BIOLOGICAL ASSESSMENT

SAN PEDRO TERRACE

APN: #023-075-050

Presented To:

Benaiah Ventures, LLC
11 Bay Rd
Menlo Park, California 94025-1728

Presented By:
Toyon Consultants
309 Seabright Ave
Santa Cruz, California 95062

REVISED
April 6, 2017

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INTRODUCTION

Project Location

The proposed project is located at the end of San Pedro Terrace Road in the City of Pacifica, San Mateo County, California. The lot is adjacent to 751 San Pedro Terrace Road.

Figure 1 shows the project location.

APN: #023-075-050

Site Description

The parcel is zoned C-3 and is currently vacant land. The site is 2.4 acres and has approximately 22 feet of frontage on San Pedro Terrace Rd.

Approximately 1.1 acres on the north-northeastern section of the parcel abuts the San Pedro Creek and has a bank with a 35% slope with a depth of approximately 15 feet. The lower edge of this bank is the ordinary high water mark. Further north-northeast of this bank is a second bank, that defines the normal creek channel. There is a terrace that retains high water flows, between the two banks.

The remaining 1.3 acres of the parcel is flat and outside of the normal floodplain of the San Pedro Creek.

Project Description

The proposed use of the site is 6 single family homes on the flat 1.3 acre section of the parcel. The houses will be served by a private street with a cul-de-sac for the fire truck turnaround. The proposed zoning of the site is R-1. No architectural plans are being submitted for the site at this time. Upon subdivision, separate permits will be submitted for each house. The houses will comply with the Pacifica Design Guidelines and the zoning regulations. Utilities are available at the site to serve the development. A public water main will be extended from the end of the existing San Pedro Terrace. Electric and cable are available via the adjacent joint pole on San Pedro Terrace. There is an existing public sanitary sewer main on the lot which the development will connect to. A new storm drain outfall to the creek is also required. While the site is 2.42 acres, approximately 1.31 acres will be disturbed as part of the new construction.

A new storm drain outfall is proposed as part an overflow for the stormwater management plan for the site, which will drain directly into San Pedro Creek. The new outfall comprises approximately 18 LF of 24 inch of reinforced concrete pipe storm drain and rip-rap energy dissipation structure. The rip-rap for the energy dissipater is non-grouted and has a minimum D50 rip-rap diameter of 200 mm. Approximately 3.1 CY of soil needs to be removed to install the rip-rap. A layer of geotextile fabric will separate the rip-rap from the native soil. Approximately 5.8 cubic yards of soil within the bank of the creek is required to be excavated to install the new outfall pipe. The rip-rap will have a footprint of approximately 10 feet x 5 feet. The outfall pipe is angled at 30 degrees to the direction of

flow to reduce turbulence. The approximate area disturbed for the outfall within the creek bank is approximately 85 square feet.

The proposed Site Plan is provided in Figure 2 and the proposed Utility Plan is shown in Figure 3.

Project Owner
Benaiah Ventures, LLC
11 Bay Rd
Menlo Park, California 94025-1728

Figure 1: Project Location (Boundary Approximate)

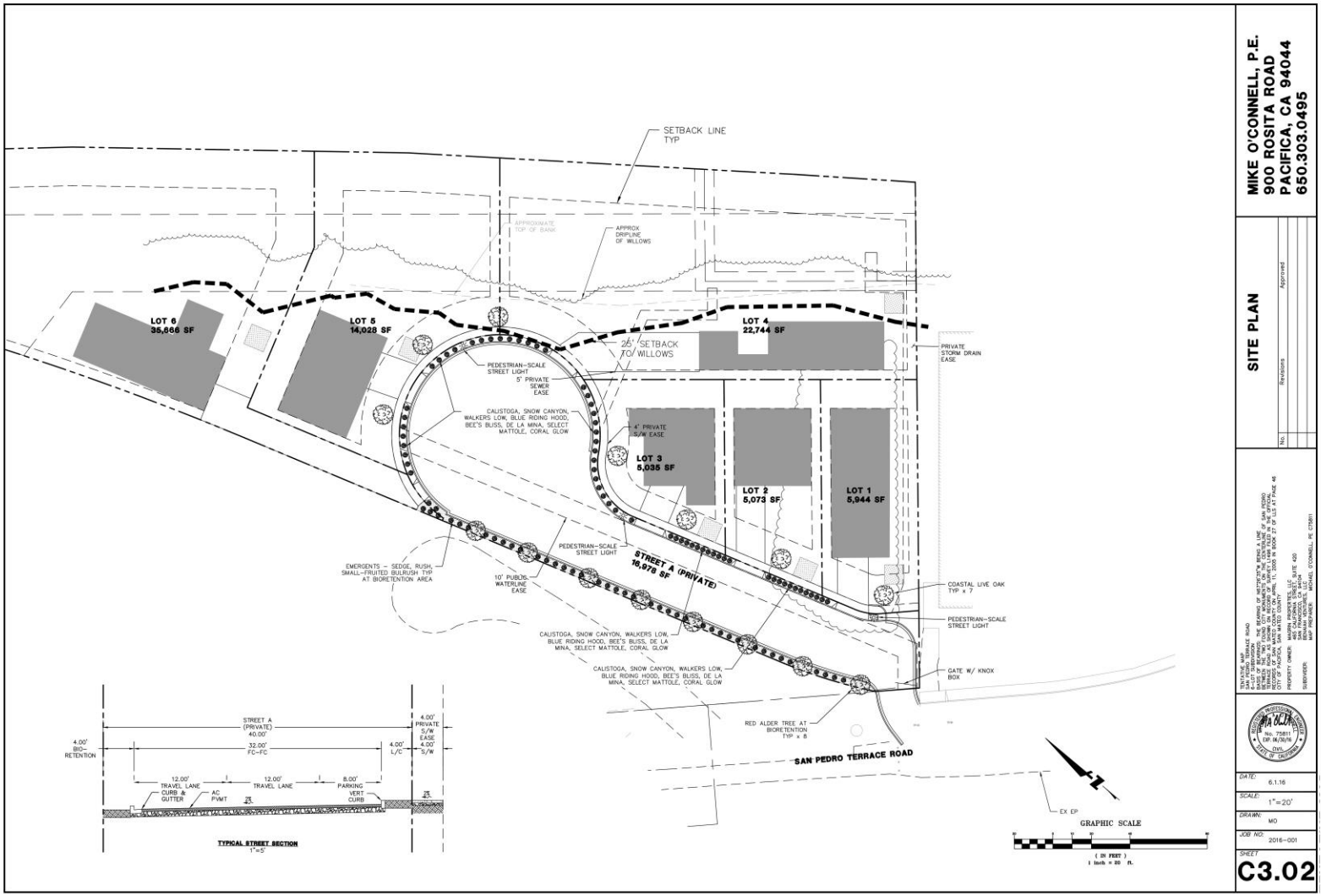


Figure 2: Site Plan

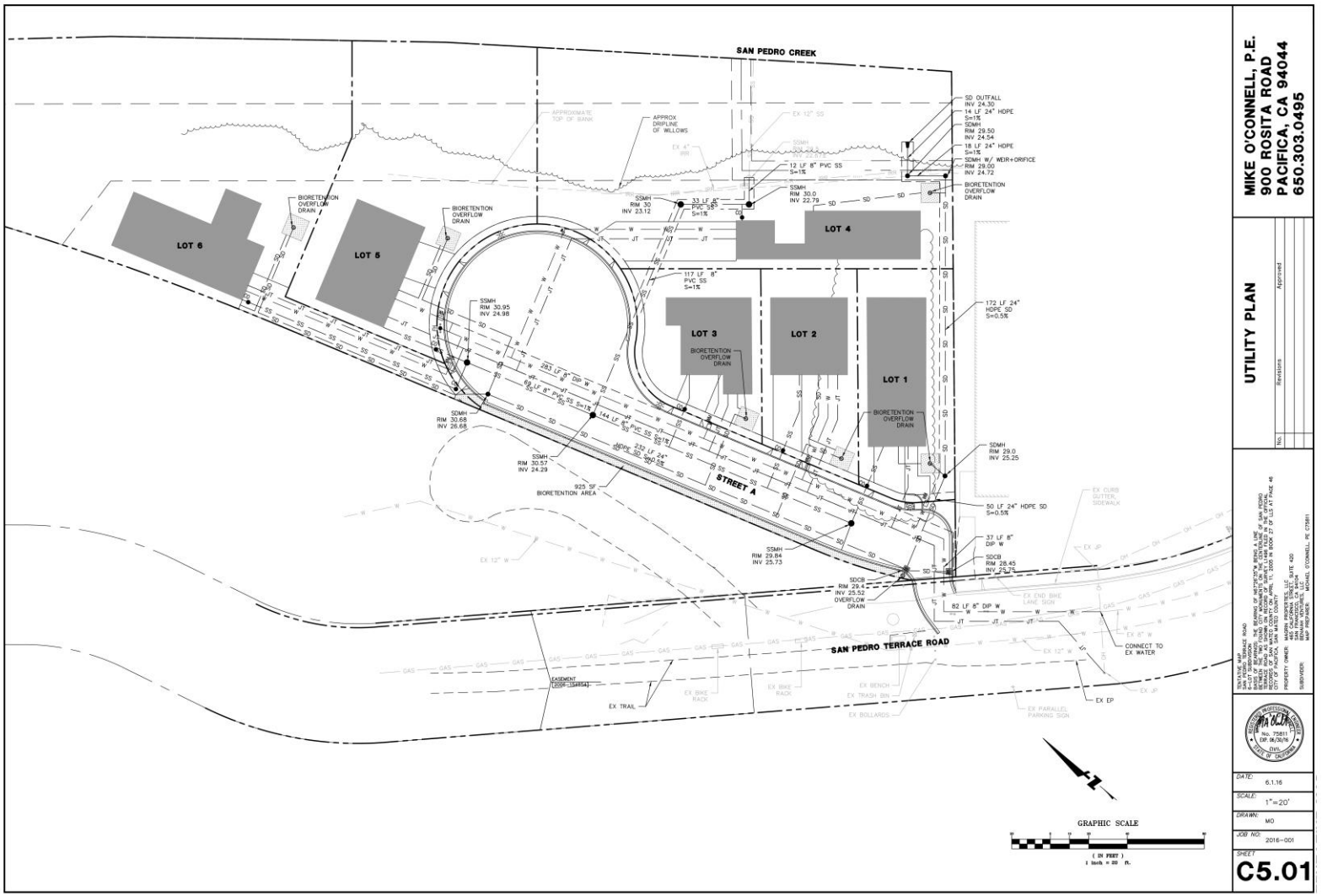
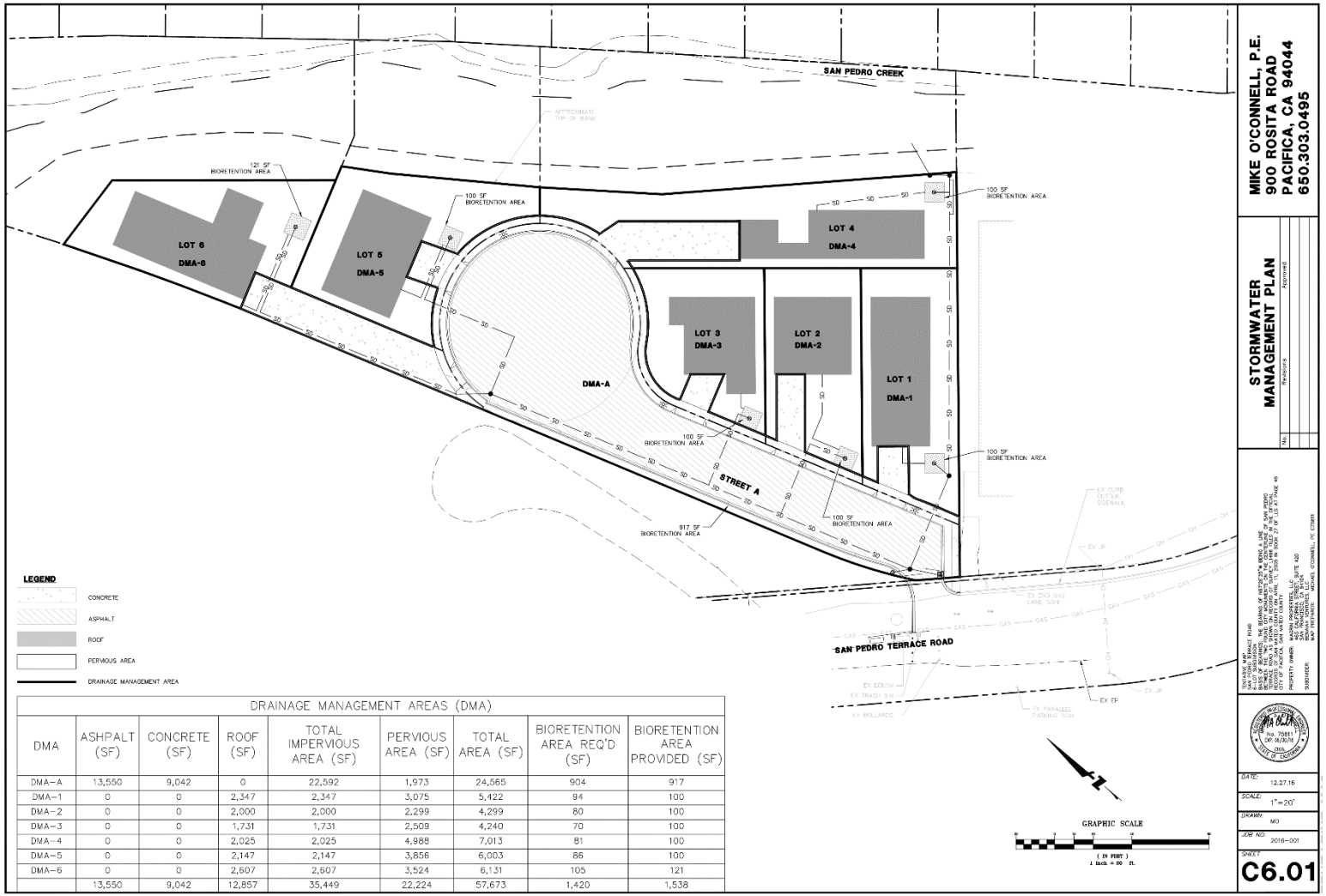


Figure 3: Utility Plan



DRAINAGE MANAGEMENT AREAS (DMA)

DMA	ASHPALT (SF)	CONCRETE (SF)	ROOF (SF)	TOTAL IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	TOTAL AREA (SF)	BIORETENTION AREA REQ'D (SF)	BIORETENTION AREA PROVIDED (SF)
DMA-A	13,550	9,042	0	22,592	1,973	24,565	904	917
DMA-1	0	0	2,347	2,347	3,075	5,422	94	100
DMA-2	0	0	2,000	2,000	2,299	4,299	80	100
DMA-3	0	0	1,731	1,731	2,509	4,240	70	100
DMA-4	0	0	2,025	2,025	4,988	7,013	81	100
DMA-5	0	0	2,147	2,147	3,856	6,003	86	100
DMA-6	0	0	2,607	2,607	3,524	6,131	105	121
	13,550	9,042	12,857	35,449	22,224	57,673	1,420	1,538

Figure 4 – Stormwater Management Plan

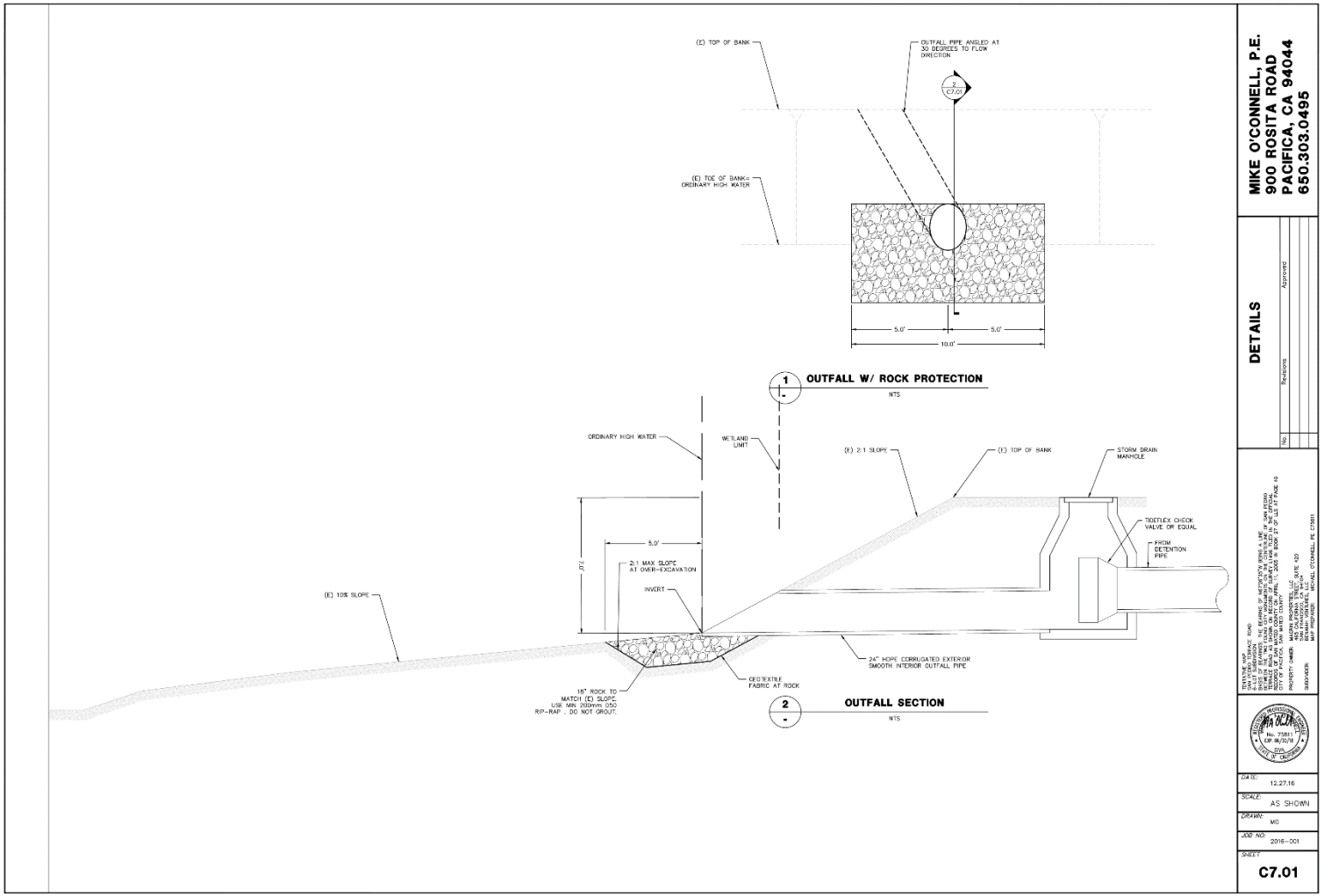


Figure 5: Stormwater Overflow Outfall Details

METHODS

Literature Review

The California Natural Diversity Database (CNDDB 2017) records were queried to determine special-status species documented in the surrounding area. Additional data regarding the potential occurrence of special-status species were gathered from other sources, including the *Special Animals List* (CDFW 2016), the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2016), and the *List of Vegetation Alliances and Associations* (CDFG 2010).

