California Red-Legged Frog (*Rana draytonii*) Habitat Assessment for the Newell Creek Dam Inlet/Outlet Replacement Project Santa Cruz County, California

PREPARED FOR

CITY OF SANTA CRUZ WATER DEPARTMENT

PREPARED BY

DUDEK

OCTOBER 2018

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FIGURES

ATTACHMENTS

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1 INTRODUCTION

This report describes the results of a formal habitat assessment conducted for the federally-threatened California red-legged frog (*Rana draytonii*; CRLF) on and in the vicinity of the proposed Newell Creek Dam Inlet/Outlet Replacement project. The focus of the habitat assessment was to determine whether or not CRLF is present, or potentially present, within or adjacent to the project site (hereafter referred to as "study area"). The habitat assessment was conducted by Dudek on June 21, 2018 and was performed in accordance with the requirements set forth in the U.S. Fish and Wildlife Service (USFWS) *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005).

Newell Creek Dam was completed in 1961 and is owned and operated by the City of Santa Cruz (City), is located in an unincorporated area of Santa Cruz County, approximately two miles east of Ben Lomond, California (Figure 1). Loch Lomond Reservoir was formed by the dam and has a water storage capacity of approximately 8,646 acre-feet. The reservoir is the primary storage facility for the City's water supply system, Newell Creek feeds the reservoir from the north, and continues south from the dam where it eventually joins the San Lorenzo River and flows into the Pacific Ocean. The proposed project involves replacement of the inlet/outlet works associated with Newell Creek Dam to correct existing deficiencies in these systems in order to comply with California Division of Safety of Dams (DSOD) drawdown requirements and to protect the City's ability to deliver drinking water to its customers.

The study area includes the following:

- The Newell Creek Dam
- The southern portion of the Loch Lomond Reservoir where the existing and proposed intakes are located
- The spillway plunge pool and plunge pool crossing
- The existing outlet structure and seepage channel at the toe of the of the dam,
- The control house on the crest of the dam
- Newell Creek Road and access roads to the toe and crest of the dam,
- A portion of the Newell Creek Pipeline (NCP)
- A portion of an emergency access road (Haul Road) along the right bank of the reservoir
- The LLRA boat launch
- Areas surrounding NCD and the Reservoir that would be used for construction staging and/or storage of excavated spoils.

The study area includes the seepage channel that conveys water from the outlet to the spillway plunge pool and Newell Creek, the spillway plunge pool and portions of Newell Creek, three

ephemeral drainages, two seasonal wetlands, two seeps, and upland habitat associated with the pipeline alignment along Newell Creek Road.

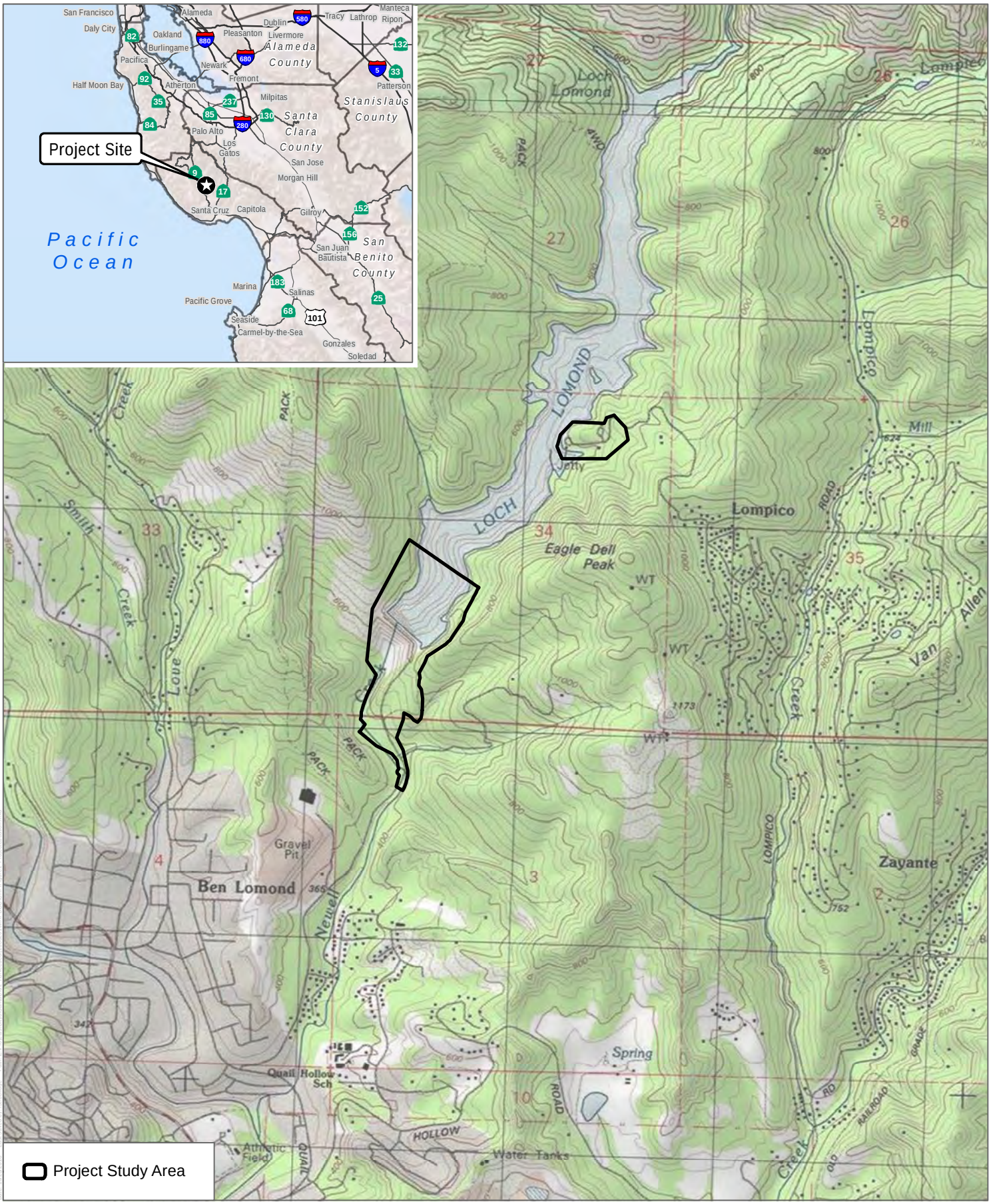
2 ENVIRONMENTAL SETTING

The study area is located within a largely undeveloped, rural area that supports a mixture of herbaceous, scrubs/shrub, and woodlands and forests. Adjacent land uses are primarily rural, with scattered residences throughout the area (Figure 2). Elevations in the vicinity of the dam range from approximately 780 feet above mean sea level (AMSL) above the dam in the surrounding mountainous watershed, to 390 feet AMSL at the bottom of the dam. Loch Lomond Reservoir sits at an elevation of 580 feet AMSL.

Fourteen terrestrial vegetation communities within and adjacent to the study area were observed and mapped during the field survey using the classifications described in A Manual of California Vegetation by Sawyer and Keeler-Wolf (2009).These largely consist of California annual grassland, coyote brush scrub, French broom, mixed chaparral, redwood forest, big leaf maple forest, white alder/bigleaf maple groves, Douglas fir forest, Douglas fir/knobcone pine forest, and live oak/madrone woodland (Figure 3). Douglas fir forest is the largest and most extensive of the communities in the study area. All forest and woodland tree communities within the study area characterized as second growth communities as a result of historical logging activity in the area.

A number of aquatic resources (wetlands and non-wetland waters), including a portion of Loch Lomond Reservoir, are also present in the study area. These include two seasonal wetlands, two small seeps, a perennial drainage, three ephemeral drainages, a roadside swale and the spillway plunge pool. These aquatic resources served as a primary focus of the habitat assessment for CRLF and are discussed in more detail below based on the Preliminary Jurisdictional Delineation prepared for the Project (Dudek, September 2018).

According to the Natural Resources Conservation Service (USDA 2018), four native soil types, and one anthropogenic soil type (Newell Creek Dam), are mapped within the study area (Figure 4). The native soils include Maymen-Rock outcrop complex, 50–75 percent slopes; Nisene-Aptos complex, 30–50 percent slopes; Nisene-Aptos complex, 50–75 percent slopes; and Lompico-Felton complex, 50–75 percent slopes. The Maymen-Rock outcrop complex is characterized by residuum weathered from sandstone and shale, or granite.



