate timing for project surveys for focal species, to confirm that these annual species are indeed visible in the study year, and to reinforce the ability of the botanist to recognize the rare taxa at the project site if they are present. Although drought conditions appeared to reduce the plant populations and in some cases plant stature, the three focal species were all readily observed and identifiable at the time of surveys, with Sonoma sunshine at their peak bloom in the late March visit, Sebastopol meadowfoam in mid-April, and Burke's goldfields in late April.

March 31 observations

- Haroutunian site: Sonoma sunshine - approximately 20% of plants in bud, 50% of plants blooming, and 30% in fruit development. Pools were dry, with no visible soil moisture at the surface.
- Alton Lane site: Sonoma sunshine - approximately 40% in bud, 50% in bloom, and 10% in fruit development. Sebastopol meadowfoam in bud; plants were notably small and had yellowed leaves, indicating drought stress. Burke's goldfields beginning to form buds. Soil was moist to saturated at the pool surface.

April 11 observations

- Laguna de Santa Rosa site: Sebastopol meadowfoam approximately 50% in bloom, 50% in fruit development. Plants were notably small and had yellowed leaved, indicating drought stress. Soil was dry at the surface.

April 15 observations

- Alton Lane site: Sonoma sunshine 10% in bloom, 90% in fruit development. Sebastopol meadowfoam 50% in bloom, 50% in fruit development. Burke's goldfields 10% in bloom, 90% in fruit development. Soil was dry at the surface.

April 30 observations

- Alton Lane site: Sonoma sunshine 5% in bloom, 95% in fruit. Sebastopol meadowfoam 10% in bloom, 90% in fruit development. Burke's goldfields 60% in bloom, 40% in fruit development.

4. Special-status Plant Species

4.1. Definition of Special-status Species

In California, special-status plants include those species that are afforded legal protection under the federal and California Endangered Species Acts (ESA and CESA, respectively) and other regulations. These species must be considered during project evaluation to comply with CEQA

and NEPA, during consultation with State and federal resources agencies, and in development of specific management guidelines and measures for resource protection. Special-status species are defined as the following:

- Species listed or proposed for listing as threatened or endangered under the federal ESA;
- Species listed or proposed for listing as threatened or endangered under CESA;
- Species that are recognized as candidates for future listing by agencies with resource management responsibilities, such as U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW);
- Plant species, subspecies, and varieties defined as rare or threatened by the California Native Plant Protection Act (California Fish and Game Code Section 1900, et seq.);
- Plant species listed by the California Native Plant Society as California Rare Plant Rank 1, 2 and 3 under CEQA (CEQA Guidelines Section 15380); and some list 4 plants based on CNPS guidelines;
- Species that otherwise meet the definition of rare, threatened, or endangered pursuant to Section 15380 of the CEQA Guidelines.

4.2. Special-status Species Evaluation Criteria

The potential for special-status species to occur on the project site can be classified into the following categories: not present, not likely to occur, moderate potential to occur, high potential to occur, or present. The criteria for each of these categories are:

Not Present – Suitable habitat is not present within the project site; the site lacks critical habitat requirements for the species and/or the project site is outside the range of the species.

Not Likely to Occur – One or more key habitat components is absent from the project site; no known occurrences in region; or habitat present but species not observed during field surveys that would be expected to discover species, if present, based on season and level of effort. Species is unlikely to occur within the project site.

Moderate Potential to Occur – Some of the habitat components required by this species are present within the project site and/or marginally suitable habitat is present within surrounding areas. Field surveys did not confirm or rule out species presence. Species may occur within the project site.

High Potential to Occur – All of the habitat components required by this species are present within the project site and/or it is known to occur in surrounding areas. Field surveys did not confirm or rule out species presence. Species is likely to occur within the project site.

Present – Species has reported occurrences within the project site which are believed to be still extant and/or was observed within the project site during field surveys.

4.3. Focal Special-status Plants

No special-status species were observed in any of PCI's surveys, and none were found to have potential to occur. Based on the project location, and presence of a vernal pool, the threatened

or endangered species of greatest concern for occurrence on the site were Sebastopol meadowfoam [*Limnanthes vinculans*], Sonoma sunshine *[Blennosperma bakeri*], and Burke's goldfields [*Lasthenia burkei*]. These species occur on the Santa Rosa Plain in vernal pool settings, often on the soil type present here, Clear Lake clay. However, for several reasons, the habitat present at the project site does not have the qualities needed to support the listed plants.