Field Surveys

On December 28, 2015, Joe Rigney from Toyon Consultants visited the site of the proposed project in order to evaluate potential biological impacts from the project. All photos were taken during that site visit unless otherwise noted. A second site visit occurred on June 30, 2016 in order to assess potential impacts to the riparian habitat from the project. An additional visit occurred on March 17, 2017. Plant species observed were noted during all visits.

Plant identification was validated using *The Jepson Manual Second Edition* (Baldwin, *et. al.* 2012).

All photos were taken during the December 28, 2015 site visit unless otherwise noted.

GIS Analysis

GPS data was collected using a Trimble GeoXT field unit at submeter accuracy. All data was collected in WGS 1984 reference. Data was entered into GoogleEarth® for analysis.

RESULTS

Habitat

Table 1 provides a list of plant species seen on the site during the two site visits. Figure 6 shows the location of habitat types observed on the site. Table 2 summarizes the habitat types observed. Numbering and alliance determination is consistent with lists developed by the CNPS and CDFW. (CDFG 2010). Photos are provided below.

Historic Site Disturbance

According to anecdotal information provided to Toyon Consultants, the site has a history of disturbance, including the placement of fill. This conformed to observances made during the site visits, as well as with aerial photos from 2002, 2004, and 2007 (Figure 7). In particular, the aerial photo from 2004 indicates the extensive changes that have occurred on the subject parcel. Almost the entire area appears to have been cleared up to the edge of the creek, and the berm that was noted during the site visit appears to have been constructed around this time.

61.205.00 Salix laevigata (Red willow thickets) Alliance

The section of the property through which San Pedro Creek runs consisted of Willow Riparian Habitat, dominated by *S. laevigata* and *S. sitchensis* (Sitka willow). The even spacing and the growth patterns of the willows indicated that they had been planted at some point in the past, likely as part of the changes to the site apparent in the aerial photo from 2004 shown in Figure 7. Willows are a common plant used in habitat restoration projects involving riparian areas due to their ease of establishment on disturbed sites. Several invasive exotic species were observed, including *Eucalyptus globulus* (blue gum eucalyptus), *Genista monspessulana* (French broom), *Cortaderia jubata* (pampas grass), and *Delairea odorata* (Cape ivy).

32.060.00 Baccharis pilularis (Coyote brush scrub) Alliance

The upper section of the bank and the area immediately adjacent to the bank are dominated by *B. pilularis* (coyote bush) and non-native species such as *Cortaderia jubata* (pampas grass), *Conium maculatum* (poison hemlock), and *Acacia dealbata* (silver wattle). The dominant presence of these species is further demonstration of the disturbed nature of this site, as both *B. pilularis* and *C. jubata* are typical early species found on disturbed site (*per. obsv.)*. The soil in this area likely includes fill dirt.

The flat section of this habitat area (where the majority of development is proposed) continues to experience disturbance, primarily periodic mowing. A recent photo shows that the site has only limited growth of shrub species such as *B. pilularis*. The upper portion of the berm within this habitat area (i.e. the portion immediately adjacent to the *S. laevigata* Alliance habitat area) does include shrub species including *B. pilularis* and *G. monspessulana*. No burrowing mammal activity was observed in this area.

Photo 1: *Salix laevigata* (Red willow thickets) Alliance
(Note undisturbed *B. pilularis* alliance in foreground

Photo 2: *Baccharis pilularis* (Coyote brush scrub) Alliance (Photo taken on 3/17/17) Note shrub growth in background of photo – this is the top of the berm observed on the site.

42.051.03 Phalaris aquatica - Avena barbata Alliance
The western edge and center of the property contains non-native grassland dominated by a number of species, including *P. aquatica* (Harding grass), *A. barbata* (slender wild oat), and *Helminthotheca echioides* (bristly ox-tongue). There were few native species observed in this habitat, and the soil in this area likely includes fill dirt. No burrowing mammal activity was observed in this area.

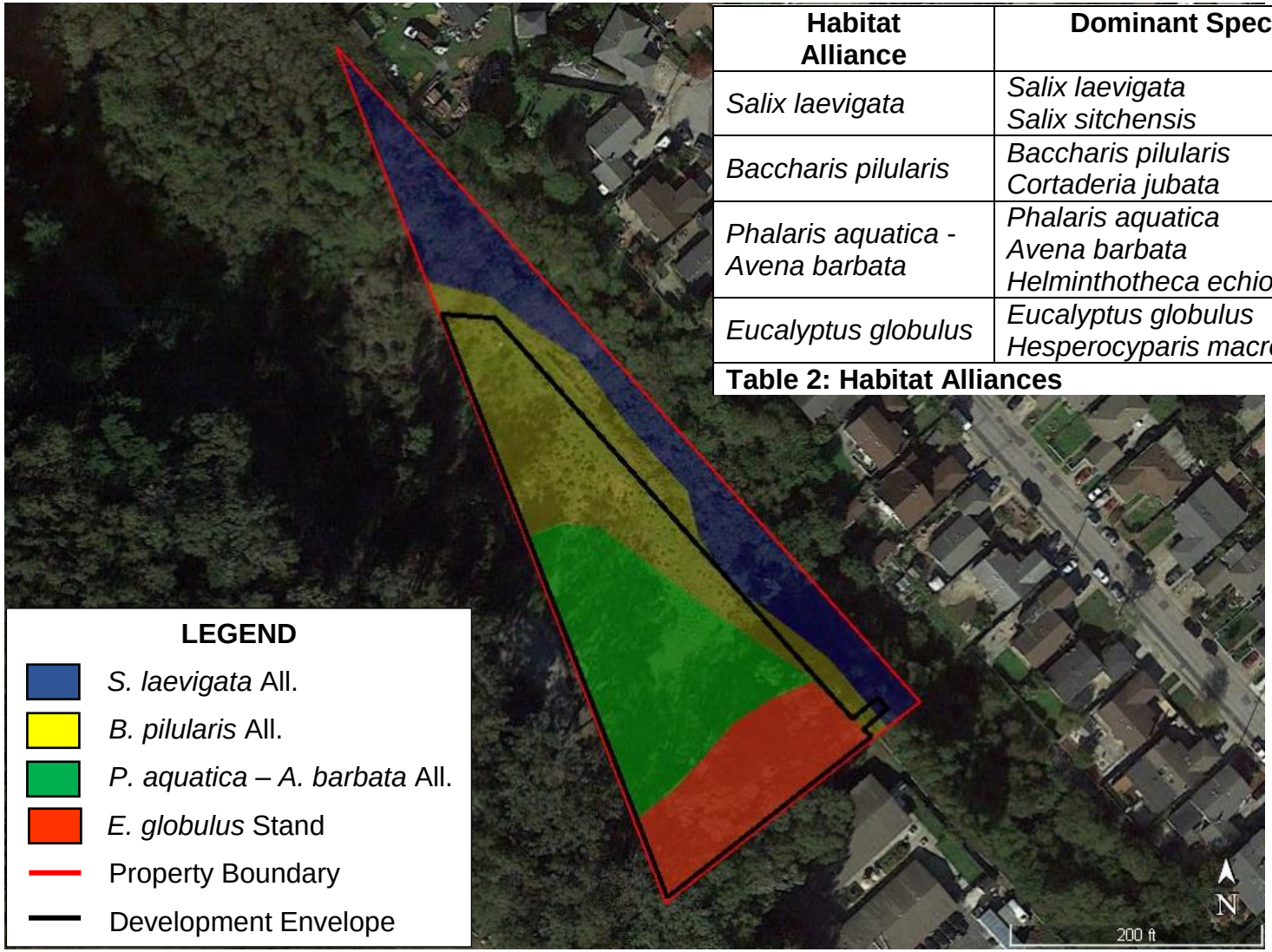
Photo 3: *Phalaris aquatica - Avena barbata* Alliance

79.100.00 Eucalyptus globulus (Eucalyptus groves) Semi-natural Stands
The eastern edge of the property consists of a grove of *E. globulus* (blue gum eucalyptus) and *Hesperocyparis macrocarpa* (Monterey cypress) trees intermixed. Although *H. macrocarpa* is native to California, it is not native to Pacifica. Both of these trees have naturalized on the site, and so both planted and wild plants were observed.

Photo 4: *Eucalyptus globulus* (Eucalyptus groves) Semi-natural Stands

Family	Species Name	Common Name	Native
Fabaceae	*Acacia dealbata*	Silver Wattle	n
Poaceae	*Avena barbata*	Slender Wild Oat	n
Asteraceae	*Baccharis pilularis*	Coyote brush	y
Poaceae	*Bromus diandrus*	Ripgut grass	n
Asteraceae	*Cirsium vulgare*	Bull Thistle	n
Apiaceae	*Conium maculatum*	Poison hemlock	n
Convolvulaceae	*Convulvulus arvensis*	Bindweed	n
Poaceae	*Cortaderia jubata*	Pampas Grass	n
Boraginaceae	*Cynoglossum grande*	Hound's Tongue	y
Asteraceae	*Delairea odorata*	Cape Ivy	n
Poaceae	*Elymus glaucus*	Western Ryegrass	y
Equisetaceae	*Equisetum arvense*	Common Horsetail	y
Papaveraceae	*Eschscholzia californica*	California Poppy	y
Myrtaceae	*Eucalyptus globulus*	Blue Gum	n
Poaceae	*Festuca perenne*	Rye Grass	n
Apiaceae	*Foeniculum vulgare*	Sweet Fennel	n
Fabaceae	*Genista monspessulana*	French broom	n
Araliaceae	*Hedera helix*	English Ivy	n
Asteraceae	*Helminthotheca echioides*	Bristly Ox-tongue	n
Cupressaceae	*Hesperocyparis macrocarpa*	Monterey Cypress	y
Juncaceae	*Juncus balticus*	Rush	y
Juncaceae	*Juncus patens*	Spreading Rush	y
Poaceae	*Phalaris aquatica*	Harding Grass	n
Brassicaceae	*Raphpanus sativus*	Wild Radish	n
Rhamnaceae	*Rhamnus californica*	Coffeeberry	y
Rosaceae	*Rubus ameniacus*	Himalayan Blackberry	n
Rosaceae	*Rubus ursinus*	California blackberry	y
Polygonaceae	*Rumex sp.*	Dock	?
Salicaceae	*Salix laevigata*	Red Willow	y
Salicaceae	*Salix sitchensis*	Sitka Willow	y
Lamiaceae	*Stachys bullata*	Hedge Nettle	y
Anacardiaceae	*Toxicodendron diversilobum*	Poison Oak	y
Tropaeolaceae	*Tropaeolum majus*	Nasturtium	n
Apocynaceae	*Vinca major*	Periwinkle	n

Table 1: Plant Species Observed



Habitat Alliance	Dominant Species	Area (acres)
Salix laevigata	*Salix laevigata* *Salix sitchensis*	0.79
Baccharis pilularis	*Baccharis pilularis* *Cortaderia jubata*	0.71
Phalaris aquatica - Avena barbata	*Phalaris aquatica* *Avena barbata* *Helminthotheca echioides*	0.58
Eucalyptus globulus	*Eucalyptus globulus* *Hesperocyparis macrocarpa*	0.31

Table 2: Habitat Alliances

Figure 6: Habitat Map. Project boundaries are approximate.
Aerial photo dated November 2, 2016.

Figure 6:
Aerial photos showing history of land disturbance on the proposed development site.

Top: September 30, 2002
Middle: January 31, 2004
Bottom: February 16, 2007

DISCUSSION

Habitat
*T*he *Salix laevigata* Alliance is a habitat of concern (CDFG 2010). Impacts to this habitat must be considered under CEQA.

Vegetation
Figure 9 shows known populations of sensitive plants species within a 10 mile radius of the project area as found in the CNDDB. Table 4 indicates all sensitive plant species with the potential to occur on the project site. Table 2 (above) contains the list of all plant species observed.

No rare or sensitive plant species were observed within the project area, and no impact is expected to such species.

Wildlife
Figure 8 shows all potentially sensitive wildlife species found within a 10-mile radius of the project site as found in the CNDDB (CNDDB 2017). Table 3 provides a list of species of concern potentially found on the project site that are considered in this report. Additional information concerning species with the highest potential to occur on the project site are provided below.

Yellow Warbler (Dendroica petechia brewsteri)
Yellow Warblers are a Species of Special Concern for the California Department of Fish and Wildlife (CDFW), and so must be considered under CEQA. None were observed during the site visits.

The bird spends the breeding season in thickets and other disturbed or regrowing habitats, particularly along streams and wetlands. They are often found among willows. The site is within the summer breeding range of this species

The site contains potential breeding habitat.

San Francisco Garter Snake (Thamnophis sirtalis ssp. terataenia)
San Francisco garter snake (SFGS) is listed as “endangered” under the Federal Endangered Species Act (FESA). Take of a listed species is illegal under FESA unless allowed under a permit issued by the US Fish and Wildlife Service (USFWS). The species is also listed as a “Fully Protected Species” by the state of California. Take is not allowed for species with this classification. “Take” includes not only the direct killing of species, but impacts to habitat as well.

SFGS preferred habitat is a densely vegetated pond near an open hillside where they can sun themselves, feed, and find cover in rodent burrows. Temporary ponds and other seasonal freshwater bodies are also used. They avoid brackish marsh areas because their preferred prey (California red-legged frogs) cannot survive in saline water.

Emergent and bankside vegetation are preferred and used for cover. The area between stream and pond habitats and grasslands or bank sides is used for basking, while nearby dense vegetation or water often provide escape cover. SFGS also use floating algal or rush mats, if available.

Adult snakes sometimes estivate (enter a dormant state) in rodent burrows during summer months when ponds dry. On the coast, snakes hibernate during the winter, but further inland, if the weather is suitable, snakes may be active year-round. Recent studies have documented San Francisco garter snake movement over several hundred yards away from wetlands to hibernate in upland small mammal burrows.

The site contains potential habitat for SFGS.

Western Pond Turtle (Actinemys marmorata)
The western pond turtle (WPT) is a Species of Special Concern for the CDFW, and so must be considered under CEQA. No turtles appeared within a ten mile radius in the CNDDB, however San Pedro Creek is within the range of this species and so it may be present.

WPT are found in permanent and intermittent waters of rivers, creeks, small lakes and ponds, marshes, irrigation ditches and reservoirs. Turtles bask on land or near water on logs, branches or boulders. In some populations, males may be found on land for some portion of ten months annually, while females can be found on land during all months of the year due to nesting and overwintering (a form of hibernation). WPT turtles can be found overwintering more than 1,500 feet from aquatic habitat, as well as migrating over half a mile.

Mating typically occurs in late April or early May. Females emigrate from their aquatic habitat to an upland location to nest and deposit eggs. Females may lay more than one clutch a year, but they most commonly deposit eggs between May and August. WPT typically nest on sandy banks near water or in fields with sunny spots up to a few hundred feet from water.

No turtles have been observed on the project site. The site contains both potential breeding and upland habitat.

California Red-legged Frog (Rana draytonii)
California red legged frogs (CRLF) are listed as “threatened” under the Federal Endangered Species Act (FESA). Take of a listed species is illegal under FESA unless allowed under a permit issued by the US Fish and Wildlife Service (USFWS). “Take” includes not only the direct killing of species, but impacts to habitat as well. The proposed project is within 500 feet of federally designated critical habitat for CRLF (Figure 10).

CRLF utilizes both water (aquatic) and upland (terrestrial) components. Habitat areas include nearly any area within 1-2 miles of a breeding site that stays moist and cool

through the summer; this includes non-breeding aquatic habitat in pools of slow-moving streams, perennial or ephemeral ponds, and upland sheltering habitat such as rocks, small mammal burrows, logs, densely vegetated areas, and man-made structures (i.e. culverts, livestock troughs, spring-boxes, abandoned sheds).

CRLF in the Central Coast region begin breeding after the onset of winter rains, typically November through March. Breeding sites are generally found in deep, still or slow-moving water (greater than 2.5 feet) and can have a wide range of edge and emergent cover amounts. They can breed at sites with dense shrubby riparian or emergent vegetation, or can proliferate in ponds devoid of emergent vegetation and any apparent vegetative cover (i.e., stock ponds).