SOURCE: USGS 7.5-Minute Series Felton Quadrangle

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FIGURE 1

Project Location

Newell Creek Dam Inlet/Outlet Replacement Project

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SOURCE: Bing Maps 2018

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FIGURE 2

Project Site

Newell Creek Dam Inlet/Outlet Replacement Project

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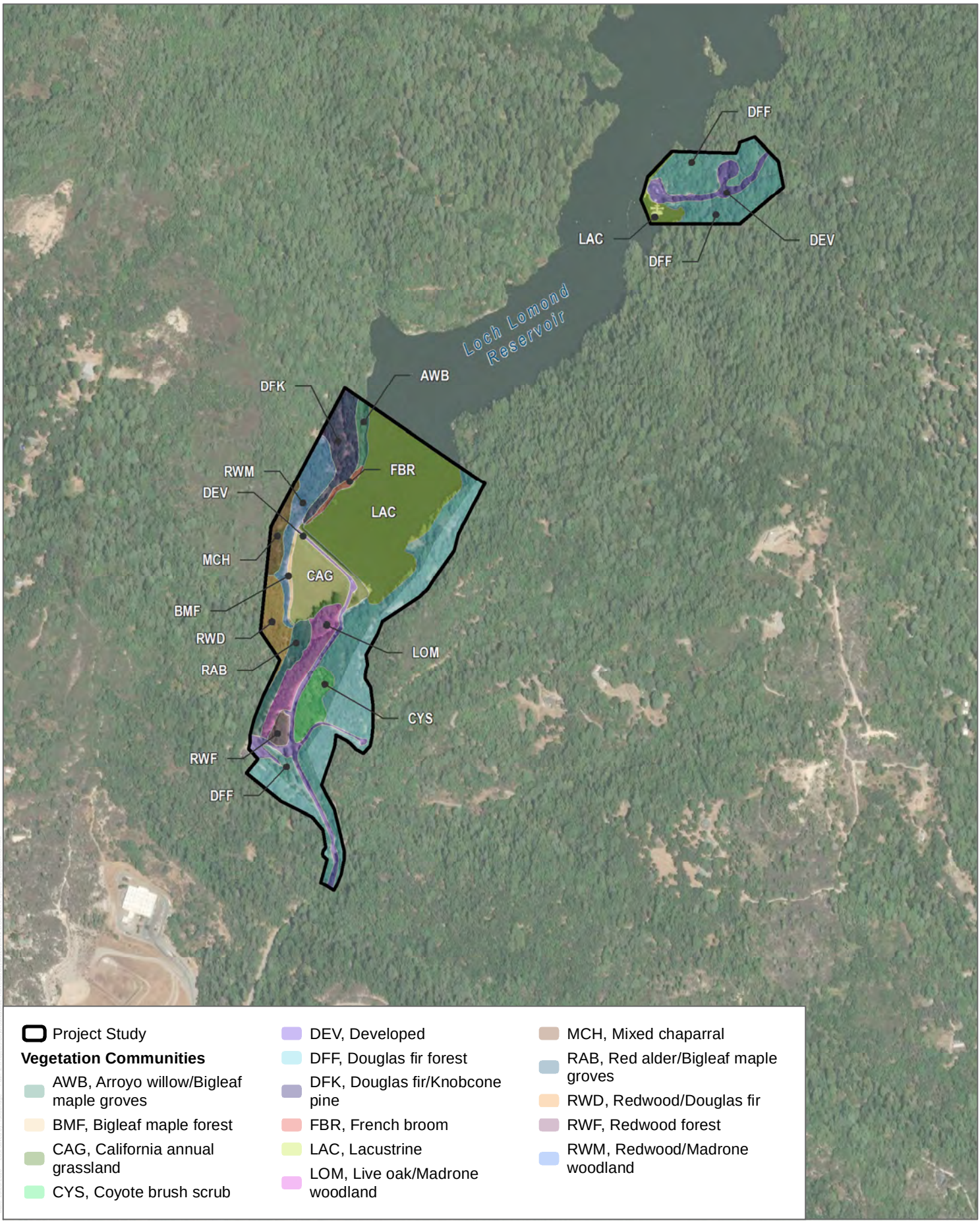

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FIGURE 3

Vegetation Communities and Land Cover Types

Newell Creek Dam Inlet/Outlet Replacement Project

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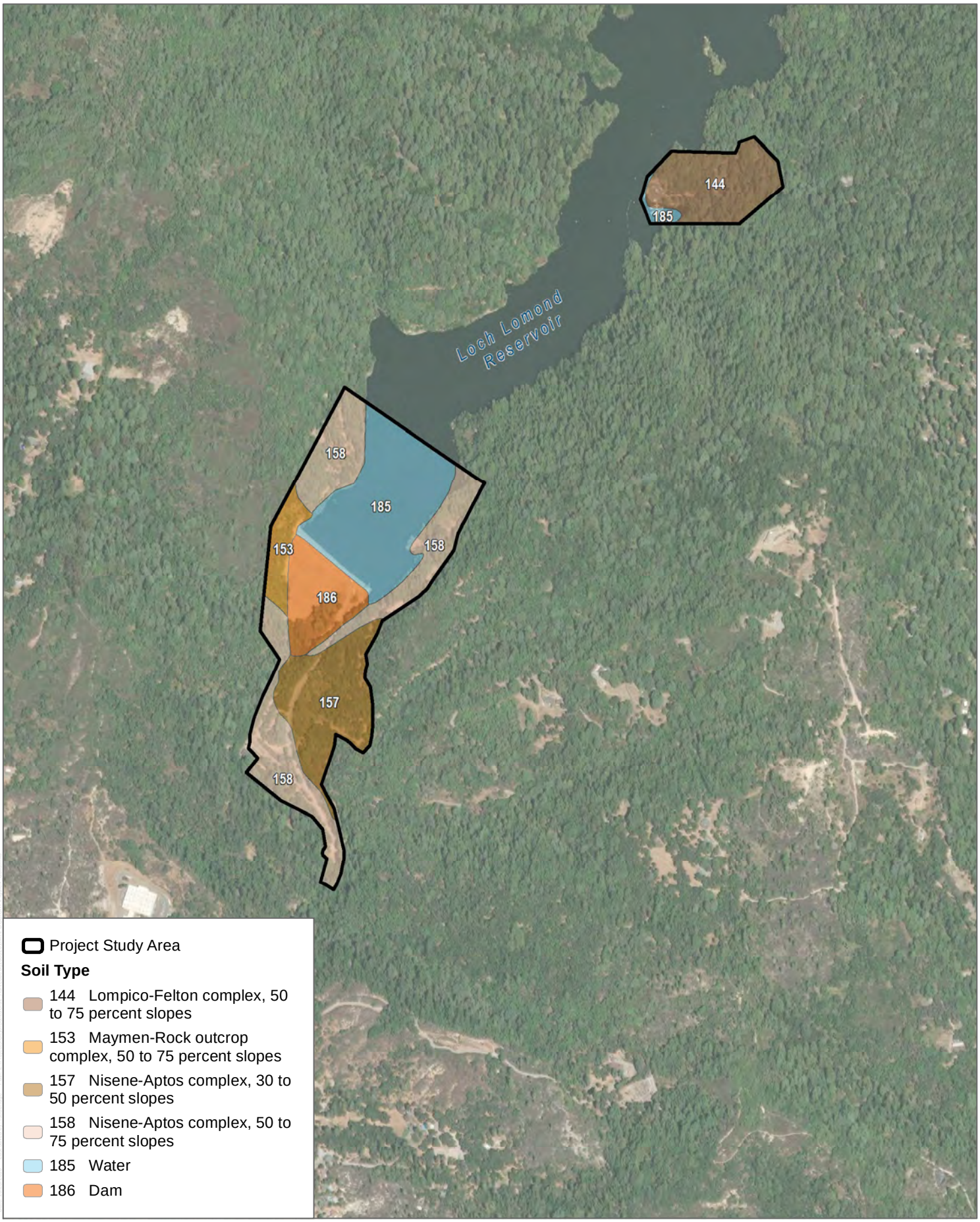

SOURCE: Bing Maps 2018; USDA 2017

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FIGURE 4

Natural Resources Conservation Service Soils Types

Newell Creek Dam Inlet/Outlet Replacement Project

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3 CALIFORNIA RED-LEGGED FROG BACKGROUND

3.1 Status

The CRLF was listed as a threatened species by the U.S. Fish and Wildlife Service (USFWS) on May 23, 1996 (USFWS 1996). In 2002, the USFWS published the *Recovery Plan for the California Red-Legged Frog* (*Rana aurora draytonii*, now *Rana draytonii*) (USFWS 2002). On April 13, 2006, the USFWS designated critical habitat for the CRLF (Federal Register Vol. 70, No. 71: 19243-19346) pursuant to the Endangered Species Act of 1973, as amended. On March 17, 2010, the Final Rule for the revised designation of critical habitat for the CRLF was published (Federal Register Vol. 75, No. 51: 12816-12959).

3.2 Distribution

The historic range of the CRLF extended coastally from the vicinity of Elk Creek in Mendocino County, California, and inland from the vicinity of Redding in Shasta County, California, southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). CRLF were historically documented in 46 counties; however, they are now restricted to 238 streams or drainages within 23 counties. CRLF are still locally abundant within portions of the San Francisco Bay Area and the Central Coast. Within the current distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern coast, and northern Transverse Ranges. CRLF are believed to be extirpated from the southern Transverse and Peninsular Ranges, but are still present in Baja California, Mexico.

