

APPENDIX D

California Red-legged Frog Habitat Assessment and Protocol Surveys

CALIFORNIA RED-LEGGED FROG HABITAT ASSESSMENT AND PROTOCOL SURVEYS FOR THE LAKEVILLE-SONOMA 115 kV TRANSMISSION LINE PROJECT



Prepared For:

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Revised Final Report

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1.0 Executive Summary

Habitat assessment and protocol surveys for California red-legged frog (*Rana aurora draytonii*) were conducted by Garcia and Associates (GANDA) for Pacific Gas and Electric Company's (PG&E) Lakeville – Sonoma 115 kV Transmission Line Project. The surveys followed the U.S. Fish and Wildlife Service (USFWS) protocol for California red-legged frog site assessment and field surveys (USFWS 1997). Habitat assessment surveys were performed from August 15 to October 10, 2002, September 25 to 26, 2003, and June 17 to July 20, 2004 at aquatic sites identified within approximately 0.6 kilometer (km) (0.4 mile) of the project corridor. Suitable aquatic habitat for California red-legged frog was identified at 25 sites in the vicinity of the proposed route. Protocol surveys (two daytime and two nighttime surveys) were conducted in October 2002, May, June, and October 2003, and June and July 2004 at 15 of these suitable habitat sites where California red-legged frogs or their habitat could potentially be affected by project activities, absent impact avoidance and minimization measures. Six adult California red-legged frogs were found in June 2004 in the upper portion of Felder Creek and an adjoining tributary near the eastern portion of segment 1. Western pond turtles (*Clemmys marmorata*), a federal species of concern and California Species of Special Concern, also were identified at two ponds in the vicinity of segment 1. In light of these findings, recommendations are provided to avoid potential adverse effects on California red-legged frog individuals and minimize impacts to suitable aquatic and terrestrial habitats for this species.

2.0 Introduction

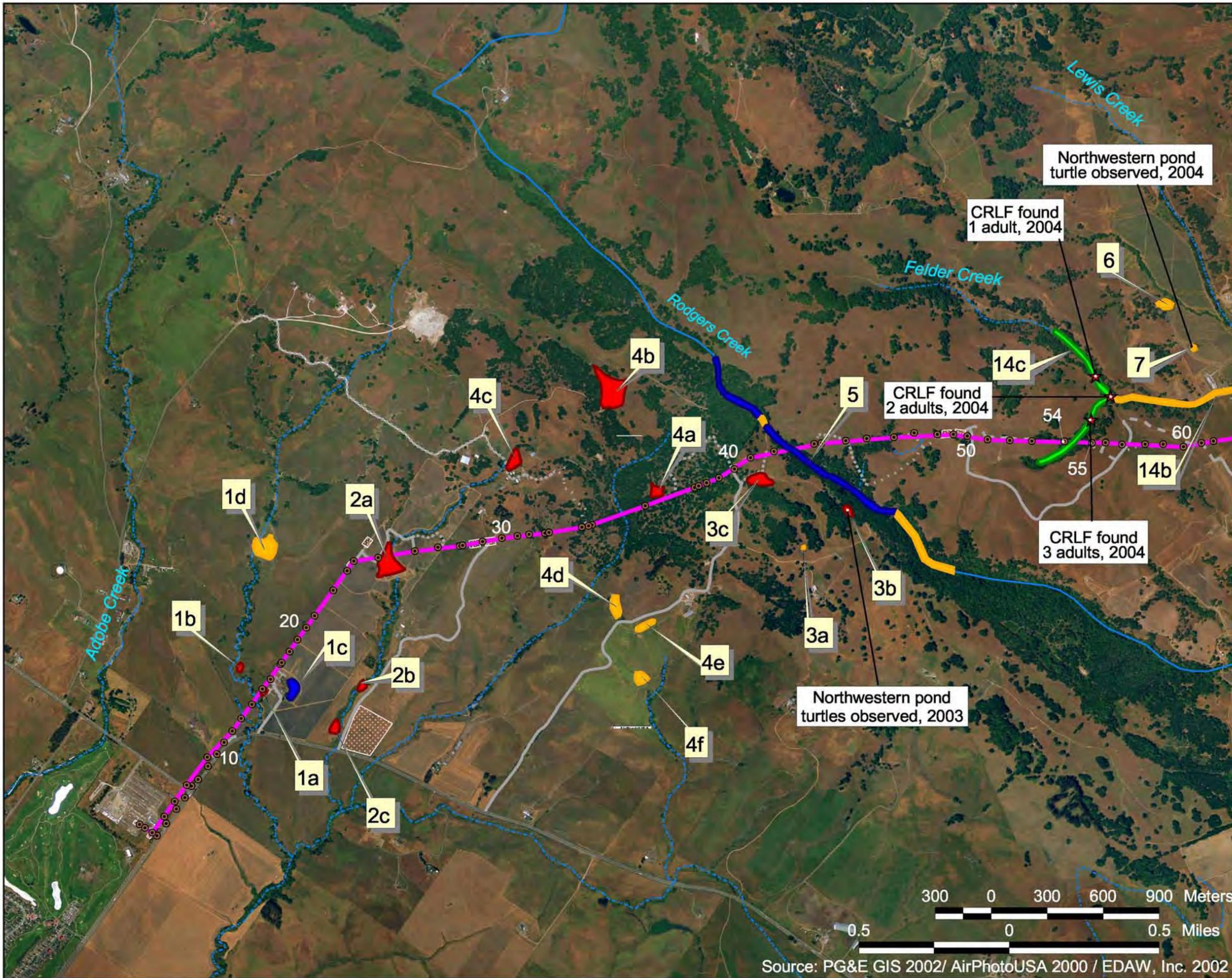
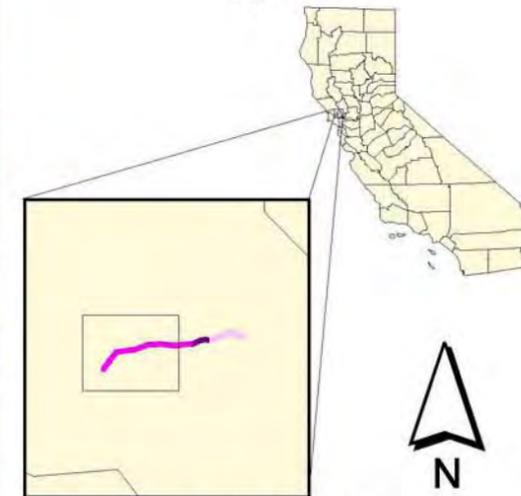
2.1 Project Location and Environmental Setting