- Vegetative cover is densely dominated by tall, robust growth of non-native annual grasses. The focal species are small-statured annual forbs which typically occur where less dense cover is present and competition for light, space and water are lower.
- No saturation or inundation was observed. The focal species can occur in shallow pools, and 2020-2021 was a dry year. However, the focal species were still present in reference sites in 2021, but not at the project site. Based on the soil observations and the high cover of species adapted to upland conditions, the hydrologic setting is not suitable for the focal species.
- The site setting is highly developed and fragmented.
- No plant species were observed that are typically present in Sonoma County vernal pools with significant native plant diversity [i.e., no "vernal pool indicator species" such as California semaphore grass (*Pleuropogon californicus*), rayless goldfields (*Lasthenia glaberrima*), or popcorn flower (*Plagiobothrys* spp.) were present]. Creeping spikerush and meadow barley were the only native species present on the site that are commonly found in vernal pools, but these two species also occur in many other wet meadow and wetland habitats, and are not specifically indicative of vernal pool conditions.
- The species were not observed during focused surveys in 2021, and one blooming season visit in 2020. The project site pool is very small and was reviewed in detail each time.
- The nearest reported occurrences of the focal species are over 1 mile away, to the west. The project site is located slightly upslope of the lower-lying Santa Rosa Plain area where the focal species are primarily known to occur (see Figure 4). The nearest occurrences of focal species are:
    - Sebastopol meadowfoam, 1.2 miles to the west, at up to approximately 105' in elevation.
    - Sonoma sunshine, 1.8 miles to the south, 95-100' in elevation.
    - Burke's goldfields, 1.9 miles to the southeast, are present in created pools that were artificially seeded, at 113-123' in elevation. CNDDB records note that these are "transplants/outside of native habitat/range" (CDFW 2021)]. The nearest naturally-occurring Burke's goldfield records are several miles to the west and northwest, at elevations up to 97'.

Based on these observations, no suitable habitat for the listed species is present.

The table below provides details of special-status species known to occur in the project region in relevant habitats (grassland and herbaceous wetland types), with the determination of their potential to occur on the project site. See Figure 4. Based on habitat needs and site observations, none were found to have potential to occur.

