Biological Resources Assessment

Yankee Hill Road

Rocklin, Placer County, California
April 2021

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1.0 INTRODUCTION

This report presents the results of a Biological Resources Assessment (BRA) conducted for the Yankee Hill Road property (Study Area) to support analysis of impacts under the California Environmental Quality Act (CEQA). The approximately 5-acre Study Area is located within the City of Rocklin, west of the termination of the street named Independence Place in western Placer County, California. The Study Area is located within Section 18, Township 11 North, Range 7 East (MDB&M) and is portrayed on the "*Rocklin, California*" 7.5-Minute Series USGS Topographic Quadrangle (USGS 2018) (**Figure 1**).

1.1 Project Description

The applicant is proposing to split an existing parcel into five residential parcels with a turn-around that provides each proposed parcel vehicular access to Independence Place (**Attachment A**). The Project ultimately consists of the construction of single family residences on each parcel consistent with City zoning and entitlements. There are several development constraints associated with development, including required noise buffers, as well as a floodplain and associated riparian zone associated with Antelope Creek. It is anticipated that much of the Study Area will be developed, with the exception of the Antelope Creek floodplain.

2.0 REGULATORY SETTING

This section describes federal, state and local laws and policies that are relevant to this assessment of biological resources.

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 protects species that are federally listed as endangered or threatened with extinction. FESA prohibits the unauthorized "take" of listed wildlife species. Take includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such activities. Harm includes significant modifications or degradations of habitats that may cause death or injury to protected species by impairing their behavioral patterns. Harassment includes disruption of normal behavior patterns that may result in injury to or mortality of protected species. Civil or criminal penalties can be levied against persons convicted of unauthorized "take." In addition, FESA prohibits malicious damage or destruction of listed plant species on federal lands or in association with federal actions, and the removal, cutting, digging up, damage, or destruction of listed plant species in violation of state law. FESA does not afford any protections to federally listed plant species that are not also included on a state endangered species list on private lands with no associated federal action.

2.1.2 Clean Water Act, Section 404

Section 404 of the Federal Clean Water Act requires that a Department of the Army permit be issued prior to the discharge of any dredged or fill material into waters of the United States, including wetlands. The U.S. Army Corps of Engineers (USACE) administers this program, with oversight from the U. S. Environmental Protection Agency. Waters of the United States include all navigable waters; interstate waters and wetlands; all intrastate waters and wetlands that could affect interstate or foreign commerce; impoundments of the above; tributaries of the above; territorial seas; and wetlands adjacent to the above.

2.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, any native migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11.). Likewise, Section 3513 of the California Fish & Game Code prohibits the "take or possession" of any migratory non-game bird identified under the MBTA. Therefore, activities that may result in the injury or mortality of native migratory birds, including eggs and nestlings, would be prohibited under the MBTA.

2.2 State Regulations

2.2.1 California Environmental Quality Act

The CEQA requires evaluations of project effects on biological resources. Determining the significance of those effects is guided by Appendix G of the CEQA guidelines. These evaluations must consider direct effects on a biological resource within the project site itself, indirect effects on adjacent resources, and cumulative effects within a larger area or region. Effects can be locally important but not significant according to CEQA if they would not substantially affect the regional population of the biological resource. Significant adverse impacts on biological resources would include the following:

- Substantial adverse effects on any species identified as candidate, sensitive, or special-status in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife (CDFW) or the U.S. Fish and Wildlife Service (USFWS) (these effects could be either direct or via habitat modification);
- Substantial adverse impacts to species designated by the California Department of Fish and Game (2009) as Species of Special Concern;
- Substantial adverse effects on riparian habitat or other sensitive habitat identified in local or regional plans, policies, or regulations or by CDFW and USFWS;
- Substantial adverse effects on federally protected wetlands defined under Section 404 of the Clean Water Act (these effects include direct removal, filling, or hydrologic interruption of marshes, vernal pools, coastal wetlands, or other wetland types);
- Substantial interference with movements of native resident or migratory fish or wildlife species population, or with use of native wildlife nursery sites;

- Conflicts with local policies or ordinances protecting biological resources (e.g. tree preservation policies); and
- Conflict with provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan.

