Appendix G
Biological Reports

Appendix G-1

USFWS Biological Assessment

SEQUOIA
Ecological Consulting, Inc.

Biological Assessment
Proposed Shiloh Resort and Casino Project
Sonoma County, California

November 2022

Prepared for:

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1.0 INTRODUCTION

Sequoia Ecological Consulting, Inc. (Sequoia) has prepared this Biological Assessment (BA) on behalf of Acorn Environmental for the proposed Shiloh Resort and Casino Project (hereafter "the Project") located in the Larkfield-Wikiup area of unincorporated Sonoma County, California. The Koi Nation, owner of the Project site and one of California's Federally recognized Native American tribes, has applied to the U.S. Bureau of Indian Affairs (BIA) for a fee-to-trust land acquisition. The BIA's Proposed Action is to place approximately 68 acres of land into Federal trust. This BA has been prepared to facilitate Section 7 consultation between the federal Action Agency and the U.S. Fish and Wildlife Service (USFWS) pursuant to the Section 7 of the Federal Endangered Species Act (FESA).

This BA discusses the physical impacts from construction of the proposed Project and the effects of these impacts on Federally listed species protected pursuant to the FESA and under jurisdiction of USFWS. Please note that species within National Marines Fisheries Service (NMFS) jurisdiction are addressed in a separate document prepared by Sequoia in July 2022 (Sequoia Ecological Consulting 2022). As detailed herein, the proposed Project would likely be regarded as a project that may affect but is not likely to adversely affect the Federally threatened California red-legged frog (*Rana draytonii*; CRLF).

In this BA, we provide: (1) a description of the habitats that occur on the Project site; (2) a list of the Federally listed species that have potential to occur on or near the Project site; (3) avoidance and minimization measures for potentially affected listed species that will be implemented to reduce impacts to these species to the greatest extent practicable; and (4) all other necessary information that the USFWS will need to complete FESA Section 7 consultation with federal Action Agency for the proposed Project.

The proposed Project includes the development of Shiloh Resort and Casino and is located on the northeastern edge of the Santa Rosa Plain (Figure 1). The Santa Rosa Plain, located in Sonoma County, California, is characterized by seasonal wetlands, primarily vernal pools, and associated upland grassland habitat. This area is known to support the Federally endangered Sonoma Distinct Population Segment (DPS) of California tiger salamander (*Ambystoma californiense*; CTS) and three Federally endangered plant species: Sonoma sunshine (*Blennosperma bakeri*), Burke's goldfields (*Lasthenia burkei*), and Sebastopol meadowfoam (*Limnanthes vinculans*), all of which are included in in the Recovery Plan for the Santa Rosa Plain (USFWS 2016). These plant species are found only in seasonal wetlands, while CTS use these wetlands during the winter-spring breeding season and surrounding uplands year-round (USFWS 2016). Although the Project site is within the Santa Rosa Plain, it does not occur within USFWS-designated critical habitat or Core and Management Areas outlined in the Recovery Plan for the Santa Rosa Plain (USFWS 2016) and is located within a Santa Rosa Plain Conservation Strategy designation of "presence of CTS is not likely and there are no listed plants in this area."

2.0 LOCATION AND SETTING

The Project is located at 222 East Shiloh Road (Assessor's Parcel Number 059-300-003) in the Larkfield-Wikiup area of unincorporated Sonoma County near Windsor, California (Figures 1 and 2). The Project site is located east of U.S. Highway 101 (US-101) and west of Shiloh Ranch Regional Park at Latitude 38.52389°, Longitude -122.77362° (Figure 1). The Project site is within the Healdsburg, CA U.S. Geological Survey (USGS) 7.5-minute quadrangle and is bordered by Shiloh Road on the north, existing vineyards on the east, scattered residences on the south, and Old Redwood Highway on the west. Pruitt Creek, a fourth-order tributary in the Russian River watershed, flows south/southwest through the center of the Project site (Figure 2). The Project site is surrounded by residential development, agricultural fields, and community centers such as a park and a church. Project activities will occur within the approximately 68-acre parcel.

This Project site is located within the Santa Rosa Plain, bordered on the north by the Russian River, on the east by Coast Range foothills, and on the south and west by the Laguna de Santa Rosa. The Santa Rosa Plain contains a combination of urban areas and rural land (USFWS 2016). The Project site is not located within USFWS-designated critical habitat or Core and Management Areas outlined in the Recovery Plan for the Santa Rosa Plain (USFWS 2016).

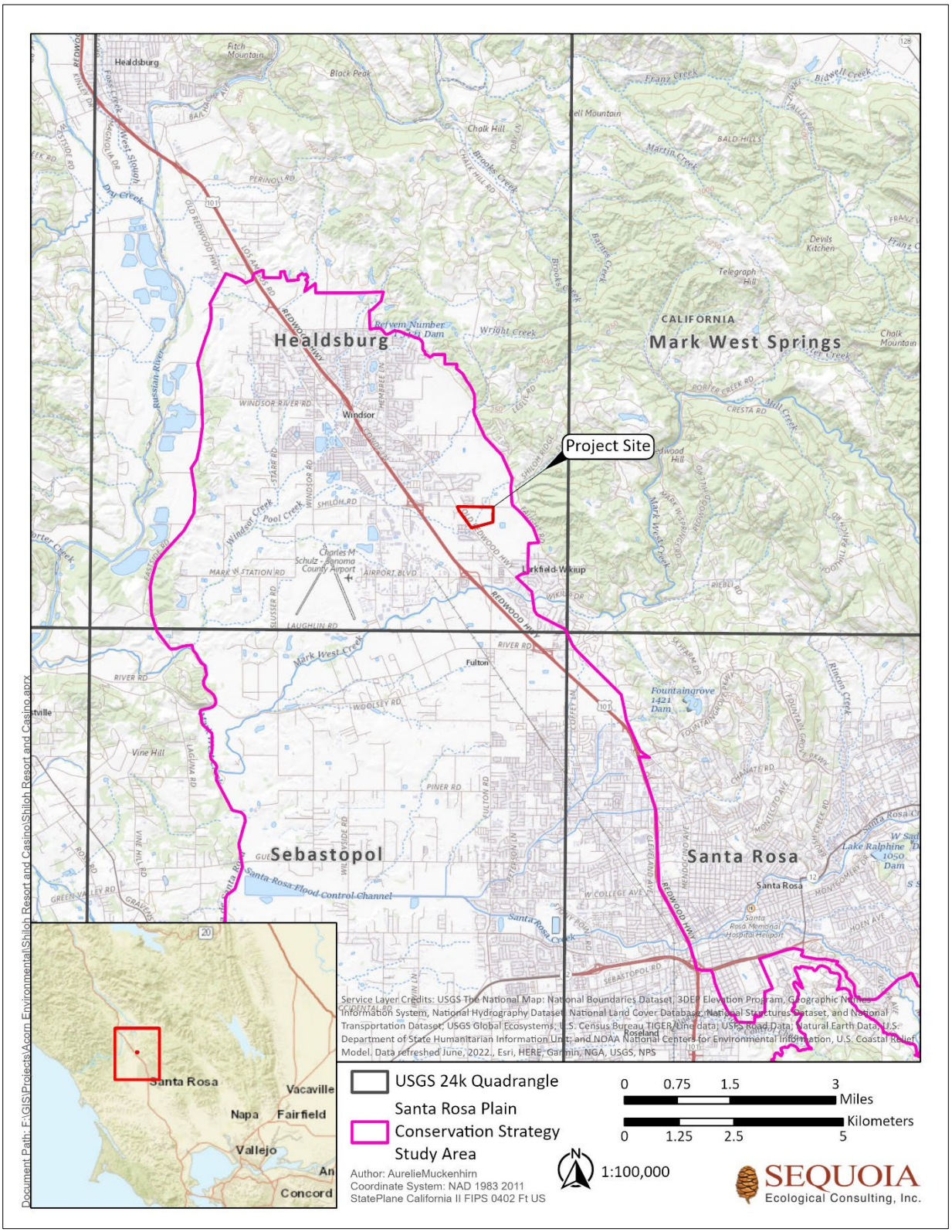

Figure 1. Regional Map of Proposed Shiloh Resort and Casino Project Site

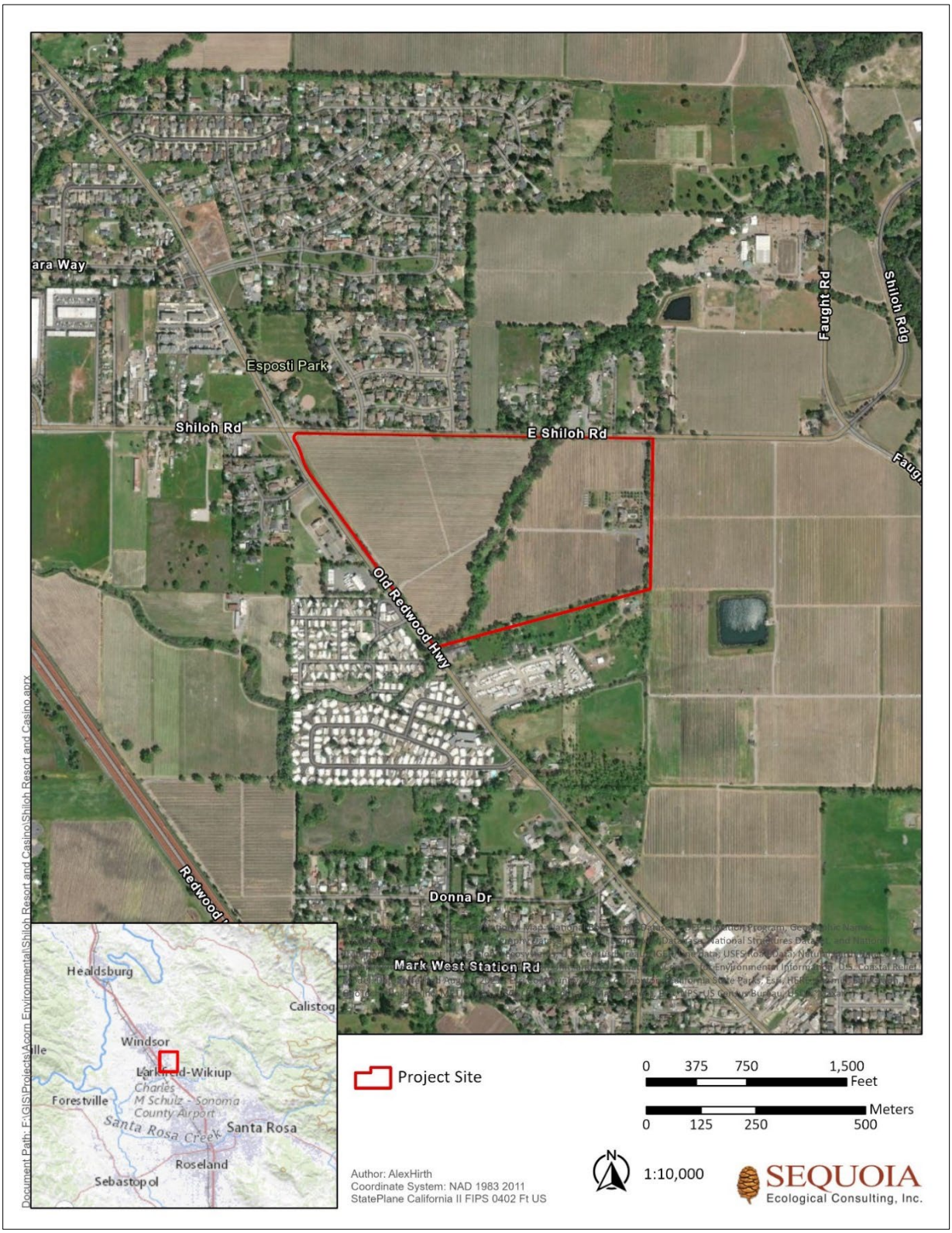

Figure 2. Location Map of Proposed Shiloh Resort and Casino Project Site

3.0 PROJECT DESCRIPTION

The Koi Nation purchased a 68-acre parcel at 222 East Shiloh Road in September 2021 and seeks approval from the BIA to take this land into trust. Development of this Project will occur at 222 East Shiloh Road and includes a 2,500 Class III gaming machine facility, a five-story hotel, restaurants, a conference center, and a spa (Appendix A). The Koi Nation will build and operate the resort and casino under authority of the U.S. Indian Gaming Regulatory Act (IGRA).

The parcel is approximately 12 miles from the Koi Nation tribal headquarters located in Santa Rosa, California. Development of this Project will promote the general welfare of the Koi Nation and raise governmental revenues. The Project will create jobs for members of the Koi Nation and the greater Sonoma County community.

3.1 Project Footprint

Development activities are restricted to the 68-acre property boundary. As currently designed, the proposed Project will result in ground disturbance to approximately 40 acres with the riparian corridor of Pruitt Creek and large portions of existing vineyard left undeveloped/unimpacted. Two clear-span creek crossings are proposed as part of the Project (Appendix A).

3.2 Site Preparation and Building

To prepare the Project site for development, staging areas will be designated and appropriate best management practices (BMPs) installed for avoidance and minimization of Project-related impacts to sensitive resources (e.g., Pruitt Creek). The property will then be cleared, grubbed, and graded.

Project construction will include installation of underground utilities and vertical construction of a five-story hotel and casino and a four-story parking garage, as well as the construction of concrete access roads, additional parking lots, and a swimming pool (Appendix A). Bioswales will be created to treat stormwater, including along Pruitt Creek near the south end of the Project site. Landscaping and riparian planting will occur once construction is complete.

3.3 Wastewater Treatment

A membrane bioreactor (MBR) tertiary treatment system will be installed to treat wastewater from the resort and casino. Effluent from the system will be disposed directly into Pruitt Creek and permitted by the EPA National Pollutant Discharge Elimination System (NPDES). The water quality of the discharge will follow the requirements of the NPDES permit, the Regional Water Quality Control Board's Water Quality Control Plan for the North Coast Region (Basin Plan; NCRWQCB 2018), and Title 22 of California's Code of Regulations Related to Recycled Water (Title 22; CCR 2022).

The EPA issued NPDES follows Clean Water Act (CWA) standards and complies with the effluent limitations adopted for the receiving water. The Receiving Water standards are based on the requirements per the NCRWQCB Basin Plan. Title 22 generally regulates the use of recycled water on state lands, which does not apply to this Project, but the system will still be designed to comply with Title 22 standards.

The regulatory, technical, and engineering issues associated with supplying water and handling wastewater have been evaluated for four different buildout alternatives.

3.4 Regulatory Setting

Regulatory authority over biological resources is shared by Federal, state, and local agencies under a variety of laws, ordinances, regulations, and statutes. The Project is unique in that it will be developed on the Koi Nation sovereign land base, pending Federal approval. Land held for trust on behalf of tribes is subject to Federal and tribal law exclusively; therefore, this Project does not fall under State or local jurisdictions. This BA is in support of National Environmental Policy Act (NEPA) compliance documentation for this Project, as well as consultation between the federal Action Agency and USFWS under Section 7 of FESA.

3.4.1 Recovery Plan for the Santa Rosa Plain

The Recovery Plan for Santa Rosa Plain was developed by the USFWS to describe the ecosystem and threats to native habitats, identify listed species covered under the Recovery Plan, and outline the elements of the recovery program. The Recovery Plan addresses the following federally-listed species endemic to the region: *Blennosperma bakeri, Lasthenia burkei, Limnanthes vinculans*, and the Sonoma County California tiger salamander, and incudes data on the distribution, abundance, habitat, reproduction and ecology, and critical habitat for plan species. This plan focuses on protecting these species from habitat loss and degradation by preserving high quality habitat. High quality habitat includes areas that are essential for connectivity, reduce fragmentation, and sufficiently buffer against encroaching development. This program has established core areas and management areas within Sonoma County. Core areas are defined as “the heart of a species historical (and current) range and represent central blocks of contiguously occupied habitat that function to allow for dispersal, genetic interchange between populations, and metapopulation dynamics” (USFWS 2016). Management areas are defined as “occupied habitat peripheral to species’ core range.”

4.0 ANALYSIS METHODS

4.1 Background Research

Prior to preparation of this BA, Sequoia researched the USFWS’ Information for Planning and Conservation (IPaC) database (USFWS 2022a), USFWS Designated Critical Habitat (USFWS 2022a), Recovery Plan for the Santa Rosa Plain (USFWS 2016), the California Department of Fish and Wildlife’s (CDFW) California Natural Diversity Database (CNDDB 2022a and 2022b), for all recorded occurrences of Federally listed species known from the region of the proposed Project. The IPaC report used in this analysis is provided as Appendix B. The potential for species occurrence was determined based on the results of literature reviews, field-based habitat assessments, and GIS-based remote sensing. All records of Federally listed species under USFWS jurisdiction are compiled and discussed in Table 1 and 2. Sequoia examined all known recorded locations to determine if USFWS-jurisdictional listed species could occur on the Project site or within an area of affect.

4.2 Site Assessment

Sequoia biologists Ari Rogers and Claire Buchanan conducted surveys on the Project site on February 23 and 24, 2022, to record biological resources and to assess the limits of areas potentially regulated by resource agencies. Surveys involved searching all habitats on the site and recording all plant and wildlife species observed. Sequoia cross-referenced the habitats occurring on the Project site with the habitat requirements of regional special-status species to determine if the proposed Project could directly or indirectly impact these species. Any special-status species or suitable habitat was documented.

Tables 1 and 2 present the potential for occurrence of Federally listed plant and animal species known to occur in the vicinity of the Project site, along with their habitat requirements, potential to occur on the Project site, and basis for occurrence classification. Tables 3 and 4 at the end of this BA provide plant and wildlife species observed on the Project site.

5.0 EXISTING CONDITIONS

5.1 Project Site Topography and Hydrology

The Project site is located within the Santa Rosa Plain, and as such the topography is fairly uniform with elevation ranging from 135 feet above mean sea level (MSL) along the western property boundary to 160 feet MSL in the northeast corner of the property. Pruitt Creek flows southwesterly through the Project site and is a fourth order tributary to the Russian River. Pruitt Creek terminates at Pool Creek which flows into Windsor Creek, then into Mark West Creek, and finally into the Russian River. At the time of the February 2022 site visit, Pruitt Creek was wetted throughout. Flow was minimal (less than 1 ft^3/sec), with an average depth of eight inches and indicators of a high flow event (leaf litter and riparian vegetation scattered throughout). Water temperature was 52°F. Water temperature was measured at 1000 hours at a depth of approximately 5 inches in the shade. Comparing the observations from the Draft Constraints Report (ESA 2021) and observations from Sequoia's February 2022 survey, it is likely that Pruitt Creek is an intermittent stream that flows from late fall to spring and begins to dry up by early summer and remains dry through the fall.

5.2 Plant Communities and Wildlife Habitats

On February 23 and 24, 2022, Sequoia staff conducted a survey of the Project site and characterized vegetation present (Figure 3). During the survey, Sequoia biologists also documented plant and wildlife species observed on the Project site (Tables 3 and 4). Nomenclature used for plant names follows *The Jepson Manual, Second Edition* (Baldwin et al., eds. 2012), while nomenclature used for wildlife follows CDFW's Complete List of Amphibian, Reptile, Bird, and Mammal Species in California (2016). Three plant communities occur on the Project site (Sawyer, Keeler-Wolf, and Evens 2009) and are further described below.

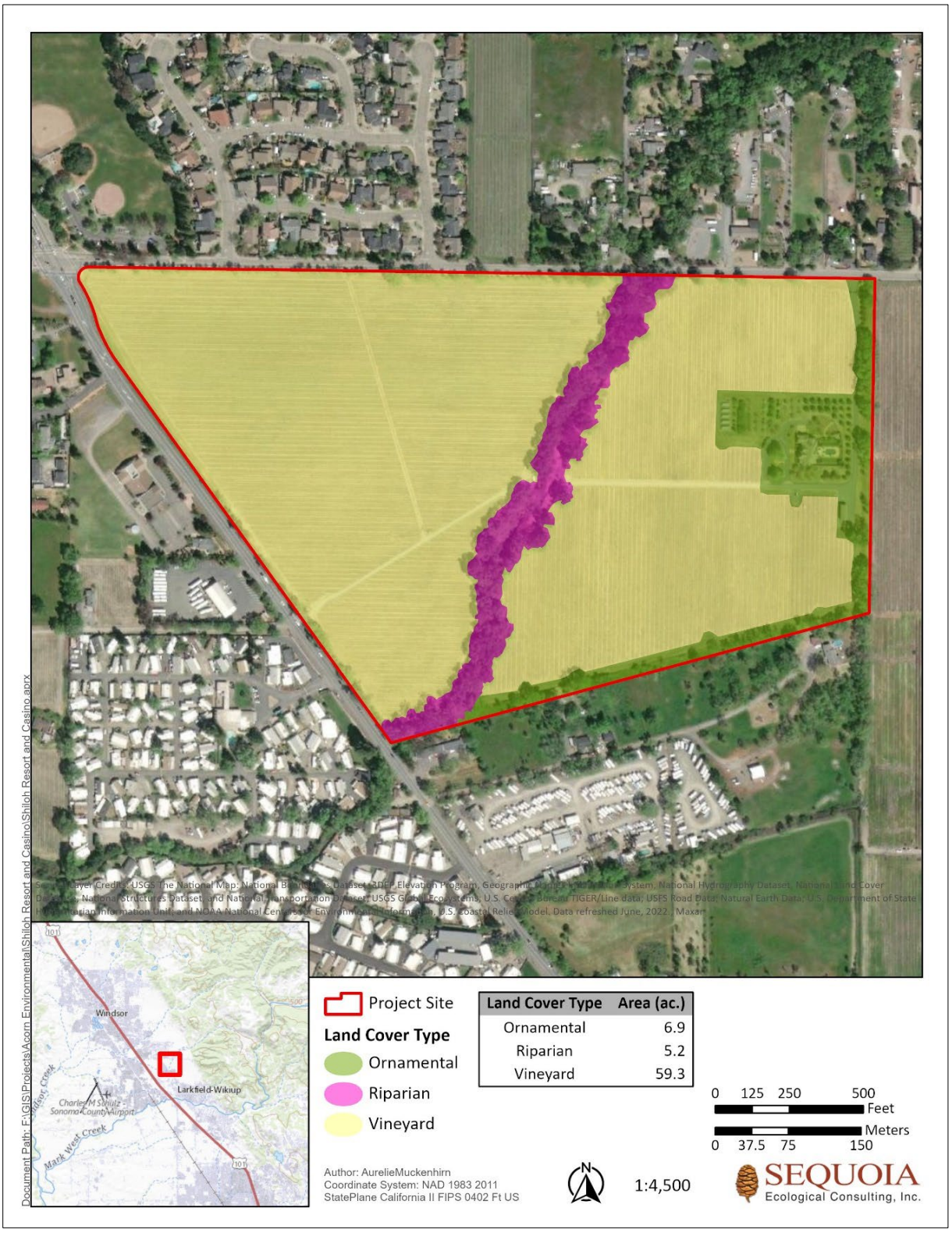

Figure 3. Land Cover Types within Proposed Shiloh Resort and Casino Project Site

5.2.1 Vineyards

The Project site is predominately an active vineyard with ruderal (weedy) vegetation growing in between the grape rows. Vineyard infrastructure is also present including dirt roads, piping, propane tanks, wash station, and electrical power poles. While the grape rows themselves are weeded and maintained, ruderal and annual vegetation grows between rows and around the vineyard perimeter; ruderal species are adapted to endure intense and/or long-term disturbance.

The vineyard land cover type occupies approximately 59.3 acres within the Project site (Figure 3).

5.2.2 Ornamental/Landscaping

Landscaped vegetation consisting of ornamental trees and shrubs surround the private residence and other structures on the Project site. There are olive trees and a variety of fruit trees on the north side of the private residence. Ruderal species occur between the landscape and orchard plantings. Large trees, primarily valley oaks (*Quercus lobata*), line the property boundary.

The ornamental land cover type occupies approximately 6.9 acres within the Project site (Figure 3).

5.2.3 Aquatic Features

A routine-level aquatic resource delineation was conducted on the Project site on February 23 and 24, 2022. A jurisdictional delineation report has been submitted to the U.S. Army Corps of Engineers (USACE) and is awaiting verification. The Project site was field-checked for indicators of hydrophytic vegetation, wetland hydrology, and hydric soils. During the aquatic resource delineation, six sample points (three pairs) were taken on the Project site and recorded on USACE data forms provided in the *Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (Arid West Manual; USACE 2008a). The draft aquatic resources jurisdictional delineation map has been provided as Appendix C of this BA.

This aquatic resource delineation was conducted in accordance with the *Arid West Manual* (Environmental Laboratory 2008) and the *Corps of Engineers Wetlands Delineation Manual* (USACE Manual; Environmental Laboratory 1987). Based on the presence or absence of field indicators (including vegetation, hydrology, and soils), the limits of potential jurisdictional wetlands and other waters of the United States were determined. Potential jurisdictional wetlands and other waters were mapped with a Trimble GPS unit (sub-meter accuracy) and overlain on a digital orthophoto using ArcGIS mapping software (Appendix C).

Seasonal wetlands are habitats that dry down in the summer and fall months, but generally in the rainy, winter months become saturated and inundated for several weeks to months. Seasonal wetlands often hold water due to soil permeability and/or the presence of topographically low, depressional areas. Soils with a high clay content or within depressional areas, or soils that have been compacted by human activities, often hold and trap seasonal rainfall over short to long durations of the winter and spring. These areas often become dominated by hydrophytic plant species that are reliant and/or dependent on

regular saturation or inundation. Roadside drainage ditches are man-made features that catch sheet flow or convey stormwater flows.

Four areas were delineated on the study area that have positive indicators of all three wetland parameters and seasonal hydrology (Appendix C). Seasonal Wetlands primarily occur on hillside seeps and adjacent swales, channels, and ditches that appear to receive hydrologic input from direct precipitation, groundwater discharge, and/or surface runoff from the adjacent slope or contributing drainages.

One Intermittent Drainage (i.e., Pruitt Creek) was delineated on the Project site (Appendix C). Intermittent Drainages are natural tributaries to downstream TNWs (either through direct discharge or culvert/storm drain networks) and support a bed, bank, and OHWM, but lack one or more wetland parameters. Pruitt Creek is mapped as "Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC)" and "Palustrine, Forested, Emergent, Persistent, Seasonally Flooded (PFO/EM1C) Freshwater Forested/Shrub Wetland" in the National Wetlands Inventory (NWI; USFWS 2022b). The NWI layer indicates a freshwater emergent wetland is present in the central northern portion of the Project site (Figure 4). Sequoia staff did not detect any wetted habitat or indications of wetland presence in that portion of the Project site while surveying for CESA-listed species

Two Roadside Drainage Ditches were delineated on the western edge of the Project site, along Old Redwood Highway (Appendix C). The roadside drainage ditches that flow along Old Redwood Highway is characterized by a mix of hydrophytic species, such as tall flatsedge (FACW), curly dock (FAC), and bog rush (FACW), and ruderal and non-native annual species consistent with the adjacent uplands, such as wild oat, ripgut brome, and common vetch.

5.2.4 Riparian Corridor

There is a narrow buffer of non-native annual grassland between the riparian corridor and the vineyards. Valley oaks dominate the riparian corridor with some smaller eucalyptus (*Eucalyptus* sp.) trees also present. Understory vegetation is composed of both native and non-native species of grasses and shrubs. The understory communities observed had distinct segments heavily dominated by native species alternating with areas dominated by non-native species. Some native species observed include California buckeye (*Aesculus californica*), California bay laurel (*Umbellularia californica*), willow (*Salix* sp.), poison oak (*Toxicodendron diversilobum*), valley oak, and coast live oak (*Quercus agrifolia*). Non-native species observed include Himalayan blackberry (*Rubus armeniacus*), eucalyptus, and black mustard (*Brassica nigra*), among others.

The riparian land cover type occupies approximately 5.2 acres within the Project site (Figure 3).

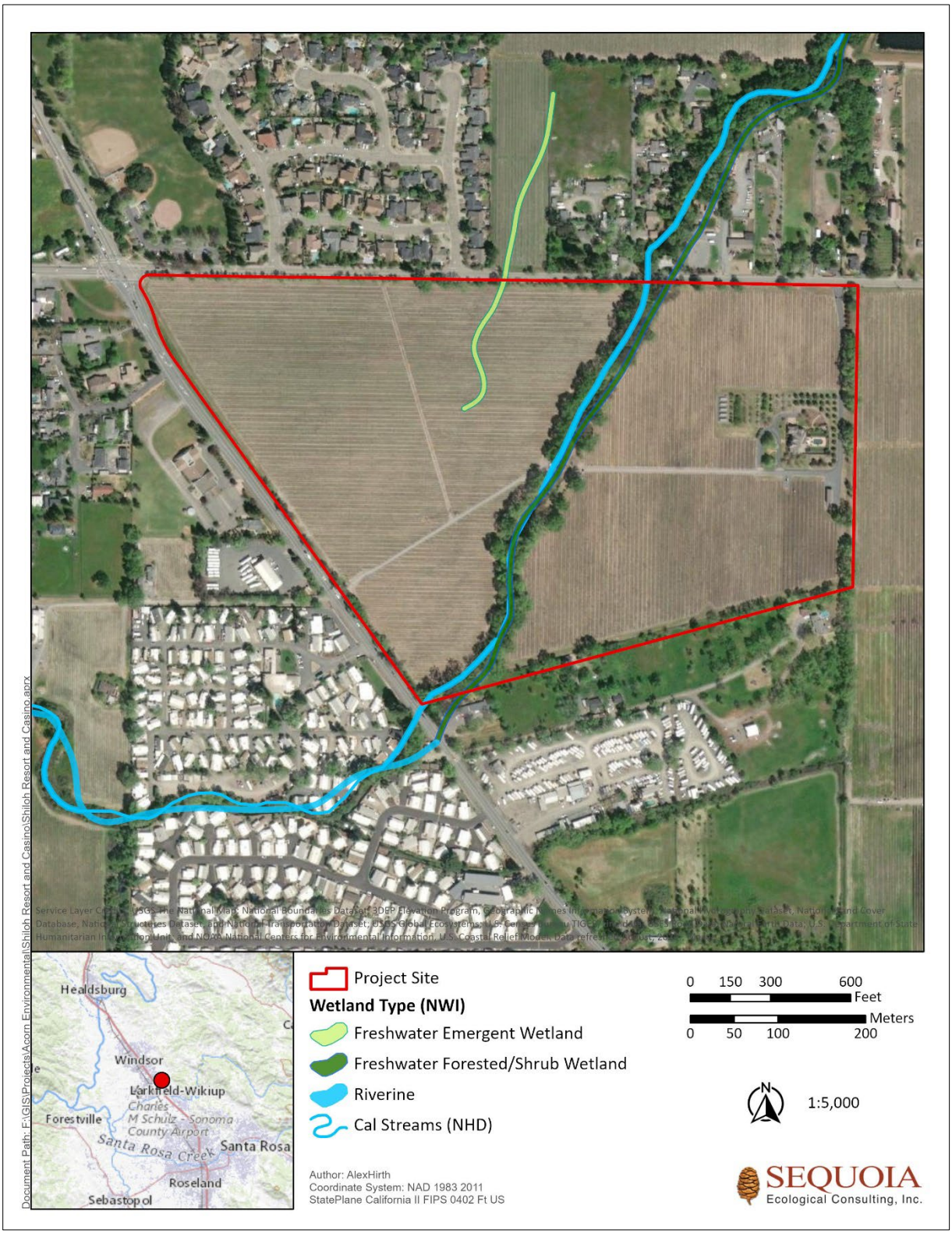

Figure 4. National Wetlands Inventory Map for the Proposed Shiloh Resort and Casino Project site

6.0 EVALUATION OF EFFECTS ON FEDERALLY LISTED SPECIES

The results of Sequoia's record search for Federally listed species occurrences within 3 miles of the Project site are discussed in the sections below. A graphical representation of the known records of Federally listed plant and wildlife species within 3 miles of the Project site is provided in Figures 5 and 6. USFWS-designated critical habitat within the vicinity of the Project site is shown in Figure 7.

6.1 Federally Listed Plants

Sequoia has determined that there are 4 Federally listed plant species known from the vicinity of the Project site based on a review of IPaC (IPaC 2022). These four species have documented occurrences within 3 miles of the Project site (Figure 5): Burke's goldfields, Sebastopol meadowfoam, Sonoma sunshine, and many-flowered navarretia. All these species occur in specialized habitats, namely marshes and vernal pools, microhabitats, and or substrates (i.e., sand) which do not occur on or adjacent to the Project site; therefore, these 4 plants were dismissed from further consideration. Accordingly, the proposed Project will not affect Federally listed plants. Table 1 presents Federally listed plant species within the vicinity of the Project site, their legal status, habitat requirements, and probability of occurring on the Project site.

6.2 Federally Listed Wildlife

Sequoia determined that there are six Federally listed wildlife species that are known from the vicinity of the Project site (IPaC 2022). Four of these species occur in specialized habitats such as mixed forests, coastal beaches, tropical waters, and perennial waterways, which do not occur on or adjacent to the Project site; therefore, California freshwater shrimp, green sea turtle, monarch butterfly, and northern spotted owl were dismissed from further consideration. The two remaining Federally listed species, California red-legged frog and California tiger salamander, are discussed further below. The Project site provides potentially suitable habitat for California red-legged frog and while no suitable habitat for California tiger salamander exists onsite, this species is still included in this analysis due to the Project site's location and the relative prevalence of California tiger salamander within the Santa Rosa Plain. Table 2 presents these Federally listed wildlife species, their legal status, habitat requirements, and probability of occurring on the Project site and Figure 6 shows CNDDB occurrences of special-status wildlife within 3 miles of the Project site.

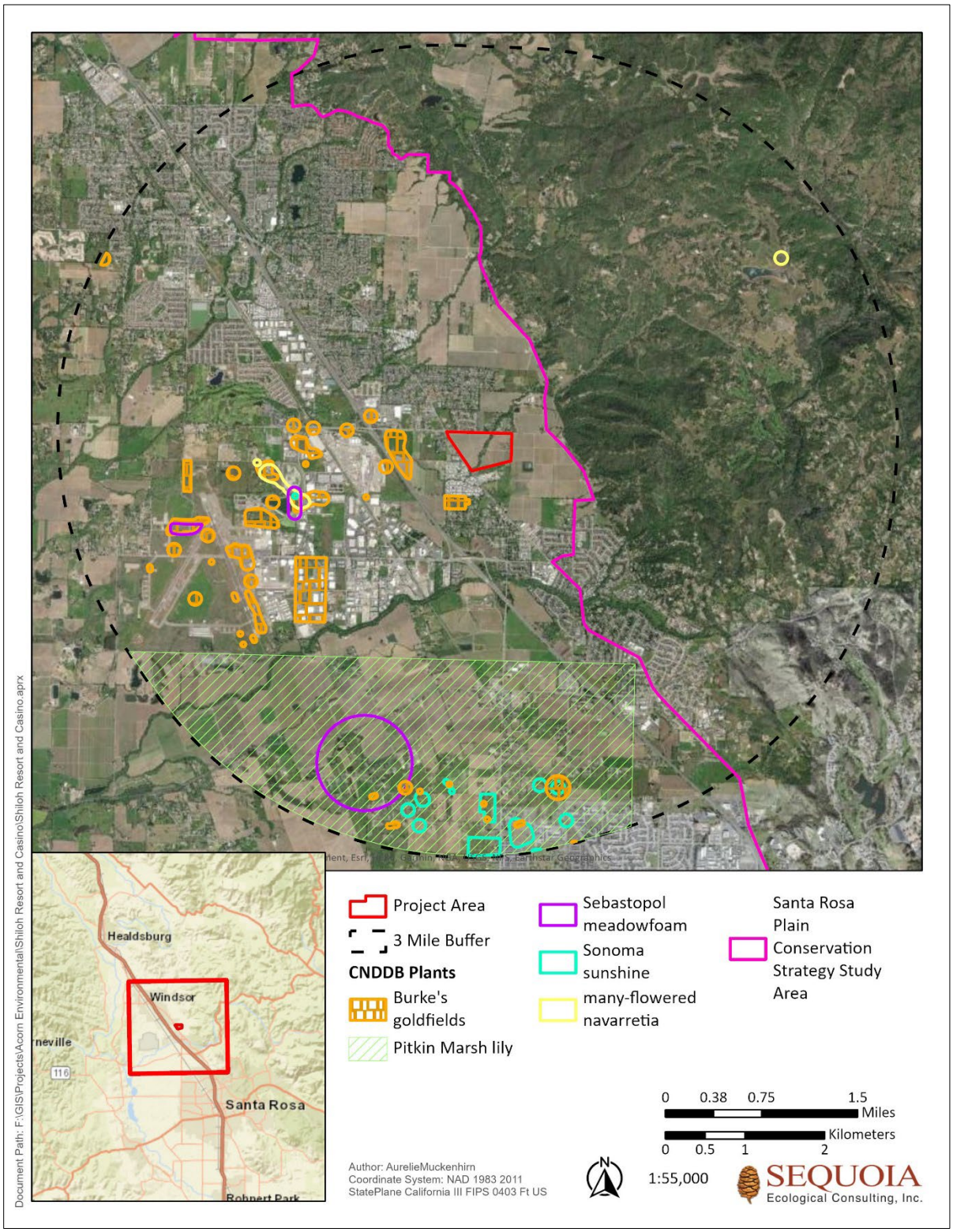

Figure 5. Closest Known Occurrences of Federally Listed Plant Species within 3 Miles of Proposed Shiloh Resort and Casino Project Site

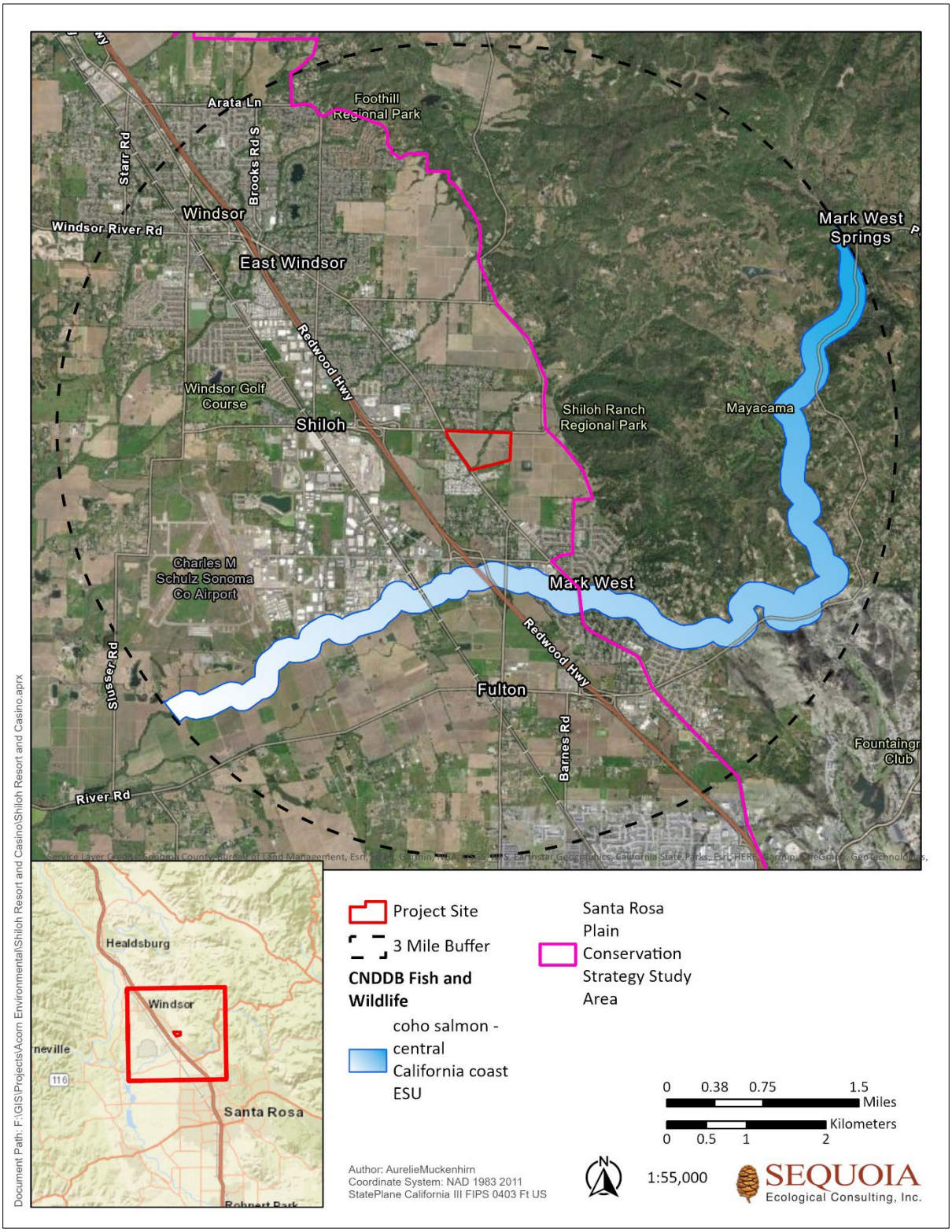

Figure 6. Closest Known Occurrences of Federally Listed Wildlife Species within 3 Miles of Proposed Shiloh Resort and Casino Project Site.