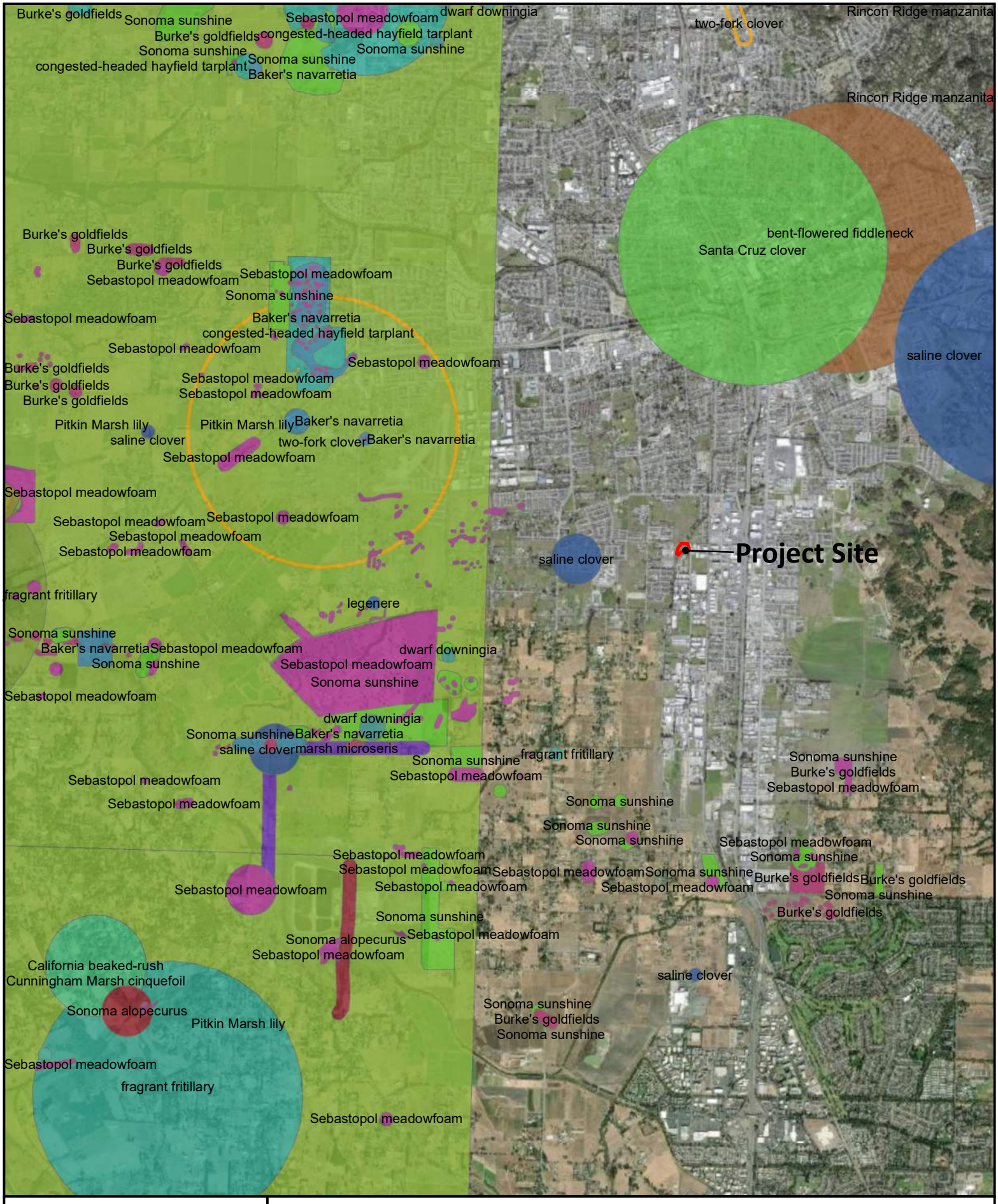

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Figure 4. Reported Occurrences of Special-status Plants in the Project Vicinity
Canine Companions for Independence
2965 Dutton Avenue, Santa Rosa

0 0.25 0.5 1 Miles

N

4/30/2021
Sources: CNDDB (CDFW 2021)

Table 1. Special-status Species Known to Occur in the Project Region

Scientific Name	Common Name	Listing Status USFWS/ CDFW/ CRPR	Life Form, Blooming Period, and General Habitat	Potential for Species Occurrence
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	FE/--/ 1B.1	Perennial herb. Blooms May-July. Freshwater marshes and swamps, riparian scrub. 5-365 m.	Not present. No suitable habitat.
Amsinckia lunaris	bent-flowered fiddleneck	--/--/ 1B.2	Annual herb. Blooms March-June. Coastal bluff scrub, woodland, grassland. Typically on gravelly slopes, grassland, openings in woodland, often serpentine. 3-500 m.	Not present. Marginally suitable habitat present but no gravelly slopes or serpentine present. Only two documented occurrences in county, both historic; nearest is 1940 record east of Santa Rosa. No Amsinckia species found on site.
Blennosperma bakeri	Sonoma sunshine	FE/SE/ 1B.1	Annual herb. Blooms March-May. grassland (mesic), vernal pools. 21-43 m (USFWS 2020).	Not present. Marginal vernal pool habitat present and appropriate soils (Clear Lake clay) present. Typically occurs in pools or swales 12-20" deep (USFWS 2020). Overall, habitat is not suitable: hydrology is very limited, and dense cover of non-native species present. Species not observed in blooming-period surveys.
Castilleja uliginosa	Pitkin Marsh paintbrush	--/SE/ 1A	Perennial herb, hemiparasitic. Blooms June-July. Freshwater marshes and swamps. 60 m.	Not present. No suitable habitat.
Centromadia parryi ssp. parryi	pappose tarplant	--/--/ 1B.2	Annual herb. Blooms May-November. Chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, grassland (vernally mesic, often alkaline). 2-420 m.	Not present. No suitable habitat. Vernally mesic habitat present but not alkaline. Nearest occurrence over 8 miles away.
Chorizanthe valida	Sonoma spineflower	FE/SE/1B.1	Annual herb. Blooms June-August. Sandy coastal prairie. 10-305 m.	Not present. No suitable habitat.
Downingia pusilla	dwarf downingia	--/--/ 2.2	Annual herb. Blooms March-May. grassland (mesic), vernal pools. 1-445 m.	Not present. Marginal vernal pool habitat present and reported occurrences on Santa Rosa Plain. However, hydrology is very limited, dense cover of non-native species present, and species not observed in blooming-period surveys.