2.2.2 State Endangered Species Act

With limited exceptions, the California Endangered Species Act (CESA) of 1984 protects state-designated endangered and threatened species in a way similar to FESA. For projects on private property (i.e. that for which a state agency is not a lead agency), CESA enables CDFW to authorize take of a listed species that is incidental to carrying out an otherwise lawful project that has been approved under CEQA (Fish & Game Code Section 2081).

2.2.3 Native Plant Protection Act

The Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are currently 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants, but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

2.2.4 Clean Water Act, Section 401

Section 401 of the Clean Water Act requires any Applicant for a 404 permit in support of activities that may result in any discharge into waters of the United States to obtain a water quality certification with the Regional Water Quality Control Board (RWQCB). Though Section 401 of the Clean Water Act is a federal statute, compliance with this law falls under the direct purview of a California government agency, the RWQCB. This program is meant to protect these waters and wetlands by ensuring that waste discharged into them meets state water quality standards. Because the water quality certification program is triggered by the need for a Section 404 permit (and both programs are a part of the Clean Water Act), the definition of waters of the United States under Section 401 is the same as that used by the USACE under Section 404.

2.2.5 California Water Code, Porter-Cologne Act

The Porter Cologne Act, from Division 7 of the California Water Code, requires any person discharging waste or proposing to discharge waste that could affect the quality of waters of the state to file a report of waste discharge (RWD) with the RWQCB. The RWQCB can waive the filing of a report, but once a report is filed, the RWQCB must either waive or adopt water discharge requirements (WDRs). "Waters of the State" are defined as any surface water or groundwater, including saline waters, within the boundaries of the state.

2.2.6 California Fish and Game Code, Section 1600 – Streambed and Lake Alteration

The Department of California Fish and Wildlife (CDFW) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code, Section 1602, requires notification to CDFW of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, state or local government agency, or public utility that proposes an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

For the purposes of Section 1602, rivers, streams and lakes must flow at least intermittently through a bed or channel. If notification is required and CDFW believes the proposed activity is likely to result in adverse harm to the natural environment, it will require that the parties enter into a Lake or Streambed Alteration Agreement (LSAA).

2.2.7 California Fish and Game Code, Section 3503.5 - Raptor Nests

Section 3503.5 of the Fish and Game Code makes it unlawful to take, possess, or destroy hawks or owls, unless permitted to do so, or to destroy the nest or eggs of any hawk or owl.

2.3 Local Regulations

2.3.1 City of Rocklin Tree Ordinance

The City of Rocklin (City) Oak Tree Preservation Ordinance (Chapter 17.77 of the City of Rocklin Code) (Tree Ordinance) regulates the removal and preservation of oak trees within the City. "Trees" under the Tree Ordinance includes all oak trees native to the Rocklin area with at least one trunk with a diameter at breast height (DBH) of six inches or more. The Tree Ordinance requires a permit for any activity that results in the physical removal of a Tree from the ground or the willful injury, trimming, disfiguring or other harmful action which leads directly to physical removal or creates such a condition that makes disease likely or results in a significant risk of injury to persons or property. The *City of Rocklin Oak Tree Preservation Guidelines* (dated April 2006) provides additional detail regarding mitigation requirements.

2.3.2 City of Rocklin Riparian Policy

Action Step OCRA-11 of the *City of Rocklin Draft General Plan* requires that an open space easement be recorded over all areas within 50 feet of the edge of the bank of all perennial and intermittent streams and creeks providing natural drainage. In addition, where riparian habitat extends further than 50 feet from the

edge of bank, the easement must be extended to include that area as well. The City may designate an easement greater than 50 feet for perennial streams when it is determined such a buffer is necessary to adequately protect drainage and habitat areas. Features that may be considered acceptable within the 50-foot setback, buffer area and/or open space easements include, but are not limited to, bridges, trails, drainage facilities, utilities, and fencing intended to delineate or protect a specific resource. Installation and maintenance of those features shall minimize impacts to resources to the extent feasible. The above setbacks and buffers apply to residential and non-residential development unless the landowner can demonstrate that literal application of this Action Plan item would preclude all economically viable use of the land under existing zoning.