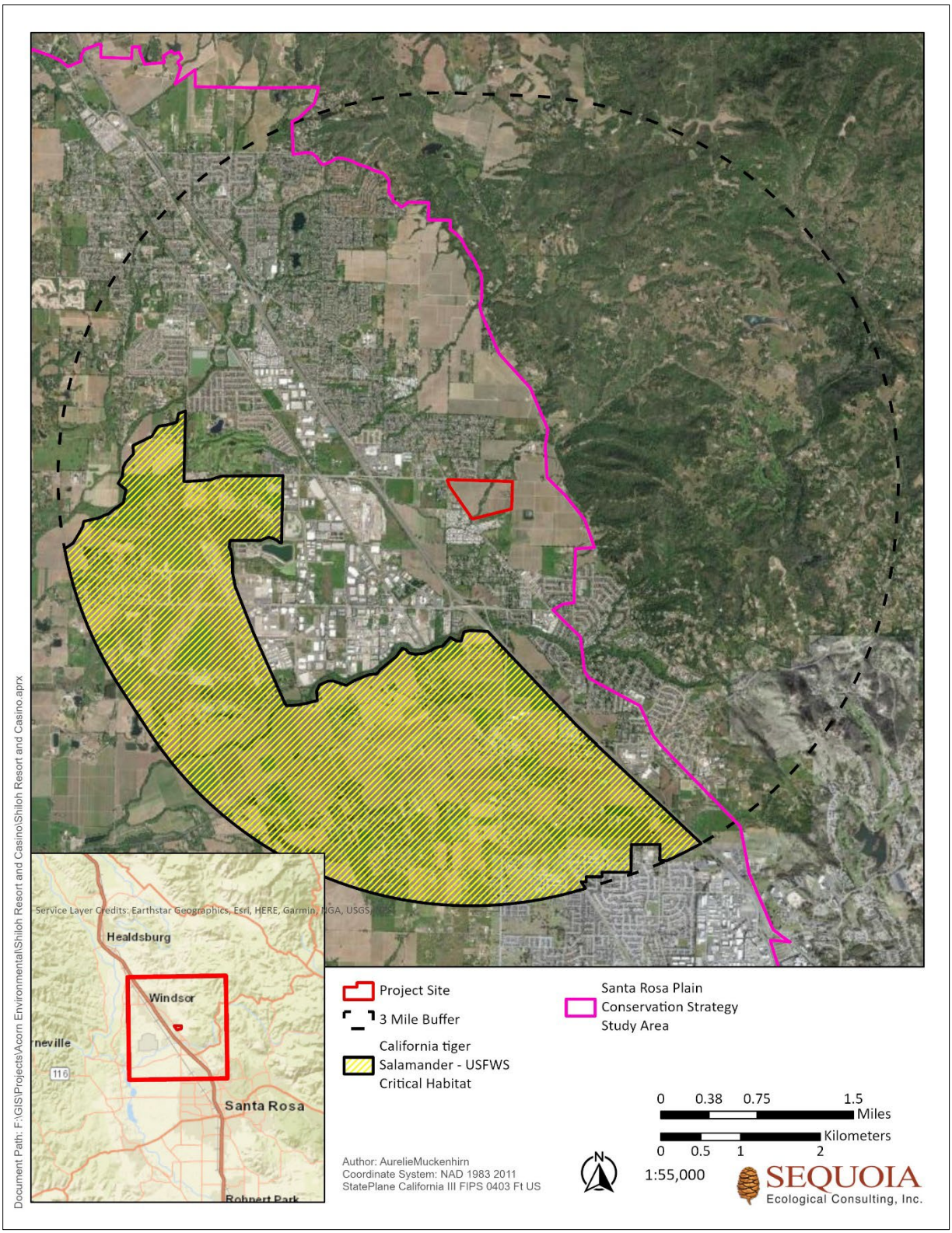

Figure 7. USFWS Critical Habitat in the Vicinity of Proposed Shiloh Resort and Casino Project Site.

6.2.1 California Red-Legged Frog

The California red-legged frog was listed as a Federally threatened species on May 23, 1996 (61 FR 25813) and is designated as a California Species of Special Concern (CNDDB 2022b). A recovery plan was published for the California red-legged frog (USFWS 2002), and critical habitat was designated for this species on April 13, 2006 (71 FR 19244), and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816). Designated critical habitat for this species is defined as areas containing Primary Constituent Elements (PCEs) including breeding aquatic habitat, non-breeding aquatic habitat, upland habitat, and dispersal habitat. The Project site is located *outside* of USFWS-designated critical habitat for California red-legged frog (Figure 7).

The California red-legged frog is distributed throughout 26 counties in California but is most abundant in the San Francisco Bay Area (USFWS 2002). Populations have become isolated in the Sierra Nevada, northern coast, and northern Transverse Ranges (Thomson, Wright, and Shaffer 2016; Stebbins and McGinnis 2012). The species is believed to be extirpated from most locations in the southern Transverse and Peninsular Ranges but is still present in Baja California, Mexico (USFWS 2002). Preliminary reintroduction of the species recently occurred in 2020 and 2021 at two locations in Southern California, one at the Santa Rosa Plateau Ecological Reserve in Riverside County and one at the Wheatley Ranch in Mesa Grande, San Diego County (Heil 2021). California red-legged frogs predominantly inhabit permanent water sources such as streams, lakes, marshes, natural and man-made ponds, and ephemeral drainages in valley bottoms and foothills up to 4,900 feet in elevation (Thomson, Wright, and Shaffer 2016; Bulger, Scott, and Seymour 2003; Stebbins and McGinnis 2012). Adults breed in a variety of aquatic habitats, while larvae and metamorphs use streams, deep pools, backwaters of streams and creeks, ponds, marshes, sag ponds, dune ponds, and lagoons. Stock ponds are frequently used for breeding when they provide a suitable hydroperiod, pond structure, vegetative cover, and are managed to control non-native predators such as bullfrogs and exotic fish. Breeding occurs between November and April within still or slow-moving water with light to dense, riparian or emergent vegetation, such as cattails (*Typha* spp.), tules (*Scirpus* spp.) or overhanging willows (*Salix* spp.) (Hayes and Jennings 1988). Egg masses are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925; Thomson, Wright, and Shaffer 2016). Larvae undergo metamorphosis 3.5 to 7 months following hatching and reach sexual maturity at 2 to 3 years of age (Thomson, Wright, and Shaffer 2016). During the dry season, California red-legged frogs may use refugia in upland habitat, such as small mammal burrows or adjacent moist vegetation (USFWS 2002).

Tatarian (2008) noted that 57 percent of frogs fitted with radio transmitters in the Round Valley of eastern Contra Costa County stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. This study reported a peak of seasonal terrestrial movement in the fall months corresponding to 0.2 inch of precipitation that tapered off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia, including ground squirrel burrows at the bases of trees or rocks, logs, grass thatch, crevices, cow hoof prints, and a downed barn door; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from 1 to 4 days; however, one female was

reported to remain in upland habitat for 50 days (Tatarian 2008). Uplands closer to aquatic sites were more often used and were more commonly associated with areas exhibiting higher object cover (e.g., small woody debris, rocks, and vegetative cover).

Most frogs move away from breeding ponds to upland areas. The distance moved is site dependent, though one recent study shows that only a few frogs move farther than the nearest suitable non-breeding habitat (Fellers and Kleeman 2007). In this Marin County study, the furthest distance traveled was 0.87 mile and most dispersing frogs moved through grazed pastures to reach the nearest riparian habitat (Fellers and Kleeman 2007). Bulger, Scott, and Seymour (2003) did not observe habitat preferences among frogs moving between ponds. They did note that when breeding ponds dry, California red-legged frogs use moist microhabitats of dense shrubs and herbaceous vegetation within approximately 330 feet of ponds.

6.2.1.1 Primary Constituent Elements (PCEs)

As part of the process for designating critical habitat for CRLF, USFWS developed and defined primary constituent elements (PCEs) consisting of four components: aquatic breeding habitat (PCE 1), non-breeding aquatic habitat (PCE 2), upland habitat (PCE 3), and dispersal habitat (PCE 4) (50 CFR 17.95(d)(2)). These PCEs are found within USFWS designated critical habitat and are used in this analysis to assess the suitability of the Project site for CRLF, as defined below.

PCE 1 – Aquatic Breeding Habitat

"Standing bodies of fresh water (with salinities less than 7.0 parts per thousand) including: natural and manmade (e.g., stock) ponds, slow moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years" (50 CFR 17.95(d)(2)(i)).

PCE 2 – Non-Breeding Aquatic Habitat

"Fresh water habitats as described above, that may or may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs" (50 CFR 17.95(d)(2)(ii)).

PCE 3 – Upland Habitat

"Upland areas within 200 ft (60 m) of the edge of the riparian vegetation or dripline surrounding aquatic and riparian habitat and comprised of various vegetational series such as grasslands, woodlands, and/or wetland/riparian plant species that provides the frog shelter, forage, and predator avoidance" (50 CFR 17.95(d)(2)(iii)).

PCE 4 – Dispersal Habitat

"Accessible upland or riparian dispersal habitat within designated units and between occupied locations within 0.7 mi (1.2 km) of each other that allow for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which also do not contain barriers to dispersal" (50 CFR 17.95(d)(2)(iv)).

6.2.1.2 Potential to Occur on the Project Site

As described in Section 5.1 above, Sequoia has confirmed that Pruitt Creek is an intermittent stream that likely flows from late fall to spring and begins to dry up by early summer and remains dry through the fall. While Pruitt Creek contains plunge pools that meet the depth requirement in PCE 1, it does not hold water long enough to support California red-legged frog breeding. Therefore, the Project site does not contain water bodies that would provide CRLF breeding habitat as defined by PCE 1.

Although Pruitt Creek does not hold water year-round it contains small-scale habitat features that could provide potential shelter, foraging, and aquatic dispersal habitat. Therefore, Pruitt Creek has some potential to be used by California red-legged frogs as non-breeding aquatic habitat as defined by PCE 2. That said, the lack of nearby (i.e., within 3 miles) occurrences of CRLF suggests that this species is not prevalent or present within the vicinity of the Project site, and accordingly there is a low potential for it to occur on site in a non-breeding aquatic capacity.

Upland habitat within the Project site is limited to developed habitat such as vineyards and ornamental landscaping that lacks ground squirrel burrows or other refugia. The Project site is in a developed area and residential and commercial developments likely serve as upland dispersal barriers to California red-legged frog. Furthermore, human- and traffic-related disturbance along associated roadways likely preclude California red-legged frog from dispersing onto the site within upland habitat. In addition, no suitable breeding habitat occurs within 2 km of the Project site from which CRLF would disperse through uplands. Therefore, the Project site does not contain suitable upland habitat for CRLF consistent with PCE 3.

Pruitt Creek an intermittent stream that connects to other waterways via the large box culverts on the north and south ends. These connections could provide migration/riparian dispersal habitat for California red-legged frog to and from other waterways. Accordingly, the Project site could provide riparian dispersal habitat consistent with PCE 4; however, the lack of nearby CNDDB occurrences makes it unlikely that CRLF are present in the vicinity and this species has a low potential to occur on the Project site in a riparian dispersal capacity.

There are no recorded occurrences of the California red-legged frog in CNDDB within 3 miles of the Project site (Figure 6). Due to the absence of suitable breeding and upland California red-legged frog habitat on and/or immediately adjacent to the Project site and the extent of regular disturbance associated with the development that make up the proposed Project, this species has little to no potential occur on the Project site in an aquatic breeding and upland capacity. Pruitt Creek is an

intermittent aquatic feature that connects to other waterways and contains microhabitats suitable for foraging, cover, and dispersal consistent with PCE 2 and 4; however, there are no documented occurrences of CRLF within the vicinity or the Project site or within the known dispersal distance for CRLF. Therefore, the creek has a low potential to be used by CRLF as migration/dispersal habitat (PCE 4) and/or aquatic non-breeding habitat (PCE 2) and CRLF is not likely to occur within the Project site overall.

Accordingly, Sequoia has determined that the proposed project is not likely to adversely affect California red-legged frog and its habitat. Impacts to aquatic resources will be reduced to a less than significant level by implementing Avoidance and Minimization Measures (AMMs) provided below and all work activities near Pruitt Creek features will occur during dry conditions.

6.2.2 California Tiger Salamander

The Project site is located within the known range of the Sonoma County "Distinct Population Segment" (DPS) of the California tiger salamander. Under FESA, the USFWS emergency listed the Sonoma County DPS as endangered on July 22, 2002 (67 FR 47726). The USFWS formalized the listing of the Sonoma County DPS of California tiger salamander as endangered on March 19, 2003 (68 FR 13497). Critical habitat for the Sonoma, Central Valley, and Santa Barbara distinct populations were designated for this species on August 31, 2011; August 23, 2005; and November 24, 2004, respectively. Recovery plans for these distinct populations were published on May 31, 2016; June 6, 2017; and December 12, 2016 (USFWS 2017). The Project site is located outside of USFWS-designated critical habitat for California tiger salamander (Figure 7).

The California tiger salamander is a large, terrestrial salamander distributed throughout the Central Valley and Central Coast ranges, from Colusa County south to San Luis Obispo and Kern Counties and is found from sea level to 3,500 feet in elevation. Two disjunct populations are located within Sonoma County and Santa Barbara County, which are geographically isolated from the Central Valley population. Shaffer et al. (2004) identified six distinct populations based on mitochondrial DNA and allozymes analysis: the Santa Rosa area of Sonoma County; the Bay Area (central and southern Alameda, Santa Clara, western Stanislaus, western Merced, and the majority of San Benito Counties); the Central Valley (Yolo, Sacramento, Solano, eastern Contra Costa, northeast Alameda, San Joaquin, Stanislaus, Merced, and northwestern Madera Counties); southern San Joaquin Valley (portions of Madera, central Fresno, and northern Tulare and Kings Counties); the Central Coast Range (southern Santa Cruz, Monterey, northern San Luis Obispo, and portions of western San Benito, Fresno, and Kern Counties); and Santa Barbara County.

California tiger salamanders inhabit lowland grasslands, oak savannah, and mixed woodland habitats, and require vernal pools, seasonal ponds, or semi-permanent calm waters that pond water for a minimum of 3 to 4 months in duration for breeding and larval maturation, and adjacent upland refugia and foraging habitat with small mammal burrows (Storer 1925; Barry and Shaffer 1994; Stebbins and McGinnis 2012). Migration to breeding sites begins with the onset of autumn rains, typically in

November. California tiger salamanders have been reported to travel distances up to 1 mile (Austin and Shaffer 1992), but Trenham and Shaffer (2005) estimate that optimal upland habitat is within approximately 2,000 feet of breeding ponds. Eggs are laid singly or in small clusters on the pond bottom or attached to individual strands of vegetation (Storer 1925; Twitty 1941; Barry and Shaffer 1994; Thomson, Wright, and Shaffer 2016). Metamorphosis requires a minimum of 10 weeks following hatching, and young migrate en masse when temporary pools begin to dry in late spring or early summer (Anderson 1968; Feaver 1971; Thomson, Wright, and Shaffer 2016; Stebbins and McGinnis 2012). Outside of the breeding season, juveniles and adults remain in subterranean habitat typically in small mammal burrows provided by California ground squirrels (*Otospermophilus beecheyi*) and pocket gophers (*Thomomys* spp.) (Shaffer, Fisher, and Stanley 1993; Barry and Shaffer 1994; Thomson, Wright, and Shaffer 2016; Stebbins and McGinnis 2012).

The California tiger salamander is the most vulnerable of the group of amphibians that breed in vernal pools due to its long developmental interval to metamorphosis, which restricts it to pools that are the longest lasting, and therefore often the largest in size. Loss and degradation of complexes of vernal pools pose a significant threat, as many of these areas are essential breeding habitat. California tiger salamanders are at risk due to loss of habitat from development of agriculture and grazing lands, habitat fragmentation, loss and degradation of complexes of vernal pools, and introduction of predatory exotic species such as mosquitofish (*Gambusia affinis*), American bullfrog (*Lithobates catesbeianus*), and Louisiana red swamp crayfish (*Procambarus clarkii*) as well as the poisoning of ground squirrels (Zeiner et al. 1988; Collins et al. 1988; Shaffer, Fisher, and Stanley 1993; Thomson, Wright, and Shaffer 2016). High mortality of California tiger salamanders crossing roads while migrating to and from breeding sites also adversely affects individuals and at-risk populations (Barry and Shaffer 1994).

6.2.2.1 Primary Constituent Elements (PCEs)

As part of the process for designating critical habitat for CTS, USFWS developed and defined PCEs consisting of four components: aquatic breeding habitat (PCE 1), adjacent upland habitat (PCE 2), upland dispersal habitat (PCE 3), and vernal pool complex habitat (PCE 4) (69 FR 48569). These PCEs are found within USFWS designated critical habitat and are used in this analysis to assess the suitability of the Project site for CTS, as defined below.

PCE 1

PCE 1 is defined as “standing bodies of fresh water, including natural and man-made (*e.g.*, stock) ponds, vernal pools, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a sufficient length of time necessary for the species to complete the aquatic portion of its life cycle.” (69 CFR 48569).

PCE 2

PCE 2 is defined as "Barrier-free upland habitats adjacent to breeding ponds that contain small mammal burrows, including but not limited to burrows created by the California ground squirrel and valley pocket gopher" (69 FR 48569).

PCE 3

PCE 3 is defined as "upland areas between occupied locations (PCE 1) and areas with small mammal burrows (PCE 2) that allow for dispersal among such sites (69 FR 48569)."

PCE 4

PCE 4 is defined as "vernal pool complex habitat- geographic, topographic, and edaphic features that support aggregations or systems of hydrologically interconnected pools, swales, and other ephemeral wetlands and depressions within a matrix of surrounding uplands. These features contribute to the filling and drying of the vernal pool, maintain suitable periods of pool inundation for larval salamanders and their food sources, and provide breeding, feeding, and sheltering habitat for juvenile and adult salamanders and small mammals that create burrow systems essential for CTS estivation (69 FR 48569)."

6.2.2.2 Potential to Occur on the Project Site

There are no recorded occurrences of the California tiger salamanders in CNDDB within 3 miles of the Project site (Figure 6). The potential seasonal wetlands identified on site during the jurisdictional delineation (Appendix C) are small and shallow and do not hold water long enough to support the aquatic portion of the CTS life cycle, as described by PCE 1. Additionally, no ground squirrel or other small mammal burrows, surface soil cracks, or other upland refugia were observed on the Project site during the February 2022 survey. Accordingly, the Project site does not contain upland habitat suitable for CTS consistent with PCE 2. The Project site is in a developed area and residential and commercial developments serve as dispersal barriers to California tiger salamander. Furthermore, human- and traffic-related disturbance along associated roadways likely preclude California tiger salamander from dispersing; however, many roads in Sonoma County are known California tiger salamander crossing routes so the presence of a roadway does not discount the possibility of California tiger salamander dispersal (when in proximity to breeding habitat). That said, migration and dispersal of this species are temporally constrained activities that occur during the wet season; work activities within aquatic features on site will occur during dry conditions. Accordingly, during Project-related activities the Project site would not be expected to be used as dispersal habitat between locations occupied by the California tiger salamander. Thus, implementation of the proposed Project would not result in loss to upland dispersal habitat consistent with PCE 3.

California tiger salamander USFWS critical habitat is located within 3 miles of the Project site; however critical habitat is located across the 101 freeway and urban areas which prevent dispersal (Figure 7). Due to the lack of nearby CNDDB occurrences (Figure 6), absence of suitable California tiger salamander

breeding, upland, and dispersal habitat on and/or immediately adjacent to the Project site, and the extent of regular disturbance associated with the development that make up the proposed Project, the species is not expected to occur on the Project site.

Accordingly, Sequoia has determined that the proposed project will have no effect on California tiger salamander and its habitat. Impacts to aquatic resources will be reduced to a less than significant level by implementing Avoidance and Minimization Measures (AMMs) provided below and all work activities near Pruitt Creek features will occur during dry conditions.

6.3 Santa Rosa Plain Species

Federally listed plant and wildlife species found within the Santa Rosa Plain include CTS and three Federally endangered plant species: Sonoma sunshine, Burke's goldfields, and Sebastopol meadowfoam. These plant species are found only in vernal pools and seasonal wetlands, while CTS utilize these wetlands during breeding season and surrounding uplands year-round (USFWS 2016). Although the Project site is within the Santa Rosa Plain, it does not occur within USFWS-designated critical habitat or Core and Management Areas outlined in the Recovery Plan for the Santa Rosa Plain (USFWS 2016). Furthermore, the site is located within a Santa Rosa Plain Conservation Strategy designation of "presence of CTS is not likely and there are no listed plants in this area."

Table 1. Federally Listed Plant Species Known to Occur in the Vicinity of the Project Site

Scientific Name	Common Name	Listed Status*	Habitat Requirements	Potential for Occurrence
Blennosperma bakeri	Sonoma sunshine	FE, CE, 1B.1	Occurs in valley and foothill grassland (mesic) and vernal pools, at elevations from 30 to 360 ft.	No potential. No suitable habitat occurs on the Project site. Species not observed during February 2022 site visit.
Lasthenia burkei	Burke's goldfields	FE, CE, 1B.1	Occurs in meadows and seeps (mesic) and vernal pools, at elevations of 50 to 1,970 ft.	No potential. No suitable habitat occurs on the Project site, no wetlands or meadows are present. Species not observed during February 2022 site visit.
Limnanthes vinculans	Sebastopol meadowfoam	FE, CE, 1B.1	Occurs in meadows and seeps, valley and foothill grassland, and vernal pools, at elevations of 50 to 1,000 ft.	No potential. No suitable habitat occurs on the Project site. Species not observed during February 2022 site visit.
Navarretia leucocephala ssp. *plieantha*	Many-flowered navarretia	FE, CE, 1B.2	Occurs in vernal pools (volcanic ash flow) at elevations of 100 to 3,115 feet.	No potential. No suitable habitat occurs on the Project site. Species not observed during February 2022 site visit.

*Key to status:
FE – Federally listed as endangered, FT – Federally listed as threatened species
CE – California listed as endangered species, CR – California rare species, CT – California listed as threatened species
1A – CNPS Rare Plant Rank of plants presumed extirpated in California, rare or extinct elsewhere.
1B – CNPS Rare Plant Rank of plants rare, threatened, or endangered in California and elsewhere
2A – CNPS Rare Plant Rank of plants are presumed extirpated in California but common elsewhere.
3 – CNPS Rare Plant Rank of plants about which we need more information (a review list)
.1/.2/.3 – Seriously endangered in California/Fairly endangered in California/Not very endangered in California

Table 2. Federally Listed Wildlife Species Known to Occur in the Vicinity of the Project Site.

Scientific Name	Common Name	Listed Status*	Habitat Requirements	Potential for Occurrences
Amphibians/Reptiles				
Chelonia mydas	Green sea turtle	FT	Common in tropical and subtropical waters as well as coastal beaches. Forages in coastal areas with plentiful algae and sea grass.	No potential. No suitable habitat on the Project site.
Ambystoma californiense (Sonoma County DPS)	California tiger salamander	FE, CT, WL	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy.	No potential. No breeding or over-summering habitat occurs on the Project site and no ponds, lakes, or vernal pools in immediate vicinity. No CNDDB occurrences within 3 miles. See text.
Rana draytonii	California red-legged frog	FT, SSC	Occurs in semi-permanent or permanent water at least 2 feet deep, bordered by emergent or riparian vegetation, and upland grassland, forest, or scrub habitats for aestivation and dispersal.	Low. No breeding or upland habitat occurs on the Project site. The project site may provide dispersal or aquatic non-breeding habitat but no occurrences within vicinity. See text.
Birds				
Strix occidentalis caurina	Northern spotted owl	FT, CT	Older, mixed forests with moderate to high canopy closure and a high occurrence of large snags and cavities.	No potential. No suitable habitat on the Project site
Invertebrates				
Danaus plexippus	Monarch butterfly	FC	Tree clumps south-facing slopes, mixture of eucalyptus and Monterey pine trees during winter, milkweed (larval host plant) during summer.	No potential. No suitable habitat on the Project site
Syncaris pacifica	California freshwater shrimp	FE, CE	Occurs in slow flowing waterways 1 to 3 ft deep, containing ample exposed roots, edge vegetation, and debris at elevations less than 380 ft.	No potential. No suitable habitat on the Project site.

*Key to status:
FE – Federally listed as endangered species, FT – Federally listed as threatened species, FC – Federally listed as a candidate species for listing
CE – California listed as endangered species, CT – California listed as threatened species
SSC – CDFW Species of Special Concern, WL – CDFW Watch List

7.0 EVALUATION OF IMPACTS TO FEDERALLY DESIGNATED CRITICAL HABITAT

7.1 Action Area

The action area is defined in 50 Code of Federal Regulations (CFR) § 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area for the proposed Project includes the 68-acre Project site (Appendix A).

7.2 Federally Listed Plants

The Project site does not fall within USFWS-designated critical habitat for any Federally listed plant species (Figure 7). Although the proposed Project is located within the *Santa Rosa Plain Conservation Strategy Study Area* (USFWS 2005), it is not located within any Santa Rosa Plain Rare Plant Core and Management Areas (USFWS 2016). That said, this Proposed Project is located within a *Conservation Strategy* designation with "no listed plants in this area" and the absence of specialized habitats and substrates precludes the establishment of Federally listed plant species onsite. No impacts will occur to Federally listed plants or suitable habitat, or USFWS designated critical habitat as a result of the proposed Project. The action will have no effect on federally listed plants.

7.3 Federally Listed Animals

No USFWS-designated critical habitats occur within the Project site. California tiger salamander USFWS critical habitat occurs within a 3-mile radius of the Project site (Figure 7). The action is not likely to adversely affect critical habitat.

In addition, this evaluation includes an assessment of the presence of any PCEs, defined specifically as physical and biological features essential to the conservation of CRLF and the Sonoma County DPS of the California tiger salamander, which occur in the greater vicinity of the Project site (Sections 6.2.1 and 6.2.2). The action may affect but is not likely to adversely affect California red-legged frog.

As discussed above, the Project site is located within the *Santa Rosa Plain Conservation Strategy Study Area* (USFWS 2005); however, it is not located within any Santa Rosa Plain California tiger salamander Core and Management Areas (USFWS 2016) and is located within an area with an area designated by the *Conservation Strategy* where the "presence of CTS is not likely." (USFWS 2005). The action will have no effect on California tiger salamander Sonoma County DPS.

8.0 AVOIDANCE AND MINIMIZATION MEASURES

As stated in Sections 6 and 7 above, the proposed Project is not likely to adversely affect CRLF and will have no effect on CTS Sonoma County DPS and its designated critical habitat, or federally listed plants. This section provides avoidance and minimization measures (AMMs) that will protect and minimize impacts to aquatic resources. General pre-construction surveys and other avoidance measures will be implemented to avoid injury to individual animals that may be in the areas affected by the proposed Project. Although highly unlikely and not expected to occur, if listed species are identified onsite the Project proponent will reconsult with USFWS before proceeding with the proposed Project. No impacts to the listed species or their habitats are expected with the proper implementation of AMMs; therefore, compensatory mitigation is not required or proposed.

8.1 Plant and Wildlife Species

- An environmental awareness training program for all Project personnel will be provided by a qualified service-approved biologist prior to initial groundbreaking. The training shall include a description of sensitive resources and habitats, and listed species and their habitats, importance of preservation, legal protections and penalties for unauthorized take, and the Project work limits.
- A qualified biologist will perform general preconstruction surveys for wildlife, plants, and sensitive resources prior to commencement of construction.
- Best Management Practices (BMPs) will be implemented to minimize the potential mortality, injury or other impacts to wildlife. Erosion control materials will be wildlife-friendly and will not contain plastic monofilament netting.
- Work within Pruitt Creek will be performed during dry conditions and outside of the winter rainy season (October through April).
- If a listed species is identified within the Action Area during Project-related activities, USFWS will be notified and consulted prior to resumption of Project-related activities.
- All trash items will be removed from the Project site to reduce the potential for attracting wildlife.

8.2 Receiving Waters

The Project proponent or its contractor will develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that will specify BMPs to be installed prior to the commencement of construction to prevent construction sediments/pollutants from draining into on and off-site downstream receiving waters. The sedimentation control measures would include use of wildlife-friendly straw wattles (as described above), silt fencing, and other measures to keep de minimus fill from accidentally entering receiving waterways and storm drain systems. To ensure no impacts occur to aquatic resources and

Federally listed fish species, construction BMPs will ensure that no sedimentation or pollution of downstream creeks/rivers occurs as a result of the proposed Project.

BMPs that will be incorporated into the proposed Project will include:

- A USFWS-approved biological monitor will be present during initial groundbreaking activities within sensitive resource areas and will assist in directing Project personnel on appropriate locations of BMPs and ensuring they are not compromised during work activities.
- Silt fence and/or wildlife-friendly straw wattles will be placed between active work areas or materials stockpiles and active waterways.
- Materials stockpiles will be covered with Visqueen or similar materials during windy conditions (winds greater than 15 mph) or when a greater than 50% chance of rainfall is predicted within a 72-hour period.
- Refueling will occur on paved surfaces and secondary containment will be used.
- A spill kit will be readily available on the Project site.
- Food-related trash will be stored in closed containers and removed from the site daily.
- To the extent feasible, work within drainage features will be performed during dry conditions.
- Work will occur during daylight hours, no earlier than 30 minutes after sunrise and no later than 30 minutes before sunset.

Implementation of these avoidance and minimization measures will ensure that the proposed Project does not adversely affect California red-legged frog and receiving waters.

9.0 CONCLUSION

This section provides a summary of potential project impacts to each species; see Section 6 and 7 above for a full discussion of potential impacts. Federally listed plant species that are known from the vicinity of the Project site require specialized habitats and substrates, such as wetlands, vernal pools, and mesic (i.e., wet, moist) grasslands, which do not occur on or immediately adjacent to the Project site. In addition, the Project site does not fall within USFWS-designated critical habitat for any Federally listed plant species (Figure 7). Accordingly, the proposed Project will not affect Federally listed plants. California tiger salamander has no potential to occur on the Project site due to the absence of suitable breeding, upland, and dispersal habitat, the lack of nearby occurrences, and the abundance of dispersal and migration barriers within and surrounding the site. Therefore, the proposed Project is anticipated to have no effect on CTS or its habitat, and USFWS designated critical habitat. The proposed project has been designed to avoid and minimize impacts to species and habitats within the Action Area.

Due to the absence of documented occurrences and suitable breeding and upland habitat for California red-legged frog on and/or adjacent to the Project site, it is very unlikely this species would occur on the

Project site; however, since Pruitt Creek could potentially be used as CRLF migration/dispersal or non-breeding aquatic habitat, the proposed Project would likely be regarded as a project that may affect, but is not likely to adversely affect California red-legged frog. As noted above, migration and dispersal of these species are temporally constrained activities that occur during the wet season and the proposed Project will occur in the dry season; in addition, work activities within the vicinity of the creek will occur during dry conditions.

All remaining Federally listed animal species known from the vicinity of the Project site require specialized habitats and substrates that do not occur on or immediately adjacent to the Project site.

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(Sonoma sunshine)*; Lasthenia burkei* (Burke's goldfields)*; Limnanthes vinculans* (Sebastopol meadowfoam); California Tiger Salamander Sonoma County Distinct Population Segment (*Ambystoma californiense*). Sacramento, CA: U.S. Fish and Wildlife Service, Pacific Southwest Region, Region 8. https://www.amphibians.org/wp-content/uploads/2019/04/USFWS-Recovery-Plan-for-the-Santa-Rosa-Plain.pdf.

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Table 3. Plant Species Observed at the Proposed Shiloh Resort and Casino Project Site

Scientific Name	Common Name	Family
Aesculus californica	California buckeye	Sapindaceae
Agapanthus africanus	African lily	Amarylidaceae
Anthemis cotula	stinking chamomile	Asteraceae
Arum italicum	Italian arum	Araceae
Avena barbata	slender oat	Poaceae
Avena fatua	wild oat	Poaceae
Brassica nigra	black mustard	Brassicaceae
Briza minor	little quaking grass	Poaceae
Bromus diandrus	ripgut brome	Poaceae
Bromus hordeaceus	soft chess	Poaceae
Calandrinia menziesii	red maids	Montiaceae
Calendula arvensis	field marigold	Asteraceae
Cardamine hirstua	bittercress	Brassicaceae
Carduus pycnocephalus	Italian thistle	Asteraceae
Carex spp.	sedges	Cyperaceae
Cerastium glomeratum	mouse-ear chickweed	Monitaceae
Chlorogalum pomeridianum	soap plant	Agavaceae
Claytonia perfoliate	miner's lettuce	Montiaceae
Cotoneaster sp.	cotoneaster	Rosaceae
Cyperus eragrostis	tall flatsedge	Cyperaceae
Elymus sp.	wild rye	Poaceae
Erodium botrys	cranesbill	Geraniaceae
Erodium cicutarium	redstem filaree	Geraniaceae
Eucalyptus globulus	blue gum	Myrtaceae
Festuca myuros	six-weeks fescue	Poaceae
Festuca perennis	Italian ryegrass	Poaceae
Fraxinus latifolia	Oregon ash	Fagaceae
Galium aparine	bedstraw	Rubiaceae
Genista monspessulana	French broom	Fabaceae
Geranium dissectum	cutleaf geranium	Geraniaceae
Geranium molle	dove's-foot geranium	Geraniaceae
Geranium robertianum	Robert's geranium	Geraniaceae
Hedera helix	English ivy	Araliaceae
Hirschfeldia incana	shortpod mustard	Brassicaceae
Hordeum murinum	mousetail barley	Poaceae
Hypochaeris radicata	rough cat's-ears	Asteraceae
Juncus balticus	Baltic rush	Juncaceae

Table 3. Plant Species Observed at the Proposed Shiloh Resort and Casino Project Site

Scientific Name	Common Name	Family
Juncus effusus	bog rush	Juncaceae
Juncus xiphioides	iris-leaf rush	Juncaceae
Lepidium nitidum	shining pepperweed	Brassicaceae
Lonicera hispidula	pink honeysuckle	Caprifoliaceae
Lysimachia arvensis	scarlet pimpernel	Myrsinaceae
Lythrum hyssopifolia	hyssop loosestrife	Lythraceae
Malva parviflora	cheeseweed	Malvaceae
Medicago polymorpha	California burclover	Fabaceae
Narcissus pseudonarcissus	daffodil	Amaryllidaceae
Nasturtium officinale	watercress	Brassicaceae
Oxalis pes-caprae	Bermuda buttercup	Oxalidaceae
Pinus sp.	pine	Pinaceae
Plantago lanceolata	English plantain	Plantaginaceae
Poa annua	annual bluegrass	Poaceae
Polygonum aviculare	yard knotweed	Polygonaceae
Quercus agrifolia	coast live oak	Fagaceae
Quercus lobata	valley oak	Fagaceae
Ranunculus muricatus	spiny fruit buttercup	Ranunculaceae
Rubus armeniacus	Himalayan blackberry	Rosaceae
Rumex acetosella	sheep sorrel	Polygonaceae
Rumex crispus	curly dock	Polygonaceae
Rumex pulcher	fiddle dock	Polygonaceae
Schoenoplectus pungens	three-square bulrush	Cyperaceae
Senecio vulgaris	common groundsel	Asteraceae
Stachys bullata	hedge nettle	Lamiaceae
Symphoricarpos mollis	creeping snowberry	Caprifoliaceae
Torilis arvensis	field hedge parsley	Apiaceae
Toxicodendron diversilobum	poison oak	Anacardiaceae
Trifolium spp.	clover	Fabaceae
Typha spp.	cattails	Typhaceae
Umbellularia californica	California bay laurel	Lauraceae
Vicia sativa	common vetch	Fabaceae
Vinca major	periwinkle	Apocynaceae

Table 4. Wildlife Species Observed at the Proposed Shiloh Resort and Casino Project Site.

Scientific Name	Common Name
Junco hyemalis	dark-eyed junco
Aphelocoma californica	California scrub-jay
Corvus brachyrhynchos	American crow
Cathartes aura	turkey vulture
Sitta carolinensis	white-breasted nuthatch
Pseudacris sierra	Sierran treefrog (= Sierran chorus frog)

Appendix A

Project Design Plans


Shiloh Road
Enter
Enter
Enter
vineyard
vineyard
vineyard
Roundabout
Hotel -4 floors/ 400 keys
Hotel Courtyard
Bus
Drop off
Water Feature
Gaming Floor 470 x 300
Paved area
Speed Ramp
Event Center
Conference Center
30,000 SF Ballroom
Bridge to Casino
Garage
3,300 paces
Service Yard
3.75 AC Treatment Plant
Old Redwood Highway
vineyard
Loop Road
Bus Parking
PARKING TABULATION
1. VALET- 489 SPACES
2. GARAGE LOWER LEVEL (GRADE) - 825 SPACES
3. GARAGE ELEVATED LEVEL (2) - 825 SPACES
4. GARAGE ELEVATED LEVEL (3) - 825 SPACES
5. GARAGE ELEVATED LEVEL (4) - 825 SPACES
5. TOTAL: 3,789 SPACES

Site Plan

Appendix B

Information for Planning and Consultation (IPaC) Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Project Code: 2022-0084810
Project Name: Koi Nation Shiloh Resort Casino Site

September 13, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Project Code: 2022-0084810
Project Name: Koi Nation Shiloh Resort Casino Site
Project Type: Commercial Development
Project Description: The Koi Nation purchased a 68-acre parcel at 222 East Shiloh Road in September 2021 and seeks approval from the BIA to take this land into trust. Development of this Project will occur at 222 East Shiloh Road and includes a 2,500 Class III gaming machine facility, a five-story hotel, restaurants, a conference center, and a spa (Appendix A). The Koi Nation will build and operate the resort and casino under authority of the U.S. Indian Gaming Regulatory Act (IGRA). Development activities are restricted to the 68-acre property boundary. As currently designed, the proposed Project will result in ground disturbance to approximately 40 acres with the riparian corridor of Pruitt Creek and large portions of existing vineyard left undeveloped/unimpacted. Two clear-span creek crossings are proposed as part of the Project (Appendix A).

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.52348245,-122.77348165657534,14z

Counties: Sonoma County, California

Endangered Species Act Species

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (CA - Sonoma County) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Burke's Goldfields *Lasthenia burkei* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4338	Endangered
Many-flowered Navarretia *Navarretia leucocephala ssp. plieantha* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2491	Endangered
Sebastopol Meadowfoam *Limnanthes vinculans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/404	Endangered
Sonoma Sunshine *Blennosperma bakeri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1260	Endangered

Critical habitats

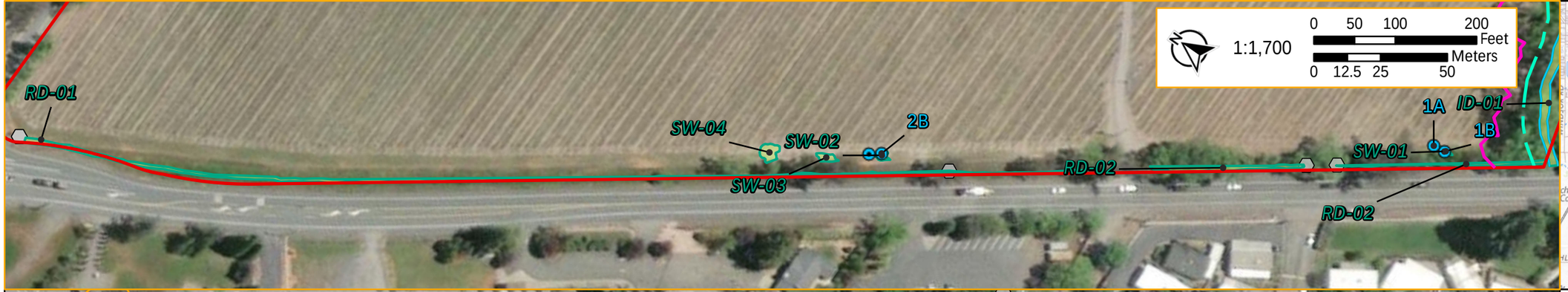
THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

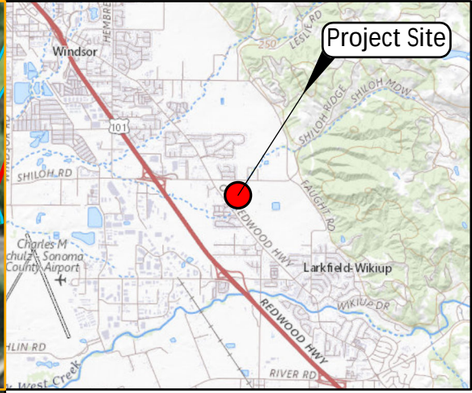
IPaC User Contact Information

Agency: Sequoia Ecological Consulting, Inc.
Name: Aurelie Muckenhirn
Address: 1342 Creekside Dr
City: Walnut Creek
State: CA
Zip: 94596
Email amuckenhirn@sequoiaeco.com
Phone: 8058869456

Appendix C

Draft Aquatic Resources Delineation Map





Project Site
Culvert Opening
Sample Point
Ordinary High Water Mark
Top-of-Bank
Riparian Dripline
Potential Aquatic Resource

Aquatic Feature Name	Area (sq. ft.)	Area (ac.)
ID-01	28,100	0.644
RD-01	2,870	0.066
RD-02	1,460	0.0334
SW-01	73.4	0.00169
SW-02	165	0.00378
SW-03	193	0.00442
SW-04	404	0.00927

Author: AlexHirth
Date Exported: 4/5/2022
Coordinate System: NAD 1983 2011
StatePlane California II FIPS 0402 Ft US

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2021., Maxar, Microsof

SEQUOIA
Ecological Consulting, Inc.