California red-legged frogs enter a dormant state during summer or dry weather (estivate) in small mammal burrows and moist leaf litter. They have been found up to 100 feet from water in adjacent dense riparian vegetation.

CRLF is known to utilize San Pedro Creek as breeding habitat, and the project is adjacent to “critical habitat” as designated by USFWS (USFWS 2006, 2008). The site contains both potential breeding and upland habitat.

Steelhead Salmon (Oncorhynchus mykiss irideus)
Steelhead found within the Central Coast Evolutionary Significant Unit (ESU) is listed under the FESA as Threatened. Take of a listed species is illegal under FESA unless allowed under a permit issued by the National Marine Fisheries Service.

Steelhead are known to occur within San Pedro Creek, and the creek is considered Critical Habitat for the Central Coast ESU (NMFS 2005).

The placement of the storm water drain into San Pedro Creek may have an impact on steelhead.

Monarch Butterfly (Danaus plexippus)
Monarch butterflies are proposed for listing under FESA, and so impacts to this species should be considered under CEQA.

Monarchs aggregate in clusters at sites scattered along 1,000 km (620 miles) of the Pacific coast from California’s Mendocino County to Baja California, Mexico. The distribution of monarchs among overwintering sites changes over the season and annually, based on regional and individual site conditions.

Coastal California provides the mild climatic conditions that monarchs need to survive the winter in western North America. The majority of overwintering sites are located within 2.4 km (1.5 miles) of the Pacific Ocean or San Francisco Bay which moderates temperatures. Sites are typically found at low elevations (60–90 m [200–300 feet]) and situated on slopes oriented to the south, southwest, or west which provide the most solar radiation or in shallow canyons or gullies.

Monarchs require very specific microclimatic conditions at overwintering sites including dappled sunlight, high humidity, fresh water, and an absence of freezing temperatures or high winds Fall- or winter-blooming flowers provide nectar which may be needed to maintain lipid levels necessary for spring migration.

Monarchs begin to arrive at overwintering sites along the Pacific coast in September and the first half of October, forming fall aggregations. By mid-November, they have formed more stable aggregations that persist through January or into February. The butterflies cluster in dense groups on the branches, leaves, and occasionally, the trunks of trees. In February and March, the surviving monarchs breed at the overwintering site before dispersing.

The trees most commonly used for roosting are the nonnative blue gum eucalyptus (*E. globulus*), and the native Monterey pine (*Pinus radiata*) and Monterey cypress (*C. macrocarpa*). Clusters are also found on nonnative red gum eucalyptus *(E. camadulensis*), and the native western sycamore (*Platanus racemosa*), coast redwood (*Sequoia sempervirens*), coast live oak (*Quercus agrifolia*), and. Suitable microclimate conditions are often found at sites consisting of roost trees, in which monarchs cluster, surrounded by a larger grove or windrow of trees.

Two clusters of roosting monarchs are listed within a ten-mile radius of the project site according to the CNDDB. Potential overwintering habitat occurs on the project site.

Species Name	Common Name	Status	Notes
Mammals			
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	CSC	No woodrat's nest observed on property; no impact from proposed project.
Nyctinomops macrotis	Big free-tailed bat	CSC	No appropriate habitat (rock crevices, buildings) found onsite; no impact from proposed project.
Taxidea taxus	American badger	CSC	No badger burrows observed; no impact from proposed project.
Birds			
Agelaius tricolor	Tricolored blackbird	CSC	Marginal habitat onsite; no individuals or flocks observed during any site visit; no impact from project.
Contopus cooperi	Olive-sided flycatcher	CSC	Project area within summer breeding range; no breeding habitat (montane or coniferous forest) on site; no impact from project.
Dendroica petechia brewsteri	Yellow warbler	CSC	Project area within summer breeding range; breeding habitat within project area; potential impact from project.
Falco columbarius	Merlin	CWL	Project area within winter non-breeding range; no impact from project.
Reptiles			
Actinemys marmorata	Western Pond Turtle	CSC	Potential habitat in creek adjacent to project area; proposed project may impact species.
Thamnophis sirtalis tetrataenia	San Francisco Garter Snake	FE, CE, CFP	Potential habitat in creek adjacent to project area; proposed project may impact species.
Amphibians			
Rana draytonii	California red-legged frog	FT, CSC	Known population in stream adjacent to proposed project; proposed project may impact species.
Fish			
Oncorhynchus mykiss irideus	Steelhead salmon	FT	Known population in stream adjacent to proposed project; proposed project may impact species.

Table 3: Sensitive Animal Species with Potential to Occur at San Pedro Terrace
CFP = California Fully Protected
CSC = California Species of Special Concern
CE = Endangered Under California Endangered Species Act
CWL = CDFW Watch List
FE = Endangered Under Federal Endangered Species Act
FT = Threatened Under Federal Endangered Species Act
FPL = Proposed for Listing Under Federal Endangered Species Act

Species Name	Common Name	Status	Notes
Insects			
Callophrys mossii bayensis	San Bruno elfin butterfly	FE	No appropriate habitat type (coastal chaparral) within project area; no impact from project.
Danaus plexippus	Monarch butterfly	FPL	Potential habitat onsite; not observed; potential impact from proposed project.
Plebejus icarioides missionensis	Mission Blue Butterfly	FE	Obligate plant species (*Lupinus albifrons*) not observed on site. no impact from project.
Speyeria zerene myrtleae	Myrtle's silverspot	FE	Presumed extinct in SF Bay Area

Table 3 (cont.): Sensitive Animal Species with Potential to Occur at San Pedro Terrace
CFP = California Fully Protected
CSC = California Species of Special Concern
CE = Endangered Under California Endangered Species Act
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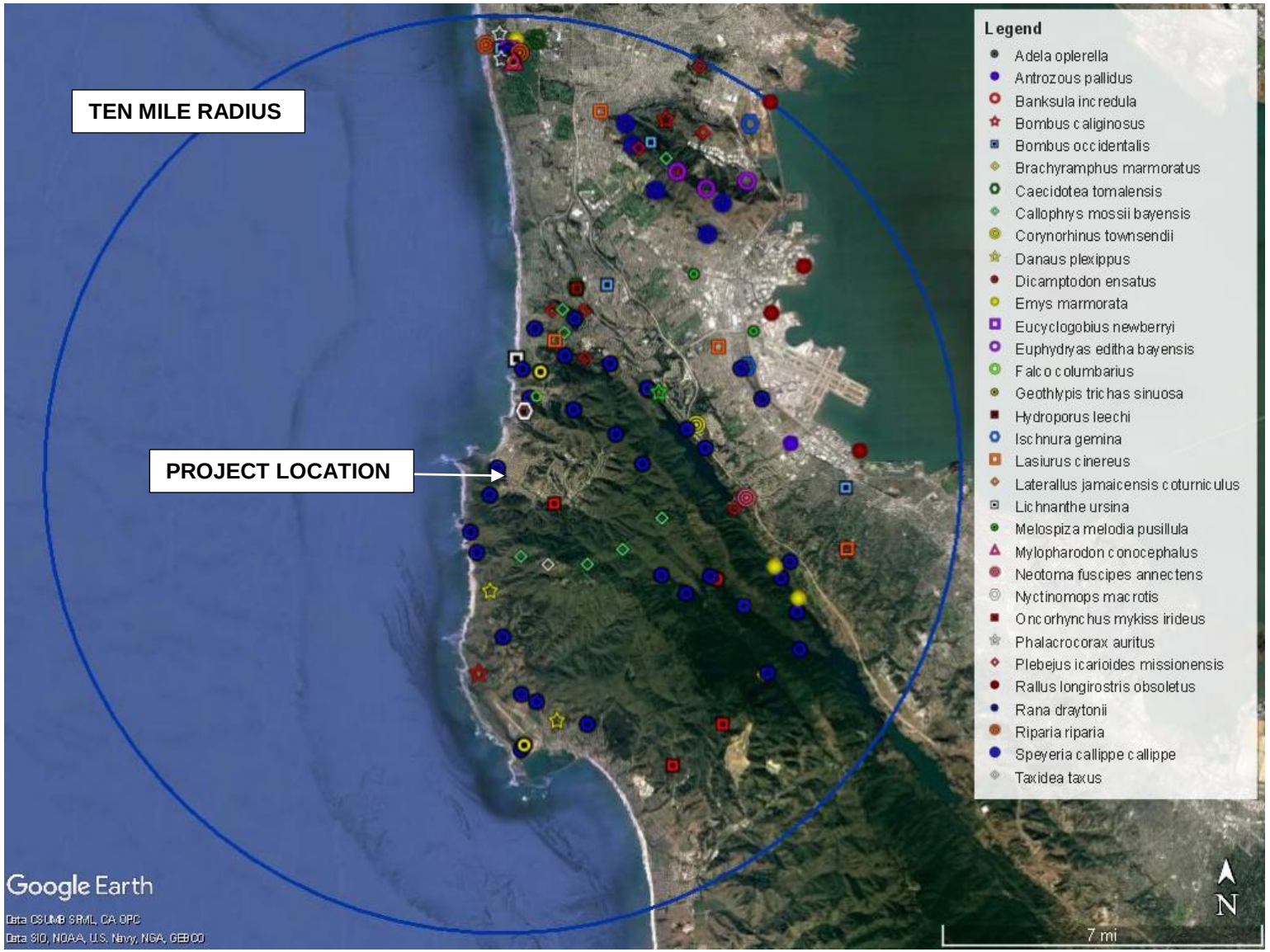

FIGURE 8: Known Locations of Sensitive Animal Species within 10-Mile Radius of the Project Location, as Found in the CNDDB (CNDDB 2017).

SCIENTIFIC NAME	COMMON NAME	FAMILY	STATUS
Acanthomintha duttonii	San Mateo thorn-mint	Lamiaceae	1B, FE, CE
Agrostis blasdalei	Blasdale's bent grass	Poaceae	1B
Arctostaphylos andersonii	Anderson's manzanita	Ericaceae	1B
Arctostaphylos franciscana	Franciscan manzanita	Ericaceae	1B, FE
Arctostaphylos imbricata	San Bruno Mountain manzanita	Ericaceae	1B, CE
Arctostaphylos montana ssp. ravenii	Presidio manzanita	Ericaceae	1B, FE, CE
Arctostaphylos montaraensis	Montara manzanita	Ericaceae	1B
Arctostaphylos pacifica	Pacific manzanita	Ericaceae	1B, CE
Arctostaphylos regismontana	Kings Mountain manzanita	Ericaceae	1B
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	Fabaceae	1B
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	1B
Chorizanthe cuspidata var. cuspidata	San Francisco Bay spineflower	Polygonaceae	1B
Chorizanthe robusta var. robusta	robust spineflower	Polygonaceae	1B, FE
Cirsium andrewsii	Franciscan thistle	Asteraceae	1B
Cirsium fontinale var. fontinale	Crystal Springs fountain thistle	Asteraceae	1B, FE, CE
Cirsium occidentale var. compactum	compact cobwebby thistle	Asteraceae	1B
Collinsia multicolor	San Francisco collinsia	Plantaginaceae	1B
Dirca occidentalis	western leatherwood	Thymelaeaceae	1B
Fritillaria lanceolata var. tristulis	Marin checker lily	Liliaceae	1B
Fritillaria liliacea	fragrant fritillary	Liliaceae	1B
Gilia capitata ssp. chamissonis	blue coast gilia	Polemoniaceae	1B
Grindelia hirsutula var. maritima	San Francisco gumplant	Asteraceae	3
Helianthella castanea	Diablo helianthella	Asteraceae	1B
Hesperevax sparsiflora var. brevifolia	short-leaved evax	Asteraceae	1B
Hesperolinon congestum	Marin western flax	Linaceae	1B, FT, CT
Horkelia cuneata var. sericea	Kellogg's horkelia	Rosaceae	1B
Horkelia marinensis	Point Reyes horkelia	Rosaceae	1B
Leptosiphon croceus	coast yellow leptosiphon	Polemoniaceae	1B
Lessingia arachnoidea	Crystal Springs lessingia	Asteraceae	1B
Lessingia germanorum	San Francisco lessingia	Asteraceae	1B, FE, CE
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	3
Lilium maritimum	coast lily	Liliaceae	1B

TABLE 4: Sensitive Plant Species Potentially Occurring in or near Pacifica, CA
FE = Federally Endangered
CE = California Endangered
CNPS List
1B = Rare, Threatened, or Endangered in CA and Elsewhere
2 = Rare, Threatened, or Endangered in CA and Common Elsewhere
3 = More Information Needed

SCIENTIFIC NAME	COMMON NAME	FAMILY	STATUS
Lupinus arboreus var. eximius	San Mateo tree lupine	Fabaceae	3
Malacothamnus aboriginum	Indian Valley bush-mallow	Malvaceae	1B
Malacothamnus arcuatus	arcuate bush-mallow	Malvaceae	1B
Malacothamnus davidsonii	Davidson's bush-mallow	Malvaceae	1B
Malacothamnus hallii	Hall's bush-mallow	Malvaceae	1B
Monardella sinuata ssp. nigrescens	northern curly-leaved monardella	Lamiaceae	1B
Monolopia gracilens	woodland woolythreads	Asteraceae	1B
Pedicularis dudleyi	Dudley's lousewort	Orobanchaceae	1B
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	Boraginaceae	1B
Polemonium carneum	Oregon polemonium	Polemoniaceae	2
Silene verecunda ssp. verecunda	San Francisco campion	Caryophyllaceae	1B
Triphysaria floribunda	San Francisco owl's-clover	Orobanchaceae	1B
Triquetrella californica	coastal triquetrella	Pottiaceae	1B

TABLE 4 (cont.): Sensitive Plant Species Potentially Occurring in or near Pacifica, CA
FE = Federally Endangered
CE = California Endangered
CNPS List
1B = Rare, Threatened, or Endangered in CA and Elsewhere
2 = Rare, Threatened, or Endangered in CA and Common Elsewhere
3 = More Information Needed

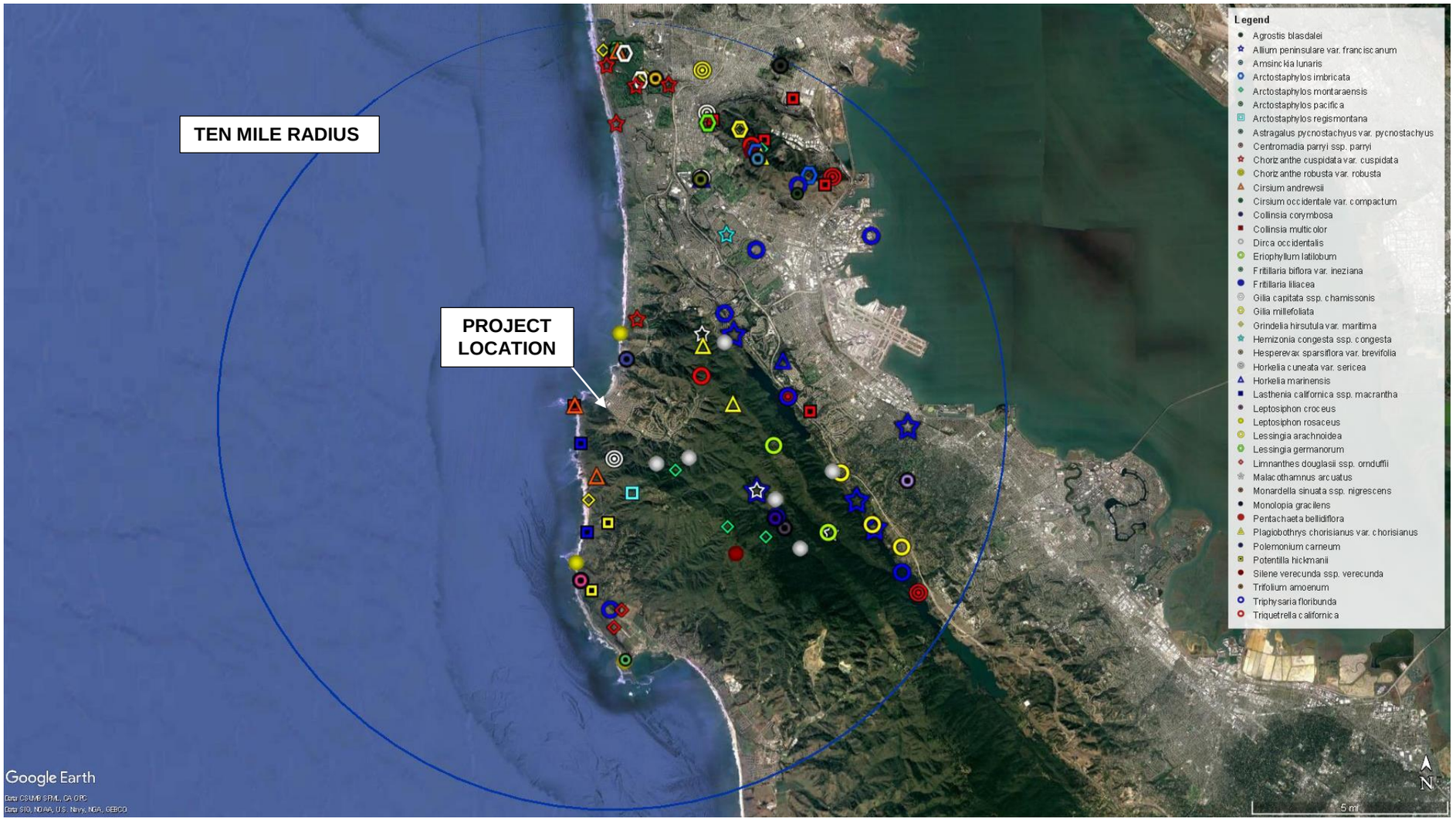

FIGURE 9: Known Locations of Sensitive Plant Species within 10-Mile Radius of the Project Location, as Found in the CNDDB (CNDDB 2017)

Figure 10: California Red-legged Frog Critical Habitat

IMPACT ANALYSIS

Impacts to Habitat

Total impact area to habitat due to the proposed project are summarized in Table 5. Figure 2 on page 16 provides an aerial photo with the development footprint superimposed over the habitat areas.