3.0 METHODOLOGY

3.1 Literature Review

A list of special-status species with potential to occur within the Study Area was developed by conducting a query of the following databases:

- California Natural Diversity Database (CNDDB) (CNDDB 2021) query of the Study Area and all areas within 5 miles of the Study Area (**Figures 2** and **3**);
- USFWS Information for Planning and Conservation (IPaC) (USFWS 2021) query for the Study Area (**Attachment B**);
- California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (CNPS 2021) query of the "*Rocklin, California*" USGS topo quadrangle, and the eight surrounding quadrangles (**Attachment C**); and
- Western Bat Working Group (WBWG) Species Matrix (WBWG 2021).

Also included were special-status species that are known to occur in the region, but that were not identified in any of the above database searches. These were also analyzed for their potential to occur within the Study Area.

For the purposes of this Biological Resources Assessment, special-status species is defined as those species that are:

- listed as threatened or endangered, or proposed or candidates for listing by the USFWS or National Marine Fisheries Service;
- listed as threatened or endangered and candidates for listing by CDFW;
- identified as Fully Protected species or species of special concern by CDFW;
- identified as Medium or High priority species by the WBWG (WBWG 2021); and
- plant species considered to be rare, threatened, or endangered in California by the CNPS and CDFW [California Rare Plant Rank (CRPR) 1, 2, and 3]:
  - CRPR 1A: Plants presumed extinct.
  - CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere.

- CRPR 2A: Plants extirpated in California, but common elsewhere.
- CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
- CRPR 3: Plants about which the CNPS needs more information – a review list.

3.2 Field Surveys

Madrone senior biologist Matt Hirkala conducted a field survey of the Study Area on 25 January 2021 to assess the suitability of habitats on-site to support special-status species. Meandering pedestrian surveys were performed on foot throughout the Study Area. Vegetation communities were classified in accordance with *The Manual of California Vegetation, Second Edition* (Sawyer, Keeler-Wolf and Evens 2009), and plant taxonomy was based on the nomenclature in the *Jepson eFlora* (Jepson Flora Project 2021). A list of all wildlife species observed during field surveys is included as **Attachment D**.

Additionally, Mr. Hirkala also conducted a delineation of aquatic resources within the Study Area. Water features and data points were mapped in the field with an Arrow 100 GNSS unit, which is capable of sub-meter accuracy. Three-parameter data (vegetation, soils, and hydrology) were collected at each data point, documenting wetland/waters or upland status, as appropriate, and a delineation map was prepared in accordance with the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016a). The field data was overlaid on an ortho-rectified aerial photograph (**Attachment E)** (City of Rocklin 2018).

The delineation was performed in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008a), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008b), and the Sacramento District's *Minimum Standards for Acceptance of Preliminary Wetlands Delineations* (USACE 2016b). U.S. Army Corps of Engineers (USACE) regulations (33 CFR 328) were used to determine the presence of Waters of the United States other than wetlands. The most recent *National Wetland Plant List* (Corps 2018) was used to determine the wetland indicator status of plants observed in the Study Area.

Mr. Hirkala also conducted a site visit with Mr. David Mohlenbrok of the City of Rocklin on 5 March 2021 to map the City's definition of the edge of bank in accordance with Action Step OCRA-11 of the *City of Rocklin Draft General Plan* (Plan). The Plan requires that an open space easement be recorded over all areas within 50 feet of the edge of the bank of all perennial and intermittent streams and creeks providing natural drainage such as the reach of Antelope Creek located within the south portion of the Study Area. The edge of bank as defined by Mr. Mohlenbrok was surveyed in the field as a series of point features using an Arrow 100 GNSS unit capable of sub-inch accuracy. Due to heavy thickets of thorny vegetation, some points were collected at locations as close as physically possible to the edge of bank and adjusted by way of "heads-up digitizing" in the office. The final edge of bank is represented as a polyline based on this point data. Madrone collected all field GIS data in, NAD83, California State Plane, Zone II, feet (State Plane).