3.3 Habitat

Adult CRLF prefer dense, shrubby or emergent riparian vegetation closely associated with deep (>2.3 feet), still, or slow-moving water (Hayes and Jennings 1988). However, frogs have also been found breeding in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation (C. Seltenrich, personal observations). The largest densities of CRLF are typically associated with deep pools with dense stands of overhanging willows (*Salix* species) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). CRLF disperse upstream and downstream of their breeding habitat, as well as across upland areas, to forage and seek sheltering habitat.

Sheltering habitat for CRLF potentially includes all aquatic, riparian, and upland areas within the range of the species. In addition, any landscape features that provide cover (such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris) or agricultural features (such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks) may also be used by CRLF.

4 ASSESSMENT METHODS

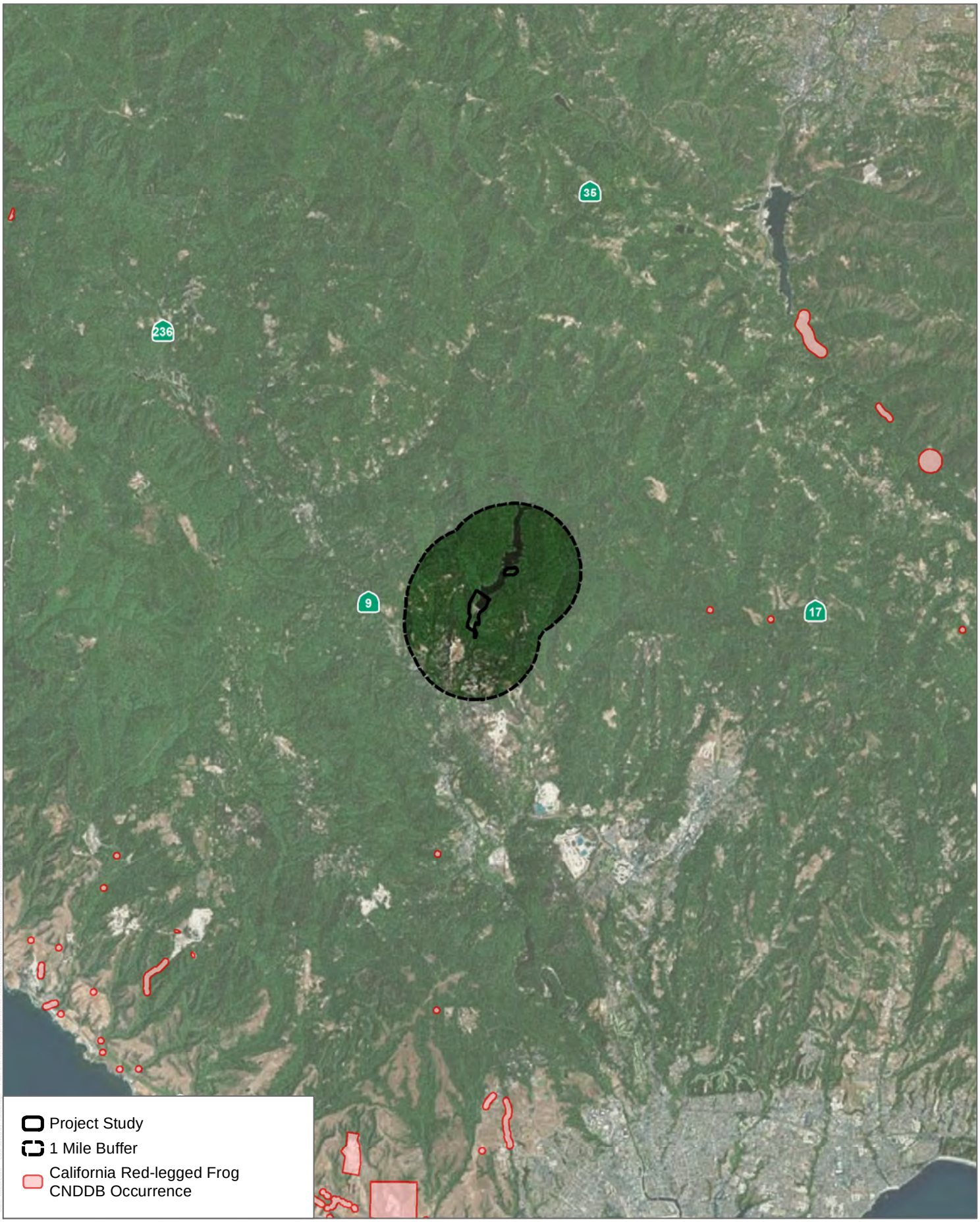
On June 21, 2018, Dudek senior aquatic ecologist Craig Seltenrich and wildlife biologist Paul Keating conducted a site assessment to evaluate potential habitat for CRLF within the study area. Aquatic habitat areas evaluated as part of the habitat assessment include the spillway plunge pool, Newell Creek (perennial) downstream of the spillway pool, a seepage channel to the spillway pool (and Newell Creek), three ephemeral drainages, two seasonal wetlands, and two seeps.

As noted above, the CRLF habitat assessment was based on requirements described in the *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005). Habitat evaluations were conducted by walking along or around the perimeter of all potential aquatic habitats and through adjacent upland areas (where possible). At each site, general and specific habitat conditions (e.g., type and location, physical parameters, upland habitat information) were recorded for both aquatic and adjacent terrestrial environments. Additionally, photographs were taken to document existing habitat conditions.

Aquatic habitats and potential aquatic habitats, as well as adjacent uplands, were evaluated by assessing their potential to support breeding, foraging activities, provide refuge and/or aestivation habitat, and as dispersal corridors for adult and juvenile frogs. In addition, habitats were also evaluated based on personal knowledge and experience with CRLF in northern and central California. Information collected during the site survey and evaluated to determine the potential for CRLF to occur within the study area included data on the following site characteristics:

- Terrain – elevation and topography
- Land use – historic and current for the study area and adjacent lands
- Existing terrestrial vegetation communities, including extent and quality
- Existing aquatic habitat types and features, including vegetation present, water surface area and depth, approximate drying date of water body
- Potential underground refugia, foraging habitat, and breeding habitat

In addition, the USFWS Information for Planning and Conservation (IPaC) database (USFWS 2018) and California Natural Diversity Data Base (CNDDB; CDFW 2018) was queried for CRLF occurrences within the *Felton*, California USGS 7.5 minute quadrangle map, with particular focus within 1.6 km (1.0 mile) of the study area (Figure 5).



SOURCE: Bing Maps 2018; USDA 2017; CNDDB 2018

FIGURE 5

CNDDB Occurrences (and Documented Field Observations) of California Red-legged Frog

Newell Creek Dam Inlet/Outlet Replacement Project

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5 ASSESSMENT RESULTS

Occurrence records from the IPaC and CNDDB database searches, aquatic habitats within and beyond 1.0 mile of the study area, and habitat characteristics within the study area (observed during the field survey) are described below. Copies of habitat assessment data sheets completed for Newell Creek and ephemeral drainage ED-01 are provided in Attachment C. Photographs of aquatic habitats and representative upland areas within the site are provided in Attachment D.

5.1 Occurrence Records within the Project Vicinity

Based on the federal and state data base records search, no occurrence records for CRLF are located within 1.0 mile of the study area; however, there are several records located greater than 3.0 miles from the site. The closest record (#584) is located approximately 3.5 miles east of the site on a tributary to Zayante Creek and represents an adult CRLF observed within a logjam pool in 2002. In 2005, a juvenile CRLF was also observed further to the east along upper Bean Creek (Record #844) approximately 4.8 miles east of the site. One additional record (#854) is located along Bull Creek immediately west of the town of Felton, approximately 4.0 miles south of the site, and represents an adult frog found in 2004.

The study area is not located within designated critical habitat for the species; however, Critical Habitat Unit SCZ-1 occurs 3.7 miles east of the site.

5.2 Aquatic Habitats Within the Study Area

Aquatic habitats located outside the study area on private property were not evaluated as part of the field assessment; however, USFWS guidelines require a cursory assessment of potential aquatic habitats within 1.0 mile of the study area boundaries. Information on aquatic habitats in the vicinity of the study area was obtained from available aerial photography (Google Earth 2018) and from the "Felton" USGS 7½ minute topographic quadrangle.

Based on available information and a thorough review of the topographic map and aerial photography, very few aquatic features are present within 1.0 mile of the site. However, the dense forest cover may have precluded observations of small stream corridors and likely any other small aquatic features that may have been present. Based on the results of this assessment and information provided in the City of Santa Cruz Watershed Management Plan (Swanson Hydrology & Geomorphology 2001), it appears that potential CRLF breeding habitats are not present within 1.0 mile of the study area.