Placement of the stormwater overflow outfall within the creek will cause 0.003 acres (135 sq. ft.) of impact to the *S. laevigata* alliance. Individual *S. sitchensis* and *S. laeviata* plants may be removed as part of the development of the overflow.

Habitat Alliance	Area (acres)	Impact (acres)
Salix laevigata	0.79	0.003
Baccharis pilularis (disturbed)	0.55	0.46
Baccharis pilularis (undisturbed)	0.16	0.002
Phalaris aquatica - Avena barbata	0.58	0.58
Eucalyptus globulus	0.31	0.31
Table 5: Area of Habitat Types and Impact		

Removal of *S. laevigata* alliance habitat is a potentially significant impact.

The Site Plan in Figure 2 shows that the boundary of the willow riparian edge, with a second line indicating 25 feet from that line. A 25-foot riparian setback will be placed on the lots for this project based on that line. The bank of the perennial creek bed to the edge of the proposed project is approximately 45 ft. A small section of the cul-de-sac is shown to encroach upon the 25-foot buffer from the edge of the riparian area, specifically a section of the sidewalk.

Encroachment within the 25-ft buffer is a potentially significant impact.

The majority of impacts to habitat are on the flat area outside of the floodplain. The entire *Phalaris aquatica - Avena barbata* and *Eucalyptus globulus* alliances will be removed. 65% of the *Baccharis pilularis* alliance will be removed. Of this, 0.002 acres (85 sq. ft.) is within the undisturbed habitat on the slope adjacent to the riparian area, while the remainder is within the disturbed area on the flat section of the property. In and of itself, removal of these habitat areas will not have a significant environmental impact. However, removal may impact specific sensitive species, as described below.

Potential Impacts to Sensitive Plant Species

No impacts to sensitive plant species are expected due to the proposed project.

Potential Impacts to Sensitive Mammals

No impacts to sensitive mammals are expected due to the proposed project.

Potential Impacts to Sensitive Birds

Yellow Warbler

Although not observed onsite, the *S. laevigata* alliance provides potential breeding habitat for the yellow warbler. In the event that this species is nesting within the riparian habitat during construction, then disturbance and possible nest abandonment could occur. Furthermore, removal of willows during construction of the stormwater overflow outfall pipe could decrease available breeding habitat for the species.

Impacts to nesting Yellow Warblers are potentially significant.

Migratory Birds

The Federal Migratory Bird Act protects certain bird nests and eggs from collection and destruction. For construction projects, this typically is of concern when trees are removed. Lots 1 and 2 will require the removal of several blue gum eucalyptus and Monterey cypress trees. In the event that nesting migratory birds are using any of these trees during tree removal, a violation of the Act could occur.

Removal of trees containing nesting birds protected under the migratory bird act is potentially significant.

Potential Impacts to Sensitive Reptiles

Western Pond Turtle

Removal of willows during construction of the stormwater overflow outfall pipe could potentially affect WPT present in the area. This is particularly true if work is performed during the rainy season when water is at its highest.

Removal of willows during construction of the stormwater outfall and removal of grassy habitat areas containing nesting WPT are potentially significant impacts.

Removal of grassy habitat in both the *B. pilularis* and *P. aquatica – A. barbata* alliance could also impact this species if it is nesting within the area.

Removal of willows during construction of the stormwater outfall and removal of grassy habitat areas containing nesting WPT are potentially significant impacts.

San Francisco Garter Snake

Removal of willows during construction of the stormwater overflow outfall pipe could potentially affect SFGS if they are present in the area, which could lead to a take of the species. Due to their propensity to stay near bodies of water, this impact is considered most likely during winter rains, when creek levels are highest.

Construction of the stormwater outfall will have a potentially significant impact on SFGS if snakes are present in the area.

The lack of burrowing mammal holes in the upland habitat areas indicates that SFGS would not be using these areas as hunting or estivation habitat.

Removal of the *B. pilularis* and *P. aquatica – A. barbata* alliance is will have no significant impact on SFGS.

Potential Impacts to Sensitive Amphibians

California Red Legged Frog

Removal of willows and undisturbed upland habitat during construction of the stormwater overflow outfall pipe could potentially affect CRLF if they are present in the area, which could lead to a take of the species.

Construction of the stormwater outfall will have a potentially significant impact on CRLF if frogs are present in the area.

Construction of the outfall will likely require the removal of both *S. laevigata* alliance and undisturbed *B. pilularis* alliance habitat. Removal of these areas will decrease potential habitat for CRLF, which would be considered a take of the species.

Removal of *S. laevigata* alliance and undisturbed *B. pilularis* alliance habitat will have a potentially significant impact.

The disturbed area of *B. pilularis* alliance habitat does not have sufficient cover of leaf litter for CRLF to use the area as upland estivation habitat. The lack of burrowing mammal holes in the upland habitat areas is further indication that CRLF would not use this area as estivation habitat. However, given that CRLF are known to move within upland habitat during rainy months, there is a potential that there would be a take of CRLF if they were present within the upland habitat areas during construction.

Removal of the *B. pilularis* and *P. aquatica – A. barbata* alliance will have a potentially significant impact if frogs are present during construction.

Potential Impacts to Sensitive Fish

Steelhead Salmon

Construction of the stormwater overflow outfall pipe could potentially affect steelhead salmon if work is performed during the rainy season when water is at or near the ordinary high water mark (Toyon Consultants 2017). These impacts could be direct through direct killing of fish, or indirect through sedimentation.

Construction of the stormwater outfall will have a potentially significant impact on steelhead salmon if work is performed during the rainy season.

Subdivision of the project site and buildout construction could potentially affect salmon in the creek. Appendix A provides the complete storm drain report for this project.

The project includes a detention pipe that will restrict flow to 0.66 cfs during a 100 year storm event. This is equal to the pre-development flow from the site. The volume of water during that time frame is 1100 cubic feet, but the detention pipe can hold 800 cubic feet, so the creek will only see 300 cubic feet at the peak of the storm. The remaining 800 cubic feet will be discharged after the peak of the storm has subsided

The total impervious area is 35,449 sf. The total pervious area is 69,966 sf. The backyards of the houses are required to be entirely pervious, so any pavement for them would be pervious. The street is 13,550 sf and is asphalt.

The source of the potable water is the North Coast County Water District. They get water from SFPUC hetch-hetchy. The estimated annual demand is 573,000 gallons. (See Appendix B for details).

Since the stormwater detention system has been specifically designed to mimic the pre-development flow from the site, no significant change is expected to the creek from the project.

Subdivision and construction is expected to have no significant impact on steelhead salmon.

Potential Impacts to Sensitive Insects

Monarch Butterflies

Although not observed on the site, the *E. globulus* grove could act as roosting habitat for overwintering monarch butterflies. Removal of this area during the roosting season would likely kill any butterflies using the habitat.

Removal of the *E. globulus* habitat area during the overwintering seaon would be a potentially significant impact to monarch butterflies if the species is present.

Summary of Potential Significant Biological Impacts

Table 6 provides a summary of potential significant biological impacts.

ACTION	IMPACT	SENSITIVE SPECIES / HABITAT IMPACTED
Construction of stormwater outfall	Removal of *S. laveagata* alliance habitat	*S. laveagata alliance* habitat Yellow Warbler San Francisco Garter Snake California Red Legged Frog
Construction of stormwater outfall	Construction below Ordinary High Water Mark	Steelhead Salmon
Construction of stormwater outfall	Removal of undisturbed *B. pilularis* alliance habitat	California Red Legged Frog
Subdivision and construction of proposed housing	Encroachment within 25-ft buffer of *S. laveagata* alliance habitat	*S. laveagata alliance* habitat
Subdivision and construction of proposed housing	Removal of *B. pilularis* and *P. aquatica – A. barbata* alliance habitat areas	California Red Legged Frog Western Pond Turtle
Subdivision and construction of proposed housing	Removal of *E. globulus* alliance habitat	Monarch Butterfly Migratory Birds
Table 6: Potential Significant Biological Impacts from the Proposed Project		

PROPOSED MITIGATIONS

Mitigation Strategy

The mitigation strategy is to avoid and minimize impacts to sensitive habitat and species so as to bring all potential biological impacts to a less than significant level.

1. S. laevigata Alliance Habitat

a. Prior to the initiation of construction, the construction manager shall flag or otherwise note the location of all areas to be disturbed within the riparian area; this area will be surveyed by the Project Biologist to prior to construction.

b. Any willows removed during the course of construction will be replaced at a 3:1 ratio from locally collected cuttings.

c. A Habitat Restoration plan shall be submitted to and approved by the Pacifica Planning Department for restoration of the *S. laevigata* area. The restoration plan shall require the removal of invasive exotic species within the riparian area on the bench between the bank and the lower creek area, adjacent to the proposed project. The plan shall include a five year mitigation monitoring and reporting plan with defined success criteria.

2. Yellow Warbler

a. Not more than one week prior to construction, a qualified biologist shall conduct a pre-construction survey for nesting Yellow Warblers within the *S. laevigata* alliance habitat area, if construction will occur during the breeding season (typically April 1 through July 31).

b. If nesting Yellow warblers are found, a construction buffer of 50 feet shall be established around each active nest.

c. No work shall occur within the construction buffer for the duration of the breeding season or until it has been confirmed that all young have fledged and are independent.

3. Migratory Birds

d. A qualified biologist shall conduct a pre-construction survey for tree-nesting birds in all trees to be removed within 15 days of the onset of ground disturbance, if such disturbance will occur during the breeding season typically (February 1 through August 31).

e. If nesting raptors are detected on the site during the survey, a construction buffer of 300 feet shall be established around each active nest.

f. If other nesting migratory birds are found, a construction buffer of 50 feet shall be established around each active nest.

g. No work shall occur within the construction buffer for the duration of the breeding season or until it has been confirmed that all young have fledged and are independent.

4. San Francisco Garter Snake

a. All grading, dredging, and construction activity related to the outfall shall be conducted during the dry season, generally between May 1 and October 15, or before the onset of the rainy season, whichever occurs first.

b. No sooner than 48 hours prior to the beginning of construction of the outfall, a pre-construction survey will be conducted by a qualified biologist to ensure that no SFGS are present in the construction area. In the event that SFGS are present, the snake(s) shall be allowed to leave the project site of their own volition. The qualified biologist shall be responsible for determining when construction activities can begin.

c. At all times, if SFGS are observed within the active construction area, all work shall cease until such a time that the snake leaves the construction area of its own volition.

d. Any erosion control fabric or matting used on the site shall be tightly woven fiber netting or similar material to ensure that SFGS do not get trapped. Plastic mono-filament netting, rolled erosion control products or similar material shall not be used at the project site because red-legged frogs and other species may become entangled or trapped in it.

e. In the event that a SFGS is injured or killed, all construction activities shall cease, and USFWS and CDFW shall be immediately notified. Construction shall not resume until further instruction has been received from USFWS and CDFW.

5. Western Pond Turtle

a. All grading, dredging, and construction activity related to the outfall shall be conducted during the dry season, generally between May 1 and October 15, or before the onset of the rainy season, whichever occurs first.

b. No sooner than 48 hours prior to the beginning of grading of the upland habitat areas, a pre-construction survey will be conducted by a qualified biologist to determine if turtles are using the area for nesting.

c. In the event that nesting turtles are observed, a construction buffer of 50 feet shall be established around each active nest.

d. No work shall occur within the construction buffer for the duration of the breeding season or until it has been confirmed that all turtles have left the nest.

6. California Red-Legged Frogs

a. All grading activity shall be conducted during the dry season, generally between May 1 and October 15, or before the onset of the rainy season, whichever occurs first, unless exclusion fencing is utilized.

b. Construction that commences in the dry season may continue into the rainy season if exclusion fencing is placed between the construction site and San Pedro Creek to keep the frog from entering the construction area. Exclusion fencing will be erected around the project boundary prior to the onset of construction activities. Fencing will be a minimum of 3 feet in height and buried in the soil to inhibit California red-legged frogs from entering the project area.

c. After the exclusion fence is installed, but no sooner than 48 hours prior to the beginning of construction, a pre-construction survey will be conducted by a qualified biologist to ensure that no California red-legged frogs are present in the construction area. In the event that red-legged frogs are present, an appropriate section of the exclusion fencing shall be removed and the frog(s) shall be allowed to leave the project site of their own volition. The qualified biologist shall be responsible for determining when construction activities can begin.

d. Construction surveys for CRLF shall be conducted each day prior to the start of construction during grading and periods of non-vertical construction activities. Construction surveys shall be conducted weekly during vertical construction. If CRLF are observed in the construction area or access areas, they shall be removed from the area by a USFWS permitted biologist and temporarily relocated to nearby suitable aquatic habitat.

e. At all times, if CRLF are observed within the active construction area, all work shall cease until such a time that either the frog leaves the construction area of its own volition or the frog is moved by a USFWS permitted biologist and temporarily relocated to nearby suitable aquatic habitat.

f. Any erosion control fabric or matting used on the site shall be tightly woven fiber netting or similar material to ensure that CRLF do not get trapped. Plastic mono-filament netting, rolled erosion control products or similar material shall not be used at the project site because red-legged frogs and other species may become entangled or trapped in it.

g. In the event that a CRLF is injured or killed, all construction activities shall cease, and USFWS shall be immediately notified. Construction shall not resume until further instruction has been received from USFWS.

h. A Habitat Restoration plan shall be submitted to and approved by the Pacifica Planning Department for restoration of the *B. pilularis* alliance habitat area disturbed by the construction of the stormwater outlet. The restoration plan shall require the planting of native species in the disturbed area. The plan shall include a five year mitigation monitoring and reporting plan with defined success criteria.

i. Additional items are to be implemented as required by the USFWS Programmatic Biological Opinion for construction of the stormwater outlet (see Appendix B):

7. Steelhead Salmon

a. All grading, dredging, and construction activity related to the outfall shall be conducted during the dry season, generally between May 1 and October 15, or before the onset of the rainy season, whichever occurs first.

b. All work on the outfall shall occur only when dry conditions are present and no water from San Pedro Creek is flowing or likely to flow in the project impact area.

8. Monarch Butterfly

a. All tree removal shall occur outside of the monarch overwintering season (typically September 15 – February 15)

Additional Permitting

The proposed storm drain will require two additional permits, as follows:

1. Lake and Streambed Alteration Agreement, through the California Department of Fish and Wildlife

2. A 404/401 Clean Water Act Permit, through the US Army Corps of Engineers.

No work should occur within the riparian area without these permits. Additional mitigation and reporting requirements may be placed on the project during these permitting processes.

CONCLUSION

The majority of the proposed project is to be built on highly disturbed habitat. There are potentially significant biological impacts due to the project: All of these impacts can mitigated to a less than significant level through the implementation of specific mitigation measures outlined in this report.

LEGAL DISCLAIMER

Although every attempt has been made to provide a thorough and complete analysis of the proposed project, the ultimate decisions concerning the environmental conditions and required mitigations are made by the regulatory agencies themselves. No legal claims, express or implied, are made in this letter. For specific legal questions, please consult with a lawyer or the appropriate agency.

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APPENDIX A – San Pedro Terrace Preliminary Storm Drain Report

PRELIMINARY STORM DRAINAGE REPORT

FOR
SAN PEDRO TERRACE ROAD
PACIFICA, CALIFORNIA

Prepared by Round House Industries, Inc.
March 11, 2017

1.0 INTRODUCTION

The project site is located adjacent to 751 San Pedro Terrace Road in Pacifica, California. The site is approximately 2.42 acres but 1.10 acres is a City drainage easement that includes San Pedro Creek. The proposed development includes 6 single family homes and a new street. There are no existing storm drain facilities on the site.

The storm drain system serving the proposed project will be a gravity system with a detention pipe and a new outfall to the creek.

2.0 DESIGN CRITERIA

The City of Pacifica does not have clear storm drain design guidelines, so the following design guidelines have been used. Peak rates of storm water runoff from the project site to the storm drain inlet structures were calculated using the Rational Method Equation.

Requirements and Assumptions:

- Storm drainage design event: 100-year storm.
- Minimum Time of Concentration (Tc) for proposed development is 10 minutes. The time of concentration is adjusted based on travel time in the pipes.
- Rainfall Intensity (I) was estimated from rainfall intensity curves given in the San Mateo County Rainfall Runoff Data.
- Roughness Coefficient (n):
  n = 0.012 for Corrugated High Density Polyethylene Pipe (HDPE)

- Runoff Coefficient (C):
  C = 0.90 for paved areas
  C = 0.95 for roofs
  C = 0.30 for landscape areas
- Rational Method Equation:
  Q = C x I x A
  Where:
  Q is the flow rate in cfs,
  C is a runoff coefficient,
  I is the rainfall intensity in inches per hour for a given time of concentration, and
  A is the area of the drainage sub area in acres.
- Time of Concentration (Kinematic Wave Equation):
  $Tc = 0.007 \times (n*L)^{0.80}/(D^{0.5})*(S^{0.4})$
  Where:
  Tc is the Time of Concentration in minutes,
  L is the horizontal length of the watershed in feet,
  S is the slope between the most remote location in the watershed and the point of concentration
  D is the depth of rainfall in inches
  n is Manning's overland flow roughness coefficient (0.15 for short grass)
  Tc = 39 minutes for the existing conditions.
- Headloss Coefficient for Junctions
  Manhole losses (hL) are computed as hL=K V2/2g, where K is the standard head loss coefficient, V is the velocity leaving the junction structure and g is the gravitational constant. The head loss coefficient is based on the geometry of the junction structure and connecting pipes. The flow depth is computed using the hydraulic grade line slope instead of the pipe slope. The hydraulic grade line slope is the slope between the pipe inlet water elevation (pipe invert elevation plus depth of flow) and the pipe outlet water elevation (pipe invert elevation plus downstream pipe flow depth plus manhole losses).
- Freeboard
  The design water surface level for the proposed system should be lower than the rim elevation during the 100-year storm.