Layout data were provided to Madrone by CNA Engineering, Inc. (CNA). CNA's layout data were geo-referenced to State Plane with ESRI ArcMap 10.7.1 GIS software (ArcMap) utilizing numerous control points based on readily visible features present on geo-rectified aerial photography flown on 19 March 2018 for the City of Rocklin. Madrone's field data was then merged with CNA's layout data; this combined data set was then geo-refenced back to CNA's coordinate system and incorporated into **Attachment A** as "Antelope Creek" which represents the City's definition of the edge of bank as described above.

4.0 EXISTING CONDITIONS

The triangle-shaped Study Area, which is situated between approximately 240 and 290 feet above mean sea level, is bounded on the northwest by an active rail line owned by the Union Pacific Railroad, by Antelope Creek on the south, and by a low-density residential development on the east. The surrounding areas in general are residential with some commercial and/or industrial parcels. A second active Union Pacific Railroad rail line is located just south of Antelope Creek outside the Study Area.

The Study Area is mostly undeveloped with the exception of a PG&E equipment staging area enclosed by a cinderblock wall near the center of the site. The site display signs of use by local residents who appear to have constructed a BMX bicycle trail. Observed trash also included several dog toys.

4.1 Terrestrial Vegetation Communities

4.1.1 Ruderal Annual Grassland

Ruderal annual grassland comprises approximately 3.04 acres of the Study Area (**Figure 4**). This terrestrial vegetation community is predominantly made up of wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and broad leaf filaree (*Erodium botrys*). Substantial amounts of trash are located throughout the site and appear to have been deposited by occupants of the residential development to the east. Much of the vegetation has been trampled by pedestrian and bicycle traffic.

4.1.2 Developed/Disturbed

Approximately 0.52 acre of the site was mapped as the developed/disturbed terrestrial vegetation community. This community includes the above-mentioned PG&E equipment staging area and the immediately surrounded areas, which mostly lack identifiable vegetation and are composed of gravel or compressed aggregate.

4.1.3 Mixed Oak Woodland

Two polygons totaling approximately 0.64 acre of mixed oak woodland was mapped within the Study Area, one in the north and one in the east. The trees in these areas were mostly Valley oak (*Quercus lobata*), live oak (*Quercus wislizeni*), and blue oak (*Quercus douglasii*). The understory was similar to that of the ruderal annual grassland vegetation community.

4.1.4 Valley Oak Riparian Woodland

Approximately 0.54 acre of Valley oak riparian woodland parallel both sides of Antelope Creek in the south portion of the Study Area. Noted tree species included Foothill pine (*Pinus sabiniana*), Valley oak (*Quercus lobata*), live oak (*Quercus wislizeni*), Fremont's cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), Oregon ash (*Fraxinus latifolia*), and walnut (*Juglans* sp.). Common subcanopy species included Himalayan blackberry (*Rubus armeniacus*), poison oak (*Toxicodendron diversilobum*), and California grape (*Vitus californicus*).

4.2 Aquatic Resources

4.2.1 Antelope Creek and Adjacent Riparian Wetlands

Approximately 0.257 acre of Antelope Creek and adjacent riparian wetlands were mapped within the Study Area. Due to dense thickets of Himalayan blackberry (*Rubus armeniacus*), it was not possible to separately delineate the Antelope Creek channel from its adjacent riparian wetlands as defined by the USACE (**Figure 5** and **Attachment E**).

Antelope Creek contained several inches of flowing water and the surrounding woody vegetation included Fremont's cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), Oregon ash (*Fraxinus latifolia*), as well as the above-mentioned Himalayan blackberry (*Rubus armeniacus*). Herbaceous vegetation included Mediterranean barley (*Hordeum marinum*), lamp rush (*Juncus effusus*), curly dock (*Rumex crispus*), and immature sedges (*Carex* sp.). The most common indicator of wetland hydrology was the presence of oxidized rhizospheres along live roots. The dominant soil matrix color was 10YR2/1 with at least 5% 10YR4/6 redoximorphic concentrations located in the matrix and pore lining (or Hydric Soils Indicator F6: Redox Dark Surface).