Document Path: F:\GIS\Projects\Acorn Environmental\Shiloh Resort and Casino\Shiloh Resort and Casino.aprx

Appendix G-2

NMFS Biological Assessment

SEQUOIA
Ecological Consulting, Inc.

Biological Assessment
Proposed Shiloh Resort and Casino Project
Sonoma County, California

National Marine Fisheries Service Biological Assessment
for Listed Pacific Salmonids
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

July 29, 2022

Prepared for:

U.S. Department of the Interior
Bureau of Indian Affairs
Pacific Region Office
2800 Cottage Way, Room W-2820
Sacramento, CA 95825-1846

Prepared on behalf of:

Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762

Prepared by:

Sequoia Ecological Consulting, Inc.
1342 Creekside Drive
Walnut Creek, CA 94596

CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

Sequoia Ecological Consulting, Inc. (Sequoia) has prepared this Biological Assessment (BA) and Essential Fish Habitat (EFH) Assessment on behalf of Acorn Environmental for the proposed Shiloh Resort and Casino Project (hereafter "the Project") located in the Larkfield-Wikiup area of unincorporated Sonoma County, California. The Koi Nation, owner of the Project site and one of California's Federally recognized Native American tribes, has applied to the U.S. Bureau of Indian Affairs (BIA) for a fee-to-trust land acquisition. The BIA's Proposed Action is to place approximately 68 acres of land into Federal trust.

This BA has been prepared to facilitate consultation between BIA and the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Federal Endangered Species Act (FESA; 16 U.S.C. 1536 [c]) and Section 305(b) of the Magnuson-Stevens Act (MSA; 16 U.S.C. 1855[B]). As this Project may affect Federally listed species, consultation with the NMFS pursuant to Section 7 of the FESA is required.

This BA discusses the physical impacts from construction of the proposed Project and the effects of these impacts on Federally listed species protected pursuant to the FESA as well as effects on EFH protected by the Magnuson-Stevens Fisheries Conservation Act. As detailed herein, the proposed Project would likely be regarded as a project that "may affect, but is not likely to adversely affect" the Federally threatened Chinook salmon (*Oncorhynchus tshawytcha*), California Coastal (CC) Evolutionarily Significant Unit (ESU); the Federally endangered coho salmon (*Oncorhynchus kisutch*), Central California Coast (CCC) ESU; and the Federally threatened steelhead (*Oncorhynchus mykiss irideus*), CCC Distinct Population Segment (DPS), the NMFS-designated Critical Habitat for steelhead CCC DPS, and EFH for Pacific Salmonids.

In this BA we provide: 1) a description of the habitats that occur on the Project site, 2) a list of the Federally listed species that have potential to occur on or near the Project site, 3) avoidance and minimization measures (AMMs) for potentially affected listed species that will be implemented to reduce impacts to these species to the greatest extent practicable, and 4) all other necessary information that the NMFS will need to complete FESA Section 7 and Magnuson-Stevens EFH consultations with BIA for the proposed Project.

1.1 Purpose of the Biological Assessment

The purpose of this document is to assess how the Proposed Action may impact listed anadromous fish, NMFS-designated Critical Habitat (National Oceanic and Atmospheric Administration [NOAA] 2005), and EFH. It discusses the physical impacts from construction of the proposed Project and the effects of these impacts on Federally listed species protected pursuant to the FESA. In addition, the information in this report is provided to comply with statutory requirements to use the best scientific and commercial information available when assessing the risks posed to listed and/or proposed species, designated and/or proposed Critical Habitat, and EFH by proposed Federal Actions. This document is prepared in accordance with legal requirements set forth under Section 7 of the FESA (16 U.S.C. 1536 [c]) and is

consistent with NMFS requirements. The species, critical habitats, and EFH considered for analysis in this document are discussed below.

1.2 Listed Species, Critical Habitat, and Essential Fish Habitat

1.2.1 National Marine Fisheries Service-Listed Species

Chinook salmon (*Oncorhynchus tshawytcha*), CC ESU, Threatened – **T**

Coho salmon (*Oncorhynchus kisutch*), CCC ESU, Endangered - **E**

Steelhead (*Oncorhynchus mykiss irideus*), CCC DPS, Threatened – **T**

1.2.2 Critical Habitat

The Proposed Action addressed within this document falls within Critical Habitat for steelhead CCC DPS. Critical Habitat for coho salmon CCC ESU and Chinook salmon CC ESU is located near the Proposed Action within the Russian River Basin. Critical Habitat for coho salmon CCC ESU is approximately .85 miles northwest of the Project boundary. Critical Habitat for Chinook salmon CC ESU is approximately 4.35 miles west of the Project boundary.

1.2.3 Essential Fish Habitat

The Proposed Action addressed within this document falls within EFH for Pacific salmon, specifically for Chinook and coho salmon within the Russian River watershed, as described in the 2014 final rule (FR) for EFH (NOAA 2014).

1.3 Consultation History

To date, no formal or informal consultation has occurred.

2.0 PROJECT DESCRIPTION

2.1 Location and Setting

2.1.1 Project Location

The Project is located at 222 East Shiloh Road (Assessor's Parcel Number 059-300-003) in the Larkfield-Wikiup area of unincorporated Sonoma County near Windsor, California (Figures 1 and 2). The Project site is located east of U.S. Highway 101 (US-101) and west of Shiloh Ranch Regional Park at Latitude: 38.52389°, Longitude -122.77362° (Figure 1). The Project site is within the Healdsburg, CA U.S. Geological Survey (USGS) 7.5-minute quadrangle and is bordered by Shiloh Road on the north, existing vineyards on the east, scattered residences on the south, and Old Redwood Highway on the west. Pruitt Creek, a fourth-order tributary in the Russian River watershed, flows south/southwest through the center of the Project site (Figure 2). The Project site is surrounded by residential

development, agricultural fields, and community centers such as a park and a church. Project activities will occur within the approximately 68-acre parcel.

2.1.2 Regulatory Setting

Regulatory authority over biological resources is shared by Federal, state, and local agencies under a variety of laws, ordinances, regulations, and statutes. The Project is unique in that it will be developed on the Koi Nation sovereign land base, pending Federal approval. Land that is held for trust on behalf of tribes is subject to Federal and tribal law exclusively. Therefore, this Project does not fall under State or local jurisdiction. This BA is in support of National Environmental Policy Act (NEPA) compliance documentation for this Project.

2.2 Project Purpose and Background

The Koi Nation purchased a 68-acre parcel at 222 East Shiloh Road in September 2021 and seeks approval from the BIA to take this land into trust. Development of this Project will occur at 222 East Shiloh Road and includes a 2,500 Class III gaming machine facility, a five-story hotel, restaurants, a conference center, and a spa (Appendix A). The Koi Nation will build and operate the resort and casino under authority of the U.S. Indian Gaming Regulatory Act (IGRA).

The parcel is approximately 12 miles from the Koi Nation tribal headquarters located in Santa Rosa, California. Development of this Project will promote the general welfare of the Koi Nation and raise governmental revenues. The Project will create jobs for members of the Koi Nation and the greater Sonoma County community.

2.3 Work Description

2.3.1 Project Footprint

Development activities are restricted to the 68-acre property boundary. As currently designed, the proposed Project will result in ground disturbance to approximately 40 acres with the riparian corridor of Pruitt Creek and large portions of existing vineyard left undeveloped/unimpacted. Two clear-span creek crossings are proposed as part of the Project (Appendix A).

2.3.2 Site Preparation and Building

To prepare the Project site for development, staging areas will be designated and appropriate best management practices (BMPs) installed for avoidance and minimization of Project-related impacts to sensitive resources (e.g., Pruitt Creek). The property will then be cleared, grubbed, and graded.

Project construction will include installation of underground utilities and vertical construction of a five-story hotel and casino and a four-story parking garage, as well as the construction of concrete access roads, additional parking lots, and a swimming pool (Appendix A). Bioswales will be created to

treat stormwater, including along Pruitt Creek near the south end of the Project site. Landscaping and riparian planting will occur once construction is complete.

2.3.3 Wastewater Treatment

A membrane bioreactor (MBR) tertiary treatment system will be installed to treat wastewater from the resort and casino. Effluent from the system will be disposed directly into Pruitt Creek and permitted by the EPA National Pollutant Discharge Elimination System (NPDES). The water quality of the discharge will follow the requirements of the NPDES permit, the California Regional Water Quality Control Board's Water Quality Control Plan for the North Coast Region (Basin Plan; NCRWQCB 2018), and State Water Resources Control Board's Title 22 of California's Code of Regulations Related to Recycled Water (Title 22; SWRCB 2018).

The EPA issued NPDES follows Clean Water Act (CWA) standards and complies with the effluent limitations adopted for the receiving water. The Receiving Water standards are based on the requirements per the NCRWQCB Basin Plan. Title 22 generally regulates the use of recycled water on state lands, which does not apply to this Project, but the system will still be designed to comply with Title 22 standards.

The regulatory, technical, and engineering issues associated with supplying water and handling wastewater have been evaluated for four different buildout alternatives.

2.3.4 Conservation Measures and Best Management Practices

Implementation of conservation measures and installation and maintenance of BMPs limit potential impacts of the proposed Project on Pacific salmonids, Critical Habitat, and EFH. These measures have been designed to help avoid and to minimize effects to listed species and their habitat while also addressing the purpose and need of the Project. Individual Pacific salmonids are not likely to be directly impacted by physical construction methods but may be indirectly affected if Project activities modify water quality parameters (e.g., increased temperature or turbidity, lowered dissolved oxygen) within Pruitt Creek.

Potential Project activities that could contribute to indirect effects include removal of riparian vegetation resulting in increased sun exposure, grading and sediment transport from uplands to the waterway, and unintentional releases (spills) of hazardous materials to surface waters. BMPs employed before, during, and after construction will ensure that ground disturbance, alterations to vegetation, and unintentional spills from the development of this Project do not impact the quality of the aquatic habitat in Pruitt Creek. These Project-related impacts cannot be fully avoided; however, the following conservation measures aim to directly reduce these impacts:

- Seasonal work window for ground disturbance between June 15 to October 15 to help avoid impacts to instream habitat quality

- Measures to reduce effects on riparian areas and establish Environmentally Sensitive Area (ESAs)
- Habitat restoration/revegetation
- Installation of silt fencing and other wildlife-friendly erosion control measures
- Toxic and hazardous materials management procedures
- A Storm Water Pollution Prevention Plan (SWPPP) to be followed during and after construction activities.
    - SWPPP to include erosion control and restoration plan, a hazardous materials management plan, and post-construction BMPs until final stabilization criteria are met.

Once all potential effects to an individual, population, and/or Critical Habitat have been identified, additional conservation measures can be logically developed. Most conservation measures are standard measures consistently requested by NMFS.

3.0 ANALYSIS METHODS

3.1 Background Research

Prior to preparation of this BA, Sequoia researched the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) database (USFWS 2022), the CalFish website (2022), the NMFS website (2022), and the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB 2022) for all recorded occurrences of Federally listed species known from the region of the proposed Project. The potential for species occurrence was determined based on the results of literature reviews, field-based habitat assessments, and GIS-based remote sensing.

Based upon queries of NMFS resources and the CNDDB (2022), three Federally listed fish species were identified to have the potential to occur within the vicinity of the proposed Project and are within the North-CCC Recovery Domain (Appendix B).

All Federally listed species records are compiled and discussed in Table 1. Sequoia examined all known record locations for special-status species to determine if Federally listed species could occur on the Project site or within an area of affect.

3.2 Site Assessment

Sequoia fisheries biologist Claire Buchanan conducted a survey on the Project site on February 23, 2022, to record biological resources and to assess the limits of areas potentially regulated by resource agencies. The survey involved assessing habitat within Pruitt Creek on the Project site and visual survey for Federally listed fish species. The habitat assessment was guided by the habitat requirements defined by EFH (Section 1.4.1) and the habitat features known to be used by the listed Pacific salmonids expected to occur on the Project site. This assessment informed the analysis of the direct and indirect

effects of the proposed Project on listed Pacific salmonids and their habitat. Any special-status fish or suitable habitat was documented.

3.3 Wetland Delineation

A complete formal aquatic resources delineation was performed on the proposed Project site on February 23 and 24, 2022, by Ari Rogers of Sequoia. The purpose of the aquatic resource delineation was to determine the location and extent of potential state and/or federally jurisdictional aquatic resources on the Project site. All features exhibiting wetland characteristics were mapped within the Project site. The wetland delineation was conducted according to the U.S. Army Corps of Engineers' (USACE) Wetlands Delineation Manual (USACE 1987) in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008) and the State Water Resources Control Board's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (2019). A separate stand-alone report will be provided to water resource agencies for this aquatic resource delineation, as necessary. A non-verified wetland delineation map of the Project site is provided as Appendix C.

4.0 ENVIRONMENTAL BASELINE

4.1 Russian River Watershed

The Russian River Basin is rated as "poor" through NOAA's Conservation Action Plan process for the following conditions: habitat complexity, riparian vegetation, passage/migration, estuary/lagoon, velocity refugia, sediment transport, and water quality (turbidity). The watershed's measurements of sediment, temperature, and viability were identified as impaired. These conditions will need to be addressed to allow for the full recovery of anadromous fish species (NOAA 2016a). Historically, anadromous fish in the Russian River watershed have been declining due to a variety of natural and anthropogenic factors.

4.1.1 Geography and Climate

The Russian River is located in a tectonically active area, which occasionally causes unstable landscapes, landslides, and increased sediment into waterways. Additionally, the soil type is typically Franciscan Geologic Complex and alluvium, which naturally produces copious sand and gravel. Sedimentation is further compounded by high annual rainfalls following hot summers, which produce more unstable soils. Recently, extreme wildland fires have occurred in the watershed, which potentially removed stabilizing vegetation and increased soil erosion, as well as increased sediment production via ash and debris. Oscillation in weather patterns such as El Niño locally affect ocean productivity, which may influence the size and health of salmonids returning inland to spawn. Variable weather conditions can also influence the creation and breakdown of sandbars, sometimes providing a physical barrier to migration and spawning.

4.1.2 Disease and Predation

Anadromous fish in the Russian River Basin are threatened by diseases associated with diminished water quality, diseases brought by introduced non-native fish, and diseases concentrated in hatchery conditions. Predation is most impactful in degraded habitat, especially areas lacking deep pools, quality estuaries, and emergent vegetation. Invasive and native aquatic species including smallmouth bass (*Micropterus dolomieu*), striped bass (*Morone saxatilis*), channel catfish (*Ictalurus punctatus*), and the Sacramento pikeminnow (*Ptychocheilus grandis*) predate on young Chinook salmon in the Russian River Basin. Once in the ocean, salmon species are predated by marine mammals (NOAA 2016a).

While hatchery efforts have shown marked success in boosting steelhead and Chinook salmon populations, coho salmon populations may have been negatively impacted by hatchery efforts. Early hatchery operations in the Russian River propagated coho salmon fry from far northern populations that were adapted to cooler temperatures and less variable habitat conditions (NOAA 2016b, Brown et al. 1994). The subsequent hybrid population may have been less well-adapted to local conditions than the native coho salmon genetic stock. The effect on today's coho salmon is difficult to measure, but compared with other salmonids, coho salmon have overall low genetic variability (Brown et al. 1994).

In addition, hatchery practices may introduce and encourage growth of disease. Coho salmon stock brought from Oregon and Washington may have greater resistance to different diseases than the native population, and they may introduce parasites or viruses from these distant waterways. Diseases may transmit between hatchery and native stocks, causing a net loss in population.

Hatchery fish may also outcompete native wild-born coho salmon; hatchery fish enter the habitat larger than wild juveniles, and territorial behavior may prevent wild-born fish from using prime juvenile rearing habitat. These hatchery-born coho salmon may exhibit a larger body size, even as spawning adults, and they may outcompete native fish for prime spawning habitat (Brown et al. 1994).

4.1.3 Land Use

Agricultural practices frequently divert and channelize naturally occurring tributaries, which results in removing or severely altering salmonid spawning habitat. Even when channels are not altered, riparian vegetation is often removed to maximize agricultural output. This practice increases water temperatures, exacerbates bank erosion, encourages the invasion of non-native plants, decreases the recruitment of large woody debris into watercourses, lowers the water table, reduces habitat diversity, and ultimately can lead to the drying of tributaries.

Grazing livestock may increase bank erosion due to trampling of the existing banks, which can also inhibit riparian vegetation. The presence of livestock near tributaries also increases animal waste into the streams, which in turn increases the level of nutrient loading and can cause algae growth and eutrophication. The subsequent decrease in dissolved oxygen levels in waterways makes streams unsuitable for salmonid use.

Historic floodplains and estuaries would have provided ideal juvenile rearing habitat for salmonids. Years of waters management, including diverting/straightening, and embanking of waterways for development and agriculture, have damaged or removed areas of prime habitat. Inundated floodplains are the most productive salmonid habitats because of plentiful prey (NOAA 2016a).

Early logging starting in the 1860s was characterized by intense timber harvest and milling activities. These early timber harvests clear-cut trees along slopes and delivered logs to mills by either dragging them downslope using oxen or floating the logs down larger streams. This practice cleared stabilizing vegetation from the slopes above waterways, causing massive erosion and subsequent sedimentation into streams. In addition, sawmills were built throughout California to process this timber. Sawmills often dumped sawdust and other material directly into adjacent waterways for disposal. From the 1870s through the 1920s, these practices were gradually outlawed or limited to control pollution. Unfortunately, early logging increased bank erosion and sedimentation in streams and the loss of riparian shade. Despite efforts to control these effects, the damage to anadromous fish spawning, rearing, and migration habitat was already done. In the 1950s, logging practices entered a new phase of destruction with the increased use of heavy machinery. The use of this machinery required the creation of roads throughout forests, and many of these roads were built without regard to their impacts on riparian resources, fish migration or erosion (NMFS 2012). These early practices contributed to the historic decline of salmonid species.

Today, large tree removal on slopes and banks above waterways can increase soil erosion by decreasing stabilizing vegetation and can cause direct input of sediment into watercourses. Removal of trees that provide riparian canopy cover can cause increased temperatures in streams. The natural level of large woody debris recruitment may also be reduced by logging practices, further reducing the quality of habitat for salmonids. Timber harvest typically involves heavy machinery and large-scale road construction. Poorly designed logging roads cause increased channel erosion and sedimentation into waterways as a result of inadequate culverts, poorly designed road edges, and plugged ditches. The resulting high sediment yields have impacted sediment transport and resulted in stream substrates unsuitable for salmonid spawning (NOAA 2016a).

4.1.4 Overharvesting

Historically, anadromous fish were commercially overharvested in the Russian River Basin beginning in the 1850s. In the early days of western fishing in the region, techniques were used that are now recognized as encouraging overharvesting of a population, including netting migrating salmon, using salmon pitchforks, guiding migrating fish into fish wheels, and even using explosives. Many of these techniques had the potential to eliminate a significant portion of the breeding population in a single waterway (NMFS 2012).

Laws governing seasonal closures, area and gear restrictions, and bag limits attempt to address this impact today. However, indirect mortality from catch-and-release of undersized salmonids and bycatch

is difficult to prevent. Data on incidental capture is not easily collected, and the degree to which current harvesting practices impact the species is not well known (NOAA 2016a).

4.1.5 Dams and Flood Control Measures

Dams dramatically alter the natural flow of water. Upstream side channels that naturally provide salmonid rearing habitat are lost when water flow is increased. Erosion control measures and stream diversions related to dam construction often involve covering slopes with rip rap rock material, which inhibits the natural meandering ability of the stream. This subsequently reduces the formation of off-channel sloughs and marshes; it also increases channel scour and inhibits growth of riparian successional vegetation.

4.1.6 Rural and Residential Development

Residential developments often introduce exotic plants that overtake native riparian vegetation. This can choke riparian corridors and reduce the natural recruitment of large woody debris into the waterways. Human development also increases the intensity of other impacts due to a greater need for land use. For example, increased development fuels an increase in demand for timber products and logging practices. As residences are established, the use of flood control measures becomes increasingly necessary for human safety. As a result, developed areas have increased levels of levee construction and channel diversions, which change the natural hydrologic processes that are essential for quality salmonid habitat.

Development is typically associated with paving of large swaths of land for parking lots, subdivisions, and shopping areas. This decreases infiltration—the absorption of rainfall into the ground—which may concentrate flows and increase downcutting in small tributaries and could wash away substrate in spawning streams.

4.2 Pruitt Creek

4.2.1 Topography and Climate

The Project site is located on a relatively flat parcel of agriculturally developed land. Elevation within the project area varies slightly and ranges from a high of 190 feet above mean sea level (MSL) to 125 feet MSL at the lowest point. The climate is temperate. Summers are warm and dry with average highs around 27.7 degrees Celsius (°C). Winters are mild with average highs ranging from 13.3 to 17.2°C and lows ranging from 2.7 to 7.2°C. The average annual precipitation is approximately 36.28 inches falling primarily between November and March (U.S. Climate Data 2022).

4.2.2 Land Use

Regular use for agricultural and residential activities has established a 30-year disturbance regime for Pruitt Creek. Based on aerial imagery, the property was first developed for agriculture starting in 1993 (Google Earth Pro 2022). Before that, it was undeveloped, despite the presence of residential

development along all of its edges with the exception of the property directly to the east which was developed for agriculture. By 2003, approximately one-third of the 68-acre parcel was developed into vineyards and in 2004 the remaining portions of the property were planted with vineyards. A private residence was constructed on the parcel, and associated roadways built. An in-creek road crossing was also constructed in 2004 as well as two pipes embedded in the creek banks that span the length of Pruitt Creek immediately upstream of the road crossing (Google Earth Pro 2022). The results of these disturbances include a washed-out portion of the creek at the legacy road crossing, litter within the riparian zone, and areas of trampling from vehicles and heavy foot traffic. The at grade legacy road crossing will not be utilized once the proposed Project is implemented.

4.2.3 Hydrology

Pruitt Creek flows southwesterly through the Project site and is a fourth-order tributary to the Russian River. Pruitt Creek terminates at Pool Creek which flows into Windsor Creek, then into Mark West Creek and finally into the Russian River. At the time of the February 2022 site visit, the creek was wetted throughout with connected, flowing water. Some areas along the banks were saturated but no defined drainages or inlets injecting water into the system were observed. Flow was minimal, less than 1 cubic foot per second, with indicators of a recent high flow event (leaf litter and riparian vegetation scattered throughout). The average width was 15 feet. The average depth was 8 inches with a maximum depth of approximately 16 inches and a minimum depth of less than 1 inch. Some of the deeper pools may hold water longer than the rest of the creek during dryer months but are likely to fully dry out by the end of the summer. Water temperature was 11.1°C. Water temperature was measured at 1000 hours at a depth of approximately 5 inches and in the shade.

Pruitt Creek is mapped as “Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC)” and “Palustrine, Forested, Emergent, Persistent, Seasonally Flooded (PFO/EM1C) Freshwater Forested/Shrub Wetland” in the NWI (USFWS 2022; Figure 3). When Environmental Science Associates (ESA) visited the Project site in May of 2021, Pruitt Creek was entirely dry. Based on this observation and observations from Sequoia’s February 2022 visit, it was confirmed that Pruitt Creek is an intermittent stream that likely flows from late fall to spring and begins to dry up by early summer and remains dry through the fall.

The hydrological patterns of Pruitt Creek can be further defined by analyzing the USGS Streamflow Data from the gauge at Mark West Creek near Mirabel Heights and just downstream from the confluence with Windsor Creek. This stream gauge is downstream of the Project site and hydrologically connected to Pruitt Creek. It can be inferred that Pruitt Creek has experienced flows historically similar to or less than Mark West Creek as it is a third-order tributary. For example, on February 23, 2022, when the biologist was onsite, the Mark West Creek gauge registered at approximately 27.5 cubic feet per second (cfs); however, discharge on Pruitt Creek was estimated to be closer to 1 cfs.

Annual trends from streamflow data logged on Mark West Creek from 2012 to 2022 show that flow drops off significantly in June, hovers around 0 cfs for most of July, August, and September, and remains

below 5 cfs until the end of October when it increases above 50 cfs following the initiation of seasonal rains. There is some variability of flow between the months of October and May, but generally flows stay above 75 cfs in the late fall and winter. There are some indications of large, flash flow events most notably in February of 2016 when flow reached 15,000 cfs.

This USGS data indicates that Pruitt Creek has a very low flow or is likely dry for almost six months of each year, and that it has the highest potential for connectivity from November to April (USGS 2022). Connectivity does not ensure that salmonids can access the creek as they have depth and flow thresholds that limit migration and movement within streams.

4.2.4 Habitat Features

4.2.4.1 Habitat Type

Approximately 1,800 feet of Pruitt Creek flows through the Project site. The upstream and downstream extents of this stretch of creek are marked by road crossings with culverts. Along the 1,800 feet of habitat assessed, some pool habitat was observed, comprising less than 15 percent. The remaining majority, 85 percent, was flat water (as defined by the *California Salmonid Stream Habitat Restoration Manual* [Flosi et al. 2010]). Pool depth and size were not sufficient holding habitat for adult salmonids. Flat water was less than 6 inches deep in most areas and was not conducive to salmonid movement or migration. Abundant shallow (depth less than 4 inches), slower-moving areas of refugia were present which could potentially accommodate juvenile salmonids.

4.2.4.2 Substrate

The substrate size classes present within Pruitt Creek are as follows: organics, silt or fine sediment, sand, gravel (0.8 to 2.5 inches), and cobble (2.5 to 10 inches). Silts and organics dominated the bottom cover of Pruitt Creek. Although some gravel and cobbles were present, it was almost entirely covered with silt and organics, especially when fully submerged in the creek. Where there are exposed or distinct creek banks, the sides of the creek channel are lined with sand. Cobbles are more common than gravel throughout.

4.2.4.3 Cover and Riparian Vegetation

Some large woody debris, root wads, and overhanging vegetation create instream cover within Pruitt Creek. Pool depths and water velocity were not large enough to provide sufficient cover for salmonids.

The variety of riparian vegetation along Pruitt Creek creates canopy cover and bank stabilization along the creek. The riparian vegetation consists of grasses, annual and perennial forbs, vines, shrubs, and trees. Valley oaks (*Quercus lobata*) dominate the overstory with some smaller eucalyptus (*Eucalyptus* sp.) trees; both provide canopy cover. Canopy cover was over 75 percent of the creek when the sun was overhead. The understory communities observed had distinct segments dominated heavily by native species alternating with areas dominated by non-native species. Some native species observed include California buckeye (*Aesculus californica*), California bay laurel (*Umbellularia californica*), willow (*Salix* sp.), poison oak (*Toxicodendron diversilobum*), valley oak, and coast live oak (*Quercus agrifolia*).

4.2.4.4 Spawning and Rearing

Rearing habitat is limited on Pruitt Creek. Although some refugia existed in the creek in February, it is unlikely that this ideal rearing habitat exists during the late spring and summer when juvenile salmonids emerge. Characteristic spawning habitat preferred by CCC coho salmon, steelhead, and CC Chinook salmon is lacking. Riffles and more gravel-sized substrate as well as lower levels of sedimentation would make the habitat more ideal for spawning. Access to spawning habitat is also extremely limited by the hydrological period of Pruitt Creek coupled with the migration timing of Pacific salmonids.

4.2.4.5 Predation and Competition

Multiple Sierran treefrogs (*Pseudacris sierra*) were observed near the creek whose eggs and tadpoles could provide food for adult salmonids. Also, some benthic macroinvertebrates were observed in the organic substrate, but generally food availability and abundance were sparse. The limited access and likely utilization of this habitat reach greatly reduces the risk of overabundance and reduces the opportunity for competition. Based on the size and condition of Pruitt Creek and its potentially limited food sources, it likely has very low carrying capacity for Pacific salmonids.

5.0 STATUS OF SPECIES AND CRITICAL HABITAT

5.1 Steelhead – CCC; DPS

5.1.1 Status of the Species and Critical Habitat

Critical Habitat for CCC steelhead was first proposed in 1996, during a comprehensive status review of West Coast steelhead. On July 298, 1997, this ESU was listed as threatened. In 2004, resident (non-anadromous) populations of steelhead that were found in the same watersheds were included in the protected population group, because there is significant gene transfer between resident and anadromous populations (NOAA 2016c). At this time, the CCC steelhead was described as an ESU, under the definition that this population is substantially reproductively isolated from other populations, and it provides a significant component of the evolutionary legacy of the species. However, under the ESU definition, the stable resident rainbow trout and the declining anadromous steelhead trout were categorized as the same ESU, as the two populations interbreed. The population was recategorized using a different system of population designations to protect the anadromous portion of the population. The new DPS determination allowed NOAA to describe and protect geographically distinct populations of anadromous fish, without requiring the protection of resident rainbow trout populations. Thus, in 2006 the population of steelhead once described as the CCC steelhead ESU was recategorized as the CCC steelhead DPS (NOAA 2006, NOAA 2022).

The description and range of the CCC steelhead DPS is defined as “Naturally spawned anadromous *O. mykiss* (steelhead) originating below natural and manmade impassable barriers from the Russian River to and including Aptos Creek, and all drainages of San Francisco and San Pablo Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers. Also, steelhead from two artificial

propagation programs: the Don Clausen Fish Hatchery Program, and the Kingfisher Flat Hatchery Program (Monterey Bay Salmon and Trout Project)" (NOAA 2006).

The Critical Habitat for all steelhead DPS were revised by NOAA on January 5, 2006 (NOAA 2006, Figure 4). The CCC steelhead DPS has mapped Critical Habitat along perennial waterways in Sonoma, Marin, Napa, San Francisco, San Mateo, Santa Cruz, Santa Clara, Alameda, Contra Costa, and Solano counties (NOAA 2006; NOAA 2016c). Critical Habitat overlaps the Project footprint in Pruitt Creek.

5.1.1.1 Species Description

Steelhead are not genetically distinct from rainbow trout; it is anadromy that differentiates them from rainbow trout. Rainbow trout remain in freshwater their entire lives while steelhead are born in freshwater rivers and migrate to the ocean to grow and only return to freshwater to spawn (CalFish 2022). The CCC DPS steelhead is divided into the same subspecies as the Klamath Mountains Province, South-Central California DPS, and Southern California DPS (*O. mykiss irideus*). However, the CCC DPS is differentiated by geographic range (CNDDB 2022).

Steelhead are generally silver in color, with pink cheek marks, green coloration on their backs, and light silver or yellow to white bellies. They have black spots on their adipose fin, dorsal fin, back. The black spots on their tail often appear in radiating lines. Steelhead have an iridescent pink to red lateral line. Their teeth are well-developed, and the mouth is noticeably large with a powerful maxillary bone that extends to behind the eye. Individuals that spend more time in freshwater typically display a darker silver coloration and more closely resemble resident rainbow trout individuals. Juveniles exhibit similar coloration to adults, with the addition of 5 to 13 ovular par marks along their sides that are interspaced at a greater distance than the width of the par marks. Juveniles also have white to orange tips on the dorsal and anal fins, and exhibit few to no black spots on the tail (CalFish 2022). Adults can reach 55 pounds in weight and 45 inches in length (NOAA 2016d), although typical adults are 8 to 11 pounds and 14 to 25 inches in length (CalFish 2022).

5.1.1.2 Life History

Steelhead sexually mature from two to five years of age. Most adults spend about two years maturing in freshwater, and another two years maturing in the ocean. They spawn from December through April. While other anadromous fish often die after spawning, steelhead can survive spawning and can spawn repeatedly. Each female typically deposits 2,000 eggs per kilogram of body weight—up to 50,000 eggs for a larger female (CalFish 2022). Steelhead fry emerge from the gravel in the summer. The steep areas surrounding the flat spawning regions of rivers provide ideal juvenile rearing habitat when eggs hatch. Steelhead eat aquatic insects, crustaceans, zooplankton, fish, fish eggs, and amphibian eggs (NOAA 2016d).

Steelhead are divided into two categories based on their spawning strategies: summer-run and winter-run. Summer-run steelhead return from the ocean before they have reached sexual maturity and begin heading upstream to their spawning grounds. They travel far upstream, arriving at their spawning grounds to breed the following spring. Winter-run steelhead mature sexually while still in the ocean and

head upstream to their spawning grounds in the winter. Winter-run steelhead have a much shorter migration from the ocean to their spawning grounds than summer-run steelhead (CalFish 2022).

5.1.1.3 Habitat Use

Steelhead require a minimum depth of 7 inches of water for adult migration from ocean to spawning habitat. Steelhead have been observed to be unable to traverse water at velocities exceeding 10 feet per second. Ideal water temperatures for migration range between 7.7 and 11.1°C.

The preferred spawning habitat for steelhead is cool, oxygenated water in small- to medium-sized rivers, and their medium-sized perennial tributaries. Spawning typically occurs at flat stretches of water from 6 to 24 inches in depth, where water velocities average 2 feet per second. Females choose spawning locations where stream substrate is composed of gravel that is small enough that they can bury their eggs, but large enough that the eggs remain oxygenated. Once the eggs are deposited, a male fertilizes them, and they are buried. Spawning water temperatures fluctuate from 3.9 to 11.1°C.

Fry and parr stay in waters less than 20 inches in depth, ranging in temperature from 7.2 to 15.6°C. Juvenile rearing habitat is composed of larger cobble substrate at a depth of 10 to 20 inches, typically in estuaries or at stream edges (CalFish 2022). Steelhead have the highest degree of variability in freshwater rearing of all Pacific salmonids—the juvenile freshwater rearing period for steelhead ranges from 1 to 4 years, and as parr grow, microhabitat use changes. Smaller fish occupy riffles, medium fish occupy runs, and larger fish occupy pools.

5.1.1.4 Range, Distribution, and Population Status

Steelhead are found from the California coast to the Kamchatka Peninsula in Russia and have been introduced worldwide (NOAA 2016d). While population trends have increased elsewhere, steelhead have consistently declined in the western United States: Of the 14 identified steelhead ESUs found in the western United States, 11 are listed as threatened or endangered (Garza et al. 2004).

Historically, nine separate populations of steelhead across two diversity strata have been present in the Russian River. These populations represented one of the most productive regions in the ESU, along with the San Francisco Bay tributaries (Bjorkstedt et al. 2005). Steelhead population levels in the eighteenth and early nineteenth centuries were not well documented, but for the first half of the twentieth century, the Russian River was known as the third most productive steelhead river in California. Despite the lack of historic data, the available information consistently suggests that steelhead abundance in the Russian River Basin has declined considerably from historic levels.

As far back as the 1800s, the Russian River Basin steelhead stock originated from a wide variety of sources and exhibited a naturally high degree of genetic diversity (Steiner Environmental Consulting 1996). Subsequent large-scale transfer of hatchery steelhead within the basin has since dramatically increased genetic diversity, and the degree to which this influence has altered the DPS is unclear (Bjorkstedt et al. 2005).

The Russian River Basin continues to support a widely distributed steelhead population, despite apparent declines in abundance (Bjorkstedt et al. 2005). Within the basin, steelhead have been extirpated in areas with barriers to upstream migration. These include the region upstream of Coyote Valley Dam, constructed in 1958, which blocks approximately 21 percent of the historical habitat of the Upper Russian River population. Additionally, the Warm Springs Dam closed the Dry Creek watershed to migration in 1983; this blocked approximately 56 percent of the Dry Creek population's historical habitat (Spence et al. 1996).

In contrast with other anadromous species in the region, aspects of the steelhead's unique life history have afforded the species resistance to extinction. However, the species' reliance on estuarine habitat for juvenile rearing has hindered its recovery. The portion of the population that rear in estuaries naturally have greater feeding resources and thus greater growth opportunities than their stream-rearing counterparts (Bond 2006; Hayes et al. 2006). Studies in juvenile movement have found that a significant portion of the Russian River steelhead population attempts to migrate toward the estuaries to rear and grow (Chase et al. 2007, Katz et al. 2011); however, rearing conditions in the Russian River estuaries are poor and juveniles have low survivorship in the estuaries. The combination of low quality upstream rearing habitat with poor rearing conditions in estuaries is likely the major cause of depressed population levels in the Russian River Basin.

5.1.2 Environmental Baseline

Steelhead historically ranged along the Pacific basin coastal waters and tributaries, from northern Mexico to the Kamchatka Peninsula in Russia. Pomo and Makahmo Indigenous People historically fished the tributaries of the Russian River and caught copious amounts of salmon and trout of unspecified species (Haran 2008). The area was sparsely settled by westerners until 1857, when the City of Healdsburg was established. Declines in trout and salmon populations were already apparent by the 1850s, and in 1852 California began passing a series of laws regulating the trout and salmon harvest season and harvesting techniques.

The Russian River population of CCC steelhead was historically the primary source for this DPS. However, historical sedimentation and pollution from agricultural runoff, timber harvesting practices, and water diversion projects severely degraded the spawning grounds for steelhead within the Russian River Basin. The basin could potentially provide a healthy source population again, supporting the recovery of the DPS. Additionally, the Russian River Basin is important geographically because it is physically large, it fosters a significant diversity of habitats, and it is the northernmost population of this DPS's range. Extirpation of the DPS in this region would cause a dramatic reduction in the population's known range. The Russian River Basin provides wet coastal as well as interior steelhead habitat, and the continued adaptation of steelhead to a diversity of habitats is vital to the species' survival.

Today, two steelhead hatchery programs are active within the DPS: the Don Clausen Fish Hatchery in Sonoma County, and the Kingfisher Flat Hatchery in Santa Cruz County (NOAA 2016d). Although hatcheries influence the genetics of other salmonids, analysis of steelhead genetics has shown that the

population structure of steelhead trout in California has been unaffected by hatcheries and is primarily influenced by migration (Garza et al. 2004).

5.1.2.1 CNDDB Occurrences and Local Records

The nearest CNDDB occurrence for steelhead is outside of the 3-mile radius analyzed (CNDDB 2022, Figure 5). However, Pruitt Creek falls under the extant range determined by expert opinion provided through the PISCES database (2022).

The Sonoma County Water Agency (SCWA) actively monitors salmonids in the Russian River Basin using downstream migrant fish traps on the mainstem of the river and on some of the major tributaries. SCWA operates a fish trap on Mark West Creek located near its confluence with the Russian River. The location of this trap is hydrologically connected to Pruitt Creek which is approximately 9 river miles upstream. This trap is typically operated during salmonid out-migration from April to July or until flow becomes disconnected and is an effort to assess population trends of steelhead and salmon smolts. In 2016, the trap was operated from April 6 to June 23; 141 young-of-the-year (YOY) and parr, and 46 smolts, all CCC steelhead, were captured. The trap was removed in June due to a large drop in the number of fish captured (Martini-Lamb and Manning 2020a). In 2017, the trap was operated from April 28 to June 20; 509 YOY and parr, and 150 smolts, all CCC steelhead, were captured. Operation of the trap ended due to a large drop in the number of fish captured (Martini-Lamb and Manning 2020b). Comparing the number of juvenile steelhead captured in SCWA-operated traps in Mark West Creek from 2012 to 2017, numbers in 2017 were only slightly lower than the average over those six years. In 2021, SCWA reported that due to extreme dry winter conditions, the traps were not operated at all on Mark West Creek because of the lack of sufficient flow during the window they typically monitor migrating smolts (SCWA Technical Advisory Committee meeting June 7, 2021).

5.1.2.2 Site-Specific Conditions

The hydrological period in Pruitt Creek is not ideal for consistent successful migration, spawning, and rearing. Thus, Pruitt Creek likely only provides suitable habitat for salmonids on rare occasions when the hydrology and associated connectivity of the system align. The flow in Pruitt Creek would need to reach 10 cfs with a depth of 7 inches at a minimum to support salmonid movement into the Project area. The estimated average width of the creek is 15 feet which means that the minimum cfs needed for salmonids to reach Pruitt Creek is approximately 1,000 cfs. During the late fall to early winter when Pacific salmonids migrate, the median flow for the past decade in Mark West Creek is approximately 175 cfs. There are occasional increases in flow that reach 1,000 cfs and fall between September to January; however, they are not consistent or sustained.

If salmonids were able to reach Pruitt Creek, the habitat is suitable but not ideal. There is instream cover and predation opportunities, but the habitat type is not diverse and is dominated by flat water with some pools. When flow is sufficient to sustain fish, the depth of the pools could temporarily accommodate adult salmonids. Temperature could be a limiting factor as the water diminishes and ambient temperatures seasonally increase.