Scientific Name	Common Name	Listing Status USFWS/ CDFW/ CRPR	Life Form, Blooming Period, and General Habitat	Potential for Species Occurrence
Fritillaria liliacea	fragrant fritillary	--/--/ 1B.2	Perennial bulbiferous herb. Blooms February-April. Woodland, coastal prairie, coastal scrub, grassland (often serpentinite). 3-410 m.	Not present. No suitable habitat.
Hemizonia congesta ssp. congesta	white seaside tarplant (congested-headed hayfield tarplant)	--/--/ 1B.2	Annual herb. Blooms April-November. Grassland, sometimes roadsides. 20-560 m.	Not present. Grassland present but highly disturbed and nearly devoid of native species.
Horkelia tenuiloba	thin-lobed horkelia	--/--/ 1B.2	Perennial herb. Blooms May-July. Broadleafed upland forest, chaparral, grassland (mesic openings, sandy).	Not present. No suitable habitat.
Lasthenia burkei	Burke's goldfields	FE/SE/ 1B.1	Annual herb. Blooms April-June. Meadows and seeps (mesic), vernal pools. 27-580 m (USFWS 2020).	Not present. Marginal vernal pool habitat present and reported occurrences on Santa Rosa Plain. Suitable soils (Clear Lake clay) present. Species typically occurs in shallow pools (less than 10" to 20" deep) (USFWS 2020). At this site, hydrology is very limited, dense cover of non-native species present, and species not observed in blooming-period surveys.
Lasthenia californica ssp. bakeri	Baker's goldfields	--/--/ 1B.2	Perennial herb. Blooms April-October. Closed-cone coniferous forest (openings), coastal scrub, meadows and seeps, marshes and swamps.	Not present. Outside of known range (coastal).
Legenere limosa	legenere	--/--/ 1B.1	Annual herb. Blooms April-June. Vernal pools. 1 -880 m.	Not present. Marginal vernal pool habitat present. One reported occurrence on Santa Rosa Plain, in a deep pool with plant associates not present at this site. Hydrology at this site is very limited (no ponding observed in field surveys in early spring), dense cover of non-native species present, and species not observed in blooming-period surveys.

Scientific Name	Common Name	Listing Status USFWS/ CDFW/ CRPR	Life Form, Blooming Period, and General Habitat	Potential for Species Occurrence
Limnanthes vinculans	Sebastopol meadowfoam	FE/SE/ 1B.1	Annual herb. Blooms April-May. Meadows and seeps, grassland, vernal pools (mesic). 15-41 m (USFWS 2020); one occurrence in Knights Valley at 116 m.	Not present. Marginal vernal pool habitat present and reported occurrences on Santa Rosa Plain. Suitable soils present (Clear Lake clay). Species most often occurs in pools 10-20" deep, at elevations from 50-135 ft (USFWS 2020). Hydrology at project site is very limited (no ponding observed in field surveys), dense cover of non-native species present, and species not observed in blooming-period surveys. Site is near upper end of species known elevation range.
Microseris paludosa		--/--/ 1B.2	Perennial herb. Blooms April-June (rarely July). Closed-cone coniferous forest, woodland, coastal scrub, grassland. 5-300 m.	Not present. No recent known occurrences in project region. Project site is highly disturbed and lacks associated species reported for this taxa.
Navarretia leucocephala ssp. bakeri	Baker's navarretia	--/--/ 1B.1	Annual herb. Blooms April-July. Vernal pools and swales; adobe or alkaline soils, in woodland, lower montane coniferous forest, meadows/seeps, grassland. 5-1740 m.	Not present. Marginal vernal pool habitat present but dominated by dense cover of non-native annual grasses, hydrology is very limited, and lacks typical associates for this taxa.
Navarretia leucocephala ssp. plieantha	many-flowered navarretia	FE/SE/ 1B.2	Annual herb. Blooms May-June. Vernal pools (volcanic ash flow). 30-950 m.	Not present. Vernal pool present but no volcanic ash flow substrate and outside of known range. Known primarily from Boggs Lake; Sonoma County occurrences are tentatively identified from Windsor area.
Potentilla uliginosa	Cunningham Marsh cinquefoil	--/--/1A	Perennial herb. Blooms May-August. Freshwater, permanent oligatrophic wetlands. 30-40 m.	Not present. No suitable habitat.
Rhynchospora alba	White beaked-rush	--/--/ 2.2	Perennial rhizomatous herb. Blooms July-August. Bogs and fens, meadows and seeps, marshes and swamps. Typically freshwater marshes and sphagnum bogs. 60-2040 m.	Not present. No suitable habitat.