4.3 Soils

According to the Natural Resources Conservation Service (NRCS) Soil Survey Database, one soil map unit occurs within the Study Area (**Figure 6**): (106) Andregg coarse sandy loam, 2 to 9 percent slopes (NRCS 2021). The main component of this map unit is not classified as hydric; however, one of its four inclusions is classified as hydric. This unnamed inclusion comprises approximately 1 percent of the map unit and is associated with drainageway landforms.

4.4 Special Lands

Based on our queries, the Study Area is not located within any of the following special designated lands:

- The Primary or Secondary Zone of the Legal Delta;
- Critical Habitat as proposed or designated by the USFWS;

- USFWS Vernal Pool Core Recovery Areas.

5.0 RESULTS

Table 2 provides a list of special-status species that were evaluated, including their listing status, habitat associations, and their potential to occur in the Study Area. The following set of criteria was used to determine each species' potential for occurrence on the site:

- Present: Species occurs on the site based on CNDDB records, and/or was observed on the site during field surveys.
- High: The site is within the known range of the species and suitable habitat exists.
- Moderate: The site is within the known range of the species and very limited suitable habitat exists.
- Low: The site is within the known range of the species and there is marginally suitable habitat.
- Absent/No Habitat Present: The site does not contain suitable habitat for the species, the species was not observed during protocol-level floristic surveys conducted on-site, the species was not observed during protocol-level wet-season and dry-season large listed vernal pool branchiopod surveys conducted on-site, or the site is outside the known range of the species.

Figures 2 and **3** are exhibits displaying CNDDB occurrences of plants and wildlife respectively, within five miles of the Study Area. Below is a discussion of all special-status plant and animal species with potential to occur on the site.

5.1 Plants

5.1.1 Big-Scale Balsamroot

Big-scale balsam root (*Balsamorhiza macrolepis*) is listed as a CRPR 1B.2 plant by the CNPS. It generally occurs at elevations ranging from 145 to 5,100 feet in Valley and foothill grassland, chaparral, and cismontane woodland. Current threats include grazing, residential and recreational development as well as energy projects. This perennial member of the sunflower family is often found on serpentine soils and blooms from March to June.

One CNDDB occurrence of this species is recorded within 5 miles of the Study Area (Occurrence #9), and it is located approximately 4 miles to the west along Highway 99 two miles north of Roseville. This record is based on provided location data from a plant collected in 1957 (CNDDB 2021). The ruderal grasslands within the Study Area provide marginally suitable habitat for this species. There is a low potential for occurrence of this species within the Study Area.

5.1.2 Butte County Fritillary

Butte County fritillary (*Fritillaria eastwoodiae*) is listed as a CRPR 3.2 plant by the CNPS. It generally occurs at elevations ranging from 160 to 4,920 feet in Valley and foothill grassland, chaparral, and cismontane

woodland. Current threats include logging and development as well as off-road vehicles, road maintenance, recreational activities, alteration of fire regimes, erosion, non-native plants, and overshading. This perennial member of the lily family is also often found on serpentine soils and blooms from March to June.

The CNDDB lists no occurrences of this species within 5 miles of the Study Area; however, the query of the CNPS database records the species as occurring within the "Roseville, California" USGS 7.5-Minute topographic quadrangle west of the parcel (CNPS 2021). The very small section of mixed oak woodland within the site represent marginally suitable habitat for this species. There is a low potential for occurrence of this species within the Study Area.

5.1.3 Sanford's Arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is listed as a CRPR 1B.2 plant by the CNPS. It generally occurs at elevations ranging from 0 to 2,135 feet in shallow freshwater habitats associated with drainages, canals, and larger ditches that sustain inundation and/or slow moving water into early summer. Sanford's arrowhead is a perennial rhizomatous emergent species, and it blooms from May to October.