Ideal spawning substrate is minimal and riffle habitat types were not present. Water temperature was measured at the upper end of the salmonid spawning threshold, 11.1°C, although the measurement was taken at the very end of the spawning season for steelhead and just outside spawning season for salmon. Water temperature along with the lack of substrate and preferred habitat type all decrease the potential for spawning to occur in Pruitt Creek.

Unless an unusual event changes the typical hydrological period in Pruitt Creek, juvenile salmonids cannot rear in the creek. The creek does not have sufficient flow to sustain incubation and rearing of juvenile populations of salmonids during the late spring and summer months.

5.2 Coho Salmon – CCC; ESU

5.2.1 Status of the Species and Critical Habitat

The CCC ESU coho salmon was listed as threatened and Critical Habitat was established on May 5, 1999 (CalFish 2022; Figure 4). The species' Federal listing was changed from threatened to endangered status on June 28, 2005 (Olswang 2017), but the Critical Habitat was not changed. This Critical Habitat is defined as "accessible reaches of all rivers (including estuarine areas and tributaries) between Punta Gorda and the San Lorenzo River (inclusive) in California, including two streams entering San Francisco Bay: Arroyo Corte Madera Del Presidio and Corte Madera Creek" (NOAA 1999). Inaccessible areas blocked by dams or other water projects are not considered part of the species' Critical Habitat. The nearest mapped Critical Habitat to the Project site is Pool Creek, which is located approximately 1 mile northwest.

5.2.1.1 Species Description

Adult coho salmon are generally silver in color, typically measuring 21 to 27 inches in length and weighing 6 to 13 pounds (Olswang 2017; CalFish 2022). Sexual dimorphism is apparent in spawning adults. Spawning males display a characteristic dark red on both sides, dark green to brown head and back, and gray to black belly. Most spawning males have an exaggerated hooked jaw and humped backs. Spawning females have similar but comparatively dull coloration, pink on their sides, and a slightly less hooked jaw. All adults have small black spots on the dorsal fin and upper caudal fin, with no spots on the lower portion of the caudal fin. They can be distinguished from other salmon by a white line on the upper area of the gums, at the base of the teeth. Juveniles, in contrast, are dusky gray or brown, and have 8 to 12 widely spaced parr marks on each side of their bodies. Juveniles have a speckled adipose fin, and their other fins are tinted orange. They can be distinguished from other salmonid juveniles by their comparatively large eyes and their anal fin, which is sickle shaped with a white leading edge (Olswang 2017).

5.2.1.2 Life History

Most adult coho salmon spend two years in the ocean before returning to their spawning ground. They begin their migration from the ocean in September through January, with spawning occurring from November through March. Female coho salmon select their desired redd (nest) site, dig a small oval

depression in the gravel, and lay approximately 100 eggs, which the male fertilizes externally. The female then buries the first redd by digging another redd immediately upstream, from which loose gravel is deposed into the location of the first redd. The total number of eggs deposited varies based on the female's health and size; studies have found the number of eggs laid per individual ranges from 1,440 to 5,700 (CalFish 2022). Adults die shortly after spawning, although female coho salmon have been seen guarding their fertilized nests for up to 14 days before perishing (CalFish 2022).

Eggs incubate from November through April. Newly hatched coho salmon, called alevins, emerge after 38 to 48 days and remain under the gravel from March through July until their egg sacs are absorbed. After 2 to 10 weeks in this stage, juvenile coho salmon emerge from the gravel and begin to gather in large schools. Unlike other salmonid species, juveniles continue to inhabit freshwater streams for about a year, during which time they exhibit territorial behavior (Brown et al. 1994). After one year in fresh water, the juveniles migrate to the ocean starting in March and continue through July with peak migration from April through June (CalFish 2022). In the ocean, coho salmon congregate in large schools. They stay close to the shore and gradually migrate northward, while feeding on crustaceans, invertebrates, and fish.

5.2.1.3 Habitat Use

Coho salmon typically inhabit cool streams in coastal redwood and conifer forests (Bjorkstedt et al. 2005). The adults return from the ocean and migrate up short coastal streams after heavy rains when sandbars are cleared (CalFish 2022). Water depths below 7.1 inches prevent migration of adult coho salmon upstream. High turbidity and temperatures exceeding 16.1°C delay out-migration of coho salmon. They prefer to wait in upstream refugia rather than migrating to the ocean when conditions are not suitable. Large woody debris, pools, riparian vegetation, and undercut banks provide cover for migrating coho salmon (California Department of Fish and Game [CDFG] 2004).

Coho salmon need small streams (often mainstem tributaries) near the coast for spawning. Females prefer redd sites with turbulent flow near the head of a riffle, just below a pool. Like other anadromous fish, a medium-sized gravel substrate (approximately 6 inches in diameter) is required to protect eggs and alevins while also being large enough to allow for ample oxygenation and waste flushing (CalFish 2022, CDFG 2004). Ideal incubation habitat has water temperatures of 8.9 to 14.4°C, water flow between 2.9 and 3.4 cfs, stream depth between 3.9 and 13 inches, low sedimentation, and good circulation of oxygenated water (CDFG 2004).

CCC coho salmon are most frequently found in small coastal streams and tributaries of large rivers. Juveniles typically use low-gradient coastal streams, channels, alcoves, estuaries, beaver ponds, and slack waters, especially low-gradient alluvial channels with abundant pools and woody debris (CalFish 2022). In contrast to other salmonids, all coho salmon juveniles over-summer in fresh water. As a result, over-summering juvenile coho salmon are at extremely high risk of impact from habitat degradation: California waterways generally exhibit declining water quality and increased temperature in the summer as intermittent waters dry (Bjorkstedt et al. 2005).

Juvenile coho salmon need habitat with at least 80 percent riparian vegetative cover, less than 60 Nephelometric Turbidity Units (NTUs) of turbidity, water depths between 9 and 48 inches, water temperatures between 2.2 and 25.5°C, and water velocity between 0.16 feet/second (pools) and 1.51 feet/second (riffles) (CDFG 2004).

The survival of juvenile coho salmon is highly dependent on water temperatures. Individuals will not survive in water temperatures exceeding 21.7°C for an extended period of time (CalFish 2022). Frissell (1992) found that in Oregon, coho salmon densities decreased linearly as temperatures exceeded 17°C, and two studies in Northern California found that juvenile coho salmon did not persist when weekly average temperatures exceeded 18.3°C (Welsh et al. 2001, Hines and Ambrose 1998).

5.2.1.4 Range, Distribution, and Population Status

Coho salmon were historically abundant in coastal watersheds from the Oregon border through Santa Cruz County. North of Humboldt County, they are believed to only be present in two-thirds of their historic habitat (Olswang 2017). Coho salmon were once present in nearly all tributaries of the San Francisco Bay and most streams south of the Bay Area but are now extirpated from these waterways (Olswang 2017). In 1994, Brown et al. noted that the current coho salmon population in California was estimated to be limited to only about 31,000 returning adults annually, 57 percent of which were born in a hatchery. Statewide, fewer than 5,000 native coho salmon individuals return to spawn that have no known hatchery ancestry; this represents 6 percent of the estimated population from the 1940s. Throughout the Pacific Northwest, coho salmon are considered extinct in the eastern half of their range, and in serious decline across their western range (Brown et al. 1994).

CCC coho salmon populations have dropped rapidly from their prolific abundance in the early 1800s to near extinction today within most of their range. Early logging and milling practices diverted water, dammed streams, increased temperatures, and deposited large quantities of sediment into coho salmon streams, making them unsuitable for habitation. This, combined with overfishing and mining practices, caused significant declines in coho salmon numbers that were apparent by 1880. In response, legislation was established to reduce overfishing and prevent stream pollution, and hatcheries began opening to propagate steelhead, coho, and Chinook salmon populations. However, coho salmon populations were not successfully increased by hatchery efforts until the mid-twentieth century.

An increase in gravel mining from rivers, urban development, and poor erosion control measures damaged and eliminated coho salmon spawning grounds. Additionally, physical barriers were introduced that blocked large portions of the historic range, including the Coyote Valley Dam, constructed in 1958, and the Warm Springs Dam, constructed in 1983 (Spence et al. 1996).

Studies of juvenile coho salmon migrating to the ocean found an 85 percent decline in population between 1975 and 1991. In 2009, only one coho salmon was observed in the Russian River Basin, and it was inadvertently killed by an angler (NMFS 2012).

Two distinct populations of CCC coho salmon were identified by Bjorkstedt et al. (2005); the northwestern portion of the Russian River Basin contains a small ephemeral coho salmon population that occupies tributaries of the Russian River, and the southern portion of the basin supports a large independent population that represents, historically, the largest and most dominant source population in the ESU. Pruitt Creek is in the range of the northwestern ephemeral population that relied on favorable conditions in the typically dryer, warmer tributaries of the Russian River to complete their life cycle.

5.2.2 Environmental Baseline

Historic abundance of coho salmon in the western United States is difficult to measure, as older records are unreliable and frequently do not distinguish between salmon species (NMFS 2012). In the 1930s, the Russian River was known for large coho salmon runs, which were "once a mainstay of California's sport and commercial fisheries" (NMFS 2012, Moyle 2002). It has been suggested that the San Francisco Bay tributaries historically provided inconsistent quality habitat for coho salmon due to temperature and water quality, and the population was historically reliant on dispersal from coastal populations to persist (Bjorkstedt et al. 2005).

Today, coho salmon are restricted to a few tributaries in the lower watershed and rear only in isolated areas of suitable habitat (Spence et al. 1996). Historically, they represented a significant component of the Russian River Basin aquatic community, occupying many tributaries throughout the basin, and likely spawning in tributaries of the main stem (CDFG 2002). Since the 1800s, the large wetland area known as Laguna de Santa Rosa in the Mark West Creek watershed has gradually been destroyed by reclamation activities. This watershed likely provided historic rearing habitat.

In 2001, the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP) was initiated to re-establish self-sustaining runs of native coho salmon in streams within the Russian River watershed that historically supported them. This program implemented a two-tiered approach to coho salmon recovery by establishing a coho salmon hatchery at Don Clausen/Warm Springs and a continuous monitoring program at all life stages for coho salmon released from the hatcheries (Obedzinski et al. 2007). From 2009 through 2012, the program released 10,000 smolts into historic spawning grounds, and an estimated 173 adults returned (Fishpro and Entrix 2012).

Juvenile coho salmon in the Russian River Basin have measuredly declined in abundance and distribution in recent years (Conrad and White 2006). The RRCSCBP has confirmed the presence of wild juvenile coho salmon in 5 of 32 historic coho salmon streams in the basin (Brown et al. 1994). Similar studies in recent years have found coho salmon juveniles in only 3 of the 32 historic coho salmon streams, and only in intermittent years (Conrad and White 2006).

Recent analyses of coho salmon genetics in the Russian River tributaries suggest that the population has experienced an acute loss of genetic diversity in the basin. The results of genetic analyses are consistent with a population experiencing extremely reduced abundance, strong departures from genetic equilibrium, and recent severe population bottlenecks (Bjorkstedt et al. 2005).

The population of coho salmon in the Russian River Basin is likely trending toward extinction given their steep declines in abundance, lack of genetic diversity, and a fragmented distribution. The population has declined so rapidly that inbreeding and demographic instability will likely occur and lead into an even faster decline (Frankham et al. 2002). The Russian River Basin represents one-third of the CCC coho salmon ESU's entire range by area, and it is located in the center of the ESU's range. This ESU represents the southern extent of the species' range (NOAA 2016b).

Conservation of this regional population is considered essential for recovery of the entire species, which is why widespread coho salmon hatchery operations have existed in the Russian River since 2005. Although hatchery efforts initially resulted in few measurable improvements to the coho salmon population, hatcheries initiated experiments to vary the timing of juvenile release beginning in 2012. Early measurements of the subsequent improvements to coho salmon have been encouraging; counts of returning coho salmon in the 2014–2015 spawning year represented the largest yield since hatchery efforts began (NOAA 2016b).

5.2.2.1 CNDDB Occurrences and Local Records

According to CNDDB, the nearest known record of CCC coho salmon was documented in in 2015 in Mark West Creek, approximately 0.75 miles south of the southern edge of the Project site (Figure 5). This occurrence was mapped to include given detection locations and represents 1,051 smolts counted at a downstream trap near the confluence of Mark West and Windsor creeks from March 26 to June 8, 2015. This occurrence also represents 67 smolts observed during direct observation snorkel surveys that were conducted in July and August of 2015. No additional records of coho salmon are recorded on CNDDB within 3 miles of the Project site.

SCWA actively monitors salmonids in the Russian River Basin using downstream migrant fish traps on the mainstem of the river and on some of the major tributaries. SCWA operates a fish trap on Mark West Creek located near the confluence with the Russian River. The location of this trap is hydrologically connected to Pruitt Creek which is approximately nine river miles upstream. This trap is typically operated during salmonid out-migration from April to July or until flow becomes disconnected. It is an effort to assess population trends of steelhead and salmon smolts. In 2016, the trap was operated from April 6 to June 23, and 37 hatchery smolts, 16 smolts of unknown origin, and 5 wild YOY/parr—all CCC coho salmon—were detected at the trap. The trap was removed in June due to a large drop in the number of fish captured (Martini-Lamb and Manning 2020a). Similarly, in 2017 the trap was operated from April 28 to June 20 and 1,065 hatchery smolts, 44 smolts of unknown origin, and 17 wild smolts, all CCC coho salmon, were detected at the trap. Operation of the trap ended due to a large drop in the number of fish captured (Martini-Lamb and Manning 2020b).

Comparing the number of juvenile coho salmon captured in SCWA-operated traps in Mark West Creek from 2012 to 2017, numbers were the highest in 2013, followed by 2017. In 2021, SCWA reported that due to extreme dry winter conditions, the traps were not operated at all on Mark West Creek because of the lack of sufficient flow during the window they typically monitor migrating smolts (SCWA Technical Advisory Committee meeting June 7, 2021).

5.2.2.2 Site-Specific Conditions

Site-specific conditions are similar for all three Pacific salmonids. Refer to Section 5.1.2.2.

Coho salmon's specific life history requirements make them less adaptable to habitat degradation than other salmonids, especially regarding water quality and temperature. While other salmonids may migrate to the ocean before fully maturing, all coho salmon spend their first summer in freshwater streams, wetlands, and estuaries. Northern California streams are naturally subject to unpredictable changes in flow, which can cause quick jumps in temperature or loss of connectivity with mainstem rivers. Combined with juvenile coho salmon's susceptibility to high water temperatures, natural variability in Northern California waterways can threaten developing coho salmon. Human influences can exacerbate this effect: agricultural runoff can cause eutrophication and algae blooms, decreasing dissolved oxygen and increasing temperatures. Development, logging, and agriculture may result in decrease/removal of emergent vegetation, reducing shade and increasing erosion into waterways, which in turn increases water temperatures and sedimentation.

5.3 Chinook Salmon – CC; ESU

5.3.1 Status of the Species and Critical Habitat

The CC ESU Chinook salmon was designated as a threatened species in 1999, with Critical Habitat designated the same year. In 2005, an addendum to the listing mandated that hatchery-born individuals are protected within this ESU. The ESU is defined as all accessible reaches south of the Klamath River to the Russian River, including seven artificial propagation programs, none of which occur within the Russian River Basin. The CC Chinook salmon Critical Habitat includes waterways in Sonoma, Mendocino, and Humboldt counties, and a few small tributaries of the Eel River that reach into Lake and Trinity counties (NOAA 2005). The closest Critical Habitat to the proposed work area is the Russian River (Figure 4).

5.3.1.1 Species Description

Chinook salmon are the largest Pacific salmonid, ranging from 20 to 99 pounds and 30 to 55 inches in length at adult size (CalFish 2022). Adults are typically blue green, with small black spots across the tail, and black gums along the base of the teeth. While in the ocean, they have silver sides. When returning to their spawning grounds, both sexes display small black spots on the back, dorsal fin, and tail, with olive brown to dark maroon blotches on their sides. Some minor sexual dimorphism is apparent during spawning; males have more hooked jaws, slightly humped backs, and are overall darker in color than females. Juvenile Chinook salmon have 6 to 12 parr marks spaced equal to or wider than the width of the marks, mostly extending below the lateral line. They can be differentiated from other juvenile anadromous fish because all their fins are clear except for the adipose fin, which is pigmented only at the upper edge, and the dorsal fin, which is spotted.

5.3.1.2 Life History

The CC Chinook salmon exhibit only fall-run migration patterns and are typical ocean-type salmon. The spring-run population is believed to be extirpated from the range of this ESU (Moyle et al. 2008). Adults typically return from the ocean to their spawning grounds from September through November. Spawning occurs soon after freshwater entry, starting in October and continuing through December. Each female deposits between 2,000 and 17,000 eggs, and adults die within a few days of spawning (Moyle et al. 2008).

In late winter through spring, alevin emerge from the gravel. Within a month of emerging, most juvenile Chinook salmon are large and strong enough to migrate downstream to deeper and faster waters where they feed opportunistically on small prey items, primarily insects, zooplankton, and other fish larvae during their gradual migration toward the ocean. They spend variable amounts of time growing from juvenile to adult size in transitional habitat such as estuaries, lagoons, and bays before entering the ocean. (Calfish 2022).

Once they enter the ocean, Chinook salmon prey primarily on crustaceans and smaller fish. Individuals often migrate northward along the coast and return to their spawning grounds after two to four years at sea (CalFish 2022).

5.3.1.3 Habitat Use

Ideal spawning habitat for Chinook salmon is similar to steelhead and coho salmon: clear, cool streams with high levels of dissolved oxygen and low sedimentation. Chinook salmon require relatively larger gravel and smaller cobble substrate compared to other salmon species (Santos et al. 2014). Spawning Chinook salmon are also particularly sensitive to low levels of dissolved oxygen and reduced water clarity (Moyle et al. 2008). Chinook salmon eggs develop best at temperatures of 5 to 13°C (Santos et al. 2014). Chinook salmon fries prefer water temperatures of 13 to 18°C for optimal growth rates; water temperatures greater than 24°C are lethal to juveniles (CalFish 2022).

After emerging from the gravel, juvenile Chinook salmon move to shallow stream margins with dense emergent vegetation. Juveniles are highly dependent on transitional habitats such as estuaries, lagoons, and bays where they grow into their adult size. Once in the ocean, Chinook salmon migrate northward along the California coast. They typically use ocean habitat ranging in depth from 65 to 150 feet and will seasonally travel to waters up to 330 feet in depth (CalFish 2022).

Chinook salmon adults migrating upstream often make use of pools with low water velocities to rest. These holding areas are typically bedrock-substrate pools containing overhanging ledges and pockets that provide cover (Calfish 2022).

5.3.1.4 Range, Distribution, and Population Status

Historical conditions of the Russian River provided substantial suitable habitat and likely supported a healthy population of fall-run Chinook salmon. Early accounts from local tribes in the Coyote Valley provide evidence that Chinook salmon were widely harvested prior to the construction of the Coyote

Valley Dam in 1958 (Steiner Environmental Consulting [SEC] 1996). However, by the 1980s, Chinook salmon were considered nearly extirpated from the Russian River Basin (Cook 2008). Hatchery programs and fishing regulations introduced since that time have helped the population to rebound, though continued development and habitat degradation increasingly threaten the recovery of the population. The degree to which the population has recovered is unknown, as reliable data on Chinook salmon abundance in the Russian River Basin was not available until 2000 (Chase et al. 2007).

Over the last several years, data from the fish ladders at Mirabel Dam have indicated an increase in Chinook salmon abundance (Chase et al. 2007). Considering there are 548 stream miles of historic habitat in the basin, the current population is not considered stable (Bjorkstedt et al. 2005).

Genetic analysis of Chinook salmon in the Russian River indicates that they are not closely related to nearby populations of Chinook salmon found in the Eel River or the Central Valley. This could be an indication that the population evolved as a diverse group of coastal sub-populations. It could also be a result of widespread hatchery stocking beginning in the 1880s (Bjorkstedt et al. 2005, Chase et al. 2007). The uncertain genetic origin of this population may mislead researchers conducting genetic analyses of the population's historic abundance. No compelling evidence of the decline of the Russian River population can be made from examining genetics alone. This analysis should be considered with caution because continued degradation of the species' habitat, including water diversion, confinement of the river channel, limited riparian vegetation, and increased sedimentation from roads, construction, and development, continue to threaten the recovery of the Russian River Chinook salmon.

The Russian River Basin is the southernmost extent of the CC Chinook salmon ESU range, and its extirpation from the region would constitute a substantial range restriction. The Russian River represents the largest watershed within the CC Chinook salmon ESU, and currently is believed to support the largest population within the ESU. As such, the Chinook salmon in the Russian River likely contribute a significant amount of genetic diversity to the ESU, and the conservation of this population of Chinook salmon is critical for the conservation of the population.

5.3.2 Environmental Baseline

The Russian River Chinook salmon population was not historically well documented, and no definitive records of the species are available prior to the first fish stocking effort in 1881 (Chase et al. 2007). All prior sources represented an unspecified salmon species. There is extensive historical record of large water projects throughout the Russian River Basin that diverted and impeded the flow of water since 1908. Extensive fish stocking programs of Chinook salmon from other watersheds beginning in the 1800s may have complicated genetic analyses of Chinook salmon populations in the area. Recent hatchery introduction of Chinook salmon from the Don Clausen Fish Hatchery has failed to result in a measurable increase in the adult population of Chinook salmon in the basin. SCWA conducted fish surveys starting in 2000 using improved survey techniques and found spawning salmon in 82 miles of the mainstem Russian River and Dry Creek (Chase et al. 2007).

This recent measured increase in Chinook salmon abundance is thought to have been a result of improved survey methods rather than a true reflection in population increase. SCWA determined that due to a lack of reliable historic data, the population of Chinook salmon in the Russian River Basin is impossible to determine prior to 2000. However, due to widespread destruction of habitat, the population has likely declined (Chase et al. 2007).

5.3.2.1 CNDDB Occurrences and Local Records

There are no recorded occurrences of the CC Chinook salmon in CNDDB within 3 miles of the Project site (Figure 5). CNDDB data for CC Chinook salmon is limited and currently only exists in Northern California near the Eel River (CNDDB 2022).

SCWA's surveys of the Russian River from Healdsburg at Riverfront Park north to Ukiah found high Chinook salmon abundance and redds between 2002 and 2006. Throughout the watershed, 1,036 redds were observed in 2002, and 1,157 redds were counted in 2003. In 2006, however, only 603 were counted in the same watershed. The highest abundance of redds occurred at Dry Creek near Ukiah, and the highest abundance of adults were counted at Mirabel Dam, approximately 1 mile upstream of the confluence of Mark West Creek and the Russian River. The small number of adults versus juveniles observed could have been caused by spawning occurring after surveys were conducted or outside of study areas; it may also be due to loss of fish to poaching and predation.

SCWA actively monitors salmonids in the Russian River Basin using downstream migrant fish traps on the mainstem of the river and on some of the major tributaries. They also operate a trap on Mark West Creek near its confluence with the Russian River. The location of this trap is hydrologically connected to Pruitt Creek which is approximately 9 river miles upstream. This trap is typically operated during salmonid out-migration from April to July or until flow becomes disconnected and is part of an effort to assess population trends of steelhead and salmon smolts.

In 2016, the trap was operated from April 6 to June 23 and 136 CC Chinook salmon smolts were detected. The trap was removed in June due to a large drop in the number of fish captured (Martini-Lamb and Manning 2020a). Similarly, in 2017 the trap was operated from April 28 to June 20 and no CC Chinook salmon smolts were detected at the trap. Operation of the trap ended due to a large drop in the number of fish captured (Martini-Lamb and Manning 2020b). Relatively few CC Chinook salmon smolts were captured in tributaries of the Russian River in 2016 and 2017, with a sharp drop in 2017. In 2021, SCWA reported that due to extreme dry winter conditions the traps were not operated at all on Mark West Creek because of the lack of sufficient flow during the window they typically monitor migrating smolts (SCWA Technical Advisory Committee meeting June 7, 2021).

5.3.2.2 Site-specific Conditions

Site-specific conditions are similar for all three Pacific salmonids. Refer to Section 5.1.2.2.

6.0 EFFECTS OF THE PROJECT ON LISTED PACIFIC SALMONIDS AND CRITICAL HABITAT

6.1 Effects to Individual Listed Pacific Salmonids

Effects of the Proposed Action are anticipated to be similar for the three Federally listed Pacific salmonids and will come from potential changes in water quality and associated changes in downstream habitat suitability, as the reach of Pruitt Creek is generally poor-quality habitat for all salmonids due to hydrological period and water quality parameters. Salmonids are sensitive to changes in water quality and temperature. They prefer a range from 7.2 to 14.4°C with adequate dissolved oxygen levels and low turbidity. Water quality can adversely affect salmonid growth and survival at all stages of their lifecycle. Water quality along with the hydroperiod can determine migration timing and spawning location, and the success of incubation, rearing and out-migration. Their resilience is highly limited by the quality and availability of their habitat. Listed Pacific salmonids are assumed to be absent from Pruitt Creek based on observations from the February 23, 2022, site assessment coupled with background research and lack of historic occurrences.

The potential for Pacific salmonids to occur and use habitat in this far east portion of the Russian River Basin is temporally and physically limited. There is a low potential that CC Chinook salmon will occur in Pruitt Creek based on their current distribution and their patterns of migration. There is a moderate potential for CCC coho salmon and steelhead to occur in Pruitt Creek; however, large rain events and associated increases in water flow and decreases in water temperature need to align with their migration event. Additionally, all higher-order tributaries to the Russian River connected to Pruitt Creek would need to have sufficient flow and provide uninhibited access to Pruitt Creek.

The extent of potential indirect effects includes the portion of Pruitt Creek within the Project site as well as a small portion of the watershed downstream. Furthermore, potential effects of the proposed Project would be minimal, short-term, and localized. Thus, no effects to the environmental baseline of the Russian River Basin are anticipated.

6.1.1 Direct Effects

Water quality can be degraded during construction activities. There is a potential for an increase in soil erosion, suspended sediment load, turbidity, or direct introduction of harmful materials such as grease and oil. This can have a direct effect on salmonids by reducing water clarity for feeding visibility, clogging fish gills, introducing fine sediment to spawning beds, or introducing an environmental toxin (Bash, Berman, and Bolton 2001). Though there is potential for such direct effects during construction, industry recognized BMPs (refer to Section 2.3.4) will be implemented to manage construction on the Project site. After construction is complete, there is a potential for untreated storm water to reach Pruitt Creek if it flows over an impervious surface. This could have the same direct effects to the water quality in Pruitt Creek as discussed above. Bioswales will be created to treat stormwater on the Project site and help avoid water qualiy degradation in the creek. In addition, direct effects to listed Pacific salmonids

can be avoided by limiting all activities with the likelihood to degrade water quality to a work window of June 15 through October 15, when Pruitt Creek is dry. During this time, salmonids would be absent from the section of Pruitt Creek bisecting the Project site; therefore, no direct effects to salmonids are anticipated as a result of the proposed Project.

Discharge of wastewater directly into Pruitt Creek from the on-site MBR treatment system could potentially decrease water quality. Water discharged into the creek could alter the temperature, hydrogen ion concentration (pH), and dissolved oxygen level. The turbidity could increase as well as the bacteria and toxicity content, and a temperature increase can have a direct effect on salmonids. Salmonid spawning, incubation, emergence, and maturation can all be affected by increasing water temperatures and consequently negatively affect the success of salmonid reproduction (Carter 2008). If temperatures are increased significantly and reach a lethal threshold for multiple days in a row, it can cause death for all life stages of salmonids. According to Carter (2008), the literature suggests that for steelhead adults migrating and holding as well as juveniles growing and rearing, the lethal temperature is 24°C and 20°C for spawning, incubation, and emergence. For Chinook and coho salmon adults migrating and holding as well as juveniles growing and rearing, the lethal temperature is 25°C and 20°C for spawning, incubation, and emergence.

Changes in the pH levels that sustain for extended periods of time in a freshwater system can have a direct effect on salmonids. Altered pH levels decrease activity levels, create stress responses, cause a decrease or absence of feeding, and can lead to a loss of physiological equilibrium. Altered pH levels can also be exacerbated by increases in water temperature (Wagner, Boasakowski, and Intelmann 1997). Reproduction and juvenile growth and rearing is affected by low levels of pH in a system (Jordahl and Benson 1987).

Dissolved oxygen at adequate levels is essential to survival, and alterations in dissolved oxygen can have direct effects on salmonids. Reduced levels of dissolved oxygen can negatively impact growth and maturation of salmonids at all life stages. High levels of dissolved oxygen can also cause disease and death for salmonids (Carter 2008). As discussed above, increased turbidity can directly affect salmonids by reducing water clarity for feeding visibility, clogging fish gills, and introducing fine sediment to spawning beds (Bash, Berman, and Bolton 2001).

Though there is potential for direct effects from wastewater discharged into Pruitt Creek, these effects from the Project will be minimized, as the design of the MBR treatment system will implement the water quality and recycled water discharge requirements based on the EPA NPDES permit and those provided in the Basin Plan (NCRWQCB 2018) and Title 22 (SWRCB 2018). The Basin Plan recognizes the unique characteristics of the region (including the Russian River watershed) and how they relate to natural water quality beneficial uses and water quality issues. The Basin Plan specifically considers the North Coast Region streams and rivers, which support anadromous fisheries such as CCC coho, CC Chinook, and CCC steelhead and details how healthy fisheries and riparian ecosystems are integral to the continued success of these native fish populations. Pruitt Creek is part of the Mark West Hydrological Subarea, and beneficial uses include cold freshwater habitat and Spawning, Reproduction,

and/or Early Development (SPWN) as defined in Chapter 2 of the Basin Plan. The wastewater discharge from the Project will meet all Basin Plan requirements for water quality for a designated cold freshwater habitat and spawning, reproduction, and/or early development. It will also consider the standards established in Title 22.

For water temperature, this means at no time or place shall the temperature be increased by more than 5°F above natural receiving water condition. If deemed necessary, a cooling mechanism will be integrated into the design to ensure that water is cooled before it is discharged into Pruitt Creek and meets the conditions required per the Basin Plan and Title 22. For turbidity, it will meet or exceed Title 22 standards of less than 0.2 NTU as well as the Basin Plan's requirement that it shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof. The pH levels will be between 8.5 and 6.5.

The daily minimum objective for dissolved oxygen will be 9 milligrams per liter (mg/L) with a 7-day moving average objective of 11 mg/L. This is the average of each set of seven consecutive daily averages and represents the highest water quality requirements based on the SPWN designation for the Mark West Hydrological Subarea. Water quality objectives designed to protect SPWN-designated waters apply to reaches where spawning occurs and during the periods of time when spawning, egg incubation, and larval development occur or have historically occurred. For the North Coast Region, this period is between September 15 and June 4. Outside of that date range, the daily minimum objective for dissolved oxygen will be 6 mg/L with a 7-day moving average objective of 8 mg/L per the cold freshwater habitat requirement.

The bacteria content will meet or exceed the Title 22 standards of less than a most probable number (MPN) of 2.2 per 100 ml for coliform. It shall not be degraded beyond natural background levels according to the North Coast Region. Additives planned for use include chlorine, which would be added to water being reused in the toilets on site. Water would be dechlorinated before being discharged to surface waters; therefore, no additives for the treated effluent will be discharged to Pruitt Creek. According to the Basin Plan, no biostimulatory substances may be discharged.

The timing of discharge will coincide with a specific threshold streamflow that must be present in Pruitt Creek. Discharge will occur only when there is sufficient flow to dilute the effluent, and it seasonally aligns with the natural low regime of the system both to minimize changes in water quality and to avoid altering migration or movement patterns of salmonids. The Basin Plan prohibits effluent discharges from wastewater treatment plants to some surface waters between May 15 and September 30 due to significant seasonal flow variations during the summer and winter months. Discharges during the wetter winter months (October 1 to May 14) must comply with the surface water rate discharge flow limitation. The wastewater discharged from the Project will be limited to discharging up to 1 percent of the measured flow at the Mark West Creek Gauging Station. For example, this percentage is equal to 450 gallons per minute when Pruitt Creek is flowing at 1 cfs. This scenario minimizes any long-term or widely spread effects to water quality from direct discharge.

The implementation of these requirements coupled with water quality monitoring as an AMM will minimize the direct effects of discharge from the MBR treatment system into Pruitt Creek.

6.1.2 Indirect Effects

Removal or alteration of riparian vegetation may lead to a loss of instream cover, loss of temperature regulation capacity, and a reduction of bank stabilization. A loss or reduction of instream cover could result in an increase in predation. Removing shade along the riparian corridor may increase the temperature of the water. Vegetation plays an important role in stabilizing the banks of a creek, and alteration to this vegetation could increase erosion and change the course of a stream. These effects have the potential to indirectly affect individual listed Pacific salmonids by degrading water quality and reducing the habitat suitability of Pruitt Creek. Salmonids are anticipated to only occur during the late fall, winter, and early spring when temperature stress is low and canopy cover has less effect on the temperature of the creek, during appropriate flow conditions. These indirect effects will have an insignificant effect on individual salmonids with implemented BMPs coupled with the seasonality of the construction window.

Water quality changes in Pruitt Creek from MBR treatment system discharge could alter habitat characteristics that would indirectly effect salmonids. Injecting bacteria into the system could cause algal blooms that could decrease oxygen levels in the water, release toxins into the system, and decrease visibility. High water temperatures, pH changes, and increased turbidity all promote the growth of bacterial algal blooms (CDC 2022). Artificially increased temperatures from effluent may limit the geographic range of salmonids which could decrease opportunities for spawning, rearing, and/or migration. Increases in water temperatures can also increase salmonid susceptibility to disease (Carter 2008) making habitat less suitable for salmonids.

These indirect effects from discharge will have an insignificant effect on individual salmonids with implemented requirements from the Basin Plan (NCRWQCB 2018) and Title 22 (SWRCB 2018) coupled with water quality monitoring required as an AMM.

6.2 Effects on Critical Habitat

The Proposed Action may have short-term and localized effects on designated CCC steelhead DPS Critical Habitat. With the implementation of the AMMs described in this BA, these potential direct and/or indirect effects would be reduced to an insignificant and discountable level.

6.3 Cumulative Effects

“Cumulative effects” are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the Action Area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the Proposed Action are not considered in these cumulative effects analysis because those actions would require separate consultation pursuant to Section 7 of the ESA.

Current, future, and reasonably foreseeable actions in the Project area that could affect listed salmonids, Critical Habitat, and EFH potentially affected by the proposed Project are discussed below:

- Development and the associated increase in surface area of impervious surfaces creates more sheet flow runoff after precipitation events. Runoff could discharge sediment and hazardous waste into Pruitt Creek and decrease the quality of habitat.
- Increase in human activity within the Project area creates more opportunity for disturbance within the creek and riparian corridor.
- Non-Federal activities that contribute to climate effects within the Project area must be considered. It is challenging to identify, qualify, or quantify the future environmental conditions caused by climate changes, but it is reasonably certain that indirect adverse effects can be expected for listed salmonids and their habitat.

Construction of the proposed project would contribute a minor amount to the cumulative loss of suitable aquatic habitat for CCC steelhead, CCC coho salmon, and CC Chinook salmon. With the implementation of the AMMs described in this BA, the Project's contribution to effects on listed fish would be reduced to a less than cumulatively considerable level.

6.4 Interrelated and Interdependent Activities

Interrelated and interdependent effects are effects that occur because of interrelated or interdependent activities. They can be direct or indirect effects. The construction of the proposed Project is an interrelated and interdependent activity to the proposed Federal action of placing land into Federal trust. The Project would not be constructed but for the transfer of land into Federal trust.

7.0 AVOIDANCE AND MINIMIZATION MEASURES

This section provides AMMs that will protect and minimize impacts to Federally listed Pacific salmonid species that may be adversely affected by the proposed Project. These measures are an integral part of the Proposed Action and will be carried out by the Applicant. AMMs as part of this Project include the following:

- Ground disturbing activities, such as grading, clearing, and excavation for the proposed Project will be performed between June 15 and October 15 when Pruitt Creek has little to no water flow. In the event of substantial, unseasonably high flow within Pruitt Creek on or after April 15, work will be altered or stopped until flow ceases in the creek. Temporary stormwater BMPs such as vegetative stabilization and linear sediment barriers should be established between disturbed portions of the project site and Pruitt Creek to prevent sedimentation in the watercourse.
- Alterations to riparian vegetation should be avoided to the maximum extent possible. The project footprint should be established at the minimum size necessary to complete the work.

Temporary setback areas should be marked with fencing to protect the riparian zone and its function. Any disturbed riparian areas will be replanted with native trees and shrubs.

- A qualified biologist shall delineate an Environmentally Sensitive Area (ESA) along Pruitt Creek. The contractor shall install high-visibility fence to prevent accidental incursion on the ESA.
- A SWPPP will be prepared and will involve site-specific erosion and sediment control practices. These practices will include but are not limited to:
  - Installation of wattles and silt fencing around disturbed areas near Pruitt Creek
  - Sediment settling basins and drainage inlet protection
  - Concrete washout areas
- If excavation occurs during a rain event, stockpiles of loose material must be covered, and runoff diverted away from Pruitt Creek. All storm runoff will be managed through an erosion control plan.
- Temporary erosion control measures should remain on the Project site until perennial or planted vegetation is established and functioning to minimize sediment discharged into the creek.
- A Spill Prevention and Response Plan will be prepared that reduces the potential for contamination spills. Such preventive measures may include but are not limited to:
  - Hazardous materials used for construction will be stored in closed containers, on an impervious surface, and protected from rainfall to prevent accidental release into the environment.
  - Limit unnecessary use of hazardous materials onsite, such as refueling or servicing equipment.
  - Maintenance materials, such as lubricants, grease, etc. will be stored offsite
- All trash on the Project site must be contained and disposed of offsite regularly.
- Staging areas, access routes, and total area of activity will be limited to the minimum area necessary to achieve Project goals. Routes and boundaries will be clearly marked and outside of the riparian area and create a buffer zone wide enough to support sediment and nutrient control and bank stabilization function.
- All wastewater discharge from the on-site MBR treatment system will follow requirements set forth in the EPA NPDES, Basin Plan (NCRWQCB 2018), and standards established in Title 22 (SWRCB 2018).
- A water quality monitoring protocol and schedule will be established to ensure that parameters are being met as required by above AMM during discharge activities in Pruitt Creek.

8.0 CONCLUSION AND DETERMINATION

The proposed project has been designed to avoid and minimize impacts to species and habitats within the Action Area. This section provides a summary of potential project impacts to each species; see Section 6 above for a full discussion of potential impacts.

Following the analysis of the potential impacts that may result from the Proposed Action, a determination is made that the Proposed Action has a determination of "May Affect, Not Likely to Adversely Affect" the CCC steelhead – DPS, the CCC coho salmon – ESU, and the CC Chinook salmon ESU.

The Proposed Action may result in effects to the salmonids and their habitat in Pruitt Creek. Due to this finding of effect, the BIA is requesting initiation of formal consultation with NMFS, in accordance with Section 7 of the ESA.

To reduce these potential impacts to a level regarded as less than significant, appropriate construction measures and AMMs will be implemented prior to Project commencement and throughout the duration of Project-related activities. Implementation of the prescribed AMMs will ensure that the proposed Project does not adversely affect CCC steelhead – DPS, the CCC coho salmon – ESU, and the CC Chinook salmon ESU, CCC steelhead – DPS Critical Habitat, Pacific salmonid EFH, and downstream receiving waters.

In conclusion, the Applicant is requesting concurrence from the NMFS that the Project "may affect but is not likely to adversely affect" the CCC steelhead – DPS, the CCC coho salmon – ESU, the CC Chinook salmon ESU, CCC steelhead – DSP Critical Habitat, and Pacific salmonid EFH.

8.1 Determination

Based on the analysis provided in this document and the more than negligible probability of take of individual listed anadromous salmonids, the Proposed Action has the following determinations:

CCC steelhead – DPS: "May Affect, Not Likely to Adversely Affect"

CCC coho salmon – ESU: "May Affect, Not Likely to Adversely Affect"

CC Chinook salmon – ESU: "May Affect, Not Likely to Adversely Affect"

CCC steelhead – DPS Critical Habitat: "May Affect, Not Likely to Adversely Affect"

EFH for Pacific Salmonids: "May Affect, Not Likely to Adversely Affect"

9.0 ESSENTIAL FISH HABITAT CONSULTATION

9.1 Overview of Essential Fish Habitat

The MSA established methods designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. The MSA requires Federal agencies to consult

with NMFS on all Actions, or Proposed Actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (MSA Section 305(B)(2)). "Adverse effect" means any impact that reduces quality and/or quantity of EFH, and may include direct, indirect, site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of Actions (50 CFR 600.810).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA Section 3). For the purpose of interpreting this definition of EFH, "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. And "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

Consultation under Section 305(b) of the MSA (16 U.S.C. 1855(B)) requires that:

Federal agencies must consult with NMFS on all Actions, or Proposed Actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;

NMFS shall provide conservation measure recommendations for any Federal or State activity that may adversely affect EFH; Federal agencies shall, within 30 days after receiving conservation measure recommendations from NMFS, provide a detailed response in writing to NMFS regarding the recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the recommendations of NMFS, the Federal agency shall explain its reason for not following the recommendations.