Beyond one mile from the study area, one pond that was identified from aerial imagery is located approximately 1.4 miles southeast of the study area. This pond, which appears to be perennial, is located within Quail Hollow Ranch County Park near the town of Felton. Since the pond is

located within a county park that receives frequent public use and may contain predatory aquatic species (including mosquitofish), it is unlikely that the pond supports CRLF. Another perennial pond, Lake Lompico, is located approximately 1.3 miles east-northeast of the site and could provide potential breeding habitat if predatory aquatic species are not present. Seven additional ponds, some of which are perennial, are present 1.5 miles south-southeast of the site. The ponds appear to be associated with Quail Hollow Quarry. It is possible that some of these ponds provide suitable breeding and summer refugia habitat.

There are several small drainages north of the study area that flow into Loch Lomond Reservoir and Love Creek which is located approximately 1.0 miles northwest of the site. Based on topographic maps and aerial imagery these smaller streams appear to have similar characteristics (stream gradient, canopy cover, etc.) as the unnamed ephemeral creeks (ED-01 through ED-03) evaluated in this document, and may provide suitable summer refugia for CRLF.

5.3 Aquatic Habitats Within the Study Area

Aquatic habitats present within the Study Area that could potentially be used by CRLF include the spillway plunge pool, Newell Creek (perennial) downstream of the spillway pool, a perennial seepage channel to the spillway plunge pool (and Newell Creek), three ephemeral drainages, two seasonal wetlands, and two seeps. All of these features are shown on Figure 6 and were evaluated during the CRLF site assessment and during the wetland delineation field studies conducted in April and September 2018 (Dudek, September 2018) as discussed further below. The reservoir was not included as potential CRLF habitat due to the presence of non-native fish species, especially largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and bluegill (*Lepomis macrochirus*), which are known to prey on amphibian eggs, larvae, and adults; and to the presence of the non-native American bullfrog (*Rana catesbeiana*). The presence of these species substantially reduces the potential for CRLF occurrence in the reservoir.

Spillway Plunge Pool (SPP-01). The spillway plunge pool, located at the base of the dam spillway, is perennial and is fed by a 1 cubic foot per second (cfs) release from the outlet structure through a seepage channel (discussed below) and directly from the reservoir during the late winter/spring when the reservoir typically spills. The pool is approximately 44 meters (m) in length and about 22 m wide, with a fairly sparse riparian fringe comprised of red alder (*Alnus rubra*) and big leaf maple (*Acer macrophyllum*). The bank is vertical along much of the eastern side of the pool below the spillway, moderate to steep along the northern perimeter, moderately steep along the western margin, and low gradient along the southern margin adjacent to the access road. At the time of the survey, the pool had a maximum depth of ± 4 m with an average depth of about 2.5 – 3.0 m. Pool substrates consist primarily of large boulders and cobble, although some bedrock and coarse gravel was also present. Canopy cover consisted mostly of

red alder and big leaf maple provided approximately 40% cover at mid-day. Red alder and big leaf maple were present on the upper banks but margin vegetation was lacking.

Several non-native fish species have been historically documented in the spillway pool including golden shiners (*Notemigonus crysoleucas*) and bluegill (*Lepomis macrochirus*) (San Lorenzo Valley Water District 2009) and potentially other species from the reservoir. *O. mykiss* have also been captured in the spillway pool.

Newell Creek (PD-01). Newell Creek, a perennial drainage, is tributary to the San Lorenzo River; the confluence is near Ben Lomond, approximately 1.7 miles downstream of NCD. Downstream of the Reservoir and spillway plunge pool, Newell Creek is relatively undisturbed for approximately 0.8 mile; it is then bordered by residential development for the next 0.9 mile to the confluence with the San Lorenzo River. Flows downstream of the Reservoir are influenced by Reservoir inflow and storage conditions. Standard Reservoir operations generally include a year-round minimum release requirement of 1 cubic foot per second (cfs) below NCD (Berry, pers. comm. 2018). This release maintains water flow into the seepage channel (a portion of Newell Creek's original alignment), spillway plunge pool, and the channel of Newell Creek.

The Newell Creek channel downstream of the spillway plunge pool (for a distance of about 300 m) averaged about 4.4 m in width, with a mixture of shallow main channel pools, long glides, runs, and low gradient riffles. The substrate was comprised primarily of bedrock, boulders, and cobble with some gravel. The percentage of sand and fines was relatively low comprising 0 to 10 percent of the reach. Water depths varied from a maximum depth of 0.54 m to 0.74 m in main channel pools with average depths of 0.4 m to a maximum depth of 0.5 m in glides and runs with average depths of about 0.25 m. There were no plunge pools or other pools with bubble cover within the 300 m reach downstream of the spillway plunge pool. Canopy cover averaged approximately 85% with the majority of the banks containing riparian vegetation although overhanging vegetation was generally sparse. Instream cover was fairly low at <8% for the reach.

Several signal crayfish (*Pacifastacus leniusculus*) were observed within the creek downstream of the spillway plunge pool while conducting the stream habitat typing. Fish were not observed during the site assessment; however, based on information provided by the City of Santa Cruz, sculpin and juvenile trout have been observed in Newell Creek and in the spillway plunge pool.

Seepage Channel (PD-02). This seepage channel, which was part of the natural Newell Creek channel alignment prior to construction of Newell Creek Dam, conveys the 1 cfs perennial release from the outlet structure (located at the base of the dam) to the spillway plunge pool and Newell Creek. The channel has an average width of 4 to 5 feet and varies in water depth from about 6 to 12 inches with moderate water velocities. The seepage channel was primarily a run with

substrates consisting of a mixture of cobble and gravel. Water velocities were moderately high due to the gradient and narrow channel margins.

Ephemeral Drainage (ED-01). Ephemeral drainage ED-01 is located west of the spillway plunge pool and conveys runoff from the western hills into Newell Creek near the base of the plunge pool. Approximately 500 feet of the channel (upstream of the plunge pool) was surveyed. The channel is deeply incised with the top of bank extending 10 to 15 feet above the channel bed with nearly vertical walls in some areas. At the time of the habitat assessment, stream flow was extremely low (< 0.01 cfs) and surface flow was only observed in areas where the channel bottom was comprised of bedrock. Alluvial sections of the creek were dry except in areas where bedrock was present underneath the alluvium where scattered small shallow pools were present. The creek channel varied in width from 4 to 8 feet and the gradient varied from 1-2% in some areas and 7-8%+ in others.

Stream habitats appeared to consist primarily of short riffles, runs, and shallow pools. With the exception of one plunge pool located approximately 25 feet upstream from the mouth of the creek which has a maximum depth of 1.5 to 1.75 feet when the stream is flowing, all of the other pools had maximum water depths of 0.75 feet (8 inches). Water temperatures in the residual pools were around 55° F. Channel substrates were dominated by bedrock in areas with steeper gradients, by boulder and cobble with some gravel with smaller amounts of sand and fines.

Some undercut banks and rootballs were present as well as overhanging vegetation that provided some cover within the channel; however overall aquatic cover was limited. Canopy cover averaged about 75% for the 500 m reach and abundant vegetative cover was present along most of the channel banks throughout the reach.

Ephemeral Drainage (ED-02). Ephemeral drainage ED-02 is located along Newell Creek Road (approximately 650 feet south of the access road to the base of the dam) and conveys runoff from the eastern hills through a culvert under Newell Creek Road and into Newell Creek. The stream channel passes under the road through a corrugated metal culvert, and flows into Newell Creek. During wetland delineation, a small amount of water (~0.01 cfs) was flowing through the channel. The narrow channel is somewhat incised with fairly steep banks and relatively sparse vegetation along and overhanging the channel. Bed substrates consisted primarily of cobble and boulders with some finer sediments. Pools were not observed within the area surveyed. The canopy was relatively dense providing substantial shading to the channel.

Ephemeral Drainage (ED-03). Ephemeral drainage ED-03 is located to the east of Newell Creek Road (approximately 350 feet north of the access road to the base of the dam) and conveys runoff from the western hillslope to the roadside swale along the east side of Newell Creek Road. This small creek channel has bed substrates comprised of boulder, cobble and gravel and some finer sediments. During the April 11 and 12 wetland delineation conducted by Laura Burris

(botanist), the channel had a very small amount of flowing water; however, pools were not observed within the area surveyed. Much of the channel was difficult to see due to the extremely dense shrub cover, which included poison oak (*Toxicodendron diversilobum*), coyote brush (*Baccharis pilularis*), and wart-leaved ceanothus (*Ceanothus verrucosus*).

Ephemeral Drainage (ED-04). ED-04 originates on a terrace above and north of Newell Creek and drains south into Newell Creek. Water appears to sheetflow overland from a culvert under Newell Creek Road and south into the two channels of ED-04 (ED-04a and ED-04b) before draining into Newell Creek. ED-04 contains an OHWM as evidenced by break in slope and change in vegetation. The channels are incised into the terrace above Newell Creek and appear to convey water on an ephemeral basis. Neither channel contained water at the time of the survey.