- Starting Water Level
  The Starting water level at the outfall is based on free discharge because the detention system will detain flow during the peak of the storm. Therefore, use of free discharge at the outfall is reasonable.
- Detention
  The project will detain the difference between the post-development flow and the pre-development flow. Detention calculations were prepared in accordance with Redwood City standards (Pacifica has no such standard for determined the storage volume). A manhole with a weir and orifice will meter flow at approximately the pre-development flow rate. Detention calculations are included in this report.

3.0 EXISTING CONDITIONS

The existing site is flat until the top of the creek bank where the slope increases to between 2:1 and 3:1. The site is covered by short vegetation.

4.0 PROPOSED CONDITIONS

The project will install storm drain (corrugated high density polyethylene pipe) pipes ranging in size from 6-inch to 24-inch diameter that will outfall to the creek.

6.0 RESULTS

Storm Drainage System:

Storm water flow from the proposed project site is conveyed to the existing off-site storm drainage systems as shown on Sheet C5.01.

Freeboard will be a minimum of approximately 1.1 feet below the lowest manhole rim elevation during a 100-year storm event.

Results for the on-site storm drainage analysis are shown in Tables 1 through 4 for the 100-year storm event. A profile of the main storm drain is included as well.

8.0 SUMMARY AND CONCLUSIONS

The proposed on-site storm drainage system meets the hydrologic and hydraulic design criteria listed in this report.

SAN PEDRO TERRACE

Hydrology Calculations

100 YEAR STORM		
Existing Conditions:		
Site Area:	1.36	acres
Runoff Coefficient:	0.30	Per CSM Standards for undeveloped land
Time of Concentration	39	minutes
Rainfall Intensity	1.61	inches per hour
Peak Runoff Rate:	**0.66**	**cfs**
Proposed Conditions:		
Site Area:	1.36	acres
Runoff Coefficient:	0.50	Per CSM Standards for residential
Time of Concentration	5	minutes
Rainfall Intensity	3.60	inches per hour
Peak Runoff Rate:	**2.45**	**cfs**
Required Storage = (Qp - Qe)*(3/2)*Tc		
Required Storage:	**806**	**cubic feet**
Detention Pipe		
Diameter	1.5	feet
Diameter	18	inches
Area	1.77	square feet
Length	458	feet
Volume	809	cubic feet
Orifice Equation:	**$Q = C * A * (2gH)^{.5}$**	
C	0.7	
H to centerline	0.8	feet
Q	0.66	cfs
Area =	0.14	square feet
Diameter =	0.41	feet
Diameter =	**5**	**inches**
Use a 18" diameter detention pipe with a 5" diameter outlet pipe as orifice.		

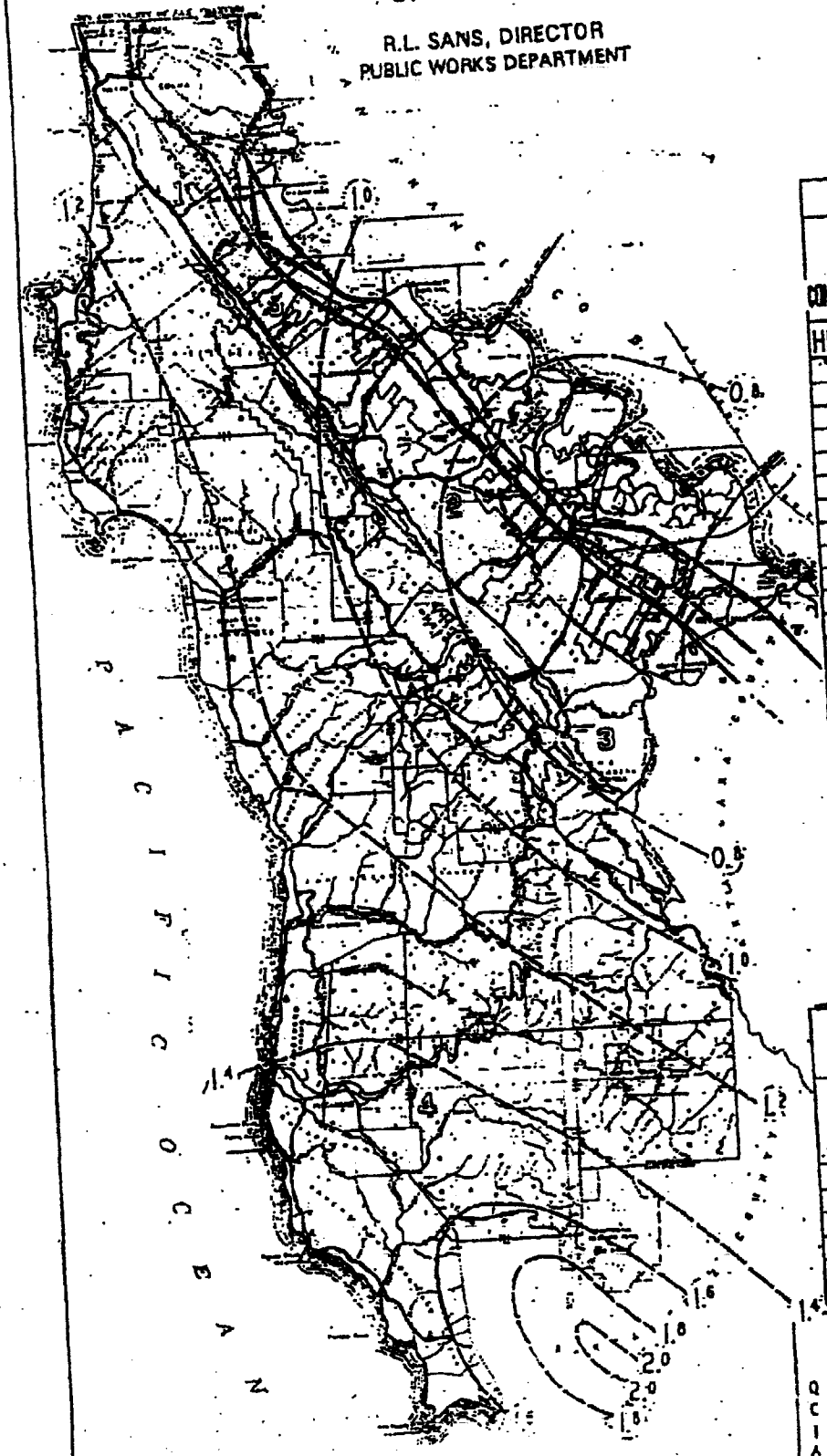
Mike O'Connell, P.E.
900 Rosita Road
Pacifica, CA 94044

RAINFALL RUNOFF DATA

SAN MATEO COUNTY

CALIFORNIA

R.L. SANS, DIRECTOR
PUBLIC WORKS DEPARTMENT



RAINFALL		
TIME OF CONCENTRATION	INTENSITY INCHES PER HOUR	
HRS. MIN.	10 YR.	100 YR.
0 — 10	2.45	3.60
0 — 15	2.05	3.00
0 — 20	1.73	2.55
0 — 25	1.50	2.22
0 — 30	1.33	1.95
0 — 35	1.20	1.75
0 — 40	1.10	1.61
0 — 45	1.02	1.49
0 — 50	0.95	1.37
0 — 55	0.90	1.28
1 — 00	0.86	1.21
1 — 15	0.75	1.07
1 — 30	0.67	0.95
1 — 45	0.61	0.87
2 — 00	0.56	0.80
2 — 30	0.49	0.70
3 — 00	0.44	0.63
3 — 30	0.40	0.57
4 — 00	0.37	0.53
4 — 30	0.34	0.49
5 — 00	0.32	0.45
6 — 00	0.29	0.41
7 — 00	0.26	0.38
8 — 00	0.24	0.35
9 — 00	0.23	0.33
10 — 00	0.21	0.30
12 — 00	0.19	0.27
24 — 00	0.13	0.18

RUNOFF COEFFICIENTS	
TYPE OF DEVELOPMENT	COEF.
PARKS AND CEMETERIES	0.30
RESIDENTIAL - ACRES	0.40
RESIDENTIAL - REGULAR	0.50
INDUSTRIAL	0.65
COMMERCIAL	0.75
PAVED AREAS	0.85

RATIONAL FORMULA

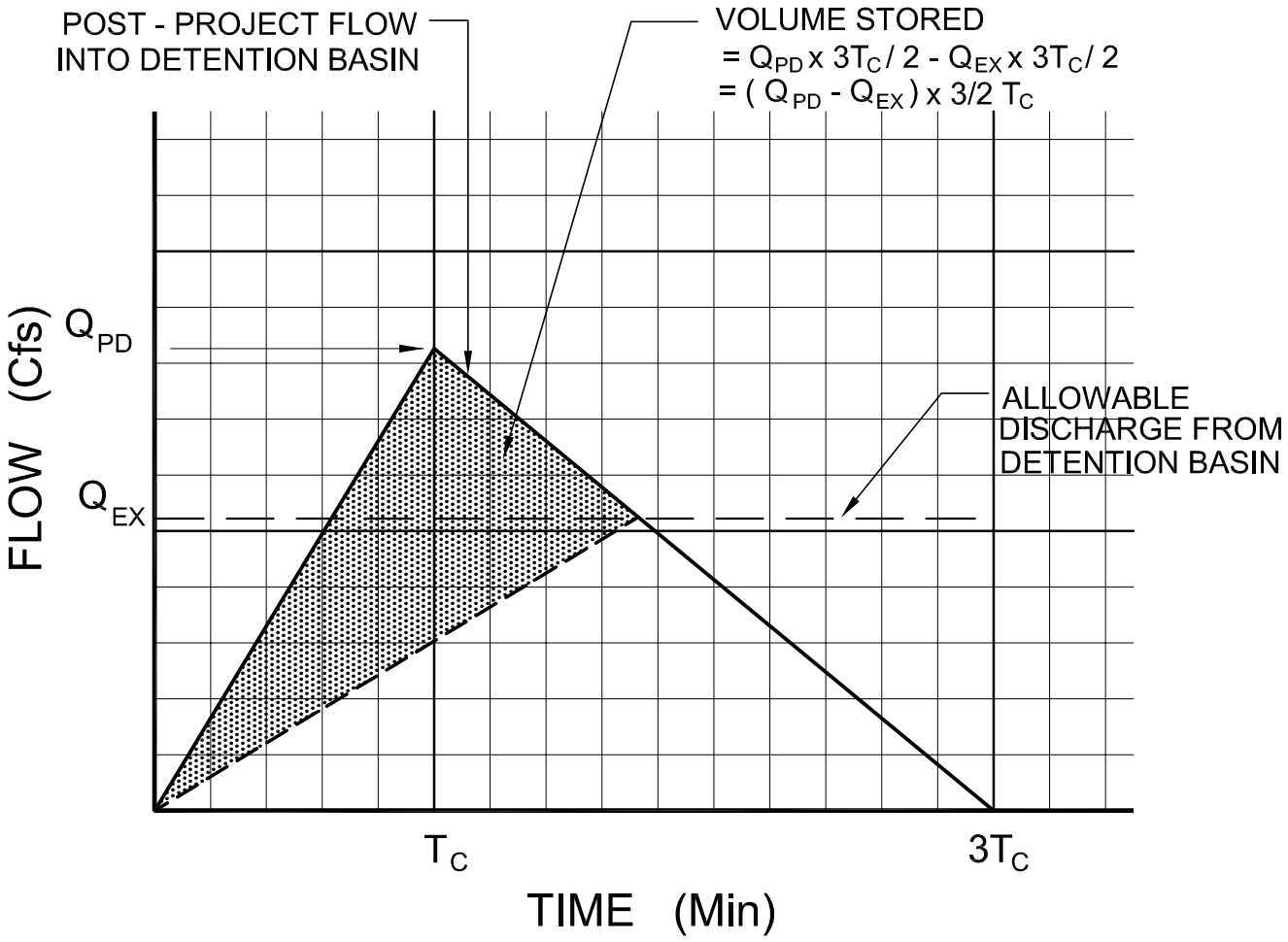
Q = C I A F

Q — RUNOFF - CUBIC FEET PER SECOND
C — RUNOFF COEFFICIENT - PER CENT
I — RAINFALL INTENSITY - INCHES PER HOUR
A — DRAINAGE AREA - ACRES
F — INTENSITY FACTOR (FROM MAP)

Dr. 22-1846

ATTACHMENT O

SYNTHETIC UNIT HYDROGRAPH
FOR ESTIMATING POST-DEVELOPMENT STORMWATER STORAGE



$$Q_{PD} = C_{PD} I A$$

$$Q_{EX} = C_{EX} I A$$

PD = POST - DEVELOPMENT CONDITIONS
EX = EXISTING PRE - DEVELOPMENT CONDITIONS

Existing Conditions

Kinematic Wave Equation

L	n	Depth	S	TC	TC
(ft)	short grass	in	(ft/ft)	hr	min
560	0.15	2.85	0.023	0.65	39

FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Time of Concentration (hours)	Flow (Total Out) (cfs)	Notes
50	CM-1	MH-1	0.400	0.500	0.170	3.87	
51	CM-2	MH-2	0.800	0.500	0.170	7.73	
52	CM-3	MH-4	0.150	0.500	0.170	1.45	
54	CM-4	CB-1	0.400	0.900	0.170	6.96	

FlexTable: Conduit Table

Hydraulic Grade Line (Out) (ft)	ID	Label	Start Node	Set Invert to Start?	Invert (Start) (ft)	Stop Node	Set Invert to Stop?	Invert (Stop) (ft)	Has User Defined Length?	Length (User Defined) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)
27.02	30	CO-1	MH-1	True	25.68	MH-2	True	24.52	False		237.7	0.005	Circle	18.0	0.012	3.87	2.19
25.81	32	CO-2	MH-2	True	24.52	MH-3	True	24.27	False		52.6	0.005	Circle	18.0	0.012	15.94	9.02
24.93	34	CO-3	MH-3	True	24.27	MH-4	True	23.41	False		155.5	0.006	Circle	24.0	0.012	15.80	6.53
24.76	36	CO-4	MH-4	True	23.41	MH-5	True	23.23	False		11.0	0.016	Circle	24.0	0.012	16.41	10.09
24.63	38	CO-5	MH-5	True	23.23	O-1	True	23.11	False		19.6	0.006	Circle	24.0	0.012	16.38	6.86
27.02	40	CO-6	CB-1	True	25.75	MH-2	True	24.52	False		16.1	0.076	Circle	12.0	0.012	6.96	8.86

Depth (Out) (ft)	Capacity (Full Flow) (cfs)	Flow / Capacity (Design) (%)	Depth (Normal) / Rise (%)	Notes
2.50	7.95	48.6	49.2	
1.54	7.85	203.1	(N/A)	
1.52	18.22	86.7	77.1	
1.53	31.33	52.4	54.1	
1.52	19.20	85.3	76.3	
2.50	10.66	65.3	58.9	