The proposed Lakeville – Sonoma 115 kV Transmission Line Project is located in southeastern Sonoma County, California (Figures 1a and 1b). It extends from the Lakeville substation east of the City of Petaluma to the Sonoma substation in the City of Sonoma. The project is composed of three transmission line segments (numbered 1, 2, and 17) which follow the route of an existing transmission line. The route covers a distance of approximately 11.6 km (7.2 miles). Segment 1 has a length of 7.4 km (4.6 miles), segment 2 of 1.4 km (0.9 mile), and segment 17 of 2.8 km (1.7 miles). Project activities will include:

- substation improvements;
- construction of new access roads and improvement of existing roads;
- installation of stream crossing structures on access roads;
- vegetation clearing and grading of landing zones, staging areas, and conductor pull sites;
- operation of project vehicles, helicopters, and heavy equipment;
- installation of new transmission poles and removal of existing poles; and
- installation of new conductors.

These activities could affect California red-legged frogs if they are present within the project area.

Figure 1a.
 California Red-legged Frog Habitat
 Assessment and Field Survey
 Site Locations:
 Segment 1 West
 Lakeville-Sonoma 115kV Transmission
 Line Project
 July 2004



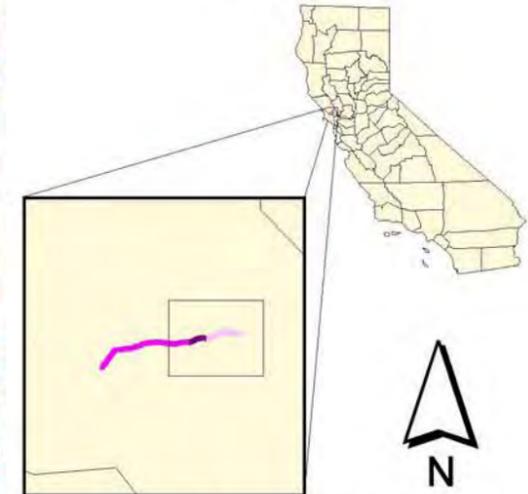
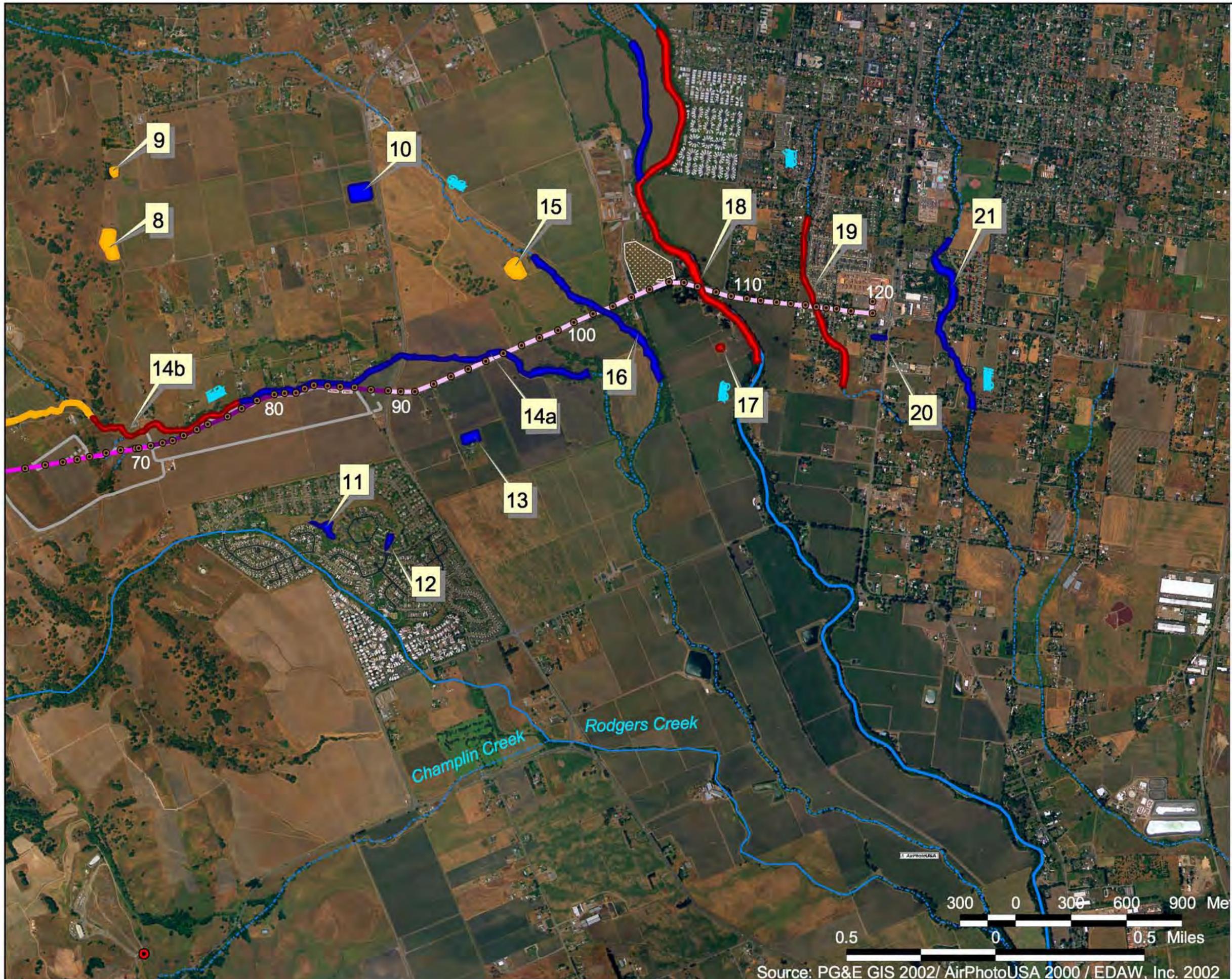
- California Red-legged Frog Occupied Habitat
- Suitable California Red-legged Frog Aquatic Habitat, With Potential Impact
- Suitable California Red-legged Frog Aquatic Habitat, No Potential Impact
- Unsuitable California Red-legged Frog Aquatic Habitat
- California Red-legged Frogs Observed in 2004 Surveys
- Proposed Transmission Line (Segment 1)
- Proposed Transmission Line (Segment 2)
- Proposed Transmission Line (Segment 17)
- Poles (Numbered in increments of 10)
- Intermittent or Ephemeral Stream
- Perennial Stream
- Existing Permanent Road
- Existing Temporary Road
- New Permanent Road
- New Temporary Road
- Landing Zone/Staging Area
- Pull Site