The MSA requires consultation for all Actions that may adversely affect EFH and does not distinguish between Actions within EFH and Actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must consider Actions that occur outside EFH, such as upstream and upslope activity, which may have an adverse effect on the EFH. Therefore, EFH consultation with NMFS is required by Federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of location.

9.2 Identification of EFH

EFH for the Pacific Coast Salmon Fishery means those waters and substrate necessary for salmon production needed to support a long-term sustainable fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH must include all those streams, lakes, ponds, wetlands, and other currently viable water bodies. It must also include most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California, except above the impassible barriers identified by Pacific Fisheries Management Council (PFMC 2014). Salmon EFH excludes areas upstream of longstanding naturally impassable barriers. In the estuarine and marine areas, salmon EFH extends

from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone offshore of Washington, Oregon, and California, north of Point Conception.

9.3 Effect on Essential Fish Habitat

With the implementation of the measures outlined in Section 7.0, the effects to EFH in the Project area from the Proposed Action will be reduced to a less than significant level. The direct and indirect effects of this Project will not significantly reduce the available breeding and rearing habitat for Pacific salmonids and will not significantly reduce their likelihood of survival in the wild by reducing their population size, distribution, or reproduction.

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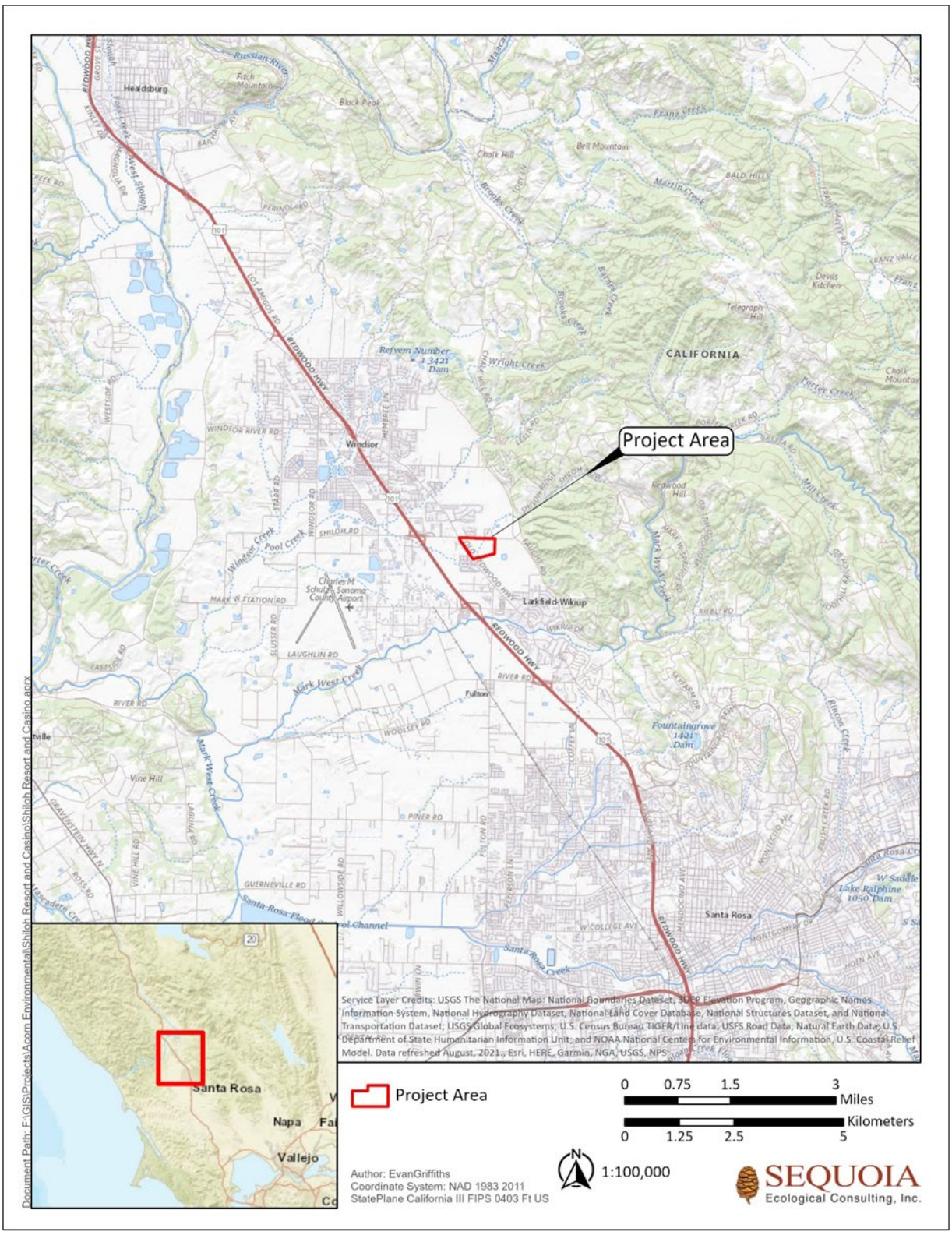


Figure 1. Regional map of the proposed Shiloh Resort and Casino project site.

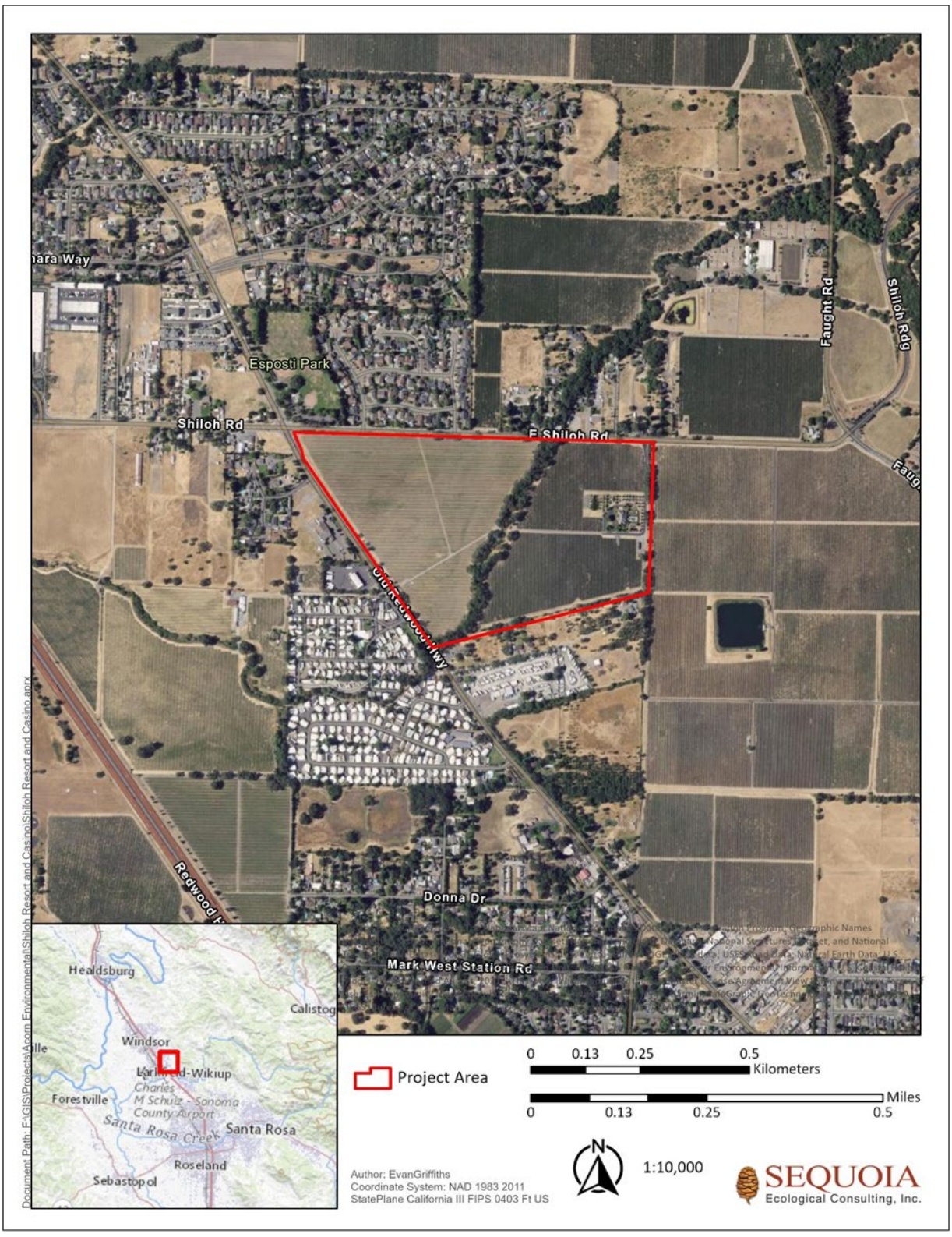


Figure 2. Location map of the proposed Shiloh Resort and Casino project site.

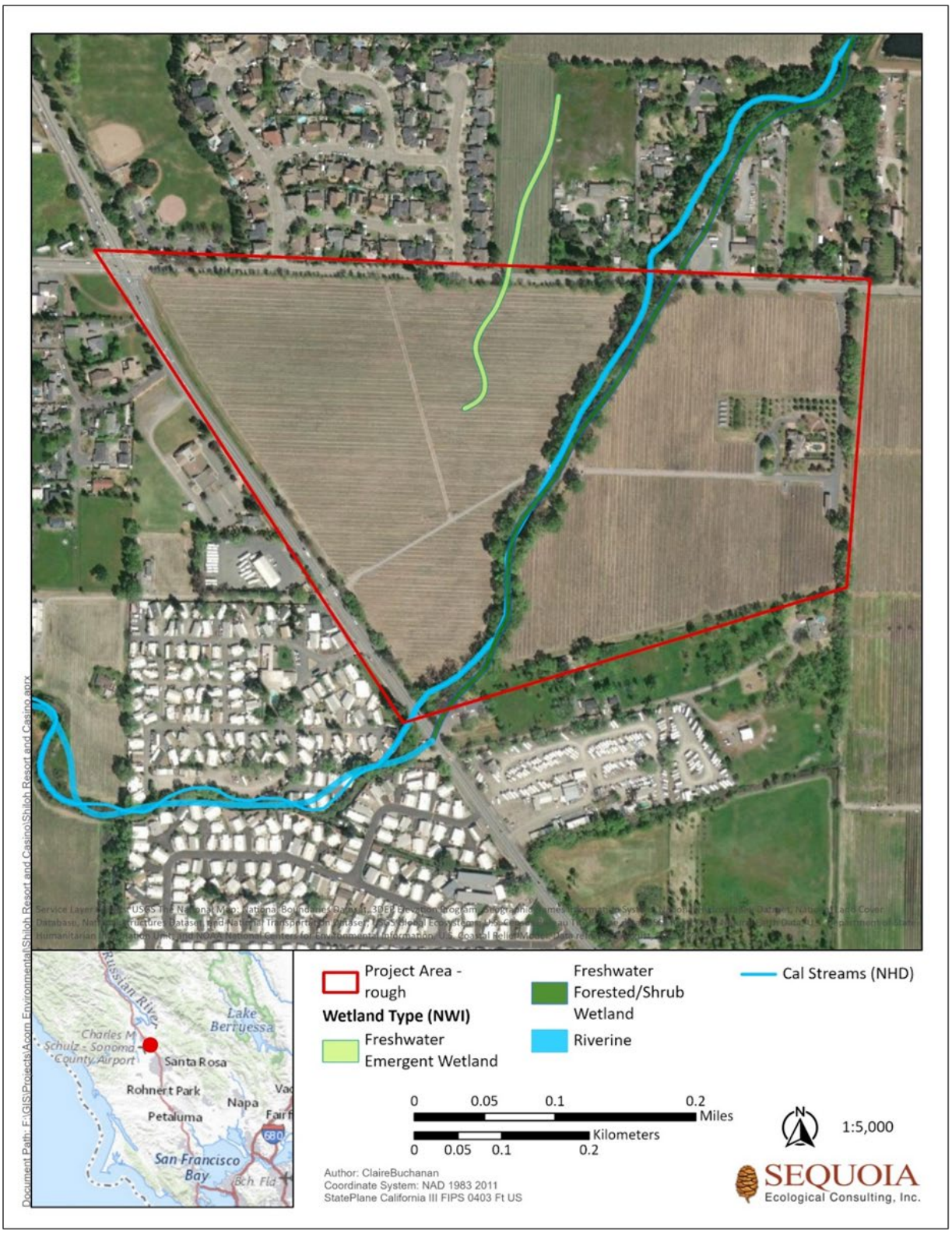


Figure 3. Aquatic features on the proposed Shiloh Resort and Casino project site.

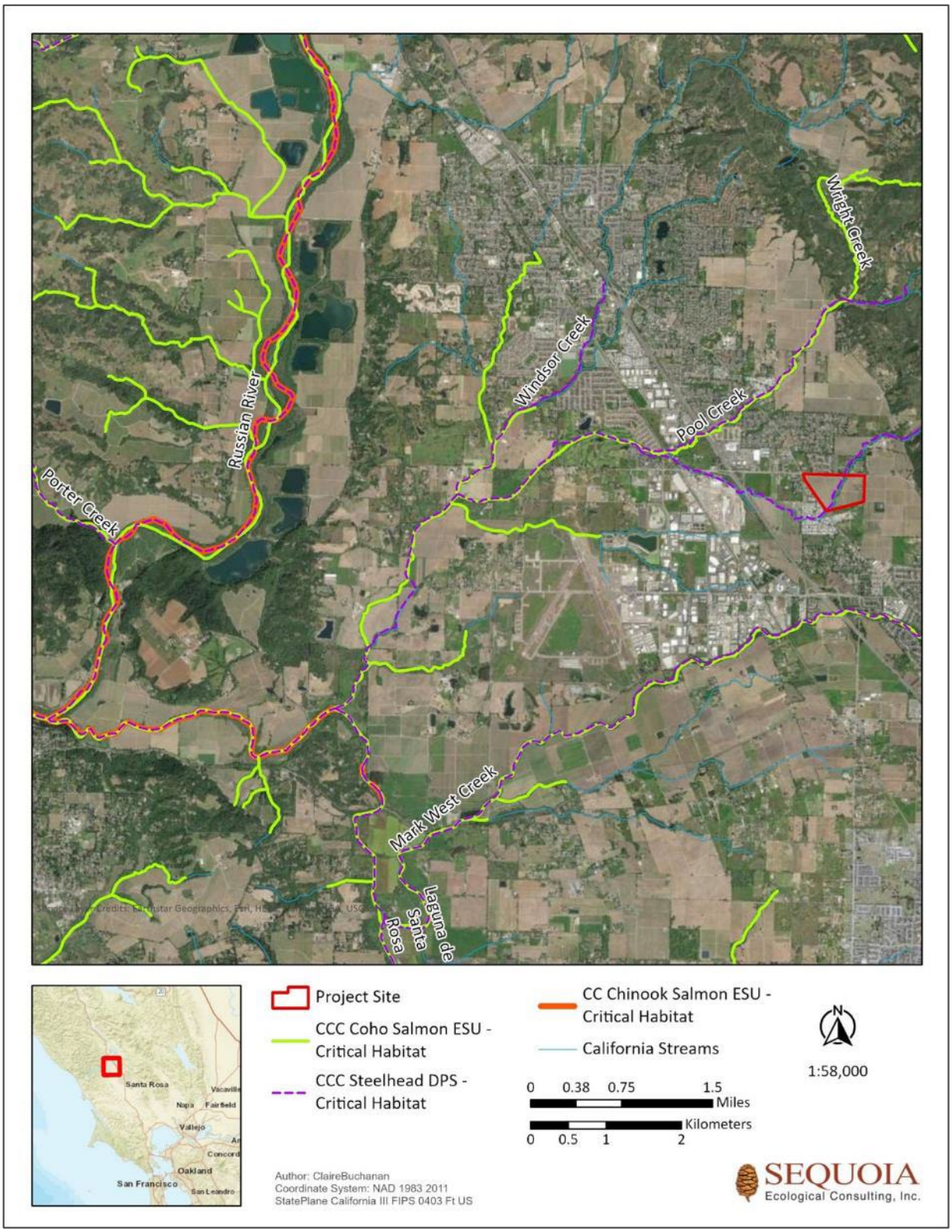


Figure 4. NMFS Critical Habitat in the vicinity of the proposed Shiloh Resort and Casino project site.

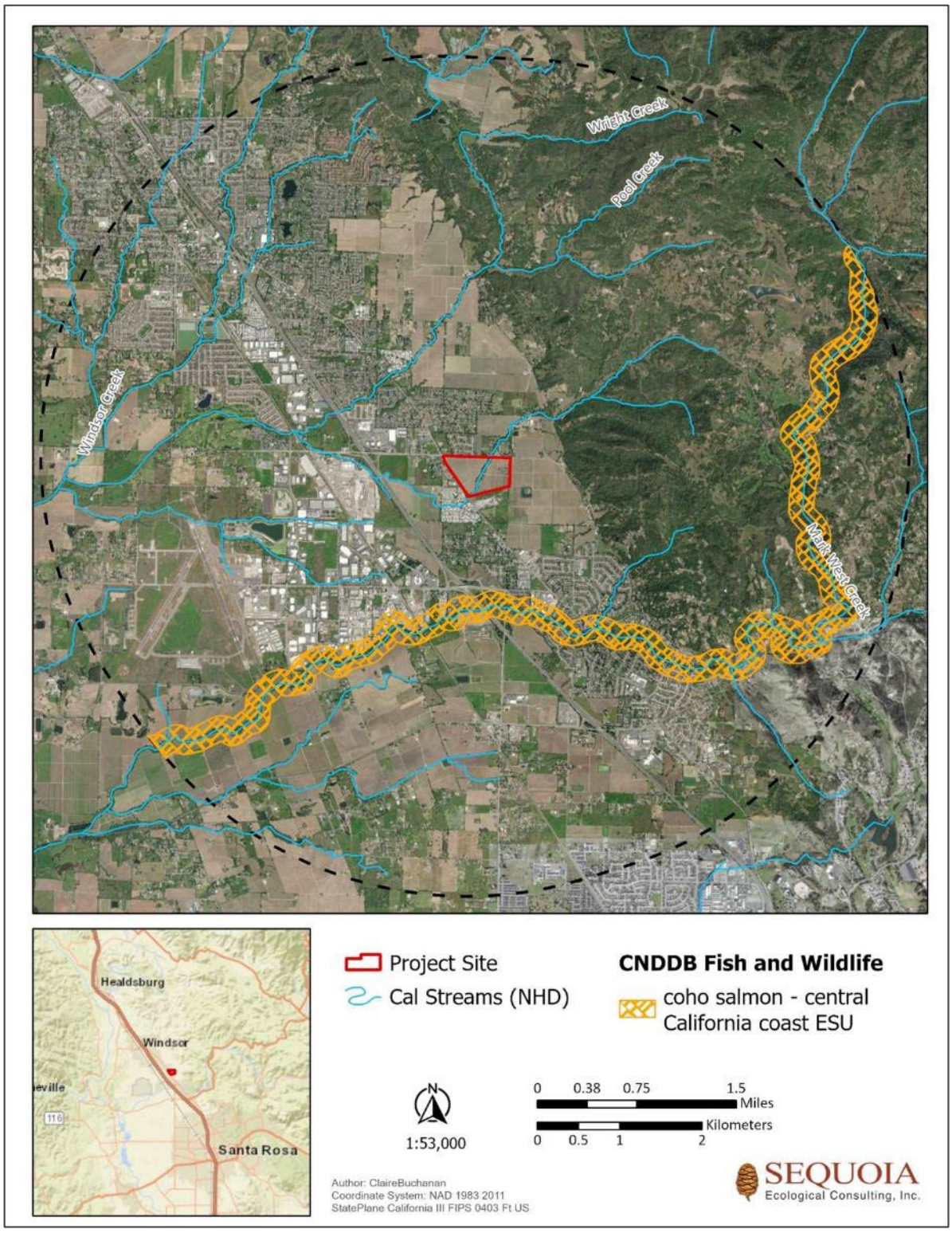


Figure 5. Closest known occurrences of federally listed species within 3 miles of the proposed Shiloh Resort and Casino project site.

Table 1. Federally listed fish species known to occur in the vicinity of the Project site

Scientific Name	Common Name	Listed Status	Critical Habitat	Essential Fish Habitat	Potential for Occurrence	Effects Determination
Oncorhynchus kisutch	Coho salmon California Central Coast ESU	FE, CE	No, final Critical Habitat within the Action Area;	Yes; EFH within Action Area	Moderate potential for occurrence in Pruitt Creek. Hydrological events and accessibility must align temporally with migration events for occurrence.	May Affect, Not Likely to Adversely Affect
Oncorhynchus mykiss irideus	Steelhead California Central Coast DPS, Northern California DPS	FT	Yes, final Critical Habitat within the Action Area	No EFH within Action Area	Moderate potential for occurrence in Pruitt Creek. Hydrological events and accessibility must align temporally with migration events for occurrence.	May Affect, Not Likely to Adversely Affect
Oncorhynchus tshawytcha	Chinook salmon California Coastal ESU	FT	No, final Critical Habitat within the Action Area	Yes, EFH within Action Area	Low potential for occurrence in Pruitt Creek based on their current distribution and their patterns of migration.	May Affect, Not Likely to Adversely Affect

Key to status:
FT - Federally listed as threatened species
CE - California listed as endangered species

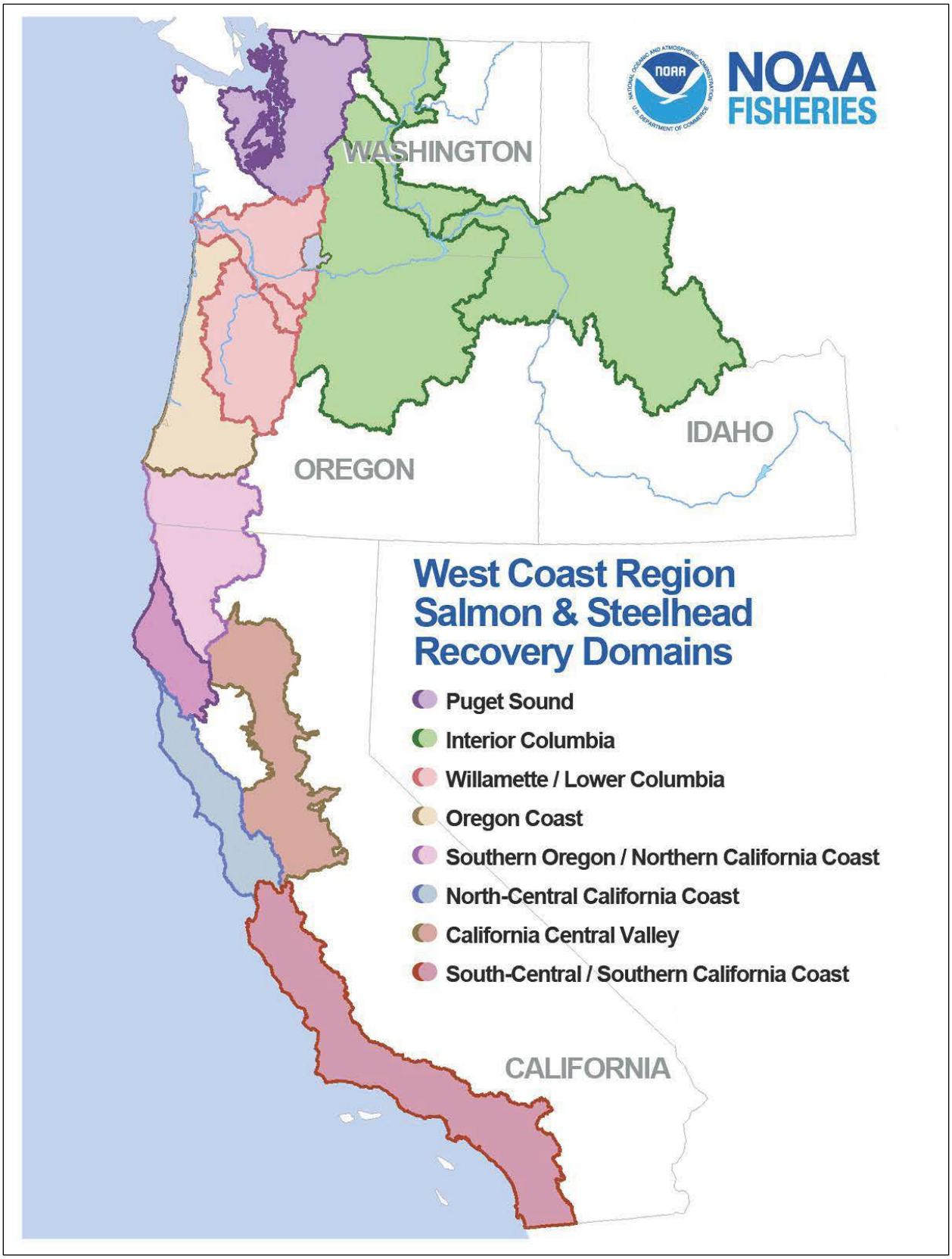
Appendix A

Preliminary Site Plans for Proposed Shiloh Resort and Casino Project

Site Plan
1" = 100'

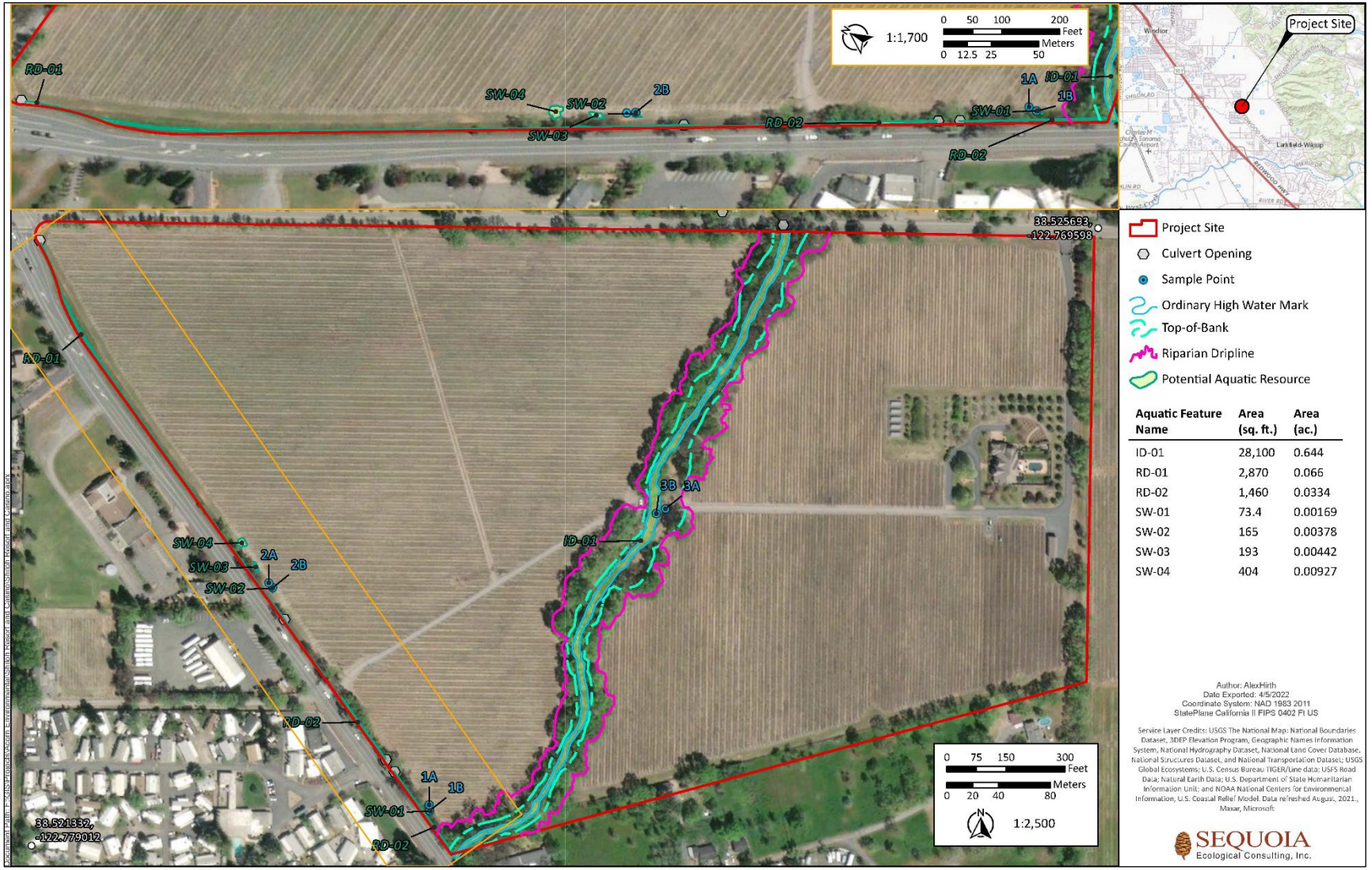
Appendix B

North-Central California Coast Recovery Domain Map


NOAA
FISHERIES
WASHINGTON
OREGON
IDAHO
CALIFORNIA
West Coast Region
Salmon & Steelhead
Recovery Domains
Puget Sound
Interior Columbia
Willamette / Lower Columbia
Oregon Coast
Southern Oregon / Northern California Coast
North-Central California Coast
California Central Valley
South-Central / Southern California Coast

Appendix C

Draft Aquatic Resources Delineation Map


1:1,700
0 50 100 200
Feet
Meters
0 12.5 25 50
RD-01
SW-04
SW-02
2B
SW-03
RD-02
1A
ID-01
1B
SW-01
38.525693,
-122.769598
3B
3A
2A
38.521332,
-122.779012
Project Site
Culvert Opening
Sample Point
Ordinary High Water Mark
Top-of-Bank
Riparian Dripline
Potential Aquatic Resource
Aquatic Feature Name | Area (sq. ft.) | Area (ac.)
ID-01 | 28,100 | 0.644
RD-01 | 2,870 | 0.066
RD-02 | 1,460 | 0.0334
SW-01 | 73.4 | 0.00169
SW-02 | 165 | 0.00378
SW-03 | 193 | 0.00442
SW-04 | 404 | 0.00927
0 75 150 300
Feet
Meters
0 20 40 80
1:2,500
Author: AlexHirth
Date Exported: 4/5/2022
Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
SEQUOIA
Ecological Consulting, Inc.

Appendix G-3

CESA Species Evaluation

SEQUOIA
Ecological Consulting, Inc.

Date: April 15, 2022

To: Bibiana Sparks-Alvarez, Project Manager
Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762

From: Claire Buchanan, Project Manager
Sequoia Ecological Consulting, Inc.

RE: **CESA-Listed Species Evaluation for the Shiloh Resort and Casino Project**

1.0 INTRODUCTION

The purpose of this memorandum is to acknowledge and assess potential impacts to California Endangered Species Act- (CESA) listed species in support of National Environmental Policy Act (NEPA) compliance documentation for the proposed Shiloh Resort and Casino Project (Project) in Windsor, California (Figures 1 and 2). The Project site is located at 222 East Shiloh Road (Assessor's Parcel Number 059-300-003) in the Larkfield-Wikiup area of unincorporated Sonoma County and is bordered by Old Redwood Highway to the west, East Shiloh Road to the north, vineyards to the east, and residential homes and the Santa Rosa Mineral Gem Society to the south (Figure 2; Google Earth 2022). The remainder of the Project site includes vineyards and associated infrastructure, a private home on the east side of the property, and multiple dirt roads that bisect the vineyards.

As detailed below, Sequoia Ecological Consulting, Inc. (Sequoia) performed a literature and desktop review for CESA-listed species known from the region and conducted a site assessment on the Project site. This memorandum discusses findings of the desktop review and field visit and evaluates potential impacts, as well as mitigation opportunities and constraints for, CESA-listed species on the Project site and within a zone of influence.

2.0 ANALYSIS

2.1 Literature and Desktop Review

Sequoia reviewed the Draft Constraints Report (ESA 2021) and updated the associated desktop review to better evaluate state listed species with potential to occur on the Project site. The review included the following sources: California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB; CDFW 2022) and RareFind 5; California Native Plant Society's (CNPS 2022) database; U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI; USFWS 2022a); Information

for Planning and Consultation (IPaC; USFWS 2022b) and U.S. Geological Survey (USGS 2022) topographic maps. The results of this desktop analysis were used to focus the subsequent on-site reconnaissance survey.

2.2 Site Assessment

Sequoia biologists, Ari Rogers and Claire Buchanan, conducted surveys on the Project site on February 23 and 24, 2022, to record biological resources and to assess potential impacts to CESA-listed species as a result of the proposed Project. Surveys involved searching all habitats on the site and recording all plant and animal species observed. Sequoia cross-referenced the habitats occurring on the Project site with the habitat requirements of regional special-status species to determine if the proposed Project could directly or indirectly impact these species. Any CESA-listed species or suitable habitat was documented.

Tables 1 and 2 present the potential for occurrence of CESA-listed plant and animal species known to occur in the vicinity of the Project site, along with their habitat requirements, potential to occur on the Project site, and basis for occurrence classification. Tables 3 and 4 provide plant and wildlife species observed on the Project site.

3.0 RESULTS OF BACKGROUND RESEARCH AND SITE ASSESSMENT

3.1 Topography and Hydrology

The Project site is located within the Santa Rosa Plain, and as such the topography is fairly uniform with elevation ranging from 135 feet above mean sea level (MSL) along the western property boundary to 160 feet MSL in the northeast corner of the property. Pruitt Creek flows southwesterly through the Project site and is a fourth order tributary to the Russian River. Pruitt Creek terminates at Pool Creek which flows into Windsor Creek, then into Mark West Creek, and finally into the Russian River. At the time of the February 2022 site visit, Pruitt Creek was wetted throughout. Flow was minimal, less than one cubic foot per second, with an average depth of eight inches and indicators of a high flow event (leaf litter and riparian vegetation scattered throughout). Water temperature was 52°F. Water temperature was measured at 1000 hours at a depth of approximately five inches in the shade. Comparing the observations from the Draft Constraints Report (ESA 2021) and observations from Sequoia's February 2022 survey, it is likely that Pruitt Creek is an intermittent stream that flows from late fall to spring and begins to dry up by early summer and remains dry through the fall.

3.2 Plant Communities and Wildlife Habitats

On February 23 and 24, 2022, Sequoia biologists conducted a survey of the Project site and characterized vegetation present (Figure 7). During the survey, Sequoia also documented plant and wildlife species observed on the Project site (Tables 3 and 4). Nomenclature used for plant names

follows *The Jepson Manual Second Edition* (Baldwin 2012), while nomenclature used for wildlife follows CDFW's *Complete list of amphibian, reptile, bird, and mammal species in California* (2016).

3.2.1 Vineyards

The Project site is predominately an active vineyard with ruderal (weedy) vegetation growing in between the grape rows. Vineyard infrastructure is also present including dirt roads, piping, propane tanks, wash station, and electrical power poles. While the grape rows themselves are weeded and maintained, ruderal and annual vegetation grows between rows and around the vineyard perimeter; ruderal species are adapted to endure intense and/or long-term disturbance.

The vineyard land cover type occupies approximately 59.3 acres within the Project site (Figure 7).

3.2.2 Ornamental/Landscaping

Landscaped vegetation consisting of ornamental trees and shrubs surround the private residence and other structures on the Project site. There are olive trees and a variety of fruit trees on the north side of the private residence. Ruderal species occur between the landscape and orchard plantings. Large trees (primarily valley oaks [*Quercus lobata*]) line the property boundary.

The ornamental land cover type occupies approximately 6.9 acres within the Project site (Figure 7).

3.2.3 Aquatic Features

Pruitt Creek is mapped as "Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC)" and "Palustrine, Forested, Emergent, Persistent, Seasonally Flooded (PFO/EM1C) Freshwater Forested/Shrub Wetland" in the NWI (USFWS 2022a; Figure 3). The NWI layer indicates a freshwater emergent wetland is present in the central northern portion of the Project site (Figure 3). Sequoia staff did not detect any wetted habitat or indications of wetland presence in that portion of the Project site while surveying for CESA-listed species.

3.2.4 Riparian Corridor

There is a narrow buffer of non-native annual grassland between the riparian corridor and the vineyards. Valley oaks dominate the riparian corridor with some smaller eucalyptus (*Eucalyptus* sp.) trees also present. Understory vegetation is composed of both native and non-native species of grasses and shrubs. The understory communities observed had distinct segments heavily dominated by native species alternating with areas dominated by non-native species. Some native species observed include California buckeye (*Aesculus californica*), California bay laurel (*Umbellularia californica*), willow (*Salix* sp.), poison oak (*Toxicodendron diversilobum*), valley oak, and coast live oak (*Quercus agrifolia*). Non-native species observed include Himalayan blackberry (*Rubus armeniacus*), eucalyptus, and black mustard (*Brassica nigra*), among others.

The riparian land cover type occupies approximately 5.2 acres within the Project site (Figure 7).

4.0 POTENTIALLY OCCURRING CESA-LISTED SPECIES

CESA-listed plant and animal species known to occur in the vicinity of the Project site are discussed below. CESA-listed plant species known to occur within 3 miles of the Project site are listed in Table 1. CESA-listed animal species known to occur within 3 miles of the Project site are listed in Table 2. We also discuss those CESA-listed species that could be impacted as a result of the proposed Project.

4.1 Potential to Occur

Potential for CESA-listed species to occur on the Project site was evaluated according to the following criteria:

- *No Potential.* Habitat on and adjacent to the site is clearly unsuitable for the species' requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- *Unlikely.* Few of the habitat components meeting the species' requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- *Moderate Potential.* Some of the habitat components meeting the species' requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- *High Potential.* All of the habitat components meeting the species' requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- *Present.* Species is observed on the site or has been recorded (i.e., CNDDB, other reports) on the site recently.

4.2 CESA-listed Plants

For the purpose of this document, CESA-listed plant species are plant species that meet one of the following criteria;

- Plant species listed as Threatened or Endangered under CESA, the laws and regulations for implementing CESA as defined by California Fish and Game Code (CFGC §2050 et seq.) and the California Code of Regulations (CCR) 14 CCR §670.1 et seq., and candidates for listing under the statute (CFGC §2068) or plants listed . These species are protected from unauthorized "take" (that is, harass, pursue, hunt, shoot, trap) of that species. If it is necessary to "take" a state Threatened or Endangered species as part of an otherwise lawful activity, it would be necessary to receive permission from CDFW prior to initiating the "take."

- Species meeting the definition of 'Rare' or 'Endangered' under California Environmental Quality Act Guidelines 14 CCR §15125 (c) and/or 14 CCR §15380, including plants listed on CNPS Lists 1A, 1B, 2A, and 2B (CNPS 2001) Rank 1 and 2 species are defined below:
    - Rank 1A: Presumed extinct in California;
    - Rank 1B: Rare, threatened, or endangered in California and elsewhere;
    - Rank 2A: Plants presumed extirpated in California, but more common elsewhere;
    - Rank 2B: Rare, threatened, or endangered in California, but more common elsewhere.

Figure 4 provides a graphical illustration for CESA-listed plant species CNDDB occurrences within 3 miles of the Project site. Table 1 provides an assessment of the potential of CESA-listed plant species to occur on the Project site. Fourteen CESA-listed plants have been previously documented within 3 miles of the Project site; however, no CESA-listed plants have been observed or mapped on the site itself. Sequoia analyzed the potential to occur for these plant species, as well as species included in CNPS and IPaC resource lists (USFWS 2022b) during the desktop review (Table 1). A number of these species require specialized habitats such as vernal pools, mesic meadows, seeps, cismontane woodland, and serpentinite soils that are not found on the Project site. Due to lack of suitable habitat and/or lack of known/recent occurrences in the Project vicinity, all 14 of these CESA-listed plant species are not expected to occur and are therefore not discussed further in this analysis. These species are: Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*), Jepson's leptosiphon (*Leptosiphon jepsonii*), Napa false indigo (*Amorpha californica* var. *napensis*), congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*), dwarf downingia (*Downingia pusilla*), narrow-anthered brodiaea (*Brodiaea leptandra*), oval-leaved viburnum (*Viburnum ellipticum*), pappose tarplant (*Centromadia parryi* ssp. *parryi*), Boggs Lake hedge-hyssop (*Gratiola heterosepala*), Burke's goldfields (*Lasthenia burkei*), many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*), Pitkin marsh lily (*Lilium pardalinum* ssp. *pitkinense*), sebastapool meadowfoam (*Limnanthes vinculans*), and Sonoma sunshine (*Blennosperma bakeri*) (CNDDB 2022; CNPS 2022).