Seasonal Wetland (SW-01). SW-01 is located at the base of a rock wall adjacent to the plunge pool where water appears to pond in a natural depression as the levels of the plunge pool recede during dry months. This shallow (one to 2 inches deep) wetland area contained abundant Harford's sedge (*Carex harfordii*) and miner's lettuce (*Claytonia perfoliata*). Dense leaf litter, from the mature woodland canopy, covered much of the area.

Seasonal Wetland (SW-02). SW-02 is located in an upland area in the northwestern portion of the southern part of the study area. The wetland occurs in a natural depression above a logging road where rainwater runoff from the surrounding hills ponds for sufficient time to create hydric soils and support hydrophytic vegetation. No standing water was observed.

Freshwater Seep (SP-01). Seep-01 is located just north of the low water crossing at the confluence of the ephemeral tributary (ED-01) and Newell Creek (PD-01). The seep area, which is relatively shallow (less than 8 inches deep), contains a bedrock layer below the soil that appears to allow for retention of water in the surface soils and the creation of wetland soils. The seep contains hydrophytic vegetation such as field sedge (*Juncus effusus*), horsetail (*Equisetum hyemale*), and redroot flatsedge (*Cyperus eragrostis*).

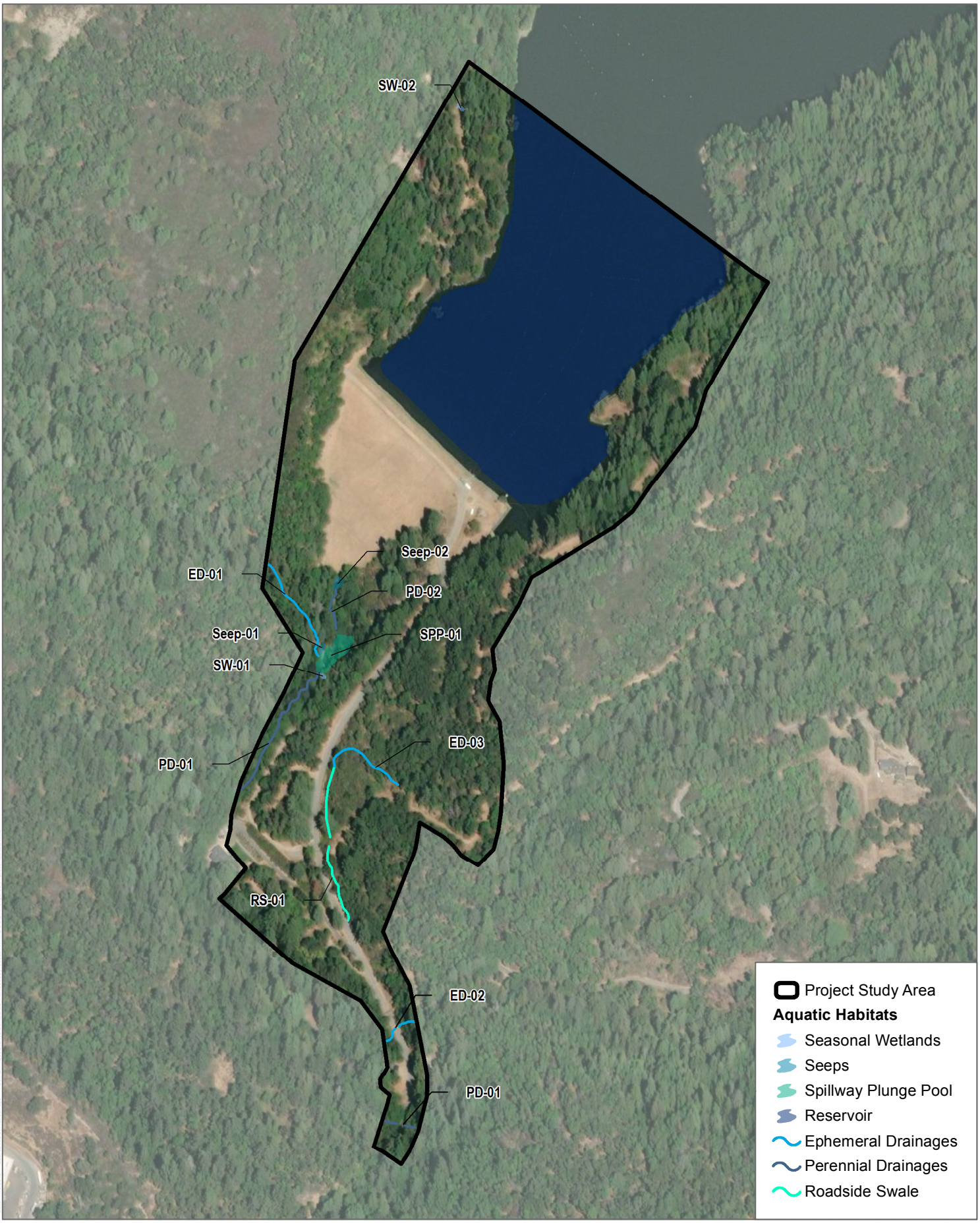
Freshwater Seep (SP-02). Seep-02 is located at the base of Newell Creek Dam, directly adjacent to the outlet structure. The seep appears to contain standing water for much of the year and supports a relatively dense cover of hydrophytic species such as watercress (*Nasturtium sp.*), stinging nettle (*Urtica dioica*), and redroot flatsedge (*Cyperus erythrorhizos*). The maximum water depth in the seep was approximately 8 inches at the time of the survey.

Several California newts and a foothill yellow-legged frog (*Rana boylii*) subadult were observed in the seep during the June 21, 2018 CRLF site assessment. The presence of a foothill yellow-legged frog in the seep is unusual since this species prefers stream habitats with cobble and gravel substrates and exposed banks for basking.

5.4 Upland Habitats

Several upland habitats occur within the study area, including California annual grassland, coyote brush scrub, French broom, mixed chaparral, redwood forest, big leaf maple forest, white alder/bigleaf maple groves, Douglas fir forest, Douglas fir/knobcone pine forest, and live oak/madrone woodland (Sawyer and Keeler-Wolf, 2009).

In general, upland habitats in the vicinity of the aquatic habitats evaluated as part of this assessment varied with location in the study area. The spillway plunge pool (SPP-01), Newell Creek (PD-01), the seepage channel (PD-02), seasonal wetland (SW-01), and both seeps (SP-01 and SP-02) are located within the Red Alder–Bigleaf Maple forest alliance. Ephemeral drainages (ED-01 and ED-02) and seasonal wetland (SW-02) occur within the Douglas fir forest alliance, and ephemeral drainage (ED-03) occurs within the Coyote Brush Scrub alliance. Terrestrial cover adjacent to these aquatic features consists primarily of vegetative (shrub) cover, leaf litter, and downed woody debris (trees, branches, etc.). Burrows were not observed in the vicinity of any of the aquatic features.



SOURCE: Bing Maps 2018

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FIGURE 6

Aquatic Habitats Evaluated within the Study Area

Newell Creek Dam Inlet/Outlet Replacement Project

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6 DISCUSSION

During the site assessment, a total of 10 aquatic habitats were evaluated for their potential to serve as CRLF breeding habitat as well as summer refugia habitat. These included the spillway plunge pool, Newell Creek downstream of the spillway pool, the seepage channel to the spillway pool (and Newell Creek), three ephemeral drainages, two seasonal wetlands, and two seeps. The specific habitat characteristics of each of these features and their overall suitability to support breeding populations of CRLF, as well as their suitability as spring/summer refugia and cover habitat, are discussed below.

Spillway Plunge Pool. The spillway plunge pool contains *O. mykiss* and non-native game fish (from the reservoir), some of which are predatory on amphibians and amphibian egg masses. Additionally, during the winter/spring when the reservoir can typically spill, the pool may lack suitable calm water areas used for CRLF egg deposition. Additionally, vehicle traffic across the base of the pool and the presence of human activities in the vicinity of the pool further reduces the potential use of the pool by CRLF. As a result, the pool was determined to not provide suitable breeding habitat for CRLF. For the same reasons discussed above regarding suitability for breeding, the spillway plunge pool does not provide suitable spring and summer refugia habitat for CRLF.

Newell Creek. Newell Creek receives high flows in the winter and spring (during the breeding period) when the reservoir can spill The lack of side channels and other calm water areas utilized by CRLF, combined with the potential presence of non-native game fish from historic reservoir stocking would preclude breeding by CRLF. Additionally, much of Newell Creek has a fairly dense canopy cover (averaging 85% in the 300 m reach downstream of the spillway plunge pool) with limited basking habitat. Portions of Newell Creek could serve as potentially suitable summer refugia and foraging habitat for CRLF. However, the relatively dense canopy cover (80% to 100%) along much of the creek below the dam limits the amount of basking habitat for the species.

Seepage Channel. The short seepage channel from the reservoir to the plunge pool and Newell Creek does not provide suitable breeding habitat for CRLF due primarily to the lack of calm water areas within the channel. For the same reason, the channel is unlikely to serve as spring and/or summer refugia habitat during movement/dispersal periods.