Source: PG&E GIS 2002/ AirPhotoUSA 2000 / EDAW, Inc. 2002



Figure 1b.
 California Red-legged Frog Habitat
 Assessment and Field Survey
 Site Locations:
 Segments 1 East, 2, and 17
 Lakeville-Sonoma 115kV Transmission
 Line Project
 July 2004



-  Suitable California Red-legged Frog Aquatic Habitat, With Potential Impact
-  Suitable California Red-legged Frog Aquatic Habitat, No Potential Impact
-  Unsuitable California Red-legged Frog Aquatic Habitat
-  California Red-legged Frog Occurrence (CDFG 2003)
-  Proposed Transmission Line (Segment 1)
-  Proposed Transmission Line (Segment 2)
-  Proposed Transmission Line (Segment 17)
-  Poles (Numbered in increments of 10)
-  Intermittent or Ephemeral Stream
-  Perennial Stream
-  Existing Permanent Road
-  Existing Temporary Road
-  New Permanent Road
-  New Temporary Road
-  Landing Zone/Staging Area
-  Pull Site

300 0 300 600 900 Me
 0.5 0 0.5 Miles
 Source: PG&E GIS 2002/ AirPhotoUSA 2000 / EDAW, Inc. 2002



The project segments traverse mostly private lands, including agricultural land (cattle grazing and vineyards) and residential properties. Vegetation types found in the project area and vicinity include California annual grassland, vernal pool, freshwater marsh, seasonal wetland, riparian forest and woodland, oak forest and woodland, California bay forest and woodland, redwood forest, agriculture, and urban landscape. Wildlife habitat types are defined according to the California Wildlife Habitat Relationships (CWHR) System (CDFG 2002a) and correspond to equivalent vegetation types except for unvegetated, open water areas of aquatic habitats. Terrestrial wildlife habitats in the project area include coastal oak woodland, coastal mixed conifer forest, annual grassland, and vineyards/irrigated row crops. Wetland and riparian habitats include valley foothill riparian, fresh emergent wetland, and seasonal wetland. Aquatic habitats in the project vicinity include several ponds (permanent and seasonal) and creeks (perennial, intermittent, and ephemeral).

2.2 Status and Natural History of California Red-legged Frog

The California red-legged frog is a federally-listed threatened species and a California Species of Special Concern. Historically, populations of this subspecies were found from Shasta County to Baja California, along both the coast range and the west slope of the Sierra Nevada Mountains, at elevations below 1,500 meters (m) (4,900 feet (ft)) (Jennings and Hayes 1994). Their current range is greatly reduced, with only a few, highly localized populations in the Sierra Nevada and most remaining populations occurring along the coast ranges from Marin County to Ventura County.

California red-legged frogs occur primarily in perennial ponds or pools and perennial or ephemeral streams where water remains long enough for breeding and development of young (Jennings and Hayes 1994). Habitats with the highest densities of frogs may contain dense emergent or shoreline riparian vegetation closely associated with fairly shallow to deep (> 0.5 m or 1.6 ft), still or slow-moving water. The types of riparian and wetland vegetation that seem to be most structurally suitable are willows (*Salix* sp.), cattails (*Typha* sp.), and bulrushes (*Scirpus* sp.). Another key habitat indicator for California red-legged frogs is the absence or near-absence of introduced predators such as bullfrogs (*Rana catesbeiana*) and predatory fish, particularly centrarchids (i.e., sunfish and bass), which may feed on the larvae at higher levels than naturally co-evolved predators (Jennings and Hayes 1994). Emergent vegetation, undercut banks, and semi-submerged rootballs afford shelter from predators (USFWS 1997).

California red-legged frogs lay their eggs from late November to late April in ponds or in backwater pools of creeks, attaching them to emergent vegetation such as cattails and bulrushes. Larvae remain in these aquatic habitats until metamorphosis. Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. California red-legged frog may disperse upstream, downstream, or upslope of their breeding habitat to forage and seek sheltering habitat. They take shelter in small mammal burrows and other refugia up to several dozen meters from the water any time of the year (Jennings and Hayes 1994). During wet periods, California red-legged frog can move long distances between aquatic habitats, traversing upland habitats or ephemeral drainages up to 1.6 km (one mile) from the nearest known frog populations. Seeps and springs in open grasslands can function as foraging habitat or refugia for wandering frogs (Jennings and Hayes 1994).

Multiple factors may be responsible for the decline of California red-legged frog populations (Davidson et al. 2001). The main factor appears to be habitat destruction due to urbanization, but ultraviolet (UV-B) radiation and wind-borne chemicals from upwind agricultural land uses may also be contributing to their decline. Other factors include diseases, trematode parasites, and introduced species such as bullfrogs and mosquitofish (*Gambusia* sp.).