The Project site's history of prolonged and intense disturbance through agricultural and residential uses has resulted in habitat conditions that are not suitable for CESA-listed plant species. These conditions, coupled with the lack of suitable habitat and/or lack of known/recent occurrences on or in the immediate vicinity of the Project site, indicate that CESA-listed plant species are not expected to occur and therefore are not discussed further in this analysis. Furthermore, per the USFWS 2005 *Santa Rosa Plain Conservation Strategy*, which was designed to ensure the conservation of the California tiger salamander (*Ambystoma californiense*) and listed plants and contribute to their recovery (USFWS 2005), the Project site is located within a designation of the Conservation Strategy that determined the presence of California tiger salamander is not likely and "no listed plants [occur] in this area."

4.3 CESA-listed Animals

For the purpose of this document, CESA-listed animal species are species that meet one of the following criteria;

- Fish, and wildlife species listed as Threatened or Endangered under CESA; and the laws and regulations for implementing CESA as defined in CFGC §2050 et seq. and CCR 14 CCR §670.1 et seq., and candidates for listing under the statute (CFGC §2068);
- Fully Protected species, as designated by the CDFW (CFGC § 3511, 4700, 5050, and 5515).

Figure 5 provides a graphical illustration for CESA-listed animal species occurrences within 3 miles of the Project site. Table 2 provides an assessment of potential to occur for CESA-listed animal species on the Project site. One CESA-listed animal species occurrence has been previously documented within 3 miles of the Project site (CNDDB 2022). Sequoia analyzed the potential to occur for this animal species, as well as species included in the IPaC resource list (USFWS 2022b) during the desktop review (Table 2). A number of these species require specialized habitat such as dense forests and woodlands, vernal pools, large bodies of water, and perennial freshwater streams. Due to lack of suitable habitat and/or lack of recent occurrences in the project vicinity, five CESA-listed wildlife species are not expected to occur and are therefore not discussed further in this analysis. These five species are: bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), northern spotted owl (*Strix occidentalis caurina*), California tiger salamander (*Ambystoma californiense*) - Sonoma County Distinct Population Segment (DPS) *and* California freshwater shrimp (*Syncaris pacifica*). Descriptions and potential for occurrence of the remaining CESA-listed wildlife species—coho salmon (*Oncorhynchus kisutch*)—central California coast Evolutionary Significant Unit (ESU) is provided in more detail below.

4.3.1 Coho Central California Coast ESU

The coho salmon is an anadromous fish that spends two years in the ocean and returns to perennial freshwater streams during the spring to spawn. Adult coho salmon enter fresh water from September through January in order to spawn. In the short coastal streams of California, migration usually begins between mid-November and mid- January. Coho salmon in northern California coastal streams are typically associated with low gradient reaches of tributary streams, which provide suitable spawning areas and good juvenile rearing habitat. Juvenile coho salmon typically rear in low-gradient coastal streams, sloughs, side channels, alcoves, estuaries, low-gradient tributaries, large rivers, beaver ponds, and large slack waters. In general salmonids require cold, well-oxygenated water for respiration and gravels with low quantities of fine sediment for spawning and egg development. Due to their early life history requirement for one year of freshwater residency, coho salmon are relatively more vulnerable to stressors that change water quality parameters such as dissolved oxygen, temperature, and turbidity over hot summer months where cold water rearing habitat is already limited. The most productive juvenile habitats are found in smaller streams with low-gradient alluvial channels containing abundant pools formed by large woody debris. Coho salmon are now absent from all tributaries of San Francisco

Bay and many streams south of the Bay; this is likely associated with adverse effects from increased urbanization and other human developments on watersheds and fish habitat (CDFG 2004).

Critical habitat includes all river reaches accessible to listed coho salmon from Punta Gorda in northern California south to the San Lorenzo River in central California, including Arroyo Corte Madera Del Presidio and Corte Madera Creek, tributaries to San Francisco Bay (NOAA 1999). Critical habitat consists of the water, substrate, and adjacent riparian zone of estuarine and riverine reaches, including off-channel habitats, in specified hydrologic units in Mendocino, Sonoma, Napa, Marin, San Mateo and Santa Cruz counties. Accessible reaches are those within the historical range of the ESU that can still be occupied by any life stage of coho salmon. Inaccessible reaches are those above dams or longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years) (NOAA 1999).

Pruitt Creek is within the designated range of the state and federally endangered Central California Coast (CCC) coho salmon evolutionary significant unit (ESU; CDFW 2021). The Project site is located within the Russian River Watershed, which is designated critical habitat for CCC coho below Coyote Dam and Warm Springs Dam; however, Pruitt Creek is not part of the mapped critical habitat for CCC coho (NOAA 2005, Figure 6). There is a CNDDB occurrence for CCC coho salmon in Mark West Creek (recorded in 2015; CNDDB Occurrence No. 25; Figure 5), approximately 0.75-air-miles south of the Project site. Mark West Creek is hydrologically connected to Pruitt Creek at times of moderate flow, historically with highest potential for connectivity from November to April (USGS 2022). At moderate flows, the habitat in Pruitt Creek would have the depth, cover, and predation opportunities to accommodate adult CCC coho salmon but there is very little spawning and rearing habitat available on the Project site.

For CCC coho salmon to occur in Pruitt Creek, large rain events and associated increases in water flow and decreases in water temperature have to align with the CCC coho salmon's migration event. Additionally, all higher order tributaries to the Russian River connected to Pruitt Creek would need to have sufficient flow and provide uninhibited access to Pruitt Creek. There is no potential for CCC coho salmon to occur on the Project when the creek is dry. There is a moderate potential for occurrence when Pruitt Creek has sufficient connection to higher order tributaries and wetted habitat. Therefore, impacts to the CCC Coho salmon are possible as a result of the proposed Project, depending on final design plans and construction methods. Individuals are not likely to be directly impacted by physical construction methods but may be indirectly affected if Project activities modify water quality parameters (e.g., increased temperature or turbidity, lowered dissolved oxygen) within Pruitt Creek. Potential project activities that could contribute to indirect effects include removal of riparian vegetation, grading and sediment transport from uplands to the waterway, and unintentional releases (spills) of hazardous materials to surface waters.

5.0 REGULATORY SETTING

Regulatory authority over biological resources is shared by federal, state, and local agencies under a variety of laws, ordinances, regulations, and statutes. Under each law we discuss their pertinence to the proposed development. As part of the Proposed Action, the Project site would be taken into federal trust for the benefit of the Koi Nation prior to any construction activities. Land that is held for trust on behalf of tribes is subject to federal and tribal law exclusively.

While this Project would not fall under jurisdiction of the CESA once the Project site is taken into federal trust, avoidance of impacts to all species should be considered to protect the natural resources on the Project site pursuant to NEPA procedures for due diligence. Typically, within their jurisdictional lands CDFW is responsible for administering CESA and issuing incidental take permits for a state listed threatened and/or endangered species only if specific criteria are met (i.e., the effects of the authorized take are minimized and fully mitigated). Accordingly, mitigation measures that are required are typically commensurate with the impact on each species. Consequently, should impacts to a species be expected, listed under CESA and/or the federal Endangered Species Act, it is prudent to acknowledge these potential impacts and find ways to minimize or avoid the impacts completely during the NEPA process. While no additional requirements exist for CESA-listed species, impacts to federally-listed species and/or designated critical habitat would require permitting with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service (NMFS) separately from the NEPA process.

6.0 SUMMARY OF CONSTRAINTS AND OTHER RECOMMENDATIONS

Based on Sequoia's assessment, there is potential for impacts to occur to species covered under the CESA. Any work plans involving Pruitt Creek and the associated riparian corridor have a possibility for directly and/or indirectly affecting the habitat. These impacts may not rise to the standard of 'take' under the CESA; however, they should still be considered during environmental review. Impacts to the creek and riparian habitat would likely require permitting and consultation with the U.S. Army Corps of Engineers, which may place avoidance and minimization measures on the riparian area.

Suitable habitat for adult CCC coho salmon exists on the Project site when flows are sufficient. There are no documented occurrences of this species on the Project site; however, occurrences have been documented in Mark West Creek, a higher order tributary to the Russian River that is assumed to be hydrologically connected to Pruitt Creek during periods of sufficient flow. The intermittent flow of Pruitt Creek is likely a determining factor for the lack of access and associated occurrences in the creek. For this anadromous species, the connectivity of tributaries in their natal watershed at the time of migration determines where they will occur. Pruitt Creek is disconnected from Mark West Creek for extended times throughout the year, but there is potential for CCC coho salmon to reach Pruitt Creek at sufficient flows. There is potential for occurrence on the Project site and potential for direct and indirect impacts to this species from Project activities. Due to the federal status of the CCC coho salmon and the presence of Essential Fish Habitat, a formal Section 7 and Essential Fish Habitat consultation will be

initiated with the NMFS by the Bureau of Indian Affairs to evaluate impacts to CCC coho at a federal level. CESA-level concerns acknowledged in this memorandum will be addressed thoroughly in that process.

If you have any questions or concerns, please do not hesitate to contact me at the email or phone number listed below. Thank you for the opportunity to support you on this Project.

Sincerely,

Claire Buchanan | Project Manager
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Mobile: 916.834.2129 | Main: 925.855.5500 | Fax: 510.439.1104
cbuchanan@sequoiaeco.com
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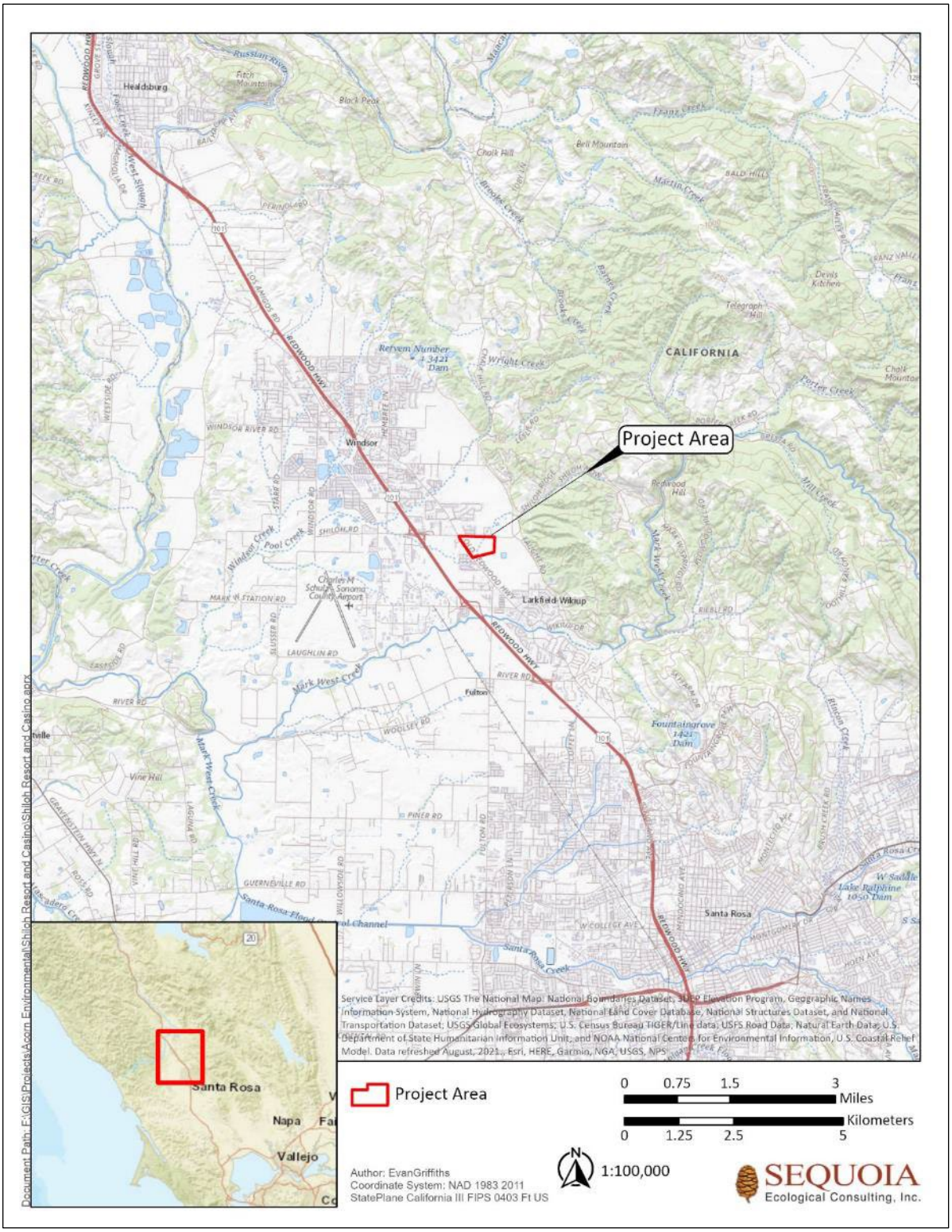

Figure 1. Regional Map of the Shiloh Resort and Casino Project Site.

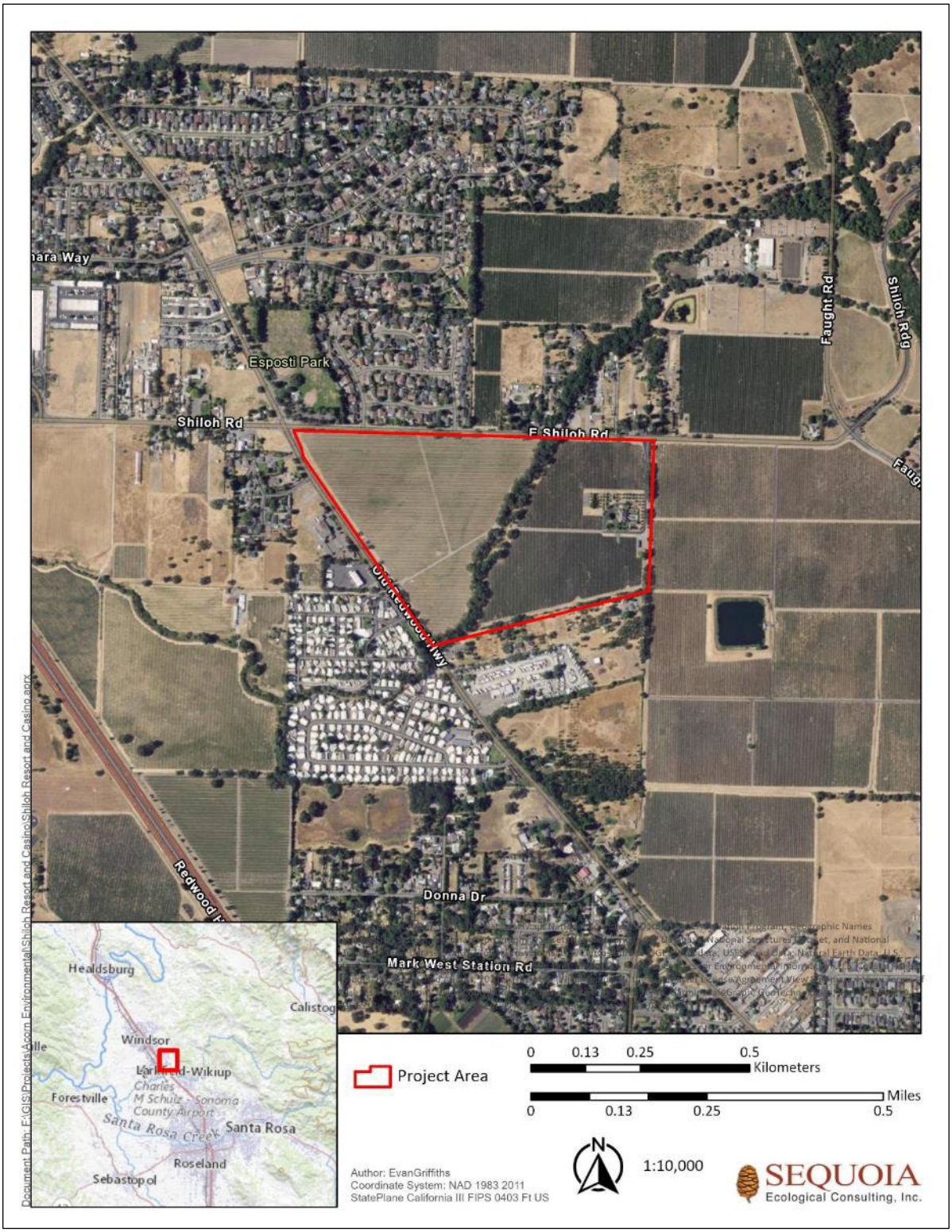

Figure 2. Location Map of the Shiloh Resort and Casino Project Site.

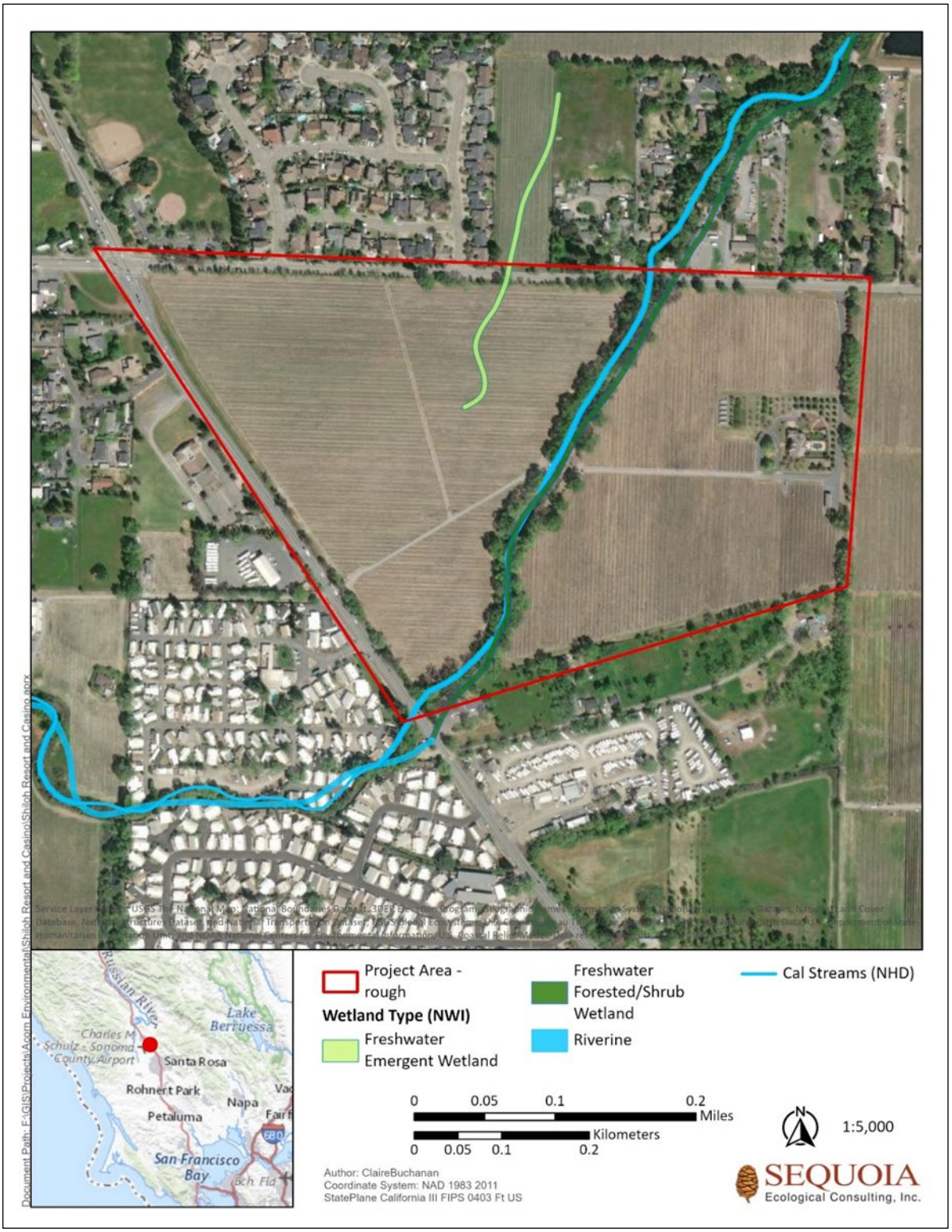

Figure 3. USFWS National Wetland Inventory Within the Vicinity of the Project Site.

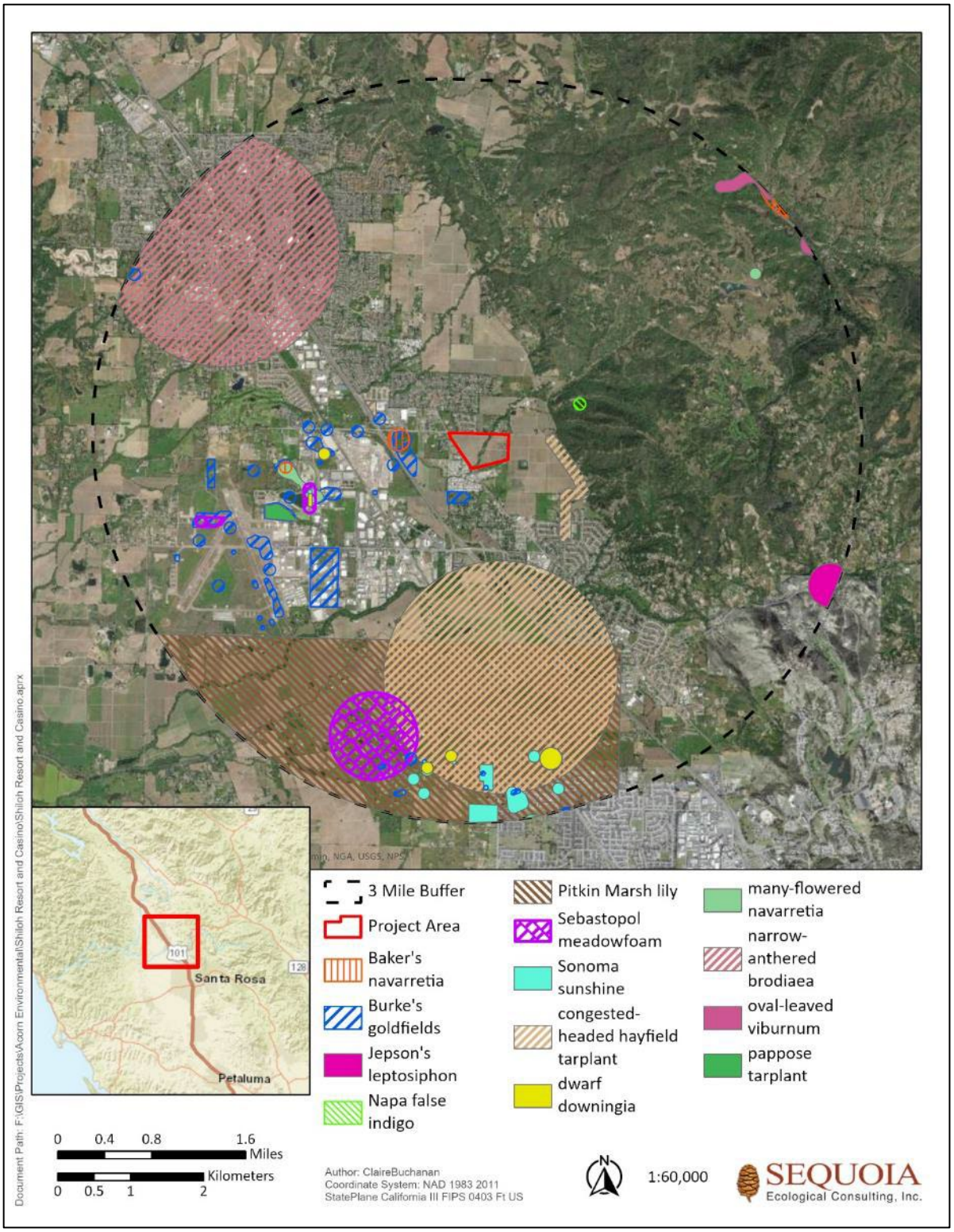

Figure 4. CESA-Listed Plant Species Occurrences Within 3 Miles of the Project Site.

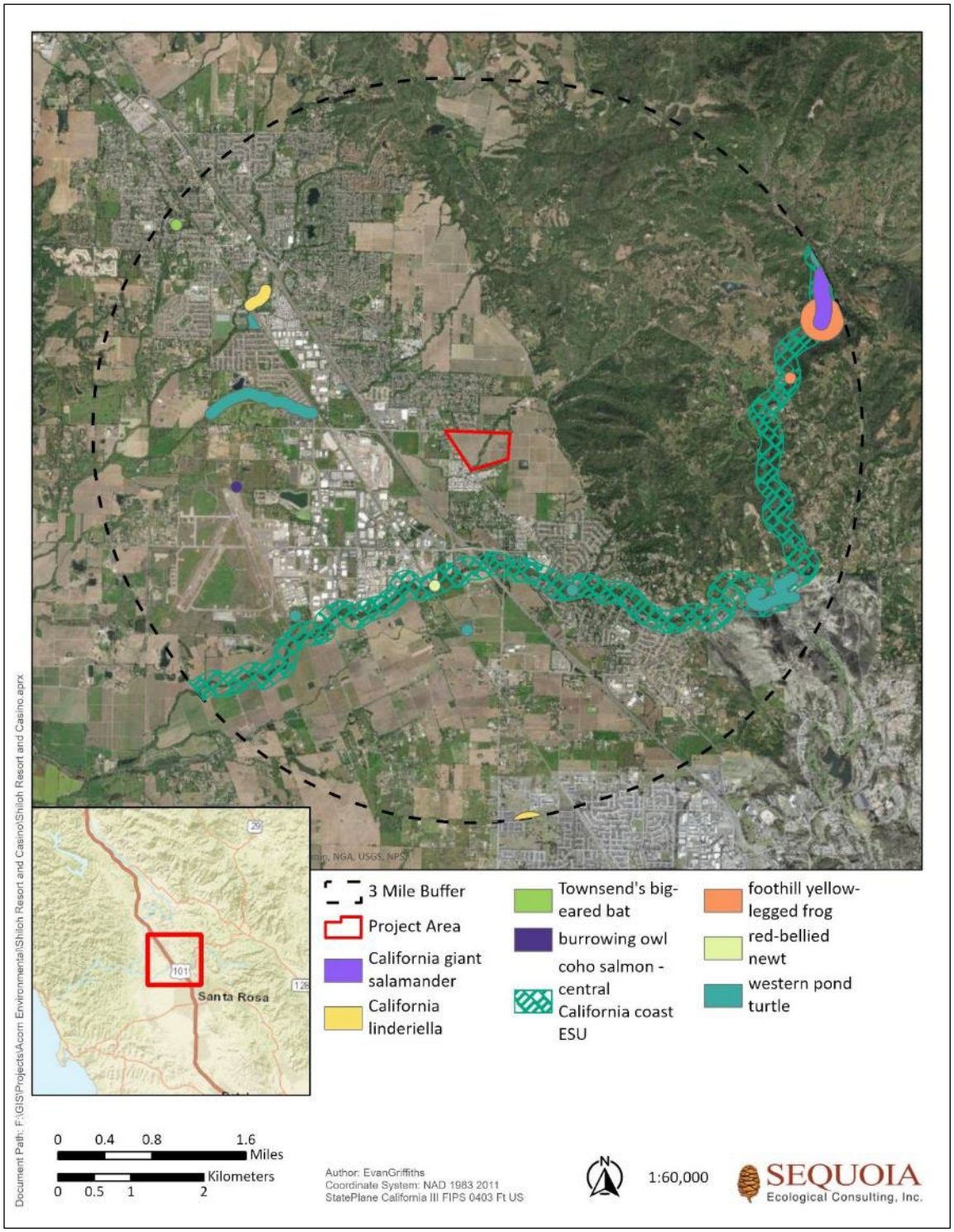

Figure 5. Special-Status Wildlife Species Occurrences Within 3 Miles of the Project Site (Note: only California tiger salamander and coho salmon are CESA-listed).

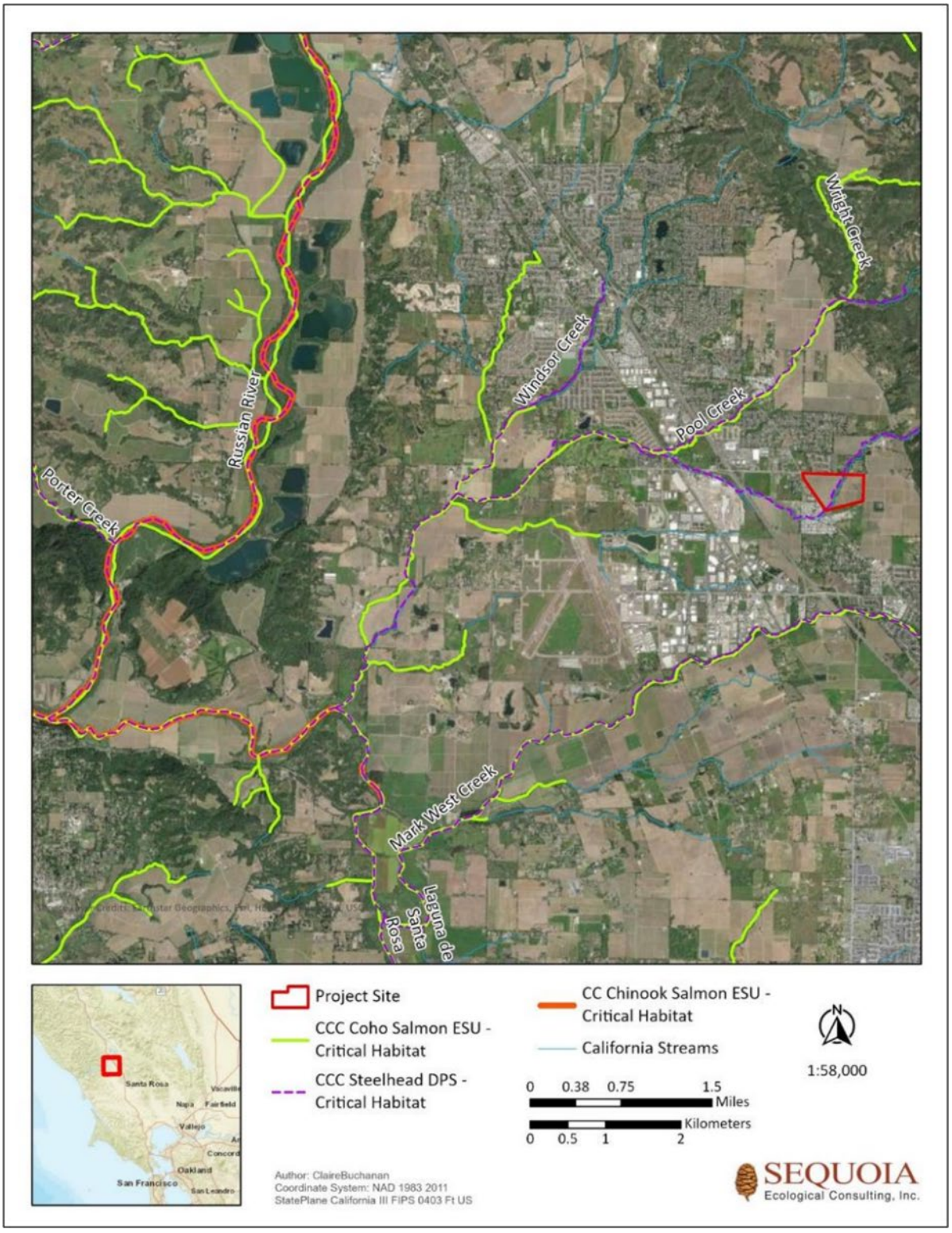

Figure 6. NMFS Critical Habitat in the Vicinity of the Proposed Shiloh Resort and Casino Project Site.

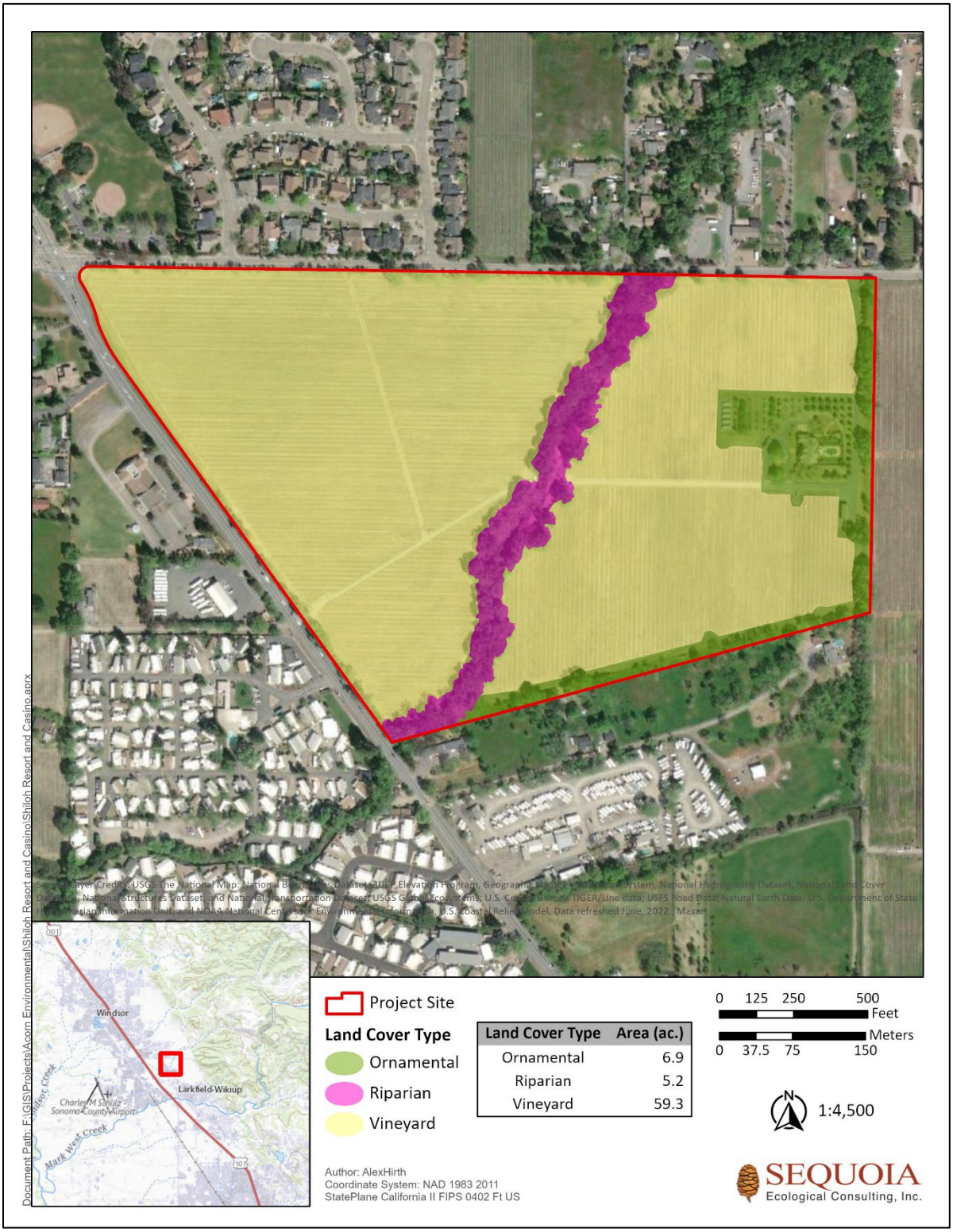

Figure 7. Land Cover Types within the Proposed Shiloh Resort and Casino Project Site.

Table 1. CESA-Listed Plant Species with Potential to Occur on the Project Site.

Scientific Name	Common Name	CESA Listing Status	Habitat Requirements	Potential for Occurrence
Amorpha californica var. *napensis*	Napa false indigo	1B.2	Occurs in chaparral at elevations below 2,600 feet.	No Potential. No chaparral occurs on the Project site.
Blennosperma bakeri	Sonoma sunshine	CE, 1B.1	Occurs in wet valley and foothill grasslands and vernal pools at elevations of 35 to 360 feet.	No Potential. No grassland or vernal pools occur on the Project site.
Brodiaea leptandra	Narrow-anthered brodiaea	1B.2	Occurs in open mixed-evergreen forest and chaparral at elevations of 130 to 4,000 feet.	No Potential. No evergreen forest or chapparal occurs on the Project site.
Centromadia parryi ssp. *parryi*	pappose tarplant	1B.2	Occurs in grassland, coastal salt marshes, alkaline springs, and seeps at elevations below 1,300 feet.	No Potential. No salt marshes or alkaline springs occur on the Project site. Grassland does not provide suitable habitat.
Downingia pusilla	dwarf downingia	2B.2	Occurs in vernal pools at elevations below 500 feet.	No Potential. No vernal pools occur on the Project site.
Gratiola heterosepala	Boggs Lake hedge-hyssop	CE, 1B.2	Occurs in shallow water and along margins of vernal pools at elevations below 5,000 feet.	No Potential. No vernal pools occur on the Project site.
Hemizonia congesta ssp. *Congesta*	congested-headed hayfield tarplant	1B.2	Occurs in grassland, barrens, chaparral, and open woodland within serpentine substrates at elevations below 1,500 feet.	No Potential. No serpentine substrates occur on the Project site.
Lasthenia burkei	Burke's goldfields	CE, 1B.1	Occurs in mesic (wet) meadows, seeps, and vernal pools at elevations of 50 to 1,970 feet.	No Potential. No mesic meadows, seeps or vernal pools occur on the Project site.
Leptosiphon jepsonii	Jepson's leptosiphon	1B.2	Occurs in open or partially shaded grassland slopes at elevations below 1,600 feet.	No Potential. No grasslands occur on the Project site.

Scientific Name	Common Name	CESA Listing Status	Habitat Requirements	Potential for Occurrence
Lilium pardalinum ssp. *Pitkinense*	Pitkin Marsh lily	CE, 1B.1	Occurs in cismontane woodland, meadows and seeps, and freshwater marshes and swamps at elevations of 115 to 215 feet.	No Potential. No meadows, seeps, or cismontane woodland occurs on the Project site.
Limnanthes vinculans	Sebastopol meadowfoam	CE, 1B.1	Occurs in meadows and seeps, valley and foothill grasslands, and vernal pools at elevations of 50 to 1,000 feet.	No Potential. No mesic habitat or vernal pools occur on the Project site.
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia	1B.1	Occurs in vernal pools at elevations below 5,500 feet.	No Potential. No vernal pools occur on the Project site.
Navarretia leucocephala ssp. *plieantha*	many-flowered navarretia	CE, 1B.2	Occurs in vernal pools with volcanic ash substrates at elevations of 100 to 3,115 feet.	No Potential. No vernal pools occur on the Project site
Viburnum ellipticum	oval-leaved viburnum	2B.3	Occurs in chaparral and yellow-pine forests on north-facing slopes at elevations of 1,000 to 4,500 feet.	No Potential. No suitable habitat occurs on the Project site and outside of elevation range.

Key to status:
CT=California listed as threatened species
CE=California listed as endangered species
CNPS Rare Plant Rank
1A=Plants presumed extirpated in California, and either rare or extinct elsewhere
1B=Pants rare, threatened, or endangered in California, or elsewhere
2A=Plants presumed extirpated in California but common elsewhere
2B=Plants rare, threatened, or endangered in California but more common elsewhere
Note: CNPS ranks below 2B were excluded from this analysis.

Table 2. CESA-Listed Animal Species with Potential to Occur on the Project Site.

Scientific Name	Common Name	CESA Listing Status	Habitat Requirements	Potential for Occurrence
Ambystoma californiense	California tiger salamander – Sonoma County DPS	CE	Occurs in grasslands and foothills with pools or ponds for breeding. Sonoma County DPS inhabits vernal pools and seasonal ponds, grasslands, and oak savannah.	No Potential. Project site does not provide suitable breeding aquatic habitat or upland grassland habitat and the Project site outside of known geographic range.
Aquila chrysaetos	golden eagle	FP	Occurs in grasslands, savannahs, oak and pine woodlands and agricultural fields. Nests on cliffs and in large trees in open areas.	No Potential. Project site's main land use is agricultural and the habitat, including vineyards, is not suitable for the species.
Haliaeetus leucocephalus	bald eagle	FP	Occurs in forested areas adjacent to large bodies of water including lakes, reservoirs, rivers, estuaries, and the coast.	No Potential. No suitable habitat such as old-growth forests, freshwater lakes or marshes are present within or near the Project site
Oncorhynchus kisutch	coho salmon – central California coast ESU	CE	Anadromous fish species that spans and spends a portion of its life in fresh inland streams, maturing in the open ocean. Critical habitat is designated to include all river riches accessible to listed coho within the range of the ESUs.	Moderate Potential. Pruitt Creek has suitable habitat for adult CCC Coho but lacks spawning and rearing habitat. Habitat is connected to known occurrences at moderate flows.
Strix occidentalis caurina	northern spotted owl	CT	Occurs in dense canopies of mature and old-growth forests. Nests in tree hollows.	No Potential. No suitable habitat is present within the Project site.
Syncaris pacifica	California freshwater shrimp	CE	Occurs in perennial freshwater streams with submerged undercut banks, overhanging plants, and exposed live roots of willow or alder.	No Potential. Pruitt Creek is dry at certain times of the year and therefore is not a perennial stream. The closest occurrence is over 6 miles to the northeast. This species is not expected to occur on the Project site.