Ephemeral drainages (ED-01 through ED-03). None of these drainages provide suitable breeding habitat for CRLF due primarily to the ephemeral nature of the drainages (lack of perennial water), to high outflows that can occur in the winter and early spring, and to the lack of sufficiently deep, calm water pools within these relatively narrow channels. While ephemeral drainage ED-01 appears to contain some water into June or July in most years and some pool habitat is available, most of the pools are shallow (less than 1 foot deep); the intermittent and

shallow nature of these pools would not be conducive to supporting breeding populations. Ephemeral drainages ED-02 and ED-03 appear to contain water only during the spring; pools were not observed within these drainages during the June survey. For the same reasons as for ED-01, these two drainages would not support breeding populations of CRLF.

Each of these drainages have some potential to serve as temporary refugia and foraging habitat during movement periods and during the winter and spring months prior to drying. However, two of the drainages (ED-01 and ED-02) have relatively dense canopy cover (80% to 100%) which limits the amount of basking habitat in these drainages.

Seasonal wetlands SW-01 and SW-02. Neither of these wetlands provide suitable breeding habitat due to the shallow water depth (several inches) for egg deposition in SW-01 and the absence of pooled water in SW-02. As a result, neither seasonal wetland provides temporary refugia or foraging habitat for CRLF.

Seeps SP-01 and SP-02. Neither of these seeps provide suitable breeding habitat due to the lack of surface water in SP-01, the shallow water depth in SP-02 (8 inches or less), and the small size of both of these features. Seep SP-02 provides suitable temporary spring and summer refugia and foraging habitat for CRLF. During the site assessment, a subadult foothill yellow-legged frog was observed in SP-02, verifying the suitability of the SP-02 habitat as temporary spring and summer refugia for populations of amphibians that breed within or near the study area.

In 2001, focused CRLF surveys were conducted at the reservoir, Newell Creek, and within other City watershed lands in the vicinity, with negative results for all surveys (City of Santa Cruz Water Department 2013). Even though the survey results are 17 years old and CRLF could have moved into the area since that time, the lack of breeding habitats within the study area and within at least 1.0 mile of the site, the marginal quality of spring and summer refugia within the study area, and the significant distance to the nearest occurrence record substantially reduces the potential for occurrence within the study area.

7 CONCLUSIONS

Based on the results of the habitat assessment, and for the reasons discussed above, none of the aquatic features evaluated as part of this assessment provide suitable breeding habitat for CRLF. Although the three ephemeral drainages, small portions of Newell Creek, and one of the seeps could serve as potentially suitable spring/summer refugia habitat for dispersing individuals, there is no known population source or suitable breeding habitat in close proximity to the study area (the nearest known population is at least 3.5 miles east of the site). Therefore, the potential for dispersing CRLF to occur in these refugia habitats, especially given their temporary nature, is considered extremely remote. Upland cover habitat (shrub cover, downed woody debris, and leaf litter) occurs in the vicinity of all of the aquatic features within the study area. However, for the same reason (lack of a population source in the vicinity), CRLF are unlikely to occur in or otherwise utilized these areas.

Due to the lack of suitable breeding habitat within the study area and because there are no known breeding populations within close proximity that would serve as a source for dispersing individuals, and based on the negative results of focused CRLF surveys conducted in 2001 in and within the vicinity of the study area, CRLF are not expected to occur within the study area.

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ATTACHMENT A

CNDDB Summary Data Sheets for
CRLF Occurrences

Occurrence Report

California Department of Fish and Wildlife

California Natural Diversity Database

Map Index Number: 49264
Key Quad: Felton (3712211)
Occurrence Number: 584

EO Index: 49264
Element Code: AAABH01022
Occurrence Last Updated: 2002-11-04

Scientific Name: *Rana draytonii*
Common Name: California red-legged frog

Listing Status: **Federal:** Threatened
State: None

Rare Plant Rank:

Other Lists: CDFW_SSC-Species of Special Concern
IUCN_VU-Vulnerable

CNDDB Element Ranks: **Global:** G2G3
State: S2S3

General Habitat:

LOWLANDS AND FOOTHILLS IN OR NEAR PERMANENT SOURCES OF DEEP WATER WITH DENSE, SHRUBBY OR EMERGENT RIPARIAN VEGETATION.

Micro Habitat:

REQUIRES 11-20 WEEKS OF PERMANENT WATER FOR LARVAL DEVELOPMENT. MUST HAVE ACCESS TO ESTIVATION HABITAT.

Last Date Observed: 2002-09-13
Last Survey Date: 2002-09-13
Owner/Manager: CITY OF SANTA CRUZ
Presence: Presumed Extant

Occurrence Type: Natural/Native occurrence
Occurrence Rank: Fair
Trend: Unknown

Location:

MOUNTAIN CHARLIE GULCH, TRIBUTARY TO ZAYANTE CREEK, 2.5 MILES EAST OF LOMPICO.

Detailed Location:

SITE IS SURROUNDED BY TIMBER PRODUCTION ZONES, CONSERVATIONS LANDS, AND RURAL RESIDENTIAL. A SMALL SAG POND IS FOUND WITHIN 1 MILE.

Ecological:

HABITAT CONSISTS A LOGJAM ON A PERENNIAL CREEK, WITH BACKWATER POOLS UP TO 2 FEET DEEP; EMERGENT VEGETATION (COLTSFOOT) UPSTREAM OF THE LOGJAM AND A LIMITED HARDWOOD / CONIFER OVERSTORY CANOPY ON ADJACENT STREAMBANKS.

Threats:

THREATENED BY SEDIMENT FILLING POOLS FROM WASTING STREAMBANKS, LANDSLIDES, AND WINTER TIMBER OPERATIONS.

General:

HISTORICALLY, CRLF'S ARE NOT KNOWN IN THIS AREA. 1 ADULT OBSERVED ON 13 SEP 2002.

PLSS: T09S, R01W, Sec. 31, SE (M)
UTM: Zone-10 N4106751 E588310

Accuracy: 80 meters
Latitude/Longitude: 37.10292 / -122.00616

Area (acres): 0
Elevation (feet): 550

County Summary:	Quad Summary:
Santa Cruz	Felton (3712211)

Sources:

BER02F0001 BERRY, C. (CITY OF SANTA CRUZ) - FIELD SURVEY FORM FOR RANA DRAYTONII 2002-09-13

Occurrence Report

California Department of Fish and Wildlife

California Natural Diversity Database

Map Index Number: 62498
Key Quad: Laurel (3712118)
Occurrence Number: 844

EO Index: 62535
Element Code: AAABH01022
Occurrence Last Updated: 2005-09-07

Scientific Name: *Rana draytonii*
Common Name: California red-legged frog

Listing Status: **Federal:** Threatened
State: None

Rare Plant Rank:

Other Lists: CDFW_SSC-Species of Special Concern
IUCN_VU-Vulnerable

CNDDB Element Ranks: **Global:** G2G3
State: S2S3

General Habitat:

LOWLANDS AND FOOTHILLS IN OR NEAR PERMANENT SOURCES OF DEEP WATER WITH DENSE, SHRUBBY OR EMERGENT RIPARIAN VEGETATION.

Micro Habitat:

REQUIRES 11-20 WEEKS OF PERMANENT WATER FOR LARVAL DEVELOPMENT. MUST HAVE ACCESS TO ESTIVATION HABITAT.

Last Date Observed: 2005-09-02
Last Survey Date: 2005-09-02
Owner/Manager: SCR COUNTY
Presence: Presumed Extant

Occurrence Type: Natural/Native occurrence
Occurrence Rank: Good
Trend: Unknown

Location:

UPPER BEAN CREEK, SOUTH OF GLENWOOD.

Detailed Location:

Ecological:

HABITAT SURROUNDING UPPER BEAN CREEK CONSISTS OF DISTURBED ALDER RIPARIAN WITHIN A SECOND-GROWTH REDWOOD CANOPY; SCATTERED TANOAK AND BIGLEAF MAPLE ALSO PRESENT. STREAM CHANNEL IMPACTED BY ROAD SLIPOUTS.

Threats:

THREATENED BY ROAD FAILURES AT SITE LOCATIONS; CRIBWALL REPAIR PROPOSED.

General:

1 JUVENILE OBSERVED ON 2 SEP 2005.

PLSS: T09S, R01W, Sec. 32 (M)
UTM: Zone-10 N4106560 E589858

Accuracy: 80 meters
Latitude/Longitude: 37.10105 / -121.98875

Area (acres): 0
Elevation (feet): 870

County Summary:

Santa Cruz

Quad Summary:

Laurel (3712118)

Sources:

KIT05F0001 KITTLESON, G. (KITTLESON ENVIRONMENTAL CONSULTING) - FIELD SURVEY FORM FOR RANA DRAYTONII 2005-09-02

Occurrence Report

California Department of Fish and Wildlife

California Natural Diversity Database

Map Index Number: 63593
Key Quad: Felton (3712211)
Occurrence Number: 854

EO Index: 63688
Element Code: AAABH01022
Occurrence Last Updated: 2006-01-05

Scientific Name: *Rana draytonii*
Common Name: California red-legged frog

Listing Status: **Federal:** Threatened
State: None

Rare Plant Rank:

Other Lists: CDFW_SSC-Species of Special Concern
IUCN_VU-Vulnerable

CNDDB Element Ranks: **Global:** G2G3
State: S2S3

General Habitat:

LOWLANDS AND FOOTHILLS IN OR NEAR PERMANENT SOURCES OF DEEP WATER WITH DENSE, SHRUBBY OR EMERGENT RIPARIAN VEGETATION.