Critical habitat for California red-legged frog was designated by the USFWS in 2001; however, most of this designation was vacated by a U.S. District Court ruling in 2002. The USFWS (2004) recently re-issued proposed critical habitat designations for this species. The project area is not within any proposed critical habitat for California red-legged frog. The closest proposed critical habitat to the project area is Unit 10, Stage Gulch and Lower Petaluma River, which extends as far north as southeastern Petaluma, approximately one mile south of Lakeville substation.

3.0 Methods

3.1 Habitat Assessment

Prior to conducting the habitat assessment, several current information sources on California red-legged frog were reviewed, including the California Natural Diversity Database (CNDDB) (CDFG 2002b and 2004), *A Field Guide to Western Reptiles and Amphibians* (Stebbins 1985), *Guidance on Site Assessment and Field Surveys for California Red-legged Frogs* (USFWS 1997), and other relevant literature including Jennings and Hayes (1994). Additionally, major museum collection databases (California Academy of Sciences, Santa Barbara Natural History Museum, and Stanford University) were consulted.

The habitat assessment was conducted by GANDA biologist Pierre Fidenci from August 15 to October 10, 2002, September 25 to 26, 2003, June 17 to 18, and July 1-20, 2004 according to the site assessment guidelines provided in the USFWS (1997) protocol. A literature search was conducted for known localities of California red-legged frog within 8 km (5 miles) of the project area. Aquatic habitats within 1.6 km (one mile) of the proposed route segments were inventoried using topographic maps and aerial photographs. The inventory consisted of identifying aquatic habitat types (wetlands, ponds, reservoir, creeks) that could support California red-legged frog, and barriers (e.g., major roads) that would minimize or preclude California red-legged frog movement. Based on the results of the map inventory, detailed field assessments were performed at aquatic sites where California red-legged frogs or their habitat could potentially be affected by project activities. Most of the field assessment sites were located within approximately 0.6 km (0.4 mile) of the proposed route (segments 1, 2 and 17). The field assessment involved documenting the aquatic habitat types and conditions, and evaluating habitat suitability for California red-legged frog. All sites visited in the field assessment were numbered and mapped on aerial photographs.

At each site assessed, data were recorded on habitat type, habitat conditions, percentage cover of vegetation, and signs of disturbance such as cattle grazing. Habitat suitability criteria important

to California red-legged frog were recorded, including width and depth of water bodies, bank gradient, water flow, substrate, percent of floating and emergent vegetation, and percent of shade (Appendix A, Table 1). Care was taken to avoid disturbing sediments, vegetation, and any visible aquatic life during the site visits. Sites identified as potential habitat were mapped on aerial photographs. Representative photographs of sites assessed are included in Appendix B. All reptiles and amphibians encountered during the habitat assessment were recorded on the survey data forms (Appendix C). Presence of fish and bullfrog was also recorded because of their potential to impact California red-legged frogs. Fish were detected by scanning aquatic habitats with binoculars. Also, any indicators left from fishermen (e.g., fishing line) were used as indirect evidence of fish presence. A combination of visual and auditory observation was used to detect bullfrogs.

3.2 Protocol Surveys

Following the initial habitat assessment, protocol surveys (USFWS 1997) were conducted by GANDA biologists Pierre Fidenci, Chloe Scott, Kevin Wiseman, Jeff Mitchell, and Jeff Steinman from October 21 to 31, 2002, May 1 to June 30 and October 20 to 30, 2003, and June 17 to July 20, 2004. The protocol surveys consisted of two daytime and two nighttime surveys. The surveys were conducted at fifteen suitable habitat sites along the proposed route that could potentially be affected by the project: sites nos. 1a, 1b, 2a, 2b, 2c, 3b, 3c, 4a, 4b, 4c, 14b, 14c, 17, 18, and 19. Protocol surveys were not performed at sites that would not be affected because of their distance from the proposed transmission line or access roads (sites 1d, 3a, 4d, 4e, 4f, 6, 7, 8, 9, and 15).

Daytime surveys were conducted by visually scanning all aquatic habitats and shoreline areas with binoculars. Nighttime surveys were conducted using binoculars and a 6-volt flashlight. Both visual (eyeshine detection) and auditory methods (listening for frog calls) were used to detect frogs. In cases where no view was available, the vegetation was parted where possible to uncover hidden pools. Care was used while walking to avoid disturbing sediment, vegetation, and amphibian larvae.

Daytime surveys were conducted during October 2002, May, June, and October 2003, and June and July 2004 between 0930 and 1700 hours. Nighttime surveys were conducted during May, June, and October 2003, and July 2004, between 2000 hours and midnight. At least 24 hours elapsed before repeating surveys at the same site.

To reduce the risk of spread of disease agents and parasites that affect amphibians between study sites, GANDA biologists followed the Code of Practice prepared by the Declining Amphibian Populations Task Force (DAPTF 1998). After surveying each site, field equipment (e.g., boots, nets) was rinsed with sterilized water (e.g., boiled or treated) and then scrubbed with 70% ethanol solution and rinsed clean with sterilized water.

4.0 Results

4.1 Occurrences in the Project Vicinity

The CNDDDB (CDFG 2004) contains one record of California red-legged frog within 8 km (5 miles) of the project area. This occurrence is north of Highway 116, approximately 2.8 km (1.7 miles) south of segments 1 and 2 (2004; Figure 1b). Here, one adult and two tadpole California red-legged frogs were found in an abandoned pond in May 2002. The next nearest CNDDDB occurrence is about 8.3 km (5.2 miles) southwest of the project area and west of the City of Petaluma. This sighting is isolated from the project area by significant barriers (e.g., Highway 101).

The project area is within the historic and current range of California red-legged frog, and several suitable habitat sites were identified within the assessment area (Figures 1a and 1b; Appendix A, Table 1).