FlexTable: Manhole Table

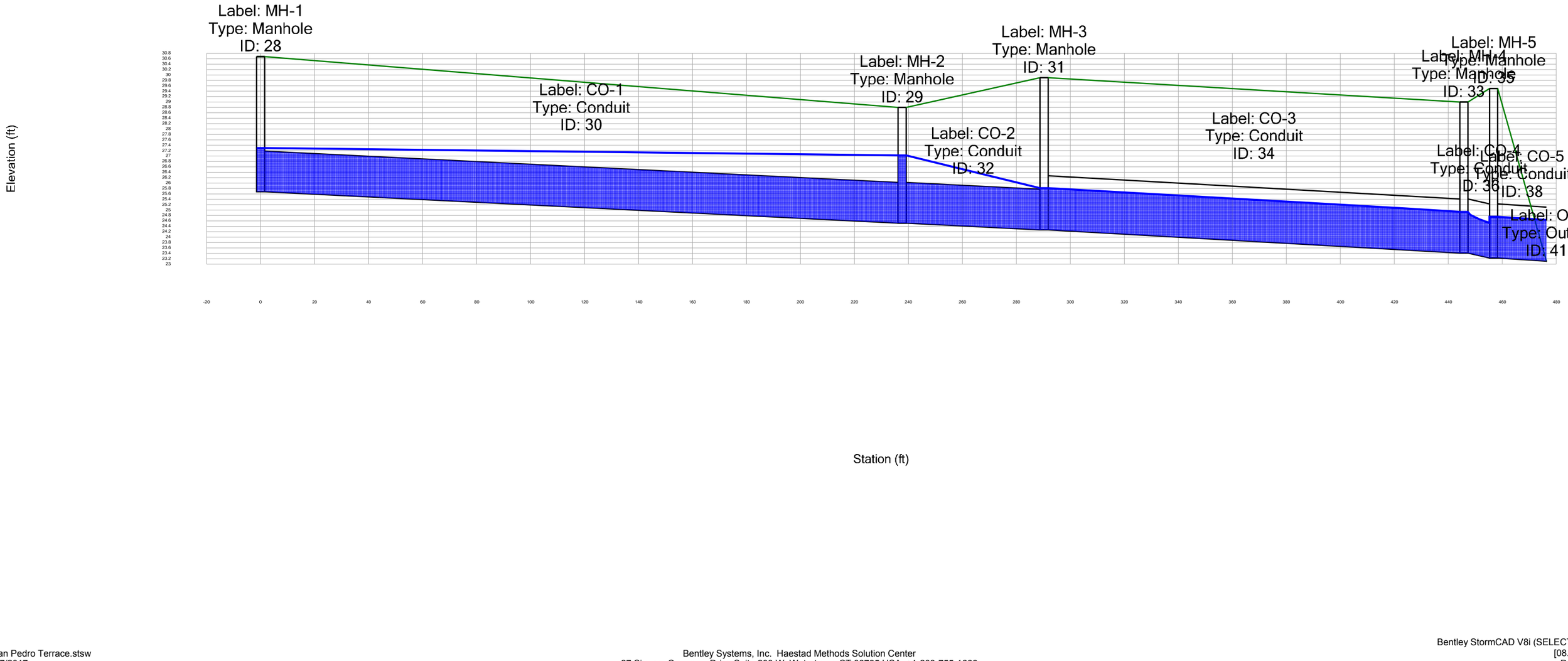
ID	Label	Elevation (Ground) (ft)	Set Rim to Ground Elevation?	Elevation (Rim) (ft)	Bolted Cover?	Elevation (Invert in 1) (ft)	Flow (Total In)	Flow (Total Out) (cfs)	Depth (Out) (ft)	Hydraulic Grade Line (Out) (ft)	Headloss Method	Hydraulic Grade Line (In) (ft)	Notes
28	MH-1	30.68	True	30.68	False	(N/A)	3.86607503890991	3.87	1.62	27.30	Absolute	27.30	
29	MH-2	28.80	True	28.80	False	24.52	18.5571613311768	15.94	2.50	27.02	Absolute	27.02	
31	MH-3	29.90	True	29.90	False	24.27	15.9375352859497	15.80	1.54	25.81	Absolute	25.81	
33	MH-4	29.00	True	29.00	False	23.41	17.2466907501221	16.41	1.52	24.93	Absolute	24.93	
35	MH-5	29.50	True	29.50	False	23.23	16.4118919372559	16.38	1.53	24.76	Absolute	24.76	

FlexTable: Outfall Table

ID	Label	Elevation (Ground) (ft)	Set Rim to Ground Elevation?	Elevation (Invert) (ft)	Boundary Condition Type	Boundary Element	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (cfs)	Notes
41	O-1	23.11	True	23.11	Free Outfall	<None>		24.63	16.31	

Profile Report
Profile: Profile - 1

Profile - 1 - Base



APPENDIX B – Preliminary Water Demands Calculations

San Pedro Terrace Road - Preliminary Water Demands

Use	Units	Units per Person	Potable Water Demand		Average Day Demand	Annual Demand
			Rate	Units	GPD	GPY
Residential	6	3.4	60	GPD/Person	1,224	446,760
Irrigation	6	3.4	17	GPD/Person	347	126,582
				Total	**1,571**	**573,342**

APPENDIX C – USFWS Programmatic Biological Opinion

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:
FF08ESMF00-2014-F-0389

JUN 18 2014

Ms. Jane M. Hicks
Regulatory Division
U.S. Army Corps of Engineers
1455 Market Street 16th Floor
San Francisco, California 94103-1398

Subject: Programmatic Biological Opinion for Issuance of Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, including Authorizations Under 22 Nationwide Permits, for Projects that May Affect the Threatened California Red-Legged Frog in Nine San Francisco Bay Area Counties, California

Dear Ms. Hicks:

This is the U.S. Fish and Wildlife Service's (Service) programmatic biological opinion for issuance of permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA), including 22 Nationwide Permits, in Marin, Napa, Solano, Sonoma, Contra Costa, Alameda, San Francisco, San Mateo, and Santa Clara counties, California. Nationwide Permits are authorized by the U.S. Army Corps of Engineers (Corps) under the Clean Water Act (33 U.S.C. 1251 *et seq.*). At issue are the adverse effects on the threatened California red-legged frog (*Rana draytonii*) and its designated critical habitat. 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 Corps may append activities authorized under CWA and RHA permits in the nine San Francisco Bay Area counties (Bay Area counties) to this programmatic biological opinion with the concurrence of the Service provided the activities meet the suitability criteria for the threatened amphibian and its critical habitat, or the Service determines that implementation of appropriate additional conservation measures sufficiently reduces the effects of the action consistent with the intent of this programmatic biological opinion.

This programmatic biological opinion is based on: (1) recovery plan for the California red-legged frog (Service 2002); (2) designated critical habitat for the California red-legged frog (Service 2010); and (3) other information available to the Service.

ADMINISTRATION OF THE PROGRAMMATIC BIOLOGICAL OPINION

This programmatic consultation will be implemented when the Corps makes a determination that a proposed project that qualifies for authorization under one of the 22 Nationwide Permits described in the Project Description, or otherwise meets the suitability criteria set forth in this document, may affect the California red-legged frog and/or its critical habitat, as required by the implementing

regulations for section 7 of the Act. The Corps will then provide the Service with all of the written documentation utilized to formulate its determination. Upon receipt of the appropriate information, the Service will review the material and append the project to this programmatic biological opinion, or we will issue a letter stating the project is not likely to affect the California red-legged frog. At the Service's discretion, an individual biological opinion will be completed for the Nationwide or other Corps permit action; or if, in addition to the California red-legged frog, other listed species also will be adversely affected, the proposed action will be appended to this programmatic biological opinion and a biological opinion completed for the additional listed species. Both the appendage and the biological opinion will then be combined into a single document by the Service that will be issued to the Corps.

A key element of this programmatic biological opinion is that each separate permit action appended will have minimal effects and low levels of incidental take of the California red-legged frog. Projects not appropriate to be appended to this biological opinion are those that exceed minimal effects to this species, including direct, indirect, and cumulative effects and these would require separate consultation. At the Service's discretion, proposed actions that do not meet the suitability criteria may still be appended, if the complete implementation of appropriate additional conservation measures sufficiently reduces the effects of the action or that the project has minimal effects that are consistent with the intent of this programmatic biological opinion.

This programmatic biological opinion is effective for a period of five (5) calendar years from the date of its issuance and can be extended if deemed appropriate by both agencies The Service will review this programmatic consultation, as appropriate, to ensure that its application is consistent with the intended criteria.

BIOLOGICAL OPINION

Description of the Proposed Action

Project Description

For this programmatic biological opinion, actions authorized by the Corps that may be appended consist of a variety of activities that may result in the incidental take of the California red-legged frog on 1.0 acre or less per project of suitable upland red-legged frog habitat, including areas within 300 feet of the top of bank of a creek, stream, waterbody, or wetland, or up to 1.0 acre of aquatic habitat/waters of the United States, or a combination of uplands and wetlands that is not larger than 1.0 acre in size. The Corps and the Service may determine on a case by case basis that projects larger than one acre can be appended to this programmatic biological opinion. Based on the following criteria: the action has minimal effects to the frog, the action is consistent with the intent of the biological opinion and appropriate conservation measures are included. Each project appended to this programmatic biological opinion may result in temporary effects and/or permanent effects. For the purposes of this biological opinion, temporary effects and permanent effects are defined as:

1. Temporary effects: The effects resulting from a Nationwide or other Corps permit-authorized activity are short term and do not result in effects to California red-legged frog habitat that are longer than one year; all habitats will be restored to better or equal to before the impact within one calendar year following disturbance. Disturbance may include alteration or reduction in vegetative cover or suitable aestivation sites, such as root wads, rodent burrows, or other forms

of cover. An elevation in ambient noise level, for example, also may be considered a disturbance. Temporary effects are those that denude, manipulate, or otherwise modify habitats from their existing, pre-project conditions as a result of project activities that include, but are not limited to, construction, staging, storage, lay down, vehicle access, borrow sites, disposal areas, vehicle parking, dredging, and vegetation removal. In order to be considered a temporary effect, the affected site must be restored to baseline habitat values or higher within one calendar year following the date of initial disturbance.

2. Permanent effects: The effects resulting from project activities which remove existing habitat or essential habitat components that cannot be restored to pre-project conditions of equal or greater value within one calendar year of the date of initial disturbance.

Projects that meet the suitability criteria and may involve some or all of the preceding activities are often authorized under the Corps' Nationwide Permit program. To guide the Corps during project evaluation, the Service has reviewed the Nationwide Permits the Corps has issued under 33 CFR 330.3 and has determined that projects typically authorized under the Nationwide Permits listed below may be appropriate for appendage to this programmatic biological opinion:

(#3) Maintenance.
(#5) Scientific Measuring Devices.
(#6) Survey Activities.
(#7) Outfall Structures.
(#12) Utility Line Discharges.
(#13) Bank Stabilization, provided that activity is less than fifty (50) feet in length.
(#14) Road Crossings.
(#15) U.S. Coast Guard Approved Bridges.
(#17) Hydropower Projects.
(#18) Minor Discharges.
(#19) Minor Dredging.
(#23) Approved Categorical Exclusions.
(#25) Structural Discharges.
(#27) Wetland and Riparian Restoration and Creation Activities.
(#31) Maintenance of Existing Flood Control Facilities.
(#32) Completed Enforcement Actions.
(#33) Temporary Construction, Access and Dewatering.
(#37) Emergency Watershed Protection and Rehabilitation.
(#38) Cleanup of Hazardous and Toxic Waste.
(#44) Mining Activities.
(#45) Repair of Uplands Damaged by Discrete Events.
(#46) Discharges in Ditches.

Suitability Criteria

To make use of this programmatic biological opinion, the Corps will ensure that each Nationwide or other permit activity that is proposed for appendage satisfies the following criteria:

1. The California red-legged frog has been found to inhabit or utilize the action area through the result of a Service-approved protocol survey; or, the action area contains suitable habitat for breeding, foraging, aestivation, movement, or other essential behaviors; or the Corps is assuming

the species will be affected by the proposed action.

2. Each Nationwide or other permit activity appended to this programmatic biological opinion adversely affects no more than 1.0 acre of suitable California red-legged frog upland habitat and no more than 1.0 acre of aquatic habitat. This includes equipment staging areas, site access routes, laydown areas, construction, equipment storage, vehicle parking areas; and stockpile and debris storage areas.

3. Activities authorized under Nationwide and other Corps permits may adversely affect the California red-legged frog through mortality, injury, harassment, capture, trap or harm, or temporary disturbance or permanent loss of the species' aquatic and upland habitats. This includes areas with suitable habitat for California red-legged frog movement. The projects will not occur in locations where the populations are so small and/or isolated that even the minor effects described in the programmatic biological opinion may have substantial adverse effects to the long-term survival and viability of the species within the recovery unit.

4. The measures to reduce and/or avoid adverse effects to the California red-legged frog described in the Conservation Measures of this programmatic biological opinion will be fully implemented by the Corps through the applicant. The measures may be modified on a project-specific basis upon written concurrence by the Service.

5. The Corps through the applicant will include enhancement, creation, or construction of habitat connectivity and safe wildlife passage across roads, whenever possible, as a conservation measure for Nationwide and other permit activities submitted for appendage to this programmatic biological opinion.

6. Nationwide and other permits appended to this programmatic biological opinion are not interdependent or interrelated with other projects being proposed or implemented by the Corps through the applicant, other government agencies, or other parties. This includes actions which have been separated from each other as a result of funding, authorizations, or other constraints.

7. The Corps through the applicant will provide the following information to the Service with their request for appending each Nationwide or other permit action to this programmatic biological opinion:

    a. Corps Permit Application including Assessor's Parcel Number(s), Universal Transverse Mercator (UTM) coordinates, and street address of the project;

    b. Corps-verified jurisdictional determination;

    c. Written description of the project, including but not limited to, construction methods, types and numbers of equipment, specific dates the work will occur, habitat restoration, conservation measures that will be fully implemented, and a monitoring plan for the California red-legged frog. The description will include the location and size of construction areas, borrow sites, laydown areas, parking areas, disposal sites, and other associated activities;

    d. A 7.5 minute U.S. Geological Survey topographic map or similar high-quality color topographic map clearly marked with the precise location of the project, construction areas,

borrow sites, laydown areas, parking areas, disposal sites, restoration sites, California red-legged frog relocation sites, and other associated activities;

e. A map showing known listed plant populations and listed animal sightings, from the California Department of Fish and Wildlife's Natural Diversity Data Base, and other sources, recorded within the action area and within a 10-mile radius of the project site;

f. A map (scale 1" =100') delineating the major vegetation communities present on and adjacent to the project site. Color photographs of the major vegetation communities present on the project site will be included with the document, with the locations of where they were taken indicated on the vegetation map;

g. One plan view and a minimum of one typical cross section indicating water bodies, vegetation types, work areas, roads, restoration sites, refueling, storage, parking, and staging areas;

h. The names and complete curriculum vitae of the biologist(s) who are being proposed to conduct pre-construction surveys, and monitor and handle California red-legged frog;

Conservation Measures

The Project Description includes the Conservation Measures that the Corps through the applicant will fully implement to avoid, minimize, and compensate for the direct effects, indirect effects, both temporary and permanent, and cumulative effects to the California red-legged frog from Nationwide and other Corps permits expected to occur in the nine San Francisco Bay Area counties.

1. For any project with greater than 0.5 acre of permanent impacts to suitable aquatic California red-legged frog habitat, and for any project with greater than 0.5 acre of suitable upland California re-legged frog habitat, the Corps will ensure harm to the California red-legged frog Nationwide or other permit action is minimized by the submittal of an appropriate habitat compensation proposal and, if appropriate, a restoration, monitoring, and management plan, at least thirty (30) calendar days prior to the date of initial ground disturbance (described in Compensation Section below) .

2. When constructing a road improvement, wherever possible, the Corps through the applicant will enhance or construct wildlife passage for the California red-legged frog across roads, highways, or other anthropogenic barriers. This includes upland culverts, tunnels, or overcrossings designed specifically for wildlife movement, as well as making accommodations for terrestrial wildlife movement through culverts that convey hydrology.

3. The Corps will ensure the applicant implements the conservation measures of this programmatic biological opinion, and the appendage. The Corps will ensure the applicant designates a point of contact for the project. The point of contact will maintain a copy of this biological opinion and the appendage onsite for the duration of the construction period. Their name and telephone number will be provided to the Service no more than thirty (30) calendar days prior to the date of initial ground disturbance. At least fourteen (14) calendar days prior to the date of initial ground disturbance, the Corps will ensure the applicant submits a signed letter to the Service verifying that they possess a copy of this programmatic biological opinion and the appendage, and have read and fully understand their responsibilities.

4. If verbally requested before, during, or upon completion of ground disturbance and construction activities, the applicant will ensure the Service, California Department of Fish and Wildlife, and/or their designated agents 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 California red-legged frog and its habitat.

5. A Service-approved biologist(s) will be onsite during all activities that may result in take of the California red-legged frog. The qualifications of the biologist(s) will be submitted to the Service for review and written approval at least thirty (30) calendar days prior to the date earthmoving is initiated at the project site. The Service-approved biologist(s) will keep a copy of this programmatic biological opinion and the appendage in their possession when onsite.

6. No more than twenty-four (24) hours prior to the date of initial ground disturbance, a pre-construction survey for the California red-legged frog will be conducted by a Service-approved biologist at the project site. The survey will consist of walking the project limits and within the project site to ascertain the possible presence of the species. The Service-approved biologist will investigate all potential areas that could be used by the California red-legged frog for feeding, breeding, sheltering, movement, and other essential behaviors. This includes an adequate examination of mammal burrows, such as California ground squirrels or gophers. If any adults, subadults, juveniles, tadpoles, or eggs are found, the Service-approved biologist will contact the Service to determine if moving any of the individuals is appropriate. In making this determination the Service will consider if an appropriate relocation site exists. If the Service approves moving animals, the Corps through the applicant will ensure the Service-approved biologist is given sufficient time to move the animals from the work site before ground disturbance is initiated. Only Service-approved biologists will capture, handle, and monitor the California red-legged frog.

7. The Service-approved biologist(s) will be given the authority to freely communicate verbally, by telephone, electronic mail, or in writing at any time with construction personnel, any other person(s) at the project site, otherwise associated with the project, the Service, the Department, or their designated agents. The Service-approved biologist will have oversight over implementation of all the conservation measures in this programmatic biological opinion, and, through the applicant, will have the authority and responsibility to stop project activities if they determine any of the associated requirements are not being fulfilled. If the Service-approved biologist(s) exercises this authority, the Service will be notified by telephone and electronic mail within twenty-four (24) hours. The Service contact is the Coast Bay Foothills Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600.

8. The Service-approved biologist will conduct employee education training for employees working on earthmoving and/or construction activities. Personnel will be required to attend the presentation which will describe the California red-legged-frog, avoidance, minimization, and conservation measures, legal protection of the animal, and other related issues. All attendees will sign an attendance sheet along with their printed name, company or agency, email address, and telephone number. The original sign-in sheet will be sent to the Service within seven (7) calendar days of the completion of the training.

9. The Corps through the applicant will minimize adverse effects to the California red-legged frog by limiting, to the maximum extent possible, the number of access routes, construction areas, equipment staging, storage, parking, and stockpile areas. Prior to the date of initial ground disturbance at the project site, equipment staging areas, site access routes, construction equipment and personnel parking areas, debris storage areas, and any other areas that may be disturbed will be identified, surveyed by the Service-approved biologist, and clearly identified with 5-foot tall bright orange plastic fencing. The fencing will be inspected by the Service-approved biologist and maintained daily by the applicant until the last day that construction equipment are at the project.