Micro Habitat:

REQUIRES 11-20 WEEKS OF PERMANENT WATER FOR LARVAL DEVELOPMENT. MUST HAVE ACCESS TO ESTIVATION HABITAT.

Last Date Observed: 2004-04-05
Last Survey Date: 2004-04-05
Owner/Manager: PVT-CALIFORNIA AMERICAN WATER
Presence: Presumed Extant

Occurrence Type: Natural/Native occurrence
Occurrence Rank: Fair
Trend: Unknown

Location:

BULL CREEK, ON THE WEST EDGE OF FELTON.

Detailed Location:

SITE IS LOCATED ADJACENT TO A LONG-ESTABLISHED AND CONTINUOUSLY OPERATED / MAINTAINED WATER LINE THAT PROVIDES PRIMARY WATER TO THE COMMUNITY OF FELTON.

Ecological:

HABITAT CONSISTS OF A CREEK WITH CLEAR, RUNNING, UNDISTURBED WATER, WITHIN A NARROW RIPARIAN DRAINAGE; OVERSTORY OF SECOND-GROWTH COAST REDWOOD / DOUGLAS-FIR INTERMIXED WITH EXOTIC ESCAPEES (ENGLISH IVY, PERIWINKLE) FROM ADJACENT FARMYARDS.

Threats:

General:

1 ADULT OBSERVED ON 5 APR 2004.

PLSS: T10S, R02W, Sec. 21, SE (M)
UTM: Zone-10 N4100371 E581551

Accuracy: 80 meters
Latitude/Longitude: 37.04602 / -122.08289

Area (acres): 0
Elevation (feet): 420

County Summary:

Santa Cruz

Quad Summary:

Felton (3712211)

Sources:

FRO04F0001 FROKE, J.B. - FIELD SURVEY FORM FOR RANA DRAYTONII 2004-04-05

ATTACHMENT B

Qualifications of Surveyors

Statement of Qualifications

Craig Seltenrich, M.S.
Senior Aquatic Ecologist

Craig Seltenrich has 38 years of experience in the field of aquatic biology, including; amphibian ecology, aquatic toxicology, and freshwater and marine fisheries. Since 1999, he has specialized in amphibian ecology and has designed and conducted numerous studies for evaluating potential impacts on special-status amphibians throughout much of the western Sierras and in other areas of central and northern California. Mr. Seltenrich worked at Pacific Gas and Electric Company for 23 years and was the principle amphibian biologist for all Company projects. He has also written several survey protocols for native Ranids in California including the foothill yellow-legged frog, Sierra Nevada yellow-legged frog, Yosemite toad, Cascades frog, and northern leopard frog. Mr. Seltenrich currently possesses a 10(A)(1)(a) permit for both CRF and the California tiger salamander (CTS).

Mr. Seltenrich has extensive experience conducting habitat assessments and surveys for CTS throughout much of central and northern California, as well as collection and handling of larvae and adults. During these surveys Mr. Seltenrich has observed CTS breeding, eggs, larvae, juveniles, and adults; and has documented numerous new populations in the San Francisco Bay area while working for PG&E. Currently, Mr. Seltenrich is the manager and dedicated biologist for the 5-year Potrero Landfill Expansion Site CTS capture and relocation project in Suisun and for CRF and CTS capture and relocation efforts at the Altamont Landfill and Resource Recovery Facility near Livermore. Additionally, he has conducted larval surveys and drift fence surveys in several locations in the Central Valley and coastal hills. Mr. Seltenrich has participated in CTS workshops and training sessions regarding larval and upland survey techniques. Mr. Seltenrich has also prepared Biological Assessments for CTS and has designed innovative approaches for minimizing impacts and conserving this species.

Mr. Seltenrich also has extensive experience conducting habitat assessments and surveys for the California red-legged frog (CRF) throughout much of central and northern California, as well as collection and handling of larvae and adults. He has conducted extensive surveys in the Altamont Pass area, along the southern flanks of Mount Diablo, in the Monterey Bay area, in the Central Valley, and in several locations in the Sierra foothills, and has documented numerous new CRF breeding locations. During these surveys, Mr. Seltenrich has observed breeding, egg masses, larvae, juveniles, and adults; and has documented numerous new populations in the San Francisco Bay area. He also conducted several CRF population assessments/surveys at the Big Gun Conservation Bank in Michigan Bluff, which is the largest population in the Sierra foothills. In addition, he has participated in CRF workshops and training sessions and has conducted CRF training workshops at the Big Gun Conservation Bank in Michigan Bluff for the last three years. Mr. Seltenrich has also prepared Biological Assessments for CRF, and has designed innovative approaches for minimizing impacts and conserving this species.

Mr. Seltenrich also has extensive knowledge and experience with Sierra Nevada and foothill yellow-legged frogs, and has worked with both Yosemite and spadefoot toads. He is senior author of two publications (in gray literature) on survey methodologies and techniques for the foothill yellow-legged frog (Seltenrich and Pool 2002), and for Yosemite toad, mountain yellow-legged frog, northern leopard frog, and Cascades frog (PG&E 2001). He managed and lead all of the amphibian surveys at PG&E associated with the relicensing of hydroelectric facilities throughout the Sierra Nevada Mountains. Mr. Seltenrich has also been an active member of the California/Nevada Amphibian Populations Task Force since 2002.

Publications

Pacific Gas & Electric Company. 2001. "Survey Protocols for Mountain Yellow-Legged Frog, Northern Leopard Frog, Cascades Frog, and Yosemite Toad: Standard Operating Procedures and Data Sheets for Amphibian Surveys and Habitat Assessments." Prepared by C. Seltenrich and A. Pool. May 2001.

Seltenrich, C.P., and A.C. Pool. 2002. "A Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog (*Rana boylii*)." Pacific Gas & Electric Company.

Stitt, E.W., and C.P. Seltenrich. 2010. California Red-Legged Frog (*Rana draytonii*) Diet. *Herpetological Review* 41(2):206.

Paul Keating
Wildlife Biologist

Mr. Keating has experience performing habitat assessments and surveys for California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*).

Relevant experience includes the following:

- Conducted a formal California red-legged frog and western pond turtle habitat assessment and survey with Craig Seltenrich (senior aquatic ecologist at Dudek) for the Estero Trail project in Sonoma County. All potential ponds, drainages, and upland habitat were evaluated on an approximately 500 acre site. Both California red-legged frogs and western pond turtles were observed in the two intermittent drainages present on the site. I also assisted Mr. Seltenrich in preparation of the final habitat assessment report.
- As an approved biologist for a multi-year California tiger salamander trapping and relocation study at the Potrero Hills Landfill site near Suisun City, Mr. Keating monitored approximately 3 miles of drift fencing and pit fall traps. During the tenure of the project he had the opportunity to handle over 40 adult and juvenile California tiger salamanders as well as conducting egg and larval surveys on all aquatic features present.
- Mr. Keating assisted Craig Seltenrich with a California tiger salamander habitat assessment for the proposed conversion of approximately 100-acres of grazing land to orchards near the town of Oakdale in San Joaquin County. The site is located within the known historic range of this species.
- In support of the development of a conservation easement, Mr. Keating mapped, assessed, and performed larval sampling on all potentially suitable vernal pools and ponds for a property near Le Grange in Stanislaus County.
- Mr. Keating provided construction monitoring services for the Cal Train Modernization project which included monitoring for California red-legged frog.
- Attended the Laguna de Santa Rosa Foundation Rare Pond Species Survey Techniques workshop for California tiger salamander, California red-legged frog, and western pond turtle. During the workshop he participated in nighttime eye-shine captures where he handled multiple California red-legged frog.