4.2 Habitat Assessment

In general, aquatic habitats in the project vicinity consist of many ponds (permanent and seasonal) and creeks (permanent and seasonal). The major drainages traversed by the proposed route are Rodgers Creek, Felder Creek, Carriger Creek, and Sonoma Creek. Fryer Creek, a smaller creek, crosses the route just west of Sonoma substation. Habitat quality is generally good for California red-legged frog at most of these aquatic sites. Artificial stock ponds are the predominant aquatic habitats along segments 1 and 2. These ponds are mostly permanent and lack dense emergent vegetation, but most have submerged vegetation along their banks. Sonoma Creek, Felder Creek, and Fryer Creek also contain suitable habitat for California red-legged frog in the project area. Portions of these creeks have dense riparian vegetation along the banks, shallow to deep waters for juveniles and adults, and some backwater areas protected from potential fish predation. Habitat assessment results are discussed in more detail below (Appendix A, Table 1).

Segment 1

Seventeen ponds (site nos. 1a, 1b, 1d, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 4d, 4e, 4f, 6 and 7) provide potential breeding habitats for California red-legged frog in the assessment area along segment 1 (Table 1 and Figures 1a and 1b). Of the seventeen ponds, ten (sites 1a, 1b, 2a, 2b, 2c, 3b, 3c, 4a, 4b, and 4c) are located where potential impact to California red-legged frogs or their habitat could occur during project activities, absent avoidance and minimization measures. These ponds are all permanent, artificial stock ponds, except for 3a. Ponds 1a (Photo 1) and 1b are small ponds; Pond 2a (Photo 2) is a larger water body. They are used to provide surface storage water for vineyards. Ponds 2b and 2c are large artificial ponds with shallow and deep water. They are mostly bordered by emergent vegetation providing suitable basking and refuge sites for California red-legged frog. Ponds 3b (Photo 3), 3c (Photo 4), 4a, 4b, and 4c are located near the middle of segment 1. These ponds provide suitable habitat characteristics for California red-legged frog. Their banks offer potential basking sites (areas with full sun or mixed sun and

shade). Frogs could bask on logs, vegetation, and bare banks. Other favorable habitat characteristics at these sites include emergent vegetation, shallow to deep water, terrestrial refuge sites, and minimal human disturbance.

Rodgers Creek (site 5) and Felder Creek (sites 14b and 14c) are the major lotic habitats along segment 1. Rodgers Creek is a medium-sized perennial creek with small pools and riffles. Rodgers Creek is well shaded and mostly does not provide potential habitat for California red-legged frog due to the lack of aquatic vegetation, areas of sun, and sufficient pool size. However, a few pools located about 700 m (2,300 ft) downstream from the transmission line, and one isolated pool located about 200 m (650 ft) upstream from the line provide suitable habitat for California red-legged frog. In general, these pools are medium sized and lack emergent vegetation.

Felder Creek and its unnamed tributary along segment 1 provide suitable habitat for the California red-legged frog. Site 14c includes the tributary and the main branch of Felder Creek to just downstream of the tributary confluence. The creek in this area is a medium-sized, permanent to intermittent creek bordered by a dense riparian and coast live oak (*Quercus agrifolia*) canopy. The stream bed is mostly composed of silt, gravel, and cobble. The tributary has characteristics similar to upper Felder Creek but has a narrower channel and is confined within a steep ravine. Site 14b encompasses Felder Creek from just downstream of the tributary confluence to Arnold Road at the eastern end of segment 2. The topography becomes more gradual downstream and the channel contains dense thickets of blackberry (*Rubus discolor*) in some areas. At both sites, water flow ceases by later summer and the stream bed becomes mostly dry. However, some water continues to percolate underground from one pool to another and a few deep pools (0.8 m or 2.6 ft deep) appear to persist until the first rains of fall. These pools provide suitable habitat for all California red-legged frog life stages and could be used for breeding sites. Both sites provide moist open banks devoid of aquatic vegetation.

The upper reach of Felder Creek and its tributary are heavily impacted by livestock, particularly in the vicinity of the tributary confluence. Signs of cattle trampling and manure were evident within the stream bed and along the banks. This likely has reduced bank vegetation and affects water quality in the creek. Indeed, turbidity was high from cattle trampling and associated erosion, with possible high nitrogen and sulfate content from cattle urine and feces.

Segment 2

Potential habitat for California red-legged frog is located within Felder Creek along the western portion of segment 2 (site 14b). The creek in this area is an intermittent, low gradient stream which is well shaded by dense riparian vegetation (Photo 5). The creek is bordered by vineyards and rural-residences and a paved road runs along the north side of the creek. The substrate is composed of silt, gravel, and cobble. Water flow ceases in this reach by late summer; however, a few deep pools that could be used by California red-legged frogs appear to persist through the summer and into early fall. The banks generally lack aquatic vegetation and contain semi-submerged root balls and woody debris. The presence of fish and bullfrogs could limit frog breeding success in this section of the creek, possibly making it unsuitable for tadpoles and metamorphs. Farther downstream in the eastern portion of segment 2, Felder Creek becomes totally dry by mid summer and is not suitable habitat.

Two ponds within 1 mile of segment 2 to the north (sites 8 and 9) also provide potential habitat (Figure 1b). These two ponds are permanent and artificial, and are small to moderate in size. The ponds are isolated from segment 1 by vineyards and dirt roads, and are not expected to be impacted by project activities.

Segment 17

Two ponds (sites 15 and 17) and two creeks (Sonoma Creek, site 18, and Fryer Creek, site 19) provide suitable habitat for California red-legged frog (Table 1 and Figure 1b). Ponds 15 and 17 are permanent artificial water bodies. Site 15 is a medium-sized pond with deep areas. Site 17 is a small-sized pond with deep areas along Sonoma Creek. Both ponds lack emergent vegetation but provide potential submerged basking and foraging sites along the banks. The shallow and deep pools of both ponds offer suitable aquatic habitat for all California red-legged frog life stages. However, based on its location relative to planned project activities, site 15 is considered to be outside the impact area.

Sonoma Creek (Site 18) is a major permanent creek with dense riparian vegetation along the shoreline (Photo 6). The creek is characterized by deep pools (> 1 m or 3 ft) with riffles. The substrate is mainly composed of gravel, cobble, and boulder. In general, the creek supports a wide range of habitat characteristics suitable for California red-legged frogs: suitable breeding sites (deep and shallow pools with few backwaters protected from fish predation); basking sites (e.g., rocks, gravel, logs); and refuge retreats (e.g., dense riparian vegetation, deep pools, and woody debris).