11. To the extent practicable, initial ground-disturbing activities will be avoided between November 1 and March 31 because that is the time period when California red-legged frogs are most likely to be moving through upland areas. When ground-disturbing activities must take place between November 1 and March 31, the Corps through the applicant will ensure that daily monitoring by the Service-approved biologist is completed for the California red-legged frog.

12. To minimize harassment, injury death, and harm in the form of temporary habitat disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, equipment staging, storage, parking, and stockpile areas. These areas will be included in pre-construction surveys and, to the maximum extent possible, established in locations disturbed by previous activities to prevent further adverse effects. Project-related vehicles will observe a 20-mile per hour speed limit within construction areas, except on County roads, and State and Federal highways. Off-road traffic outside of designated and fenced project work areas will be prohibited.

13. The Corps through the applicant will ensure bio-swales and bio-filtration are installed at the project site adjacent to roadways to avoid and minimize sediment loading and point source pollutants.

14. Stormwater pollution prevention plans (SWPPPs) and erosion control BMPs will be developed and implemented to minimize any wind- or water-related erosion and will be in compliance with the requirements of the Corps. The applicant will include provisions in construction contracts for measures to protect sensitive areas and prevent and minimize stormwater and non-stormwater discharges. Protective measures will include, at a minimum, those listed below.

    a. No discharge of pollutants from vehicle or equipment cleaning will be allowed into any storm drains or water courses.

    b. Vehicle and equipment fueling and maintenance operations will be at least 50 feet away from water courses, except at established commercial gas stations or established vehicle maintenance facilities.

    c. Concrete waste and water from curing operations will be collected in washouts and will be disposed of and not allowed into water courses.

d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.

e. Dust control measures will include use of water trucks and organic tackifiers to control dust in excavation-and-fill areas, covering temporary access road entrances and exits with rock (rocking), and covering of temporary stockpiles when weather conditions require.

15. If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than five millimeters to prevent California red-legged frogs from entering the pump system. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate.

16. The Corps through the applicant will maintain all construction equipment to prevent leaks of fuels, lubricants, or other fluids.

17. Each encounter with the California red-legged frog will be treated on a case-by-case basis in coordination with the Service, but the general procedure is as follows: (1) the animal will not be disturbed if it is not in danger; or (2) the animal will be moved to a secure location if it is in any danger. These procedures are further described below:

a. When a California red-legged frog is encountered in the action area, all activities which have the potential to result in the harassment, injury, or death of the individual will be immediately halted. The Service-approved biologist will then assess the situation in order to select a course of action that will avoid or minimize adverse effects to the animal. To the maximum extent possible, contact with the frog will be avoided and the applicant will allow it to move out of the potentially hazardous situation to a secure location on its own volition. This procedure applies to situations where a California red-legged frog is encountered while it is moving to another location. It does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the species should the individual move away from the hazardous location.

b. California red-legged frogs that are in danger will be relocated and released by the Service-approved biologist outside the construction area within the same riparian area or watershed. If relocation of the frog outside the fence is not feasible (i.e., there are too many individuals observed per day), the biologist will relocate the animals to a Service pre-approved location. Prior to the initial ground disturbance, the applicant will obtain approval of the relocation protocol from the Service in the event that a California red-legged frog is encountered and needs to be moved away from the project site. Under no circumstances will a California red-legged frog be released on a site unless the written permission of the landowner has been obtained by the applicant.

The Service-approved biologist will limit the duration of the handling and captivity of the California red-legged frog to the minimum amount of time necessary to complete the task. If the animal must be held in captivity, it will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. The container used for holding or transporting the individual will not contain any standing water.

c. The applicant will immediately notify the Service once the California red-legged frog and the site is secure. The contact for this situation is the Coast Bay Foothills Division Chief of the Endangered Species Program by email and at telephone (916) 414-6600.

18. Uneaten human food and trash attracts crows, ravens, coyotes, and other predators of the California red-legged frog. A litter control program will be instituted at each project site. All workers will ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash are deposited in covered or closed trash containers. The trash containers will be removed from the project site at the end of each working day.

19. All grindings and asphaltic-concrete waste may be temporally stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any culvert, pond, creek, stream crossing, or other waterbody. On or before the date of project completion, the waste will be transported to an approved disposal site.

20. Restoration and re-vegetation work for temporary effects will be implemented using native California plant species collected on-site or from local sources (i.e., local ecotype). Native or non-native plant species and material from non-local sources will be utilized only with prior written authorization from the Service. All topsoil from natural lands will be removed, cached, and returned to the site according to Service-approved restoration protocols.

21. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of the California red-legged frog.

22. The Corps through the applicant will not apply insecticides or herbicides at the project site during construction or long-term operational maintenance where there is the potential for these chemical agents to enter creeks, streams, waterbodies, or uplands that contain potential habitat for the California red-legged frog.

23. No pets will be permitted at the project site, to avoid and minimize the potential for harassment, injury and death of the California red-legged frog.

24. No firearms will be allowed at the project site except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials to avoid and minimize the potential for harassment, injury and death of the California red-legged frog.

25. For onsite storage of pipes, conduits and other materials that could provide shelter for California red-legged frogs, an open-top trailer will be used to elevate the materials above ground. This is intended to reduce the potential for animals to climb into the conduits and other materials.

26. To the maximum extent practicable, no construction activities will occur during rain events or within 24-hours following a rain event. Prior to construction activities resuming, a Service-approved biologist will inspect the action area and all equipment/materials for the presence of California red-legged frogs. The animals will be allowed to move away from the project site of their own volition or moved by the Service-approved biologist.

27. To the maximum extent practicable, night-time construction will be minimized or avoided by the applicant. Because dusk and dawn are often the times when the California red-legged frog is most actively moving and foraging, to the maximum extent practicable, earthmoving and construction activities will cease no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Except when necessary for driver or pedestrian safety, to the maximum extent practicable, artificial lighting at a project site will be prohibited during the hours of darkness.

28. Plastic monofilament netting (erosion control matting), loosely woven netting, or similar material in any form will not be used at the project site because California red-legged frogs can become entangled and trapped in them. Any such material found on site will be immediately removed by the Service-approved biologist, construction personnel, or the applicant. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer or other synthetic materials will not be used.

29. Dust control measures will be implemented during construction, or when necessary in the opinion of the Service-approved biologist, Service, California Department of Fish and Wildlife, or their authorized agent. These measures will consist of regular truck watering of construction access areas and disturbed soil areas with water or organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract. Watering guidelines for truck watering will be established to avoid any excessive run-off that may flow into contiguous or adjacent areas containing potential habitat for the California red-legged frog.

30. Trenches or pits one (1) foot or deeper that are going to be left unfilled for more than forty-eight (48) hours will be securely covered with boards or other material to prevent the California red-legged frog from falling into them. If this is not possible, the applicant will ensure wooden ramps or other structures of suitable surface that provide adequate footing for the California red-legged frog are placed in the trench or pit to allow for their unaided escape. Auger holes or fence post holes that are greater than 0.10 inch in diameter will be immediately filled or securely covered so they do not become pitfall traps for the California red-legged frog. The Service-approved biologist will inspect the trenches, pits, or holes prior to their being filled to ensure there are no California red-legged frogs in them. The trench, pit, or hole also will be examined by the Service-approved biologist each workday morning at least one hour prior to initiation of work and in the late afternoon no more than one hour after work has ceased to ascertain whether any individuals have become trapped. If the escape ramps fail to allow the animal to escape, the Service-approved biologist will remove and transport it to a safe location, or contact the Service for guidance.

31. The Service-approved biologist(s) will permanently remove any aquatic exotic wildlife species, such as bullfrogs and crayfish from the project site, to the maximum extent possible.

32. The Corps will ensure the applicant reports any information to the Service about take or suspected take of listed wildlife species not exempted by this programmatic biological opinion. The Service will be notified via electronic mail and telephone within twenty-four (24) hours from the time the information is received by the applicant. Notification will include the species, number of individuals, 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, and names of the persons who observe the take and/or found the animal. The

individual animal will be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are the Chief of the Coast Foothill Division, Endangered Species Program, Sacramento Fish and Wildlife Office at (916) 414-6600, and Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 569-8444.

Compensation

Compensation measures include protecting and managing habitat at a secure location to minimize the harm of the California red-legged frog caused by alteration, disturbance, or destruction of its habitat. The Corps through the applicant will provide compensation in the form of in-perpetuity habitat protection for any project appended to this BO with greater than 0.5 acre of permanent impacts to suitable California red-legged frog habitat. An area of non-habitat is not necessarily an area absent of vegetation. Shoulder areas or right-of way that lack vegetative cover may function in a landscape highly fragmented by linear structures, such as roads, railways, and canals, as a corridor for dispersal, or potential refugia areas despite the appearance of degradation The compensation ratios for adverse effects are as follows:

California Red-legged Frog Habitat Compensation

Level of Effect	**Compensation Ratio**
Permanent	3:1
Temporary	1:1*

* this often is in the form of on-site restoration in Waters of the United States.

The Corps will ensure the applicant provides in-kind habitat as part of the compensation for projects appended to this programmatic biological opinion. Aquatic habitat will be provided for adverse effects to aquatic habitat, and upland habitat will be protected for damage or loss of upland habitat. The applicant will compensate for adverse effects for temporary or permanent effects to the California red-legged frog by one of the following options: 1) acquire land, by itself, or possibly in conjunction with a conservation organization, State park, State Wildlife Area, National Wildlife Refuge, or local regional park that provides occupied habitat; 2) purchase the appropriate credit units at a Service-approved conservation bank; or 3) by restoration of Waters of the US of an area suitable to support the frog. The Service and the Corps will have to approve the applicability of restoration of a proposed site on a case-by-case basis.

Conservation credits or appropriate habitat obtained by the applicant will consist of the following measures:

1. At least thirty (30) calendar days prior to the date of initial ground disturbance, the applicant will acquire habitat occupied by the California red-legged frog or habitat that is important to this threatened animal, such as movement corridors, that the Service has concurred is appropriate in writing. The property will have a conservation easement or other appropriate entitlement; management plan, and endowment to manage the habitat in perpetuity. All of these documents will be reviewed and approved by the Service. The conservation easement will name the Service

as third-party beneficiaries and it will be held by an entity qualified to hold conservation easements subject to approval by the Service. An in-perpetuity endowment to manage the land and monitor the conservation easement will be secured using an escrow account or other funding assurance acceptable to and approved by the Service. The endowment will be held by a Service-approved entity in an amount agreed to by the Service. A Service-approved management plan will be developed prior to acquisition of land and it will include, but not limited to; a description of existing habitats and planned habitat creation, restoration and/or enhancement; monitoring criteria for the California red-legged frog; an integrated pest management and monitoring plan to control invasive species; habitat creation, restoration and/or enhancement success criteria; and adaptive management strategies if success criteria are not met or to incorporate new scientific data.

OR

2. The applicant will purchase an appropriate number of credits at a Service-approved conservation bank whose service area includes the action area for the proposed appendage to this programmatic biological opinion. Conservation credits will be purchased and documentation provided to the Service comprising the Agreement for Sale of Conservation Credits, Bill of Sale, Payment Receipt and Updated Credit Ledger at least fourteen (14) calendar days prior to the date of initial ground disturbance at the project.

OR

3. The applicant will provide a restoration, monitoring and management plan to the Service and the Corps at least 30 calendar days prior to ground disturbance for review and approval. The plan will include at a minimum success criteria and information regarding site preservation. The plan may also include the removal of invasive species. Because not in all cases will restoration benefit, the species this will be reviewed on a case-by-case basis.

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." This programmatic consultation addresses minor projects within the following California counties: Napa, Solano, Contra Costa, Alameda, San Francisco, San Mateo, Santa Clara, Sonoma and Marin. Areas within 1,000 feet of the project footprint, parking, equipment storage, stockpile, access, and borrow site locations for each Nationwide or other permit are included within the action area.

Analytical Framework for the Jeopardy and Adverse Modification Analysis

Jeopardy Determination
The following analysis relies on four components to support the jeopardy determination for the California red-legged frog: (1) the **Status of the Species**, which evaluates the species' range wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the **Environmental Baseline**, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; (3) the **Effects of the Action**, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) **Cumulative Effects**, which evaluates the effects of future, non-Federal activities in

the action area on the species.
In accordance with the implementing regulations for section 7 and Service policy, the jeopardy determination is made in the following manner: the effects of the proposed Federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the current status of the California red-legged frog and, for non-Federal activities in the action area, those actions likely to affect the species in the future, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the California red-legged frog and the role of the action area in providing for those needs as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

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

In accordance with policy and regulation, the adverse modification analysis in this programmatic biological opinion relies on four components: (1) *Status of Critical Habitat*, which evaluates the range wide condition of designated critical habitat for the California red-legged frog in terms of PCEs, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units; and (4) *Cumulative Effects* which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units. For purposes of the adverse modification determination, the effects of the proposed Federal action on the California red-legged frog critical habitats are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the California red-legged frog.

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

Status and Environmental Baseline of the California Red-Legged Frog

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813) (Service 1996). Critical habitat was designated for this species on April 13, 2006 (71 FR 19244) (Service 2006) and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816) (Service 2010). At this time, the Service recognized the taxonomic

change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). A Recovery Plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description: The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution: The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay Area and the Central California Coast. Isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (CDFG 2013a).

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

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

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5-mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically

along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

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

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

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

The diet of California red-legged frogs is highly variable; changing with the life history stage. The diet of the larval stage has been the least studied and is thought to be similar to that of other ranid frogs, which feed on algae, diatoms, and detritus (Fellers 2005; Kupferberg 1996a, 1996b, 1997).

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

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

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

The urbanization of land within and adjacent to California red-legged frog habitat has also affected the threatened amphibian. These declines are attributed to channelization of riparian areas,

enclosure of the channels by urban development that blocks dispersal, and the introduction of predatory fishes and bullfrogs. Diseases may also pose a significant threat, although the specific effects of disease on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson et al. 2003). Chytridiomycosis and ranaviruses are a potential threat because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson et al. 2003; Lips et al. 2006). Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric threespine sticklebacks in northwestern California. Non-native species, such as bullfrogs and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al.* 2006). Humans can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e., contaminated boots, waders or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease.

The action area for the 22 Nationwide and other Corps permits in the nine Bay Area counties contains three recovery units that were designated in the recovery plan for the California red-legged frog (Service 2002). They are the North Coast and North San Francisco Bay Unit; South and East San Francisco Bay Unit; and the Central Coast Recovery Unit (Service 2002). Recovery Units are based on the identification of various regional areas of the species' range that are essential to its survival and recovery.

The entirety of the proposed project is located within the range and current distribution of the California red-legged frog. Ensure its survival and recovery in the action area is important because most of the known populations of this species are found in the San Francisco Bay region and the central coast range (Service 2002; Fellers 2005). The action area contains a mosaic of industrial, residential, agricultural, fallow, and open space land uses, although the majority of lands do not contain suitable habitat for the animal. The lands containing suitable habitat range from highly modified and degraded to high quality. The Point Reyes peninsula and associated areas in Marin County are known to contain large populations of the California red-legged frog, however, the majority of populations within the action area consist of a small number of individuals.

The California red-legged frog occurs within the action area as demonstrated by: (1) historic and recent observation of the species at numerous locations in all nine San Francisco Bay Area counties (Service 2002; California Department of Fish and Wildlife 2013a, 2013b); (2) the biology and ecology of the animal, especially the ability of individuals to move considerable distances and their ability to spend the dry months of the year in habitats with suitable environmental conditions; (3) the action area contains numerous creeks, streams, constructed drainage features, perennial and seasonal ponds, including stock ponds, and marshes that provide breeding and non-breeding aquatic habitat for the California red-legged frog. Riparian vegetation along creeks and drainages and landscape vegetation in the action area provide valuable refuge, forage, and dispersal habitat for red-legged frogs; (4) the action area contains upland habitat with rodent burrows and other cover sites; (5) the action area contains upland habitat that provides refuge, forage, and dispersal habitat for the species; and (6) the numerous locations and movement corridors where the species can move within the action area and vicinity.

Status and Environmental Baseline of California Red-Legged Frog Critical Habitat

The Service designated critical habitat for the California red-legged frog on April 13, 2006 (71 FR 19244) (Service 2006) and a revised designation to the critical habitat was published on March 17, 2010 (75 FR 12816) (Service 2010). At this time, the Service recognized the taxonomic change from Rana aurora draytonii to Rana draytonii (Shaffer et al. 2010). Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.12(b)). The Service is required to list the known Primary Constituent Elements (PCE's) 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.

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

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

2. Non-Breeding Aquatic Habitat. Freshwater and wetted riparian habitats, as described above, that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period.

3. Upland Habitat. Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile in most cases and comprised of various vegetational series such as grasslands, woodlands, wetland, or riparian plant species that provide the frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter.

4. Dispersal Habitat. Accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other that allow for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified in PCE's 1, 2, or 3 as essential to the conservation of the subspecies.

With the revised 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 PCE's sufficient to support the life-history functions of the species. Because not all life-history functions require all the PCE's, not all areas designated as critical habitat will contain all the PCE's. Please refer to the final designation of critical habitat for California red-legged frog for additional information (75 FR 12816).

There are 20 critical habitat units of the California red-legged frog located within the action area for the 22 Nationwide and other Corps permits in the nine San Francisco Bay Area counties. The critical habitat units range in size from 1,564 acres to 204,718 acres totaling 692,945 acres in eight counties. There is no designated critical habitat for the California red-legged frog in San Francisco County.

Effects of the Proposed Action

<u>California Red-legged Frog</u>

Projects authorized by the Corps under the 22 Nationwide and other permits in the nine San Francisco Bay Area counties covered by this PBO could have adverse effects on the threatened California red-legged frog through mortality, capture, injury, harassment, and harm of individual subadults and adults.