Key to status:
CE=California listed as endangered species
CT=California listed as threatened species
FP=California listed as fully protected

Table 3. Plant Species Observed on the Project Site.

Scientific Name	Common Name	Family
Aesculus californica	California buckeye	Sapindaceae
Agapanthus africanus	African lily	Amarylidaceae
Anthemis cotula	stinking chamomile	Asteraceae
Arum italicum	Italian arum	Araceae
Avena barbata	slender oat	Poaceae
Avena fatua	wild oat	Poaceae
Brassica nigra	black mustard	Brassicaceae
Briza minor	little quaking grass	Poaceae
Bromus diandrus	ripgut brome	Poaceae
Bromus hordeaceus	soft chess	Poaceae
Calandrinia menziesii	red maids	Montiaceae
Calendula arvensis	field marigold	Asteraceae
Cardamine hirstua	bittercress	Brassicaceae
Carduus pycnocephalus	Italian thistle	Asteraceae
Carex spp.	sedges	Cyperaceae
Cerastium glomeratum	mouse-ear chickweed	Monitaceae
Chlorogalum pomeridianum	soap plant	Agavaceae
Claytonia perfoliate	miner's lettuce	Montiaceae
Cotoneaster sp.	cotoneaster	Rosaceae
Cyperus eragrostis	tall flatsedge	Cyperaceae
Elymus sp.	wild rye	Poaceae
Erodium botrys	cranesbill	Geraniaceae
Erodium cicutarium	redstem filaree	Geraniaceae
Eucalyptus globulus	blue gum	Myrtaceae
Festuca myuros	six-weeks fescue	Poaceae
Festuca perennis	Italian ryegrass	Poaceae
Fraxinus latifolia	Oregon ash	Fagaceae
Galium aparine	bedstraw	Rubiaceae
Genista monspessulana	French broom	Fabaceae
Geranium dissectum	cutleaf geranium	Geraniaceae
Geranium molle	dove's-foot geranium	Geraniaceae
Geranium robertianum	Robert's geranium	Geraniaceae
Hedera helix	English ivy	Araliaceae
Hirschfeldia incana	shortpod mustard	Brassicaceae

Scientific Name	Common Name	Family
Hordeum murinum	mousetail barley	Poaceae
Hypochaeris radicata	rough cat's-ears	Asteraceae
Juncus balticus	Baltic rush	Juncaceae
Juncus effusus	bog rush	Juncaceae
Juncus xiphioides	iris-leaf rush	Juncaceae
Lepidium nitidum	shining pepperweed	Brassicaceae
Lonicera hispidula	pink honeysuckle	Caprifoliaceae
Lysimachia arvensis	scarlet pimpernel	Myrsinaceae
Lythrum hyssopifolia	hyssop loosestrife	Lythraceae
Malva parviflora	cheeseweed	Malvaceae
Medicago polymorpha	California burclover	Fabaceae
Narcissus pseudonarcissus	daffodil	Amaryllidaceae
Nasturtium officinale	watercress	Brassicaceae
Oxalis pes-caprae	Bermuda buttercup	Oxalidaceae
Pinus sp.	pine	Pinaceae
Plantago lanceolata	English plantain	Plantaginaceae
Poa annua	annual bluegrass	Poaceae
Polygonum aviculare	yard knotweed	Polygonaceae
Quercus agrifolia	coast live oak	Fagaceae
Quercus lobata	valley oak	Fagaceae
Ranunculus muricatus	spiny fruit buttercup	Ranunculaceae
Rubus armeniacus	Himalayan blackberry	Rosaceae
Rumex acetosella	sheep sorrel	Polygonaceae
Rumex crispus	curly dock	Polygonaceae
Rumex pulcher	fiddle dock	Polygonaceae
Schoenoplectus pungens	three-square bulrush	Cyperaceae
Senecio vulgaris	common groundsel	Asteraceae
Stachys bullata	hedge nettle	Lamiaceae
Symphoricarpos mollis	creeping snowberry	Caprifoliaceae
Torilis arvensis	field hedge parsley	Apiaceae
Toxicodendron diversilobum	poison oak	Anacardiaceae
Trifolium spp.	clover	Fabaceae
Typha spp.	cattails	Typhaceae
Umbellularia californica	California bay laurel	Lauraceae

Scientific Name	Common Name	Family
Vicia sativa	common vetch	Fabaceae
Vinca major	periwinkle	Apocynaceae

Table 4. Wildlife Species Observed on the Project Site.

Scientific Name	Common Name
Junco hyemalis	dark-eyed junco
Aphelocoma californica	California scrub-jay
Corvus brachyrhynchos	American crow
Cathartes aura	turkey vulture
Sitta carolinensis	white-breasted nuthatch
Pseudacris sierra	Sierran treefrog (= Sierran chorus frog)

Appendix G-4

Aquatic Resources Delineation Report

SEQUOIA
Ecological Consulting, Inc.

Aquatic Resources Delineation Report
Shiloh Resort and Casino Property
Larkfield-Wikiup, Sonoma County, California

April 2022

Prepared on behalf of:

Acorn Environmental
5170 Golden Foothill Parkway
El Dorado Hills, CA 95762
Attention: Bibiana Sparks-Alvarez

Prepared by:

Sequoia Ecological Consulting, Inc.
1342 Creekside Drive
Walnut Creek, CA 94596
Contact: Ari Rogers

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APPENDICES

1.0 INTRODUCTION AND BACKGROUND

As contracted by Acorn Environmental for the Koi Nation of Northern California (Tribe; Property Owner), Sequoia Ecological Consulting, Inc. (Sequoia) is submitting this preliminary jurisdictional determination request to the U.S. Army Corps of Engineers (USACE) for the proposed Shiloh Resort and Casino (R&C) Project (Project) site, located in Larkfield-Wikiup, Sonoma County, California (Assessor's Parcel Number 059-300-003) (Figures 1 and 2). Sequoia's delineation of "waters of the United States" followed the U.S. Environmental Protection Agency and Department of the Army's 2020 *Navigable Waters Protection Rule* and USACE's 1987 *Wetlands Delineation Manual* and 2008 *Regional Supplement for the Arid West Region*. The Applicant proposes to acquire the Project site into federal trust as the initial reservation for the Koi Nation of Northern California, which will subsequently develop a resort and casino.

This report presents the results of the delineation of potential waters of the United States by Sequoia on February 23 and 24, 2022. Sequoia respectfully requests that USACE confirm whether the areas mapped on the Project site meet criteria as "wetlands" and "other waters" subject to USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA), through the use of a Preliminary Jurisdictional Determination (PJD). Sequoia understands that only USACE can determine the actual acreage of "waters of the United States" pursuant to Section 404 of the CWA.

1.1 Location And Setting

The Project site is located at 222 East Shiloh Road in Larkfield-Wikiup, a census-designated place in Sonoma County, California (Figures 1 and 2). The Project site is bordered by Shiloh Road on the north, existing vineyards on the east, a portion of Pruitt Creek and scattered residences on the south, and Old Redwood Highway on the west. The site is predominately occupied by vineyards bisected by an intermittent drainage, Pruitt Creek, and a single-family residence exists near the eastern property boundary. A gate on the western side of the property provides access from Old Redwood Highway and a paved driveway accessed from East Shiloh Road runs along the eastern edge of the property boundary and leads to the private dwelling.

1.2 Project Description

Sequoia understands that Acorn Environmental is preparing National Environmental Policy Act (NEPA) compliance documentation for the proposed Project on behalf of the Federal Bureau of Indian Affairs (federal Lead Agency). This confidential Project involves the acquisition of an approximately 60-acre site near the Town of Windsor into federal trust as the initial reservation for the Tribe, and the subsequent development of a resort and casino by the Tribe.

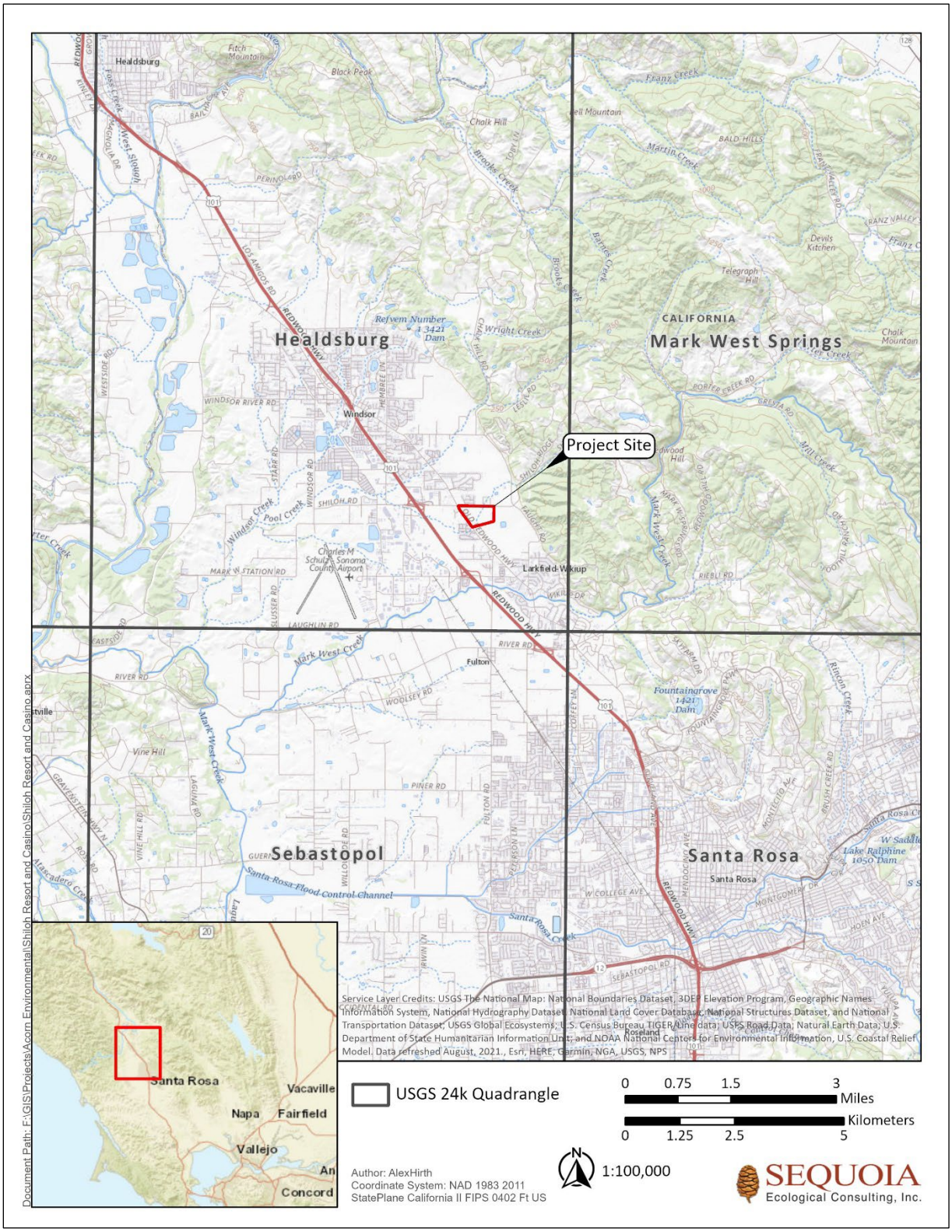

Figure 1. Regional Map of the Shiloh Resort and Casino Project Site.

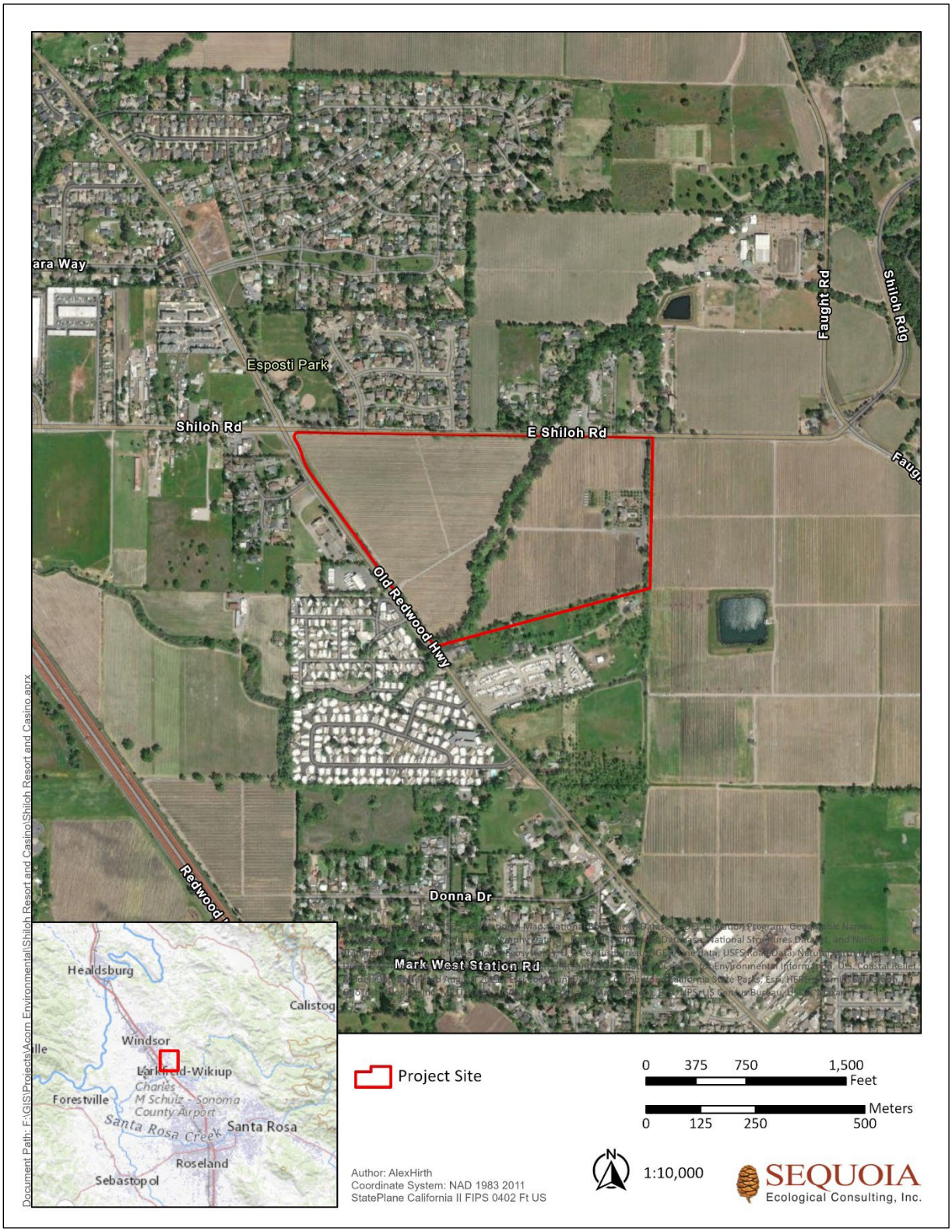

Figure 2. Location Map of the Shiloh Resort and Casino Project Site.

2.0 METHODS

Prior to the field delineation, available reference materials were reviewed, including the Natural Resource Conservation Service (NRCS) Web Soil Survey (NRCS 2022a), hydric soils lists (NRCS 2022b), the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI; USFWS 2022), the U.S. Geologic Survey (USGS) National Hydrography Dataset (NHD; USGS 2022), geologic data (California Geological Survey 2010), topographic maps, and aerial imagery. A routine-level aquatic resource delineation was conducted on the Project site on February 23 and 24, 2022.

The Project site was field-checked for indicators of hydrophytic vegetation, wetland hydrology, and hydric soils. During the aquatic resource delineation, six sample points (three pairs) were taken on the Project site and recorded on USACE data forms provided in the *Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (Arid West Manual; USACE 2008a). USACE data forms are included in Appendix A.

This aquatic resource delineation was conducted in accordance with the *Arid West Manual* and the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE Manual; Environmental Laboratory 1987). Based on the presence or absence of field indicators—including vegetation, hydrology, and soils—the limits of potential jurisdictional wetlands and other waters of the United States were determined. Potential jurisdictional wetlands and other waters were mapped with a Trimble GPS unit (sub-meter accuracy) and overlain on a digital orthophoto using ArcGIS mapping software (Appendix B).

2.1 Hydrophytic Vegetation

Hydrophytic vegetation is defined as "the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987). In order to determine if hydrophytic vegetation is present, each plant species occurring in a sample plot is identified and assigned a wetland indicator status (Table 1) based on the *National Wetland Plant List* (USACE 2020).

Table 1. Wetland Plant Indicator Status.

Wetland Indicator Status	Definition
OBL – Obligate	Occur over 99% of the time in wetlands
FACW – Facultative wetland	Occur 33 to 67% of the time in wetlands
FAC – Facultative	Occur 50% of the time in wetlands
FACU – Facultative upland	Occur 1 to 33% of the time in wetlands
UPL - Upland	Occur less than 1% of the time in wetlands
NI – Non-indicator	No classification given due to lack of information

Plants that have an indicator status of OBL, FACW, and FAC are considered to be typically adapted for life in anaerobic soils conditions, and qualify as hydrophytic species for Section 404 delineations. If more than 50 percent of the dominant plant species present in a sample plot are classified as hydrophytic species (e.g., FAC or wetter), the area has met the hydrophytic vegetation criterion. Dominant species are selected using the "50/20 rule" (USACE 2008a).

2.2 Wetland Hydrology

Wetland hydrology "encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season sufficient to create anaerobic and reducing conditions" (Environmental Laboratory 1987). The jurisdictional wetland hydrology criterion is satisfied if the area supports "*14 or more consecutive days of flooding or ponding, or a water table 12 in. (30 cm) or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability)*" (USACE 2008a). If recorded data—such as stream, tidal gauge, or hydrologic monitoring—are lacking, field indicators are used to determine the presence of wetland hydrology. Field indicators include primary indicators, such as observed inundation or saturation, biotic crust, and oxidized rhizospheres on living roots; or secondary indicators, such as drainage patterns and FAC-neutral test. The presence of one primary indicator, or two secondary indicators, is sufficient to conclude that an area has wetland hydrology (USACE 2008a).

2.3 Hydric Soils

Hydric soils are defined by the Natural Resources Conservation Service as "soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil" (Federal Register 1994). Nearly all hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation, or both, for more than a few days. Characteristic hydric soil indicators observable in the field include: histic epipedons; sulfidic material; aquic or preaquic moisture regime; reducing conditions; iron and manganese concretions; and soil colors (gleyed soils, soils with mottles and/or low chroma matrix). Color designations are determined by comparing a soil sample with a standard Munsell soil color chart (Munsell 2012). The presence of any one of the above listed field indicators is considered sufficient to meet the hydric soil criterion.

2.4 Other Waters of the U.S.

In addition to potential jurisdictional wetlands, this study evaluated the presence of any "Waters of the U.S." other than wetlands potentially subject to jurisdiction under Section 404 of the CWA. "Other Waters" are seasonal or perennial water bodies, such as lakes, stream channels, drainages, ponds, and other surface water features that exhibit an Ordinary High Water Mark (OHWM) but lack positive indicators of one or more of the three wetland parameters (hydrophytic vegetation, wetland hydrology, hydric soils) (Federal Register 1986). In non-tidal "other waters," USACE jurisdiction extends to the

OHWM, defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressions on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris" (Federal Register 1986; USACE 2005; 2008b).

2.5 Waters of the State

All potential aquatic resources observed on the study area were delineated during the field visits. Areas that may be exempt from USACE jurisdiction (discussed in Section 5.1), but may be included as Waters of the State under the State Water Resources Control Board's (SWRCB) *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (which took effect May 28, 2020) or the Porter-Cologne Water Quality Control Act, were identified during the delineation. Final regulatory jurisdiction would need to be determined by the applicable agencies.

3.0 ENVIRONMENTAL SETTING

3.1 Topography and Hydrology

The Project site is located within the Santa Rosa Plain and accordingly its topography is relatively flat overall, with gradual elevational changes trending from northeast to southwest; elevation is highest in the northeastern corner of the Project site, at 165 feet above sea level, and decreases to 137 feet above sea level in the northwestern corner and 147 feet above sea level in the southeastern corner. This topographic trend is further defined by Pruitt Creek, a blue line stream that enters the Project site from the north via a box culvert below Shiloh Road and flows diagonally south-southwest across the site (Figure 3). The southernmost extent of Pruitt Creek exits the Property boundary and continues above ground on a separate parcel before exiting via a box culvert under Old Redwood Highway. This feature is predominantly fed by offsite water sources but sheet flow runoff from precipitation or other on-site sources may contribute to the creek's hydrology. Additionally, sheet flow from direct precipitation and irrigation runoff feeds a roadside drainage ditch that flows parallel to Old Redwood Highway, along the western boundary of the Project site.

3.2 Soils

Four soil types occur within the Project site, as mapped by the NRCS (Figure 3). The mapped soil units are HtA: Huichica loam 0 to 2 percent slopes, RnA: Riverwash, HuB: Huichica loam, ponded, 0 to 5 percent slopes, and YsA: Yolo silt loam, 0 to 5 percent slopes (NRCS 2022). Test pits dug by Sequoia at each sample site confirmed that soils were consistent with the soil descriptions provided by the NRCS.

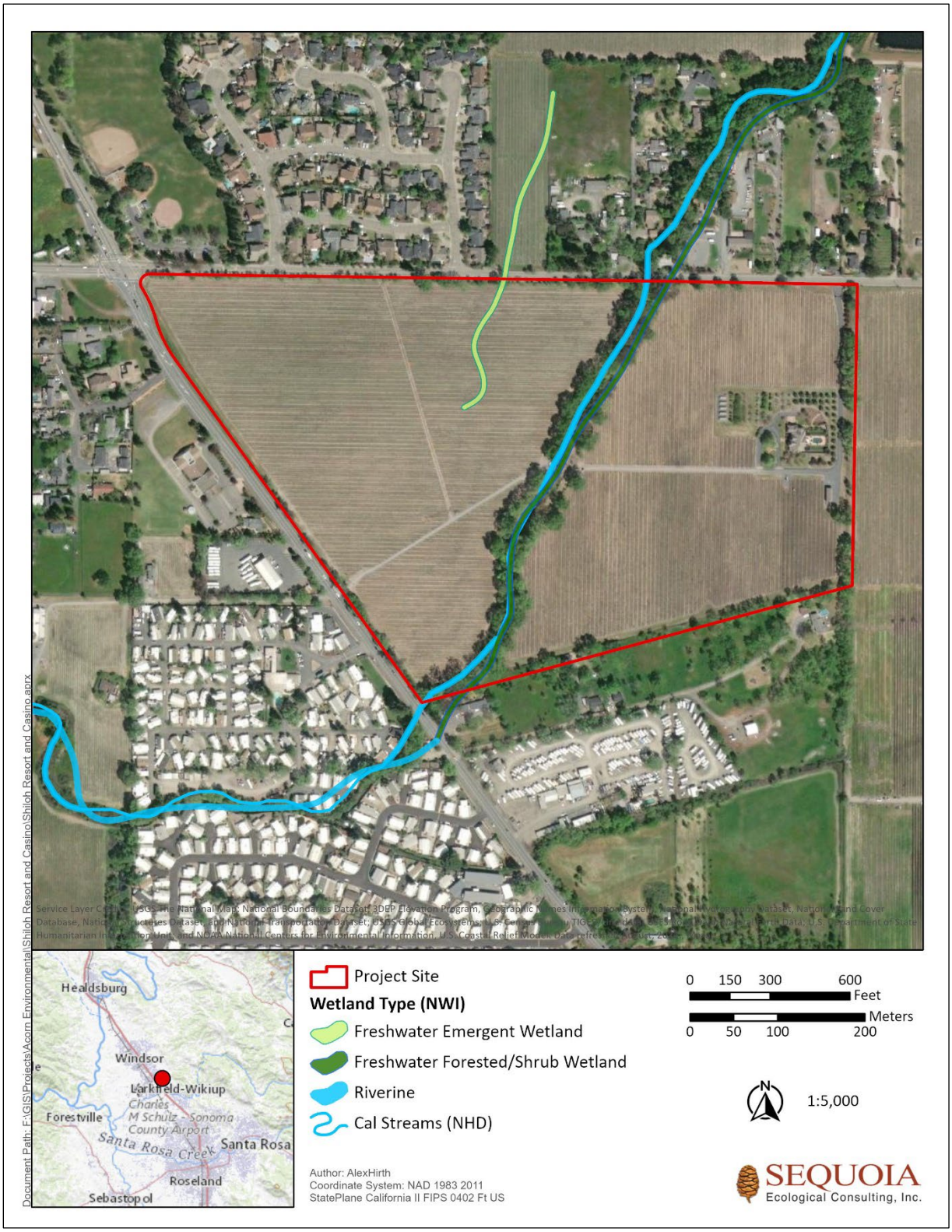

Figure 3. National Wetlands Inventory Map for the Shiloh Resort and Casino Project Site.

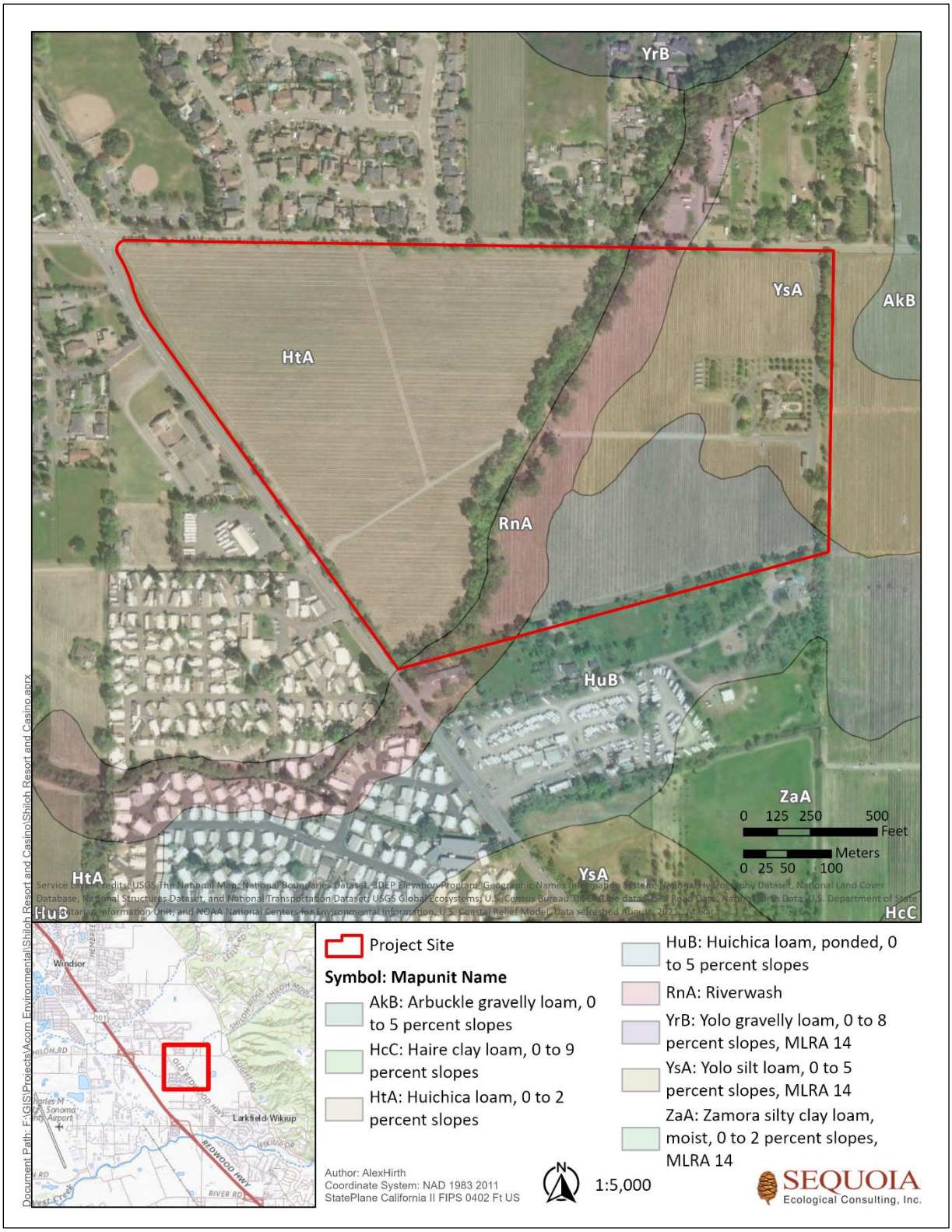

Figure 4. Soil Types Mapped within the Shiloh Resort and Casino Project Site.

3.3 Project Site Vegetation

On February 23 and 24, 2022, Sequoia staff conducted a survey of the Project site and characterized the vegetation present. During the survey, Sequoia biologists also documented plant and wildlife species observed on the Project site. Nomenclature used for plant names follows *The Jepson Manual* Second Edition (Baldwin 2012), while nomenclature used for wildlife follows CDFW's *Complete List of Amphibian, Reptile, Bird, and Mammal Species in California* (2016). Habitat affinities were assigned following the classification of Lichvar et.al (2014), as updated in 2016. Wetland indicator species (i.e., species that can tolerate soil saturation during grow period and/or prolonged inundation) were taken into consideration when classifying vegetation types.

Four plant communities occur on the Project site (Sawyer and Keeler-Wolf 1995) and are further described below. Representative photographs of the Project site are included in Appendix C and a list of all plant species observed during the surveys can be found in Appendix D.

3.3.1 Agricultural Land

The majority of the Project site is characterized by vineyards comprised of grape arbors and associated infrastructure, including dirt roads, piping (irrigation, propane, utility, etc.), propane tanks, wash station, and electrical power poles. While the grape rows themselves are weeded and maintained, ruderal and annual vegetation grows between rows and around the vineyard perimeter; ruderal species are adapted to endure intense and/or long-term disturbance. Ruderal species observed within the Project site include non-native annual grasses such as slender wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceous*), as well as stinking chamomile (*Anthemis cotula*), English plantain (*Plantago lanceolata*), California burclover (*Medicago polymorpha*), common vetch (*Vicia sativa*), and filaree species (*Erodium botrys*, *E. cicutarium*).

3.3.2 Anthropogenic/Developed

Anthropogenic or developed land cover includes areas that have been manipulated, altered, or converted for human use. Vegetation associated with anthropogenic/developed habitat is typically non-native ornamental and landscaping species, as well as agricultural species. This habitat within the Project site consists of dirt access roads, a paved driveway along the eastern property boundary, and the existing private residence. Surrounding the residence are an orchard, various infrastructure such as solar panels and agricultural equipment, and outbuildings, including a large barn or garage located just south of the dwelling. Vegetation within anthropogenic/developed areas on the Project site is dominated by landscaping comprised of agricultural and ornamental species, with interspersed ruderal species and non-native grasses and forbs.

Landscaping surrounding the residence include various landscape trees and shrubs, including rose (*Rosa* sp.), mulberry (*Morus alba*), maple (*Acer* sp.), and purpleleaf plum (*Prunus cerasifera*). A grove of olive (*Olea europaea*) trees occurs on the north side of the dwelling, along with an orchard that supports

varieties of edible fig (*Ficus carica*), citrus (*Citrus* sp.), apple (*Malus domestica*), apricot (*Prunus armeniaca*), pear (*Pyrus* sp.), peach (*Prunus persica*), nectarine (*Prunus persica*), and various species of plum, pluot, and cherry (*Prunus* sp.). Additional small, planted orchard trees and two large valley oaks (*Quercus lobata*) are located the vicinity of the barn. Ruderal species, similar to those found between the vineyard rows, and non-native grasses and forbs also occur around the residence and other anthropogenic/developed areas on site. Non-native annual grasses and forbs are species that mature in spring and early summer, before spreading seed and dying in late summer and fall. Grasses and forb species observed in anthropogenic/developed areas on the Project site include slender wild oat, ripgut brome, soft chess, Mediterranean barley (*Hordeum marianum*), black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), and filaree species.

3.3.3 Riparian Woodland

Riparian woodlands are diverse habitats that support numerous plant species that can include grasses, annual and perennial forbs, vines, shrubs, and trees. A variety of plants creates a complex layering of understory and overstory, which in turn provides habitat to numerous wildlife species. When found within the bed, channel, or bank of any river, stream, or lake, riparian vegetation is also protected under Section §1602 of the California Fish and Game Code (CFGC); and CDFW has included riparian communities in the California Natural Diversity Database (CNDDB). Accordingly, Sequoia mapped the extent of the riparian woodland, referred to as the riparian dripline, and top-of-bank (TOB) in order to determine the potential limits of CDFW jurisdiction pursuant to CFGC Section §1602.

The extent of this habitat type within the Project site is limited to the riparian corridor surrounding Pruitt Creek, which is bisected by an existing dirt road crossing. The canopy in the portion of the riparian corridor north of the crossing is dominated by eucalyptus (*Eucalyptus sp.*) and valley oak trees, while native trees such as Oregon ash (*Fraxinus latifolia*), buckeye (*Aesculus californica*) and California bay-laurel (*Umbellularia californica*) are more prevalent in the southern half of the riparian corridor. Coast live oak (*Quercus agrifolia*) trees characterize the terrace floodplain adjacent to the creek through the upper extent of the riparian woodland is characterized. Understory riparian vegetation composition is consistent throughout the entire riparian corridor and is comprised of a mix of native and non-native species of shrubs, herbs, and grasses. Native species observed include poison oak (*Toxicodendron diversilobum*), pink honeysuckle (*Lonicera hispidula*), creeping snowberry (*Symphoricarpos mollis*), soap plant (*Chlorogalum pomeridianum*), and miner's lettuce (*Claytonia perfoliata*). Non-native understory species include French broom (*Genista monspessulana*), Himalayan blackberry (*Rubus armeniacus*), black mustard, curly dock (*Rumex crispus*), English ivy (*Hedera helix*), and periwinkle (*Vinca major*). Hydrophytic plant species were also identified within, along the margins of, or directly adjacent to the wetted channel and include bog rush (*Juncus effusus*), tall flatsedge (*Cyperus eragrostis*), three-square bulrush (*Schoenoplectus pungens*), and iris-leaf rush (*Juncus xiphioides*).

Evidence of human use and/or disturbance were observed throughout the riparian corridor, most notably in the area with the dirt low-flow crossing; two pipes embedded in a stone and cement masonry

structure cross the creek from top-of-bank to top-of-bank near a kiosk sign just north of the crossing. Other human infrastructure and debris within the riparian corridor includes pieces of concrete that have been scattered or imbedded in the bed and banks of the creek, pole-mounted bird or bat boxes, a bee swarm box attached to a tree, and a wooden and metal fence that spans the creek on the southern property line.

3.3.4 Seasonal Wetlands

Seasonal wetlands are habitats that dry down in the summer and fall months, but generally in the rainy, winter months become saturated and inundated for several weeks to months. Seasonal wetlands often hold water due to soil permeability and/or the presence of topographically low, depressional areas. Soils with a high clay content or within depressional areas, or soils that have been compacted by human activities, often hold and trap seasonal rainfall over short to long durations of the winter and spring. These areas often become dominated by hydrophytic plant species that are reliant and/or dependent on regular saturation or inundation. Roadside drainage ditches are man-made features that catch sheet flow or convey stormwater flows.

Seasonal wetlands occur on the western edge of the Project site, between the perimeter fencing along Old Redwood Highway and the grape arbors (Appendix B). While cover within these seasonal wetlands was dominated by bare ground and algal matting, the vegetation present consisted almost exclusively of hydrophytic species, including iris-leaf rush (OBL), annual bluegrass (*Poa annua*; FAC), yard knotweed (*Polygonum aviculare*; FAC), and hyssop loosestrife (*Lythrum hyssopifolia*; OBL).

The roadside drainage ditches that flow along Old Redwood Highway is characterized by a mix of hydrophytic species, such as tall flatsedge (FACW), curly dock (FAC), and bog rush (FACW), and ruderal and non-native annual species consistent with the adjacent uplands, such as wild oat, ripgut brome, and common vetch.

4.0 RESULTS

Aquatic resources delineated on the Project site during the February 2022 delineation fall into three categories: (1) Seasonal Wetlands; (2) Intermittent Drainage; and (3) Roadside Drainage Ditches. Seasonal Wetlands were delineated in areas supporting positive indicators of all three wetland parameters. Pruitt Creek, a tributary that contributes surface water flow to a Traditional Navigable Water (TNW; including through culverts)—but lacks at least one wetland parameter and supports a bed, bank, and OHWM—was delineated as an Intermittent Drainage, as field conditions and/or background sources (NWI, NHD, USGS topographic maps, or other sources) indicate intermittent flow during a typical year. Roadside Drainage Ditches were delineated in ditches apparently constructed in uplands for roadside drainage that do not occur in a wetland or replace a natural tributary.

Where observable in the field, culverts were mapped to help determine the hydrologic connections between

aquatic resources and observed or presumed downstream waters which discharge into a TNW. However, some culverts are presumably present but were not mapped during the delineation because they were buried or otherwise not observable, or were located off the Project site. Additionally, the extent of the riparian dripline and TOB contour were mapped.

Aquatic resources identified during the February 2022 delineation are discussed below and are listed in Table 4. Delineation datasheets are included in Appendix A and a map of aquatic resources is included in Appendix B. Photographs of representative aquatic resources and delineation sample points are included in Appendix C. A list of plant species observed on the Project site, and their wetland indicator status, is included in Appendix D.

Table 2. Potential Aquatic Resources Delineated on the Project Site.

Feature Name	Area (ft^2)	Length (ft)	Acre(s)	Avg Width (ft)	Sample Point	Bed/Bank /OHWM	Hydrology/ Observed Outlet	Lat/Long	Potential Agency Jurisdiction
Seasonal Wetlands									
SW-01	73.4	10	0.002	10	1A/1B	Yes	Seasonal	38.521599, -122.775482	USACE (?) /State
SW-02	164.5	15	0.004	12	2A/2B	Yes	Seasonal	38.523142, -122.776893	USACE (?) /State
SW-03	192.8	21	0.004	8.5	NA	Yes	Seasonal	38.523288, -122.777046	USACE (?) /State
SW-04	404.0	25	0.009	17	NA	Yes	Seasonal	38.523451, -122.777169	USACE (?) /State
Intermittent Drainage									
ID-01	28,100	1,790	0.644	15	3A/3B	Yes	Intermittent /Channel and culvert	38.523686, -122.773475	USACE /State
Roadside Ditches									
RD-01	2,870	1,305	0.066	1.5	NA	Yes	Ephemeral/ Culvert	38.52416, -122.777946	State (?)
RD-02	1,460	444	0.033	2	NA	Yes	Ephemeral/ Culvert	38.52191, -122.775839	USACE (?) /State

4.1 Seasonal Wetlands

Four areas were delineated on the study area that have positive indicators of all three wetland parameters and seasonal hydrology (Table 2; Appendix A, B). Seasonal Wetlands primarily occur on hillside seeps and adjacent swales, channels, and ditches that appear to receive hydrologic input from direct precipitation, groundwater discharge, and/or surface runoff from the adjacent slope or contributing drainages.

Seasonal Wetlands, generally classified as Freshwater Emergent Wetlands in the Cowardin Classification System/NWI (USFWS 2022), are dominated by wetland-classified shrubs and herbaceous species. The

Seasonal Wetlands are shallow depressions situated in topographic low spots along a narrow right-of-way used as an access road for vineyard operations. Land cover in Seasonal Wetlands within the Project site was dominated by bare ground and biotic crust, namely algal mats; however, the vegetation present was dominated by hydrophytic species such as iris-leaved rush, hyssop loosestrife, annual bluegrass, and yard knotweed (Sample Points 1B and 2B; Appendix A). Hydric soil indicators are present, including Redox Dark Surface (F6) and Redox Depressions (F8), as well as Group B wetland hydrology indicators, which serve as evidence of recent inundation and include Surface Soil Cracks (B6), Water-Stained Leaves (B9), and Algal Mats/Biotic Crust (B4/B12). Furthermore, topographical trends and patterns in the land cover/vegetation indicate the Seasonal Wetlands are hydrologically connected to, if not a direct water source for the southernmost Roadside Drainage Ditches (RD-02) that flows along Old Redwood Highway into Pruitt Creek, and ultimately the Russian River, Sonoma Creek, or the Petaluma River. Adjacent uplands occur on berms, slopes, and roads or other development above the wetland, are typically dominated by upland-classified plant species, and lack wetland hydrology and hydric soil indicators. Sample points taken within the adjacent uplands (Sample Points 1A and 1B; Appendix A) contained Oxidized Rhizospheres Among Living Roots, a Group C hydrologic indicator serving as evidence of current or recent soil saturation, and hydric soil indicators (Redox Dark Surface) but lacked a dominance of hydrophytic vegetation.