Fryer Creek (site 19) is characterized by shallow pools with silt, clay, and gravel substrate. The tributary section within the project area has permanent water all year providing suitable breeding sites for California red-legged frogs (Photo 7). The banks are mostly covered by dense riparian vegetation. Semi-submerged root balls are found along the banks. In general, the creek offers suitable habitat characteristics for California red-legged frog: breeding sites (e.g., large pools), basking sites (e.g., banks with sun exposure), and refuge retreats (e.g., riparian vegetation, woody debris or root balls).

The other creeks (sites 14a, 16 and 21) located within the segment 17 survey corridor do not provide suitable habitat for California red-legged frogs (Table 1, Figure 1b). Those creek reaches lack permanent water, deep pools and aquatic vegetation. During the field habitat assessment conducted along segment 17, these three creeks were dry.

4.3 Protocol Surveys

Weather conditions were favorable for conducting California red-legged frog protocol surveys. During daytime surveys, air temperatures ranged from 15°C to 28°C (59°F to 82°F) with winds from zero to 5 m/s (0-10 mph). Water temperatures at 5 cm (2 inches) depth ranged from 14°C to 25°C (57°F to 77°F). During nighttime surveys, air temperatures ranged from 15°C to 24°C (59°F to 75°F) with winds from 0-5 m/s (0-10 mph), and water temperatures ranged from 15°C to 25°C (59°F to 77°F).

California red-legged frogs were present at one site along the eastern portion of segment 1. This site (14c) includes the upper branch of Felder Creek and its adjoining tributary (Figure 1a). Six adult frogs were observed here on June 17, 2004. Two of them were found at the downstream end of a concrete culvert where a private dirt road crosses Felder Creek (Photo 8). As noted above, this location showed impacts from livestock that use this area of the creek for drinking. Three of the frogs were located adjacent to a small pool in the tributary (Photo 9) approximately 90 m (300 ft) north of where the transmission line spans over the tributary. One frog was found in a pool in the main branch of Felder Creek, approximately 60 m (200 ft) upstream of the tributary confluence (Photo 10). California red-legged frogs were not observed at any of the other protocol survey sites visited during any of the daytime or nighttime surveys, including sites farther downstream in Felder Creek adjacent to the transmission line route.

Other Herpetofauna Encountered

Other native amphibians and aquatic reptiles detected during the field surveys included California newt (*Taricha torosa*), Pacific treefrog (*Hyla = Pseudacris regilla*), and western pond turtle, a federal species of concern and California Species of Special Concern. Two western pond turtle adults were observed near segment 1 at site 3b and one adult was observed at site 7. Non-native bullfrogs were present, often at high population densities, at several of the sites surveyed (sites 1a, 1b, 2a, 2b, 2c, 3c, 3b, 4a, 4b, 4c, 5, 7, 14b, 17, and 18).

5.0 Discussion and Recommendations

5.1 Potential Effects on the California Red-legged Frog

Construction activities, including pole installation, pole removal, access road construction, and conductor installation in the vicinity of Felder Creek could affect California red-legged frogs if they are present in the work areas. The survey results indicate that California red-legged frogs are present in the upper Felder Creek watershed near the proposed project area. Results were negative farther downstream where the transmission line route runs adjacent to Felder Creek, and this area of the creek was almost completely dry in July 2004. This supports the conclusion that the species is probably absent in this lower reach of the creek during the dry season. However, since stream zones provide potential dispersal corridors, and red-legged frogs can move one mile or more during the wet season, it is possible that individuals could move into this downstream area and adjacent upland habitats during the wet season.

The proposed transmission line spans the tributary to Felder Creek approximately 90 m (300 ft) from where California red-legged frogs were observed. Project activities would not affect aquatic habitat in this area and would have minimal effect on adjacent upland habitats. Pole 54, on the northwest side of the tributary, is located within oak woodland which could provide suitable estivation or dispersal habitat (Photo 11). This pole is proposed to be removed by crews walking in to the site and will be carried away by helicopter. There will be no new pole installed at this location. Pole 55, which is closest to the tributary on the east side, is also proposed to be removed in the same manner. It is located on a ridge top in open grassland high above the creek (Photo 12) and there is no suitable estivation habitat within the proposed pole footprint or work area.

A new upland access road is proposed that would avoid the crossing of Felder Creek where California red-legged frogs were found. This new unpaved road would be located approximately 120 m (400 ft) from the creek at its closest point. Construction of this road would take place during the dry season (June 1 to October 15), which would avoid potential impacts to individual frogs or their habitat in the vicinity of Felder Creek.

Segment 2 and the eastern end of segment 1 (poles 69-87) are located adjacent to Felder Creek approximately 1.3 to 2.4 km (0.8 to 1.5 miles) downstream from where California red-legged frogs were found. In this segment, several poles are situated at or near the edge of the riparian woodland corridor of Felder Creek (Photo 13). Most project activities in this area, including installation of pole foundations and structures and construction/improvement of access roads, will be performed during the dry season. As noted above, the negative survey results and dry conditions observed in this reach of the creek during the summer indicate that the species is not likely to occur there during the dry season. Therefore, project activities in this area during the dry season are not likely to affect California red-legged frogs. In addition, the new poles will be set back farther from Felder Creek than the existing poles and will be outside of the riparian vegetation zone. This will avoid impacts to potential estivation habitat.

Some project activities such as conductor installation, topping of wood poles, removal of poles 54 and 55, and installation of pole 77 (above-ground attachment of the tubular steel pole to the foundation prepared in the dry season), are proposed to be conducted during the wet season. This is necessary to enable electricity shutdown clearances to be obtained; clearances are generally only feasible during periods of lower power demand. It is possible that individual frogs could move into work areas along portions of the route adjacent to Felder Creek during the wet season. Thus, there is some potential for individual frogs to be affected in this area, absent avoidance and minimization measures described below.