ATTACHMENT C

Copies of Field Data Sheets

California Red-Legged Frog Habitat Assessment Form

General Information

Observers: CSeltzer, PKeating	Site #: 2	Location: Newell Creek (and spillway pool)	
	Date: 6-21-18	Time: 1330	Elevation: ~475'

Additional:

Aquatic Habitat

Pond Lake	Temporary	Permanent	Size:
(Stream) Pool	Temporary	(Permanent)	
spillway pool	(Pools) No Pools	Size: 44 x 22 m	Depth: avg. 2m, max. 4m
	% Riffles:	Stream Gradient	
Pools (along stream)	Temporary	Permanent	Size/Depth:

Comments: The spillway pool has a fairly sparse riparian band along the northern and some of the western perimeter consisting of alder (red) and bigleaf maple. The bank along the eastern side is nearly vertical and is moderately steep along the northern and western sides and low at south end. Substrate is primarily large boulder, bedrock, and cobble with some gravel. However, no margin vegetation

Aquatic Features Newell Creek

Size (meters)	Width: Avg. 4.4 m	Length: 300 m from below spillway pool	
Depth (meters)	Maximum: 0.74 m	Minimum: —	Average: .2 m
Est. Flow (CuFt/sec):	1 cfs	Turbidity: (Low (clear)) Moderate High	
Shade on water (mid-day)	85 % (Canopy)	Floating	
Emergent Vegetation	% Cover: 5	Type: Water cress	
Submerged Vegetation	% Cover: <2	Type: algae	
Basking Sites	Absent (Present)	Type: boulders, bedrock	Abundance: H M (L)
Substrate (%)	Silt/Mud — Sand 5	Gravel 15 Cobble 25 Boulder 25 Bedrock 30	

Comments:

Shoreline Features

Overhanging Vegetation	% Cover: 15	Type: riparian, grasses, forbs, ferns	
Undercut Banks	Absent (Present)	Abundance: H M (L)	sparse
Mud/Sand Banks	Absent (Present)	Abundance: H M (L)	highly limited
Rootballs	Absent (Present)	Abundance: H M (L)	" "
Bank Gradient	Range (degrees):	(Low Medium) High	

Comments: much of the stream margin contains vegetation

Terrestrial Habitat and Features

Cover (within 50 ft)	% Cover: 100%	Type: vegetation, downed woody debris	
Burrows/Cover Objects	(Absent) Present	Type:	Abundance: H M L
Logged: ?	Yes No	Amount: H M L	Impacts:
Grazed	Yes (No)	Amount: H M L	Impacts:

Comments:

Wildlife Observed

Amphibians:	Fish: observed in spillway pool - not identified	
Other: crayfish (Pacifastacus) in creek		

Comments:

California Red-Legged Frog Habitat Assessment Form

General Information

Observers: CPS - PK	Site #:	Location: Ephemeral drainage ED-01	
	Date: 6-21-18	Time: 10:15	Elevation: 475'

Additional: Potential habitat is a small tributary to Newell Cr. that flows into the lower portion of the pool at the base of the dam spillway (55° F)

Aquatic Habitat

Pond Lake	Temporary	Permanent	Size:
Stream	Temporary ✓	Permanent ~~Perennial~~	~~1cfs release~~ -
	Few (Pools) (circled) No Pools	Size: 4-8' wide	Depth:
	% Riffles: —	Stream Gradient generally 4-8% with steeper bedrock sections	
Pools (along stream)	Temporary	Permanent	Size/Depth:

Comments: Creek channel dry in most locations with a few residual pools - which range in size from 1'x2' to 8'x13' / 1.5x8' / 5'x15' by 8" or less deep. Small amount of flow present in bedrock sections goes subsurface in alluvial stretches. One small pool (7x5') in lower reach

Aquatic Features

Size (meters)	Width:	Length:	
Depth (meters)	Maximum: 1.5' when flowing	Minimum: —	Average: 8-10" when flowing
Est. Flow (CuFt/sec):	.01	Turbidity: (Low (clear)) (circled) Moderate High	
Shade on water (mid-day)	60 % (Canopy) (circled)	Floating	
Emergent Vegetation	% Cover:	Type:	
Submerged Vegetation	% Cover: 0	Type:	
Basking Sites	Absent (Present) (circled)	Type: bedrock/boulder	Abundance: H (M) L (M circled)
Substrate (%)	Silt/Mud 2 Sand 3	Gravel 10 Cobble 35	Boulder 10 Bedrock 40

Comments: Went up creek channel approximately 450-500'

Shoreline Features

Overhanging Vegetation	% Cover: 30	Type: Poison oak, ferns, blackberries	
Undercut Banks	Absent (Present) (circled)	Abundance: H M (L) (L circled)	
Mud/Sand Banks	(Absent) (circled) Present	Abundance: H M L	
Rootballs	Absent (Present) (circled)	Abundance: H M (L) (L circled)	
Bank Gradient	Range (degrees):	(Low Medium) (circled) High	

Comments: Banks with some overhanging sedges, blackberry vines, poison oak, herbs, sword ferns, ivy, scotch broom, and more - some small woody debris present

Terrestrial Habitat and Features

Cover (within 50 ft)	% Cover: 75	Type: leaf litter, vegetation, logs - downed trees	
Burrows/Cover Objects	Absent (Present) (circled)	Type: downed trees	Abundance: H (M) L (M circled)
Logged:	Yes (No) (circled)	Amount: H M L	Impacts:
Grazed	Yes (No) (circled)	Amount: H M L	Impacts:

Comments: Newts in drainage to pool

Wildlife Observed

Amphibians: FYLF - Newt	Fish:
Other: Juv.	

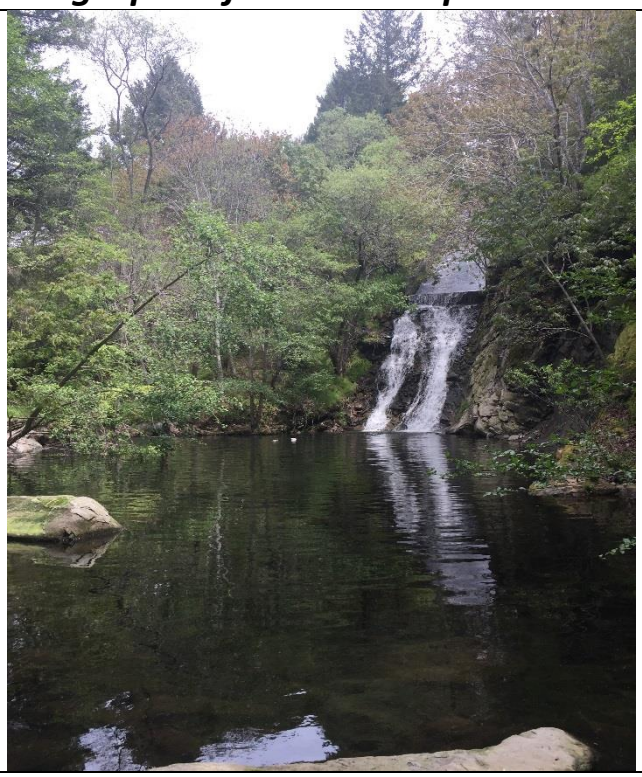
Comments: → observed in small collection pool at base of dam - receives flow from leakage ~ .05 cfs?

ATTACHMENT D

Photographs of Aquatic and Upland Habitats

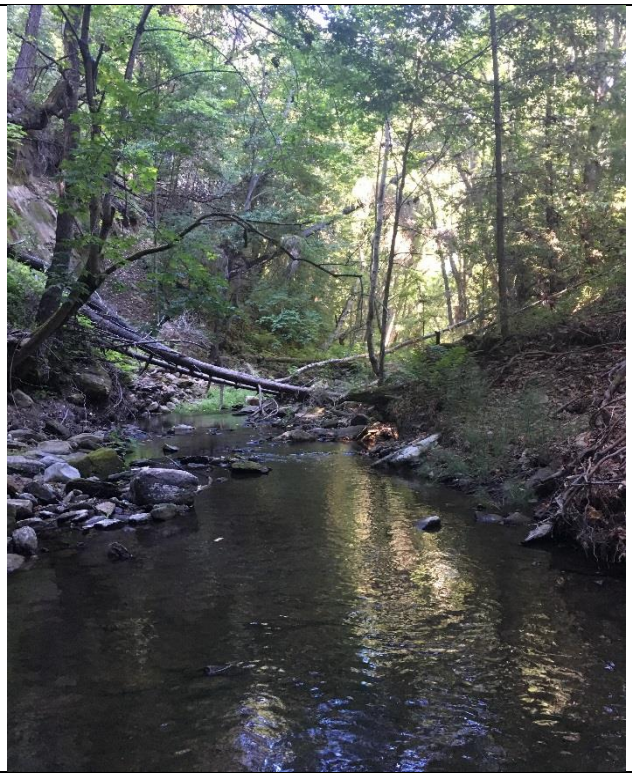
Attachment D

Representative Photographs of Selected Aquatic and Upland Habitats



1. Spillway plunge pool (SPP-01)

2. Newell Creek (PD-01) just downstream of the spillway plunge pool



3. Newell Creek approximately 150 downstream of the spillway plunge pool

4. Perennial drainage (PD-02) – seepage channel below the outlet structure

5. Ephemeral drainage (ED-01) upstream of confluence with Newell Creek and the spillway plunge pool

6. Ephemeral drainage (ED-01)

7. Ephemeral drainage (ED-02)

8. Ephemeral drainage (ED-03)

9. Seep (SP-02)

10. Representative upland habitat

11. Representative upland habitat

12. Representative upland habitat