The presence of hydrologic and hydric soil indicators within adjacent uplands is presumably the result of runoff from irrigation infrastructure associated with the vineyard, such as hoses, piping, emitters, and control valves. The presence of this infrastructure, coupled with evidence of recent saturation and/or inundation between and around the grape rows suggests that irrigation runoff is contributing to the hydrology of the general area. The prevalence of redoximorphic features observed within upland soil samples provides further evidence that saturation and/or inundation occurs often and long enough for anerobic conditions to develop ubiquitously within surrounding soils. Therefore, it is presumed that the hydrology of the Seasonal Wetlands is at least partially influenced by agricultural activities.

4.2 Intermittent Drainage

One Intermittent Drainage (i.e., Pruitt Creek) was delineated on the Project site (Table 4; Appendix A, B). Intermittent Drainages are natural tributaries to downstream TNWs (either through direct discharge or culvert/storm drain networks) and support a bed, bank, and OHWM, but lack one or more wetland parameters.

Pruitt Creek is mapped as “Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC)” and “Palustrine, Forested, Emergent, Persistent, Seasonally Flooded (PFO/EM1C) Freshwater Forested/Shrub Wetland” in the NWI (USFWS 2022). The Drainage was considered intermittent because: (1) the channel had pooled and flowing water that appeared to be the result of seasonal and recent rains and not perennial hydrology; (2) the channel had significant OHWM indicators such as natural line impressed on the bank, shelving, changes in soil character, presence of litter and debris, and matted and bent vegetation to indicate seasonal flow; and/or (3) background sources (the NWI, NHD, USGS topographic

maps, and other sources) indicated seasonal flow. A sample point (Sample Point 3B; Appendix A) taken within a vegetated shelf immediately adjacent to the wetted channel contained a dominance of hydrophytic vegetation, namely three-square bulrush (OBL), and primary (Saturation [A6] and Water-Stained Leaves [B9]) and secondary (Drift Deposits [B3] and Drainage Patterns [B10]) indicators of wetland hydrology but lacked hydric soil indicators. The absence of redoximorphic features may be explained by the abundance of sand and gravel in the soil matrix precluding the development of these features, the proximity of flowing water resulting in features being stripped or removed from the matrix, or a combination of these factors. The paired upland sample point (Sample Point 3A; Appendix A) was taken in the adjacent low terrace east of the creek channel and lacked all three wetland criteria.

Pruitt Creek features a defined bed and bank and contained water during the February 2022 survey. The creek's active floodplain is characterized by a gravel- and sand-lined low-flow channel at its center and a mix of vegetated shelves, gravel/sand bars, and cobble point bars along the lateral extents, between TOB and the wetted channel. Width varies between 3 and 10 feet for the wetted channel and approximately 10 to 30 or more feet for the active floodplain. Water depth within the channel ranges from 6 to 8 inches to 3 or 4 feet. Riffles, shallows, and pools were observed throughout the meandering channel but were predominately in the southern portion of the Drainage. Several low terraces, one of which appears to feature a paleo channel or ephemeral swale, are present in the northern portion of the Drainage and are situated at or above OHWM but below TOB. The active floodplain width at TOB ranges between approximately 30 to 60 feet, with the upper extent reaching nearly 100 feet in some areas when including adjacent low terraces. The low-flow channel bed is lined with small cobble, gravel, sand, and dirt, with interspersed vegetation and leafy and woody debris. Creek banks vary from being highly vegetated to bare dirt, and range from heavily incised cut banks to gradual slopes.

Pruitt Creek enters the Project site from the north via a box culvert underneath East Shiloh Road and flows to southwest through the center of the Project site, where it is bisected by a dirt low flow crossing. The Drainage continues to the southwestern corner of the Project site where it flows offsite through an adjacent property to the south and into a box culvert below Old Redwood Highway. Once offsite, Pruitt Creek eventually drains into Pool Creek, which flows into Windsor Creek, then into Mark West Creek, and finally into the Russian River.

4.3 Roadside Drainage Ditches

Two Roadside Drainage Ditches were delineated on the western edge of the Project site, along Old Redwood Highway (Table 4; Appendix B, D). Roadside Drainage Ditches appeared to be excavated in uplands for roadside drainage, and (based on conditions observed in the field and a review of the NWI, NHD, USGS topographic maps, and other sources) are not natural tributaries to downstream TNWs. Roadside Drainage Ditches were dry during the delineation and support a marginal bed and bank in some areas but are generally swale-like, as well as OHWM, including presence of leaf litter, matted or absent vegetation, and scour. These ditches appeared to be excavated in uplands (rather than wetlands) and are not replacing any natural drainages or wetlands, nor did they appear to be fed by seeps or

hydrologic sources other than direct precipitation and runoff from the roadside and Seasonal Wetlands. Group B wetland hydrology indicators, which serve as evidence of recent inundation, were observed in the Roadside Drainage Ditches, and include Water-Stained Leaves (B9) and Algal Mats (B4). Additionally, hydrophytic species such as bog rush (FACW), curly dock (FAC), and tall flatsedge (FACW) were present but not dominant within the Roadside Drainage Ditches.

The drainage ditch is bisected by the western entrance to the Project site located off Old Redwood Highway. The associated driveway embankment does not feature a culvert, drain, or other artificial structure that would convey water between the northern and southern extent of the ditch. Therefore, the Roadside Drainage Ditches are not only physically disjunct, but also lack direct hydrological surface connection. It is presumed that hydrologic connectivity between the Roadside Ditches, if any, would be limited to subsurface water flow or seepage. Two culverts associated with the northern Roadside Drainage Ditch (RD-01) were identified and mapped, one on the northernmost end below the intersection of East Shiloh Road and Old Redwood Highway, and a lateral culvert that enters the western side of the ditch from below Old Redwood Highway (Appendix B). The southern Roadside Drainage Ditch (RD-02) appears to be split by a small berm associated with a Sonoma County bus stop; however, a 12-inch corrugated metal pipe is present below the berm and allows for direct surface connection between the two sections of the southern Roadside Drainage Ditch. The southern Drainage Roadside Ditch appears to lead directly to Pruitt Creek at its outlet below Old Redwood Highway, in the southwestern corner of the Project site.

5.0 AGENCY JURISDICTION

5.1 Potential USACE Jurisdiction

On January 23, 2020, the U.S. Environmental Protection Agency (USEPA) and the USACE finalized the Navigable Waters Protection Rule to define "waters of the U.S." The rule took effect on June 22, 2020. On August 30, 2021, the U.S. District Court for the District of Arizona vacated and remanded the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency.*

According to the EPA (USEPA 2021): "*In light of this order, the agencies have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice. The agencies continue to review the order and consider next steps. This includes working expeditiously to move forward with the rulemakings announced on June 9, 2021, in order to better protect our nation's vital water resources that support public health, environmental protection, agricultural activity, and economic growth. The agencies remain committed to crafting a durable definition of "waters of the United States" that is informed by diverse perspectives and based on an inclusive foundation*.

The agencies are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice … The term waters of the United States means:

1. *All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;*
2. *All interstate waters including interstate wetlands;*
3. *All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:*
    a. *Which are or could be used by interstate or foreign travelers for recreational or other purposes; or*
    b. *From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or*
    c. *Which are used or could be used for industrial purposes by industries in interstate commerce;*
4. *All impoundments of waters otherwise defined as waters of the United States under this definition;*
5. *Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;*
6. *The territorial sea;*
7. *Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.*

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA" (USEPA 2021).

According to guidance present prior to the pre-2015 regulatory regime (USEPA 2008):

"*The agencies will assert jurisdiction over the following waters:*

- *Traditional navigable waters*
- *Wetlands adjacent to traditional navigable waters*
- *Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months)*
- *Wetlands that directly abut such tributaries*

The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- *Non-navigable tributaries that are not relatively permanent*
- *Wetlands adjacent to non-navigable tributaries that are not relatively permanent*
- *Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary*

The agencies generally will not assert jurisdiction over the following features:

- *Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow)*
- *Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water*

The agencies will apply the significant nexus standard as follows:

- *A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters*
- *Significant nexus includes consideration of hydrologic and ecologic factors"*

Based on current guidance (USEPA 2008; 2021), the Intermittent Drainage delineated on the Project site would presumably qualify as "*non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months)"* and therefore fall under USACE jurisdiction.

Four Seasonal Wetlands were delineated on the Project site. Based on current guidance (USEPA 2008; 2021) and an analysis of field and background data, the Seasonal Wetlands do not directly abut "*Non-navigable tributaries of traditional navigable waters that are relatively permanent",* but are hydrologically connected to such tributaries via the Roadside Drainage Ditches, and may qualify as "*Wetlands adjacent to non-navigable tributaries that are not relatively permanent.*" Conversely, pursuant to CWA 33 CFR § 328.3 "*artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease*" are considered non-jurisdictional. Furthermore, the effect of agricultural activities on the jurisdictional status of the Seasonal Wetlands may also be influenced by CWA 33 CFR § 323.4, which exempts "*normal and established farming, silviculture and ranching activities such as plowing, seeding, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices*" from USACE regulations and permitting. While these exemptions appear to be applicable to the Seasonal Wetlands, only the USACE can determine their pertinence and jurisdiction.

Therefore, "*The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water.*"

The northern Roadside Drainage Ditch (RD-01) does not appear to have direct surface connection to a TNW or tributary, whereas the southern Roadside Drainage (RD-02) ditch flows directly into Pruitt Creek (Appendix B). The presence/absence of a significant nexus may influence the jurisdictional determination of the Roadside Drainage Ditches but is unlikely to, as these "*Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water"* are specifically excluded from USACE jurisdiction under current guidance (USEPA 2008; 2021).

The regulatory analysis described above is preliminary. Due to recent changes based on Court decisions, regulatory jurisdiction is in flux, and therefore the USACE would need to determine its jurisdiction on the study area based on a verification of this report.

5.2 Potential State Jurisdiction

On April 2, 2019, the SWRCB adopted a *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Procedures), for inclusion in the *Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California*. The Procedures took effect May 28, 2020. The Procedures consist of four major elements: (1) a wetland definition; (2) a framework for determining if a feature that meets the wetland definition is a water of the state; (3) wetland delineation procedures; and (4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. Aquatic resources (such as ephemeral tributaries, some drainage ditches, and isolated wetlands), which may be exempt from federal jurisdiction under the Navigable Waters Protection Rule would likely be considered waters of the State under the Porter-Cologne Water Quality Control Act and/or the Procedures that took effect May 28, 2020.

Based on the Procedures, the Seasonal Wetlands and Intermittent Drainages would likely qualify as "Waters of the State" subject to jurisdiction by the SWRCB, as discussed above. The jurisdictional status of the Roadside Drainage Ditches is unclear. Agricultural ditches are excluded from the Procedures, and while the ditches on the Project site are roadside ditches they also appear to be fed, at least partially, by agricultural runoff from the on-site vineyard. Based on previous delineations conducted by Sequoia within Sonoma County (Sequoia Ecological Consulting, Inc. 2020, 2022), Roadside Drainage Ditches were excluded from State jurisdiction. Roadside Drainage Ditches delineated in this report are similar to those delineated in other reports, and State regulations have not changed since that delineation was conducted, making it unlikely that they would be considered Waters of the State. That said, the jurisdictional status of the Roadside Drainage Ditches and other potential Waters of the State would need to be determined by the SWRCB and local Regional Water Quality Control Board (RWQCB) based on a verification of this report.

Work, such as placement of fill material, occurring within USACE jurisdiction normally requires a permit under Section 404 of the federal CWA. In addition, the USACE, under Section 401 of the federal CWA, is required to meet state water quality regulations prior to granting a Section 404 permit. This is accomplished by application to the local RWQCB for Section 401 certification that requirements have been met. Streams, rivers, and lakes up to the TOB or dripline of riparian vegetation (whichever is greater) also fall within the jurisdiction of the California Department of Fish and Wildlife (CDFW). Work within CDFW jurisdiction normally requires a Streambed Alteration Agreement. These requirements typically apply to public and private projects and the description of potential State jurisdiction has been included for reference; however, in the case of the proposed Project, the property will be taken over into federal trust for the Tribe at which point State jurisdiction would no longer apply.

6.0 LIMITATIONS

The results of this delineation are preliminary. Regulatory agencies, including the USACE, SWRCB, and CDFW, make the final determination about the location and extent of wetlands and other waters on the Project site, and this delineation report should be sent to the USACE for verification. This report does not constitute authorization to conduct the Project, and all necessary permits and approvals should be obtained from regulatory agencies prior to Project implementation.

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Appendix A

Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 1A

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

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

Subregion (LRR): Mediterranean CA (LRR C) Lat: 38.521638 Long: -122.775493 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent slopes NWI classification: none

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Vicia sativa	30	x	FACU
2. Medicago polymorpha	30	x	FACU
3. Bromus hordeaceous	10		FACU
4. Ranunculus muricatus	30	x	FACW
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust None

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 30	x 2 = 60
FAC species _____	x 3 = _____
FACU species 70	x 4 = 280
UPL species _____	x 5 = _____
Column Totals: 100 (A)	340 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation dominated by facultative upland species.

SOIL

Sampling Point: 1A

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	80	7.5YR 5/6	15	C	M	loam	Redox distinct and contemporan
			GLEY1 4/N	5	D	M		

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are abundant.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Oxidized rhizospheres present among living roots. No soil saturation or other hydrological indicators present. Area is immediately adjacent to vineyard with irrigation system that may be creating runnoff.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 1B

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): California Lat: 38.521600 Long: -122.775482 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent slopes NWI classification: none

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Juncus xiphiodes	10	x	OBL
2. Poa annua	10	x	FAC
3. Medicago polymorpha	2		FACU
4.			
5.			
6.			
7.			
8.			
	22 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 38 % Cover of Biotic Crust 50

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 10	x 1 = 10
FACW species _____	x 2 = _____
FAC species 10	x 3 = 30
FACU species 2	x 4 = 8
UPL species _____	x 5 = _____
Column Totals: 22 (A)	48 (B)

Prevalence Index = B/A = 2.18

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Area mostly devoid of vegetation, but what is present is dominated by hydrophytic species. Leaf litter and algal mats abundant.

SOIL

Sampling Point: 1B

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	96	7.5YR 5/6	5	C	M	loam	Redox distinct and contemporary
			GLEY1 4/N	1	D	M		
10-12	10YR 3/2	100					sandy loam	Inclusions of sand

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are distinct and contemporary.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Water stained leaves and biotic crust present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/24/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 2A

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

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

Subregion (LRR): California Lat: 38.523176 Long: -122.776926 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent slopes NWI classification: none

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Poa annua	10	x	FAC
2. Anthemis cotula	60	x	FACU
3. Bromus hordeaceous	10		FACU
4. Medicago polymorpha	15		FACU
5.			
6.			
7.			
8.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust None

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 10	x 3 = 30
FACU species 85	x 4 = 340
UPL species _____	x 5 = _____
Column Totals: 95 (A)	370 (B)

Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation dominated by facultative upland species.

SOIL

Sampling Point: 2A

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	80	7.5YR 5/6	15	C	M	loam	Redox distinct and contemporan
			GLEY1 4/N	5	D	M		

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are abundant. Gravel and rocks are present but not restrictive.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Oxidized rhizospheres present among living roots. No soil saturation or other hydrological indicators present. Area is immediately adjacent to vineyard with irrigation system that may be creating runnoff.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/24/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 2B

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): California Lat: 38.523176 Long: -122.776926 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent slopes NWI classification: none

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Polygonum aviculare	2	x	FAC
2. Lythrum hyssopifolia	5	x	OBL
3. Poa annua	5		FAC
4.			
5.			
6.			
7.			
8.			
	12 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 38 % Cover of Biotic Crust 50

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 5	x 1 = 5
FACW species _____	x 2 = _____
FAC species 7	x 3 = 21
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 12 (A)	26 (B)

Prevalence Index = B/A = 2.16

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Area mostly devoid of vegetation, but species present are hydrophytic indicators. Leaf litter and algal mats abundant.

SOIL

Sampling Point: 2B

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	80	7.5YR 5/6	15	C	M	loam	Redox distinct and contemporan
			GLEY1 4/N	5	D	M		

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are abundant. Intrusions of gravel and rocks are present but not restrictive.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Multiple primary hydrologic indicators are present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 3A

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

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

Subregion (LRR): California Lat: 38.523713 Long: -122.773416 Datum: NAD83

Soil Map Unit Name: RnA - Riverwash NWI classification: none

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Avena sativa	67	x	UPL
2. Bromus hordeaceous	10		FACU
3. Geranium dissectum	5		NL
4. Rumex acetosella	10		FACU
5. Cardamine hirstua	2		FACU
6. Rumex crispus	2		FAC
7. Cerastium glomeratum	2		UPL
8. Erodium botrys	2		FACU
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation dominated by facultative upland and upland species.

SOIL

Sampling Point: 3A

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/2	10					loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: Rock/gravel

Depth (inches): 5-12

Hydric Soil Present? Yes _____ No ✓

Remarks:

Unable to dig past 5 inches due to restrictive layer of rock and gravel.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): None

Water Table Present? Yes _____ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 3B

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): <1

Subregion (LRR): California Lat: 38.523681 Long: -122.773496 Datum: NAD83

Soil Map Unit Name: RnA - Riverwash NWI classification: Riverine

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

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

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

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

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

Remarks:

Soils naturally problematic due to location of sample point on gravel/sandbar adjacent to creek and below top-of bank.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Schoenoplectus pungens	55	x	OBL
2. Galium aparine	15		FACU
3. Vicia sativa	10		FACU
4. Avena sativa	8		UPL
5. Geranium robertianum	10		FACU
6. Torilis arvensis	2		NL
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 55	x 1 =	55
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species 35	x 4 =	140
UPL species 8	x 5 =	40
Column Totals: 98 (A)		235 (B)

Prevalence Index = B/A = 2.39

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Area dominated by hydrophytic species.

SOIL

Sampling Point: 3B

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	100					sandy loa	
8-9	-						gravel	
9-12	10YR 2/2	100					gravelly l	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks:

Redoximorphic features not observed, possibly because of high sand/gravel content in the matrix and proximity to flowing water.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): None

Water Table Present? Yes ____ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 0-8

Wetland Hydrology Present? Yes ✓ No ____

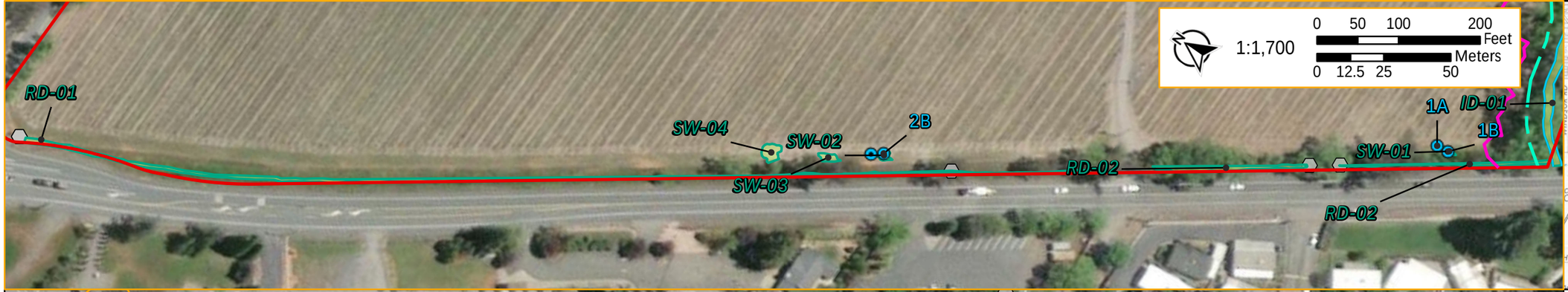
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

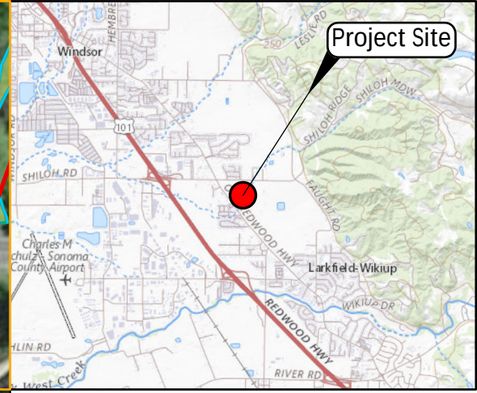
Remarks:

Area immediately adjacent to creek, below top-of-bank but on a small gravel/sand bar.

Appendix B

Draft Aquatic Resources Delineation Map





Project Site
Culvert Opening
Sample Point
Ordinary High Water Mark
Top-of-Bank
Riparian Dripline
Potential Aquatic Resource

Aquatic Feature Name	Area (sq. ft.)	Area (ac.)
ID-01	28,100	0.644
RD-01	2,870	0.066
RD-02	1,460	0.0334
SW-01	73.4	0.00169
SW-02	165	0.00378
SW-03	193	0.00442
SW-04	404	0.00927

Author: AlexHirth
Date Exported: 4/5/2022
Coordinate System: NAD 1983 2011
StatePlane California II FIPS 0402 Ft US

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2021., Maxar, Microsof

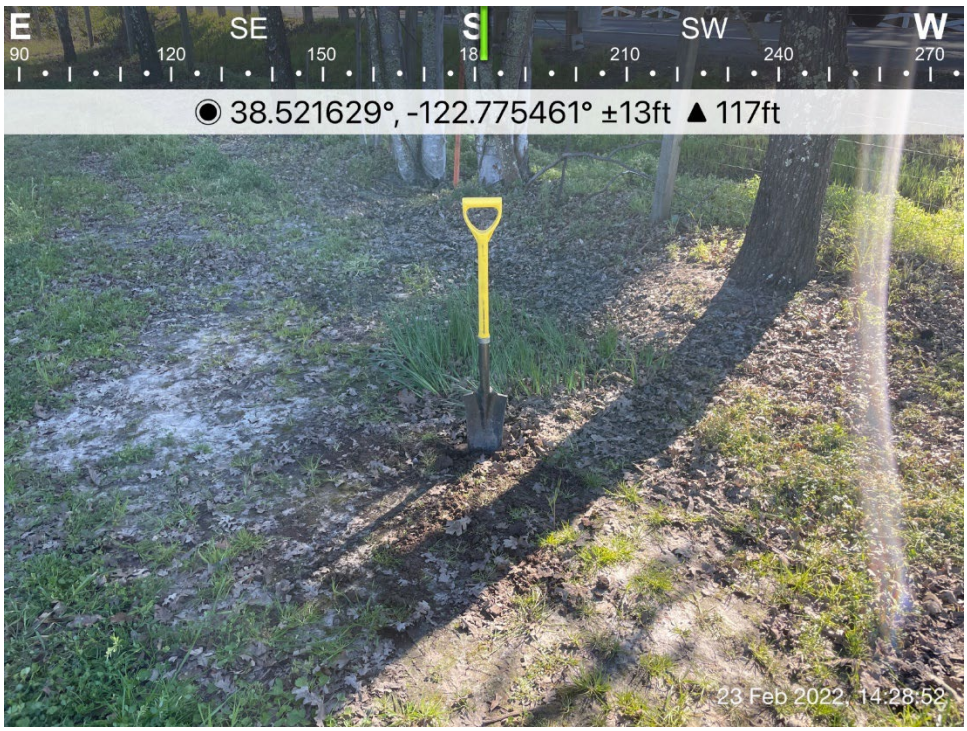
SEQUOIA
Ecological Consulting, Inc.

Document Path: F:\GIS\Projects\Acorn Environmental\Shiloh Resort and Casino\Shiloh Resort and Casino.aprx

Appendix C

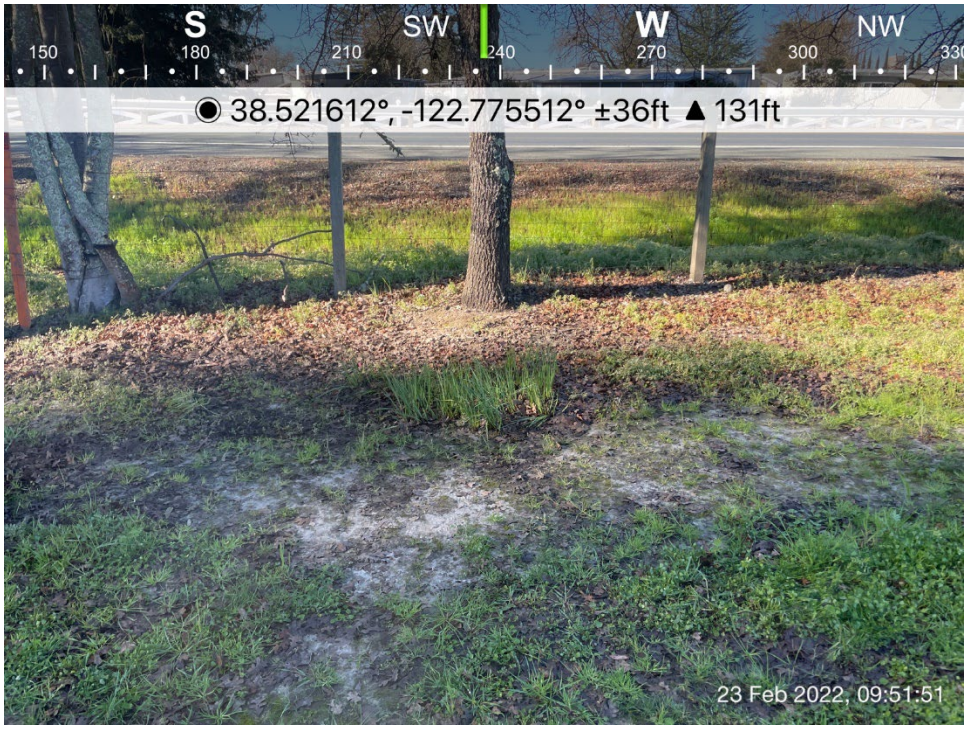
Project Site Representative Photographs

Photograph 1: Photo shows the location of upland Sample Point 1A.



Photograph 2: Photo shows the location of wetland Sample Point 1B within Seasonal Wetland SW-01.

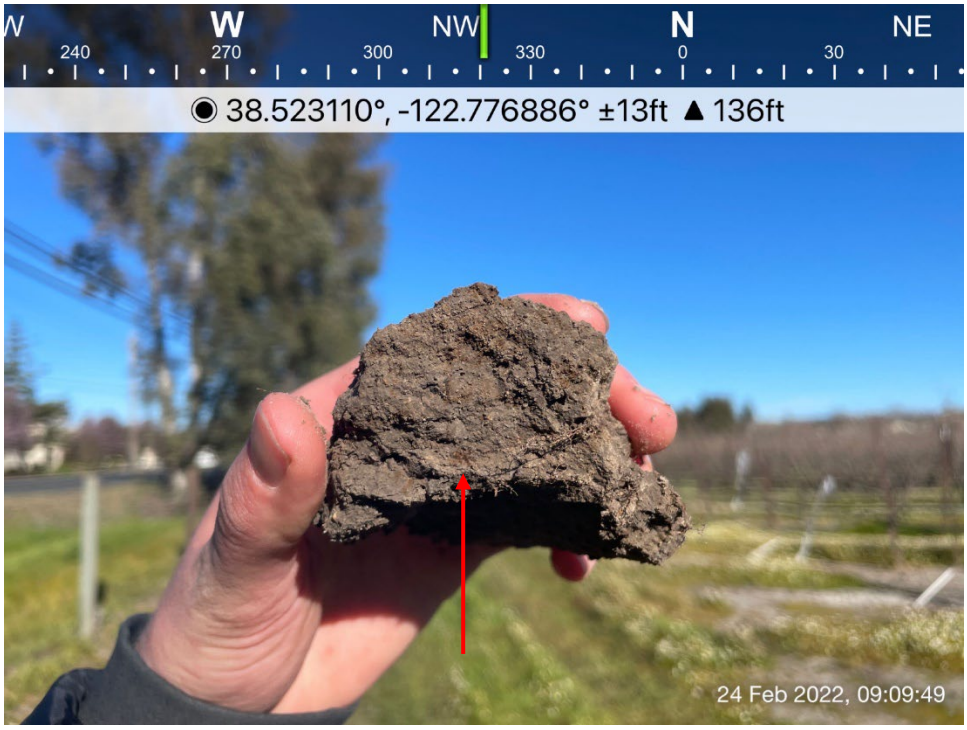
Photograph 3. Photo shows redoximorphic concentrations within the soil matrix and pore linings from Sample Point 1B.



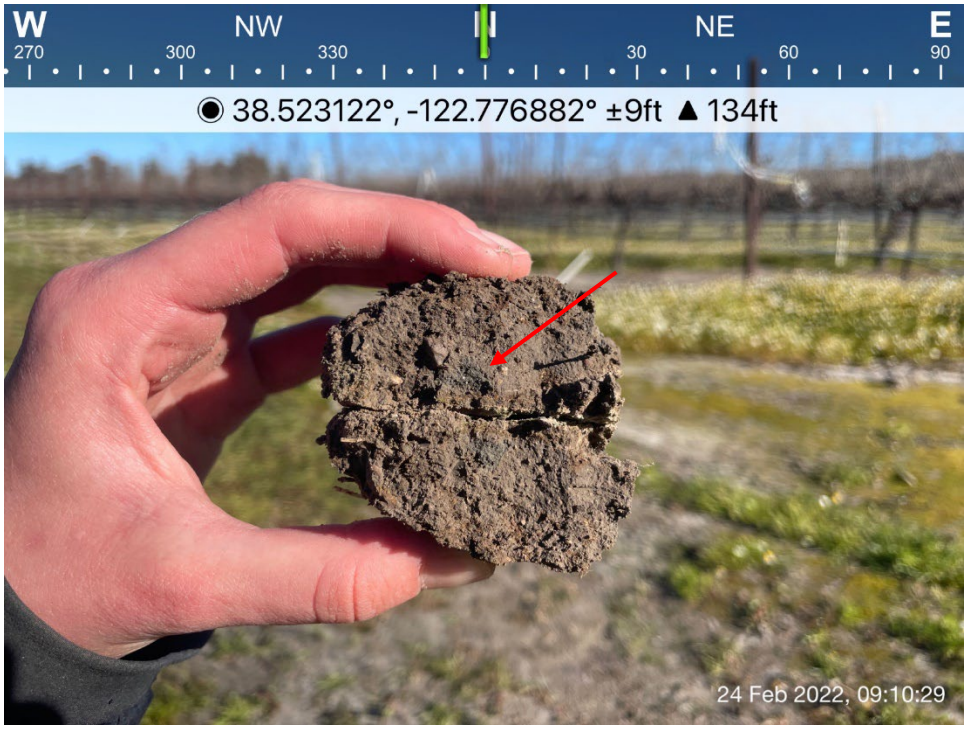
Photograph 4: Photo shows an overview of Seasonal Wetland SW-01.

Photograph 5: Photo shows wetland sample point 2B within Seasonal Wetland SW-02.

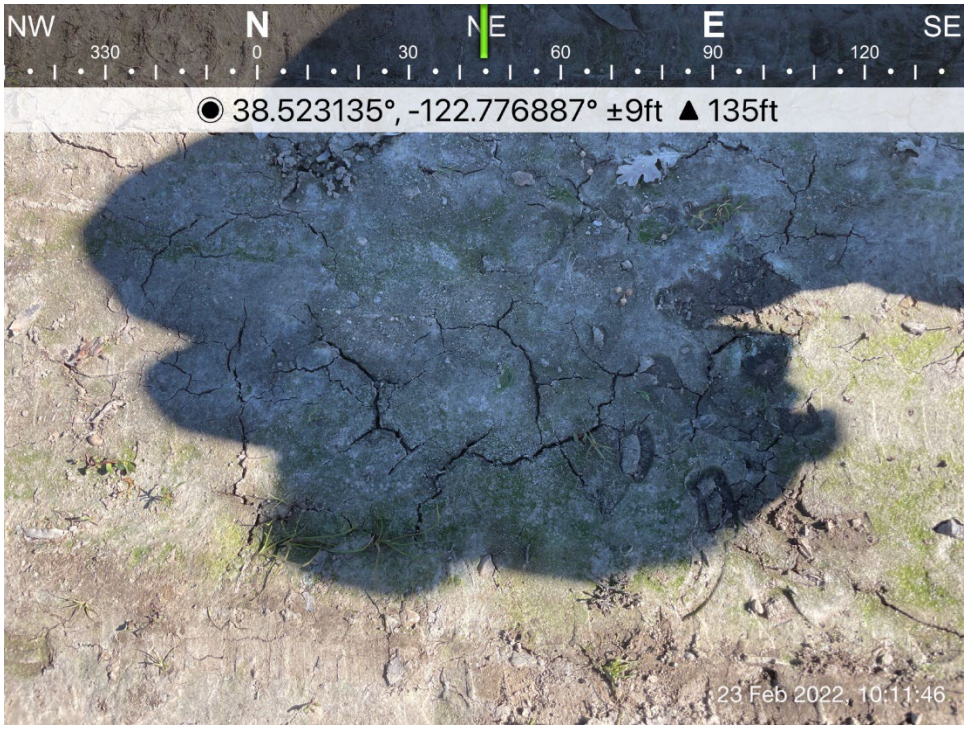
Photograph 6: Photo shows an overview of Seasonal Wetland SW-02.



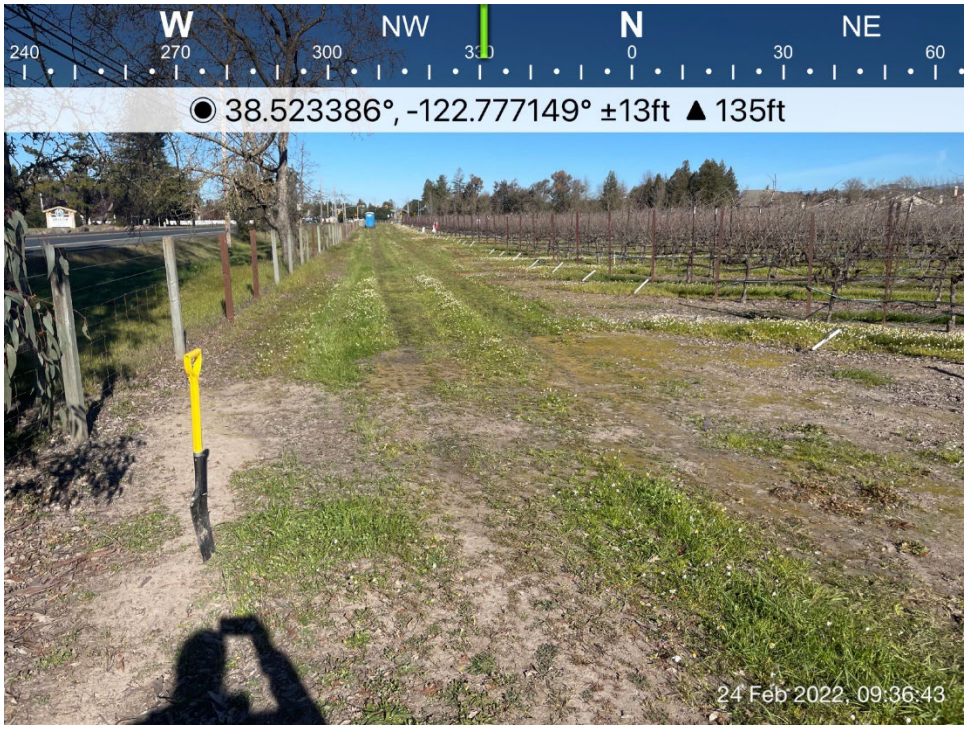
Photograph 7: Photo shows redoximorphic concentrations (red arrow) within soils from wetland Sample Point 2B.



Photograph 8: Photo shows redoximorphic depletions (red arrow) within soils from wetland Sample Point 2B.



Photograph 9: Photo shows hydrologic indicators (Surface Soil Cracks, Biotic Crust) within Seasonal Wetland SW-02.



Photograph 10: Photo shows Seasonal Wetland SW-03.

Photograph 11: Photo shows Sample Point 3B taken within a vegetated shelf adjacent to Pruitt Creek.

Photograph 12: Photo shows the soil profile from Sample Point 3B and evident Saturation, a primary hydrologic indicator.

Photograph 13: Photo shows changes in soil character (red line), an indicator of OHWM, along Pruitt Creek.

Photograph 14: Photo shows an overview of the Pruitt Creek channel and OHWM.

Photograph 13: Photo shows the swale-like roadside drainage ditch (RD-01) and OHWM.

Photograph 14: Photo shows an overview of the southern roadside drainage ditch RD-02.

Appendix D

Plant Species Observed on the Project Site

Scientific Name	Common Name	Family	Indicator Status
Aesculus californica	California buckeye	Sapindaceae	-
Agapanthus africanus	African lily	Amarylidaceae	-
Anthemis cotula	stinking chamomile	Asteraceae	FACU
Arum italicum	Italian arum	Araceae	-
Avena barbata	slender oat	Poaceae	-
Avena fatua	wild oat	Poaceae	UPL
Brassica nigra	black mustard	Brassicaceae	-
Briza minor	little quaking grass	Poaceae	FAC
Bromus diandrus	ripgut brome	Poaceae	-
Bromus hordeaceus	soft chess	Poaceae	FACU
Calandrinia menziesii	red maids	Montiaceae	FACU
Calendula arvensis	field marigold	Asteraceae	-
Cardamine hirstua	bittercress	Brassicaceae	FACU
Carduus pycnocephalus	Italian thistle	Asteraceae	-
Carex spp.	sedges	Cyperaceae	FAC
Cerastium glomeratum	mouse-ear chickweed	Monitaceae	UPL
Chlorogalum pomeridianum	soap plant	Agavaceae	-
Claytonia perfoliata	miner's lettuce	Montiaceae	FAC
Cotoneaster sp.	cotoneaster	Rosaceae	-
Cyperus eragrostis	tall flatsedge	Cyperaceae	FACW
Elymus sp.	wild rye	Poaceae	-
Erodium botrys	cranesbill	Geraniaceae	FACU
Erodium cicutarium	redstem filaree	Geraniaceae	-
Eucalyptus globulus	blue gum	Myrtaceae	-
Festuca myuros	six-weeks fescue	Poaceae	FACU
Festuca perennis	Italian ryegrass	Poaceae	FAC
Fraxinus latifolia	Oregon ash	Fagaceae	FACW
Galium aparine	bedstraw	Rubiaceae	FACU
Genista monspessulana	French broom	Fabaceae	-
Geranium dissectum	cutleaf geranium	Geraniaceae	-
Geranium molle	dove's-foot geranium	Geraniaceae	-
Geranium robertianum	Robert's geranium	Geraniaceae	FACU
Hedera helix	English ivy	Araliaceae	FACU
Hirschfeldia incana	shortpod mustard	Brassicacrae	-
Hordeum murinum	mousetail barley	Poaceae	FAC

Hypochaeris radicata	rough cat's-ears	Asteraceae	FACU
Juncus balticus	Baltic rush	Juncaceae	FACW
Juncus effusus	bog rush	Juncaceae	FACW
Juncus xiphioides	iris-leaf rush	Juncaceae	OBL
Lepidium nitidum	shining pepperweed	Brassicaceae	FAC
Lonicera hispidula	pink honeysuckle	Caprifoliaceae	FACU
Lysimachia arvensis	scarlet pimpernel	Myrsinaceae	FAC
Lythrum hyssopifolia	hyssop loosestrife	Lythraceae	OBL
Malva parviflora	cheeseweed	Malvaceae	-
Medicago polymorpha	California burclover	Fabaceae	FACU
Narcissus pseudonarcissus	daffodil	Amaryllidaceae	-
Nasturtium officinale	watercress	Brassicaceae	OBL
Oxalis pes-caprae	Bermuda buttercup	Oxalidaceae	-
Pinus sp.	pine	Pinaceae	-
Plantago lanceolata	English plantain	Plantaginaceae	FAC
Poa annua	annual bluegrass	Poaceae	FAC
Polygonum aviculare	yard knotweed	Polygonaceae	FAC
Quercus agrifolia	coast live oak	Fagaceae	-
Quercus lobata	valley oak	Fagaceae	FACU
Ranunculus muricatus	spiny fruit buttercup	Ranunculaceae	FACW
Rubus armeniacus	Himalayan blackberry	Rosaceae	FAC
Rumex acetosella	sheep sorrel	Polygonaceae	FACU
Rumex crispus	curly dock	Polygonaceae	FAC
Rumex pulcher	fiddle dock	Polygonaceae	FAC
Schoenoplectus pungens	three-square bulrush	Cyperaceae	OBL
Senecio vulgaris	common groundsel	Asteraceae	FACU
Stachys bullata	hedge nettle	Lamiaceae	-
Symphoricarpos mollis	creeping snowberry	Caprifoliaceae	FACU
Torilis arvensis	field hedge parsley	Apiaceae	-
Toxicodendron diversilobum	Poison oak	Anacardiaceae	FACU
Trifolium spp.	clover	Fabaceae	FAC
Typha spp.	cattails	Typhaceae	OBL
Umbellularia californica	California bay laurel	Lauraceae	FAC
Vicia sativa	common vetch	Fabaceae	FACU
Vinca major	periwinkle	Apocynaceae	FACU