The negative survey results at sites other than the upper Felder Creek area indicate that California red-legged frogs may not occur elsewhere along the project route. However, while absence may be concluded in accordance with the USFWS (1997) protocol, it is possible (although unlikely) that California red-legged frogs could be present but not detected in the surveys. Small numbers of individuals are especially difficult to find in dense vegetation. The presence of bullfrogs (in some instances in large numbers) at most of the protocol survey sites reduces, but does not eliminate, the chance of finding viable populations of California red-legged frogs at these sites. With the high densities of bullfrogs that were observed, predation by larger bullfrogs on smaller California red-legged frogs would be inevitable. Other exotic predators that could impact California red-legged frogs such as introduced fish and crayfish were also encountered (e.g., sites 2b, 2c, 3c and 19).

5.2 Avoidance and Minimization Recommendations

To avoid potential adverse effects on California red-legged frogs and other special-status aquatic species and minimize potential impacts to their habitat, GANDA recommends that the following measures be implemented prior to and during construction:

-
- Before construction begins, a qualified biologist should provide environmental awareness training for all project personnel. This training should include topics such as recognition of California red-legged frogs and their habitat, what to do to avoid and minimize impacts to habitat, and what to do if a California red-legged frog is found.
 - Driving to work sites should be limited to established roadways and identified access routes.
 - All fueling and vehicle maintenance areas should be located away from creeks (at least 30 m [100 ft] from edge of a creek) and ponds (at least 90 m [300 ft] from edge of a pond), and away from any other sensitive biological resource exclusion areas marked by a qualified biologist.
 - To the extent practicable, ground-disturbing construction activities such as site grading, access road construction, and installation of pole foundations should be done during the dry season (June 1 to October 15). The dry season window may begin as early as May 1 if ground conditions at the work sites and access routes are determined to be sufficiently dry by a qualified biologist. If work must occur during the wet season (November 1 to May 31), use appropriate erosion control measures for the local site, which might include one or more of: tacked straw, erosion control fabrics, silt fencing, and graded bedding on roads. For wet-season work in the vicinity of Felder Creek, apply the following measures.
 - Immediately prior to wet-season work activities in the vicinity of Felder Creek, a qualified biologist should perform a preconstruction survey for California red-legged frog. The survey area should consist of all proposed wet-season work sites within one mile of Felder Creek and should include all suitable aquatic and upland habitats within 90 m (300 ft) of these proposed work sites.

If a California red-legged frog is found nearby but outside a proposed work area, it should not be disturbed. Temporary construction fencing should be installed to mark the limits of the affected work area(s) and to limit construction personnel and equipment to the designated work area. The location of the fencing should be determined by the biologist in coordination with the construction supervisor. In addition, as recommended by the biologist, a temporary drift fence (e.g. silt-fence) barrier should be installed to prevent California red-legged frogs from entering those work area(s) during project activities.

If CRLF are found within a work area prior to construction, the biologist, with prior authorization from the USFWS, will relocate the frogs out of harm's way. Immediately thereafter, a temporary silt-fence barrier will be installed to prevent CRLF from re-entering the work area.

- A qualified biologist should monitor work activities in the vicinity of Felder Creek and other streams, wetlands, and riparian habitats that could be affected during project implementation. The monitor should be present full time during all work activities in the wet season within 90 m (300 ft) of Felder Creek, and periodically in the vicinity of other wetland and stream areas. The monitor will verify that environmental fencing, erosion and sediment control measures, and any other protection measures are properly installed and are effective. If problems are found, the monitor will recommend remedial measures.

If a CRLF is encountered during construction, project activities will cease in the area where the frog is found until the biologist, with prior authorization from the USFWS, relocates the frog out of harm's way and/or takes other appropriate steps previously authorized by the USFWS to protect the animal. Work may resume once the biologist has determined that construction activities will not harm any CRLF and barrier fencing has been installed to prevent the animal from re-entering the work area. The USFWS will be contacted within 24 hours of the finding and informed of actions taken.

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Appendix A

**Table 1. Habitat Assessment For California Red-legged Frog in the Vicinity
of the Lakeville – Sonoma 115 kV Transmission Line Project**

Table 1. Habitat Assessment For the California Red-legged Frog (*Rana aurora draytonii*) in the Vicinity of the Lakeville – Sonoma 115 kV Transmission Line Project

Site number/ Habitat type	Segment number(s)	Water Bodies: permanent or seasonal	Width/ Max. Depth (meters)	Bank gradient/ Water flow	Dominant Substrate	% floating vegetation % emergent vegetation % shade	Potential habitat for CRLF?	Potential project-related impacts (absent avoidance or minimization)?	Herpetofauna species and predators encountered
1a Pond	1	permanent	20 2	Medium to high/ None	Silt-clay	10-20 0 0	Yes	Yes	BF Raccoon
1b Pond	1	permanent	20 1.5	Medium/ None	Silt-clay	1-10 0 0	Yes	Yes	BF Blue heron, raccoon
1c Pond	1	permanent	25 2	High/ None	Silt-clay	0 0 0	No	Yes	None
1d Pond	1	permanent	30 2	Medium/ None	Silt-clay	ND ND ND	Yes	No	None
2a Pond	1	permanent	150 2	Low/ None	Silt-clay	0 10 10	Yes	Yes	BF, TF Raccoons
2b Pond	1	permanent	20 2	Low/ None	Silt-clay	10 10 10	Yes	Yes	BF Fish, crayfish, heron
2c Pond	1	permanent	20 2	Medium/ None	Silt-clay	10 10 5	Yes	Yes	BF Fish, crayfish, heron
3a Pond	1	Seasonal	15 0.3	Low/ None	Silt-clay	5 5 10	No	Yes	None
3b Pond	1	permanent	30 1.5	Low/ None	Silt-clay	5 10 30	Yes	Yes	BF, WPT Fish (<i>Gambusia</i>)