Scientific Name	Common Name	Listing Status USFWS/ CDFW/ CRPR	Life Form, Blooming Period, and General Habitat	Potential for Species Occurrence
Rhynchospora californica	California beaked-rush	--/--/ 1B.1	Perennial rhizomatous herb. Blooms May-July. Bogs and fens, lower montane coniferous forest, seeps, freshwater marshes and swamps. Typically freshwater seeps and open marshy areas. 45-1010 m.	Not present. No suitable habitat.
Rhynchospora capitellata	brownish beaked-rush	--/--/ 2.2	Perennial herb. Blooms July-August. Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest (mesic). 45-2000 m.	Not present. No suitable habitat.
Rhynchospora globularis var. globularis	round-headed beaked-rush	--/--/ 2.1	Perennial rhizomatous herb. Blooms July-August. Freshwater marshes and swamps. 45-60 m.	Not present. No suitable habitat.
Trifolium amoenum	two fork clover	FE/--/ 1B.1	Annual herb. Blooms April-June. Coastal bluff scrub, grassland (sometimes serpentinite). Open, sunny sites, swales. 5-415 m.	Not present. Very few known extant occurrences; these are coastal. Grassland present but highly disturbed.
Trifolium hydrophilum	saline clover	--/--/ 1B.2	Annual herb. Blooms April-June. Marshes and swamps, grassland (mesic, alkaline), vernal pools. 0-300 m.	Not present. No suitable habitat. Vernal pool present but not alkaline.

5. Conclusions

For the Canine Companions proposed expansion project at 2965 Dutton Avenue in Santa Rosa, one year of a single botanical survey, and a second year of three protocol-level surveys, was completed by PCI. Additional site observations were made previously by PCI in the course of other biological study of the site. The project site is outside of the Core and Management Areas identified by USFWS for all listed plant species of the Santa Rosa Plain. A single vernal pool is present, but it does not provide specific habitat elements required by these species, and the site is slightly beyond their known distribution (i.e., it is upslope of the Santa Rosa Plain area supporting nearest occurrences). Based on background research, reference site visits, professional experience with the listed plants and vernal pools, and site observations, PCI concludes that no suitable habitat for these species is present on the project site.

6. References

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7. Photographs

REFERENCE SITE CONDITIONS

Sonoma sunshine stand at reference site, Haroutunian Preserve, 3/31/21.

Sonoma sunshine stand at reference site, Haroutunian Preserve, 3/31/21.

Sebastopol meadowfoam at reference site, Alton Lane, 4/15/2021.

Burke's goldfields (yellow flower) at reference site, Alton Lane, 4/30/2021.

PROJECT SITE CONDITIONS

Vernal pool (dry) on project site, 3/30/2021.

Closeup of typical cover in vernal pool, dominated by non-native annual grasses; 3/30/2021.

Vernal pool on project site (recently mown but plant composition still identifiable), 4/15/2021.

Vernal pool on project site, 4/30/2021.

Closeup of typical cover in vernal pool on project site, 4/30/2021.