Ground disturbance and construction activities associated with projects authorized under the Nationwide and other Corps permits may remove vegetation and other materials utilized for cover and aestivation, fill or crush burrows or crevices, and reduce the prey base for the California red-

legged frog. Because this listed amphibian uses small mammal burrows and soil crevices for shelter, individuals may be crushed, buried, or otherwise injured during construction activities. Disturbance caused by construction activities may cause individuals to disperse into areas containing unsuitable habitat, increase the risk of predation or other sources of mortality. Direct injury or mortality to the animal may result from poisoning by pesticides, or harassment from night-lighting, noise, and vibration.

The Corps will ensure the permittees compensate for permanent and, in some cases, temporal habitat loss with in-perpetuity preservation and or restoration of appropriate amounts of California red-legged frog habitat. Preservation of high value habitat at a Conservation Bank will allow for the permanent protection, long-term management, and enhancement of the habitat for the California red-legged frog which will contribute to the recovery of this species. In some cases, the permittee may choose to use a site they acquire which would need to be protected in perpetuity and be managed for the benefit of the frog. In addition, for small in-stream impacts revegetation/restoration of the site may be appropriate and this may benefit the species by improving the functions. This compensation, combined with the implementation of the other conservation measures described above, is anticipated to offset the adverse effects of harm resulting from project-related habitat modification or loss.

Preconstruction surveys and the relocation of the California red-legged frog may reduce injury or mortality. However, death and injury of individual red-legged frogs could occur at the time of relocation or later in time subsequent to their release. Although survivorship for translocated members of this species has not been determined, survivorship of translocated wildlife, in general, is lower because of intraspecific competition, lack of familiarity with the location of potential breeding, feeding, and sheltering habitats, increased risk of contracting disease in a foreign environment, and the risk of predation. Improper handling, containment, or transport of individuals will be reduced or prevented by use of a Service-approved biologist, limiting the duration of handling, limiting the distance of translocation, and requiring the proper transport and release of the animals.

Unless rescued by the Service-approved biologist, individual California red-legged frogs could be harassed, injured, or and killed by ground disturbing and construction-related activities. Even with a Service-approved biologist present at the project site, worker awareness, and escape ramps, animals may fall into the trenches, pits, or other excavations, and then risk being directly injured, killed, or be unable to escape and die as a result of desiccation, entombment, or starvation.

Plastic netting and similar materials that are used for erosion control and other reasons could result in the entanglement and death of California red-legged frogs, as well as birds and wildlife, due to exposure, starvation, strangulation, or predation (Stuart *et al.* 2001). However, the Corps has committed, through implementation of the Conservation Measures, to ensuring the permittees do not utilize these materials which reduces these adverse effects.

Habitat Loss and Fragmentation

The primary factor leading to the listing of this animal is the result of habitat loss and fragmentation in the form of roadway construction, and urban encroachment. Activities associated with urban development, including roadway projects, removal of vegetation and other materials utilized as cover and aestivation, damage or destruction of water bodies utilised by all life history stages, reduction or elimination of movement corridors and upland habitat, filling or collapsing rodent burrows or crevices, and potentially reduce the prey base for the California red-legged frog. Construction activities are likely to result in the direct disturbance, displacement, injury, and/or morality of

California red-legged frogs. Individuals likely are to be killed or injured by construction equipment or other vehicles accessing the construction site. Disturbance from human activities, including roadway activities may also cause individuals to move into or across areas of unsuitable habitat where they may be prone to higher rates of mortality from vehicles and predation.

Summer cover and foraging habitat within the action area may be temporarily and permanently eliminated by the proposed projects. Individual red-legged frogs occupying the affected habitat run the risk of being crushed or buried by earth moving activities. Those that do survive will suffer permanent and temporary loss of habitat and harassment from increased human activity. Loss or reduction of dispersal habitat increases intra-and inter-specific competition for food and living space for the red-legged frog in the action area. Removal of native vegetation, such as willow and coyote brush, may increase exposure of the California red-legged frog to predators due to the permanent loss of cover. Measures to minimize habitat destruction and alteration such as reducing the project footprint, restoration and re-vegetation of disturbed sites with locally collected native plant species can potentially provide refuge, food and shelter for the listed amphibian, while also limiting the establishment of invasive and non-local native plants.

Fragmentation of habitat isolates populations of the California red-legged frog such that breeding between populations becomes impossible or extremely limited. Fragmentation also limits dispersal resulting in a reduced chance of repopulation to locations where it has been extirpated. Isolation due to fragmentation can result in the ultimate decline of populations because of the lack of genetic variability. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians, such as the California red-legged frog, and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are especially vulnerable to traffic induced mortality.

Road Kills

Roadways, bridges, and other associated structures or facilities may result in adverse effects to the California red-legged frog. Aside from direct construction related-effects, the threats are the result of the slow movements of this animal, inability to notice the approach of cars in time to avoid them, their tendency to become immobilized when in danger which leaves them on roads for longer periods of time, their life cycles that involve periodic long distance dispersal. Traffic volume influences the permeability (e.g., the likelihood of crossings) of roads and the probability for mortality due to vehicle strikes. Factors such as the width of the road, the presence of a median with or without Jersey or "K" rail concrete barriers, the velocity of the traffic, the physical nature of the approach and shoulder of the road, and the behavior of the animals attempting to cross determine probabilities for mortality. Clevenger *et al.* (2003) found that studying roads in Canada found that a low volume road (1,068 to 3,231 vehicles per day) in Canada resulted in higher mortalities of small vertebrate fauna than high volume roads (14,000 to 35,000 vehicles per day).

Contaminants

The presence of roads, ground disturbance and construction or repair of roadways can result in the introduction of chemical contaminants to the site. Contaminants can be introduced in several ways. Substances used in road building materials or to recondition roads can leach out or wash off roads adjacent to habitat. Vehicle exhaust emissions can include hazardous substances which may concentrate in soils along roads. Heavy metals such as lead, aluminum, iron, cadmium, copper, manganese, titanium, nickel, zinc, and boron are all emitted in vehicle exhaust (Trombulak and Frissell 2000). Concentrations of organic pollutants (i.e. dioxins, polychlorinated biphenyls) are higher in soils along roads (Benfenati *et al.* 1992). Ozone levels are higher in the air near roads

(Trombulak and Frissell 2000). Vehicles may leak hazardous substances such as motor oil and antifreeze. A variety of substances could be introduced during accidental spills of materials. Spills can result from leaks in vehicles, small containers falling off vehicles, or from accidents resulting in whole loads being spilled. Large spills may be partially or completely mitigated by clean-up efforts, depending on the substance. Although the quantity leaked by a single vehicle may be small, the substances can accumulate on roads and may be washed into the adjacent environment by runoff during rain storms.

The California red-legged frog could be exposed to contaminants if it inhabits or utilizes areas adjacent to the project site. Exposure pathways could include inhalation, dermal contact and absorption, direct ingestion of contaminated soil or plants, or consumption of contaminated prey. Exposure to contaminants may cause short- or long-term morbidity. Carcinogenic substances could cause genetic damage resulting in sterility, reduced productivity, or reduced fitness among progeny. Contaminants may also have a negative effect on the prey of the California red-legged frog. This could result in reduced prey diversity and abundance, and diminished local carrying capacity for the animal.

Disease

Biologists and construction personnel working in different geographic locations inhabited by different amphibian species may transmit diseases to the California red-legged frog though contaminated equipment and other materials. The chance of a disease, such as chytrid fungus, being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations, as well as Global Climate Change in California and the United States. Chytrid fungus may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes that reduce normal immune response capabilities (Bosch *et al.* 2001).

Invasive Species

Construction of roads can facilitate the invasion and establishment by species not native to the area. Disturbance and alteration of habitat adjacent to roads may create favorable conditions for non-native plants and animals. Non-native plants can spread along roadsides and then into adjacent habitat (Gelbard and Harrison 2003). American bullfrogs and other non-native animals may use modified habitats adjacent to road to disperse into California red-legged frog habitat. These exotic animals could compete for resources such as food or refugia, or directly injure or kill them. Non-native plants and animals may reduce habitat quality for the California red-legged frog or its prey, and reduce the local carrying capacity. Introductions of non-native species could cause them to alter behavioral patterns by avoiding or abandoning areas near roads.

Disturbed areas adjacent to roads provide favorable habitat conditions for a number of non-native plant species. Some of these taxa are aggressively invasive and they can alter natural communities and potentially affect habitat quality. A problematic species within the range of the red-legged frog is yellow star thistle. Dense stands of this plant can form along roadsides and then spread into adjacent habitat. This plant displaces native vegetation and competes with native plants for resources.

Road Effect Zone

In addition to the adverse effects occurring during ground disturbance and construction, roadways are a major source of injury and mortality for amphibians. Ehmann and Cogger (1985) estimated that five million reptiles and frogs are killed annually on Australian roads. Vos and Chardon (1998)

found that road density within 750 feet of a pond was negatively associated with the size of moor frog populations. The density of roads within 2250 feet of a pond was negatively associated with the probability that species would occupy the pond at all. Van Gelder (1973) estimated that 30% of the females from a local breeding population of the common toad succumbed to road kill and reported that an equivalent percentage for males was likely. In a study of frogs and toads, Fahrig *et al.* (1995) found the proportion of dead-to-live animals increased and the total density of animals decreased with increasing traffic intensity.

Roads act as barriers to California red-legged frogs attempting to cross fragmented habitats. As barriers, roads restrict gene flow leading to negative, demographic consequences that can cause extinction (Shepard *et al.* 2008). Roads were found to be significant barriers to gene flow among common frogs in Germany resulting in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Failure to cross roads by the California red-legged frog may disconnect fragmented populations from mating resulting in population declines over time. Isolated populations have a greater chance of extinction when new immigrants are not contributing to the gene pool and are less likely to be re-colonized after extinction. The installation of culverts, tunnels, bridges, and overcrossings, to facilitate safe wildlife passage under or across roads can minimize the reduction of population isolation or loss.

Adverse effects to the California red-legged frog from roads may extend some distance from the actual road. The phenomenon can result from any of the effects already described in this programmatic biological opinion (e.g. vehicle-related mortality, habitat degradation, invasive exotic species, etc.). Forman and Deblinger (2000) and Forman (2000) described the effect as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet to either side of the road for an average total zone width of approximately 1970 feet. However, in places they detected an effect > 0.6 mile from the road. Trombulak and Frissell (2000) described how heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, but elevated levels of metals in both soil and plants were detected at 660 feet of roads. The road effect zone apparently varies with habitat type and traffic volume. The road effect zone and the California red-legged frog have not been adequately investigated; however, it is possible it exists given the effects of roads on the animal.

Effects to Critical Habitat

The Service anticipates that the activities associated with the Project could negatively affect some of the PCEs of California red-legged frog critical habitat within the action area. However, these activities will only result in minor effects to habitat and these activities (implemented with the conservation measures) will not prevent critical habitat from providing essential conservation values for the California red-legged frog. While disturbance within critical habitat may prevent some California red-legged frogs from using portions of the critical habitat for essential life functions whether temporarily (e.g., disturbance that can be restored to pre-project conditions within one calendar year from the date of initial ground disturbance) or permanently (e.g., disturbance that cannot be restored to pre-project condition within one calendar year), they will still be able to complete their essential ecological and biological functions in the remaining areas of critical habitat. All critical habitat units will retain their PCEs and the PCEs within each critical habitat unit will still remain functional. Therefore, the designated critical habitat for the California red-legged frog will still be able to perform its intended functions and conservation role.

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 programmatic 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.

Numerous non-Federal activities continue to adversely affect, primarily through the damage or destruction of habitat, the California red-legged frog in the action area. In addition, the same activities affect this threatened species also affect its critical habitat. Loss and degradation of habitat affecting this listed species with or without Service authorization continues as a result of urbanization; road construction and maintenance, utility right-of-way management; flood control and water banking projects that may not be funded, permitted, or constructed by a Federal agency; inappropriate levels of grazing by livestock; and continuing agricultural expansion. This threatened amphibian also is adversely affected by ground squirrel reduction, mosquito control, including the planting of exotic mosquito fish, and reduction of food sources. Unauthorized take is occurring, and the Service continues to request re-initiation of projects when project descriptions have changed markedly since our biological opinions were issued.

The Association of Bay Area Governments 2007 Projection forecasts the San Francisco Bay Area nine-county population will increase by 2.2 million residents from 2000-2035 (ABAG 2007). The human population is projected to increase by 18 percent for the San Francisco Bay hydrologic region from 1995 to 2020 with agricultural crop land use in the region projected to remain around 65,000 acres (California Department of Water Resources 1998). Development projects that occur during this timeframe due to increases in human population growth will continue to imperil the California red-legged frog.

Conclusion

After reviewing the current status of the California red-legged frog, the environmental baseline for the action area; the effects of projects potentially authorized under the 22 Nationwide and other Corps permits in the nine San Francisco Bay Area counties, and the cumulative effects; it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of this threatened species. We based this determination on the following conservation measures that will be fully implemented by the Corps: (1) habitat loss will be compensated with in-perpetuity preservation of occupied California red-legged frog habitat in the action area; (2) the Corps will incorporate construction or enhancement of culverts or other structures to ensure safe passage of California red-legged frogs across the roadways where appropriate; (3) pre-construction surveys will be conducted for listed species; (4) a Service-approved biologist will monitor all activities for compliance with this programmatic biological opinion; (5) California red-legged frogs found in the project work area will be relocated to nearby suitable habitat; and (6) other conservation measures, as described in the Conservation Measures of this programmatic biological opinion.

After reviewing the current status of the California red-legged frog, the environmental baseline for the action area, the effects of projects potentially authorized under Nationwide or other Corps permits in the nine San Francisco Bay Area counties, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to destroy or adversely modify California red legged frog critical habitat. The proposed action is not likely to result in the destruction or

adverse modification of critical habitat for this threatened species because although the project may adversely affect primary constituent elements within a portion of some of the critical habitat units in the action area, these activities will be limited to a small proportion of the critical habitat and will not affect the ability of the remaining critical habitat to conserve the California red-legged frog.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral 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 this Incidental Take Statement. The Incidental Take Statement accompanying this biological opinion does not address the restrictions or requirements of other applicable laws.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order 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 adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when individuals are not in their breeding ponds, they inhabit the burrows of ground squirrels or other rodents, root wads or other objects; they may be difficult to locate due to their cryptic appearance and behavior; subadults and adults may be located a distance from the breeding ponds; their distance movements occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Adverse effects to this animal also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Due to the difficulty in quantifying the number of the California red-legged frog that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the harm and harassment, capture, injury and mortality of all eggs, egg masses, tadpoles, subadults, and/or adults inhabiting or utilizing a total of seventy-five (75) acres for the five (5) year duration of this programmatic biological opinion. Reinitiation will be triggered if the amount of incidental take is exceeded by the Corps.

Effect of the Take

The Service has determined that this level of anticipated take for projects potentially authorized under the 22 Nationwide and other Corps permits in the nine San Francisco Bay Area counties, as appended to this biological opinion, is not likely to result in jeopardy to the California red-legged frog, or adverse modification or destruction of its designated critical habitat.

Reasonable and Prudent Measure

1. The Corps shall minimize adverse effects to the California red-legged frog by fully implementing terms and conditions

Terms and Condition

In order to be exempt from the prohibitions of section 9 of the Act, the Corps shall comply with the following Term and Condition that implements the reasonable and prudent measure described above. This Term and Condition is nondiscretionary.

The following Term and Condition implements the Reasonable and Prudent Measure:

1. The Corps shall implement the conservation measure described within the project description of this programmatic biological opinion.

Reporting Requirements

For each Nationwide or other Corps permit appended to this programmatic biological opinion, the Service-approved biologist will maintain a written record that will include, but is not limited to: (1) beginning and ending time of each day's construction activity and monitoring effort; (2) California red-legged frogs, and wildlife species, that were observed, including the specific time and location; and (3) description of any actions taken to protect the California red-legged frog or its habitat. The biological monitor will submit the original written record to the Service within fourteen (14) calendar days of the completion of their monitoring, or immediately upon verbal, email, or written request from the Service, California Department of Fish and Wildlife, or their authorized agent.

Injured California red-legged frogs must be cared for by a licensed veterinarian or other qualified person such as the Service-approved biologist; dead individuals shall be placed in a zip-lock® plastic bag containing a piece of paper with the date, time, and location where the animal was found, and who found it legibly written in permanent ink, and then placed in a freezer located in a secure location. The Service must be notified within twenty-four (24) hours via telephone and electronic mail of the discovery of death or injury to any listed species that occurs or is suspected to have occurred as a result of project related activities, or is observed in or near the action area. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal 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. The Service contacts are the Coast Bay Foothills Division Chief at telephone (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division at telephone (916) 569-8444.

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 has developed the following conservation recommendations based, in part, on the Recovery Plan for the California Red-legged Frog (Service 2002).

1. Implement actions within the 2002 Recovery Plan for the California Red-legged Frog.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed and/or proposed species or their habitats, the Service requests notification of the implementation of this recommendation.

REINITIATION NOTICE

This concludes formal consultation on the 22 Nationwide and other Corps permits in the nine San Francisco Bay Area counties. 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 maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species that was not considered in this opinion; or (4) a new species is listed that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions concerning this biological opinion on projects authorized under the 22 Nationwide and other Corps permits in the nine San Francisco Bay Area counties, please contact Ryan Olah (Ryan_Olah@fws.gov at the Sacramento Fish and Wildlife Office at the letterhead address or at telephone (916)414-6623.

Sincerely,

Jennifer M. Norris
Field Supervisor

cc: Scott Wilson, California Department of Fish and Wildlife, Yountville, California

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