Site number/ Habitat type	Segment number(s)	Water Bodies: permanent or seasonal	Width/ Max. Depth (meters)	Bank gradient/ Water flow	Dominant Substrate	% floating vegetation % emergent vegetation % shade	Potential habitat for CRLF?	Potential project-related impacts (absent avoidance or minimization)?	Herpetofauna species and predators encountered
3c Pond	1	permanent	30 1.5	Low/ None	Silt-clay	80 20 20	Yes	Yes	BF Fish (<i>Gambusia</i>)
4a Pond	1	permanent	20 2	Low/ None	Silt-clay	70 10 10	Yes	Yes	BF, TF Fish
4b Pond	1	permanent	50/ 3	Low/ None	Sand/silt	1 1 1	Yes	Yes	BF Fish, heron
4c Pond	1	permanent	8/ 1.5	Low/ None	Sand/silt	10 0 0	Yes	Yes	BF
4d Pond	1	permanent	10/ 1.5	Low/ None	Sand/silt	40 1 10	Yes	No	BF
4e Pond	1	permanent	8/ 1.5	Low/ None	Sand/silt	10 0 0	Yes	No	none
4f Pond	1	permanent	10/ 1.5	Low/ None	Sand/silt	10 0 0	Yes	No	none
5 Rogers Creek	1	permanent	2-3/ 0.8	Low to high/ Low to medium	Silt-clay, cobble	70 0 0	No	No	BF, TF, Fish: sculpin and trout
6 Pond	1, 2	permanent	NA	Low/ none	Sand/silt	NA	Yes	No	None
7 Pond	1, 2	permanent	20/ 2	Low/ None	Sand/silt	5 5 1	Yes	No	WPT, BF

Site number/ Habitat type	Segment number(s)	Water Bodies: permanent or seasonal	Width/ Max. Depth (meters)	Bank gradient/ Water flow	Dominant Substrate	% floating vegetation % emergent vegetation % shade	Potential habitat for CRLF?	Potential project-related impacts (absent avoidance or minimization)?	Herpetofauna species and predators encountered
8 Pond	2	permanent	20/ 2	Low/ None	Sand/silt	0 0 0	Yes	No	None
9 Pond	3	permanent	NA	Low/ None	Sand/silt	NA	Yes	No	None
10 Pond	2, 17	permanent	10 2	Low/ None	Sand/silt	NA	No	No	None
11 Pond	2	permanent	10 1.5	Low/ Low	Cement	0 0 0	No	No	None
12 Pond	2	permanent	10 1.5	Low/ None	Cement	0 0 0	No	No	None
13 Pond	17	permanent	10/ 1.5	Low/ None	Sand/silt	5 5 1	No	No	None
14a Felder Creek, lower reach	17	temporary	2-3/ 0.3	Low/ None	Silt, gravel, cobble	0 0 20	No	Yes	None
14b Felder Creek, middle reach	2, eastern end of 1	permanent	2-4/ 0.8	Low/ Low	Silt, gravel, cobble	0 0 80-90	Yes	Yes	BF Fish
14c Felder Creek, upper reach and tributary	1	permanent	2-4/ 0.6	Low/ Low	Silt, gravel, cobble	0 0 80	Yes	Yes	CRLF TF
15 Pond	17	permanent	15 2	Low/ None	Sand/silt	10 0 0	Yes	No	None

Site number/ Habitat type	Segment number(s)	Water Bodies: permanent or seasonal	Width/ Max. Depth (meters)	Bank gradient/ Water flow	Dominant Substrate	% floating vegetation % emergent vegetation % shade	Potential habitat for CRLF?	Potential project-related impacts (absent avoidance or minimization)?	Herpetofauna species and predators encountered
16 Carriger Creek	17	seasonal	2-3/ 0.5	Low/ None	Silt, gravel, cobble	0 0 0	No	Yes	None
17 Pond	17	permanent	10/ 2	Low/ None	Sand/silt	10 0 0	Yes	Yes	BF Raccoon
18 Sonoma Creek	17	permanent	4-10/ 1.5	Low to high/ Low to medium	Silt, gravel, cobble, boulder	0-5 0-20 70-80	Yes	Yes	BF Fish, crayfish, raccoon
19 Fryer Creek	17	permanent	2-4/ 1	Low to medium/ Low	Silt, clay, gravel	0 5 40	Yes	Yes	Fish (<i>Gambusia</i>) and crayfish
20 Pond	17	permanent	5/ 1	Low/ None	Plastic cover	0 0 0	No	No	None
21 Nathanson Creek	17	seasonal	2/ 0.5	Low to high/ None in August '02	Silt, gravel, cobble	0 0 60	No	No	None

Gradient: Low < 4 %, Medium 4-35%, High >35%; BF: bullfrog, CN: California newt, CRLF: California red-legged frog, TF: Pacific treefrog, WPT: western pond turtle.

Appendix B

Photographs



Photo 1. Suitable habitat for California red-legged frog, site 1a (segment 1).



Photo 2. Suitable habitat for California red-legged frog, site 2a (segment 1).



Photo 3. Suitable habitat for California red-legged frog, site 3b (segment 1).



Photo 4. Suitable habitat for California red-legged frog, site 3c (segment 1).



Photo 5. Suitable habitat for California red-legged frog along Felder Creek, site 14b (segment 2).



Photo 6. Suitable habitat for California red-legged frog along Sonoma Creek, site 18 (segment 17).



Photo 7. Suitable habitat for California red-legged frog along Fryer Creek, site 19 (segment 17).



Photo 8. Culvert at upper Felder Creek where California red-legged frogs were found in June 2004 (site 14c, segment 1).



Photo 9. California red-legged frog adults at an unnamed tributary to Felder Creek, June 2004 (site 14c, segment 1).



Photo 10. Pool in upper Felder Creek where California red-legged frog was found (site 14c, segment 1).



Photo 11. Pole 54, located in oak woodland upslope of tributary to Felder Creek near where California red-legged frogs were found.



Photo 12. Pole 55, located upslope and east of tributary to Felder Creek near where California red-legged frogs were found.



Photo 13. Transmission line along the edge of riparian vegetation of Felder Creek approximately 1.5 miles downstream from California red-legged frog location.