The CNDDB lists no occurrences of this species within 5 miles of the Study Area; however, the query of the CNPS database records the species as occurring within the "Citrus Heights, California" USGS 7.5-Minute topographic quadrangle southwest of the parcel. The reach of Antelope Creek in the south part of the site represents only limited suitable habitat for this species due to the heavy thickets of Himalayan blackberry (*Rubus armeniacus*) which is supplanting native vegetation. There is a moderate potential for occurrence of this species within the Study Area.

5.2 Fish

5.2.1 Central Valley Steelhead

Steelhead (*Oncorhynchus mykiss irideus*) populations in the Central Valley ESU have been listed by the NMFS under the ESA as threatened. Steelhead, the anadromous form of rainbow trout, historically inhabited most tributaries to the Sacramento River. Juvenile steelhead may spend up to three years in freshwater prior to emigrating to the ocean as smolts. Typically, juvenile steelhead emigrate as age class 1+ fish (one year in fresh water) through the Sacramento River and the Sacramento-San Joaquin Estuary from November through May. Spawning steelhead require gravel or cobble substrates 0.2 to 5.1 inches in diameter for egg laying. Fine sediments (e.g., silt, fine sand, and clay) may suffocate eggs by preventing the transport of dissolved oxygen from the water to the eggs. The range of water temperatures for optimal survival and growth of rainbow trout is between 59 and 64°F (Moyle 2002). Both fry and older juveniles require instream object cover, cobble or boulders, large woody debris, undercut banks, or submerged and overhanging vegetation for protection against predators.

Steelhead have been observed within the lower reaches of the watershed in Dry Creek downstream of the Study Area (NMFS 2009). The Antelope Creek substrate within the Study Area is too degraded and sand-

dominated to provide suitable spawning habitat, but steelhead could swim through it occasionally. The potential for occurrence is low.

5.2.2 Central Valley Fall-Run Chinook Salmon

Chinook salmon are an anadromous species which spawn in freshwater rivers but migrate to the ocean to rear (Moyle 2002). Chinook salmon typically return to their natal stream to spawn. Within the Central Valley there are four races of Chinook salmon: fall-run, late fall-run, winter-run, and spring-run. Adult fall-run Chinook salmon migrate through the Delta and into Central Valley rivers from July through December and spawn from October through December.

Chinook rely on suitable water temperature and substrate for successful spawning and incubation. Rearing habitat for juveniles includes riffles, runs, pools, and inundated floodplains. In streams, Chinook are opportunistic feeders. They eat aquatic insects, terrestrial insects and bottom invertebrates. Juvenile Chinook are significantly affected by predatory non-native fish (Moyle 2002).

Chinook salmon have been observed within the lower reaches of the watershed in Dry Creek downstream of the Study Area (NMFS 2009). The Antelope Creek substrate within the Study Area is too degraded and sand-dominated to provide suitable spawning habitat, but Chinook salmon could swim through it occasionally. The potential for occurrence is low.

5.3 Reptiles

5.3.1 Western Pond Turtle

The western pond turtle (*Emys marmorata*) is a California species of special concern. Favored habitats include streams, large rivers and canals with slow-moving water, aquatic vegetation, and open basking sites. Although western pond turtles must live near water, they can tolerate drought by burrowing into the muddy beds of dried drainages. This species feeds mainly on invertebrates such as insects and worms, but will also consume small fish, frogs, mammals, and some plants. Western pond turtle predators include raccoons, coyotes, raptors, weasels, large fish, and bullfrogs. This species breeds from mid to late spring in adjacent open grasslands or sandy banks.

The only CNDDB occurrence of this species within 5 miles of the Study Area is located approximately 5 miles to the north within blue oak woodland with an adjacent network of ponds and seasonal creeks (CNDDB occurrence #1217) (CNDDB 2021).

The reach of Antelope Creek in the south part of the site represents suitable habitat within the range of this species. There is a high potential for occurrence of this species within the Study Area.

5.4 Birds

5.4.1 Tricolored Blackbird

Tricolored blackbirds (*Agelaius tricolor*) are not federally listed, but are state listed as threatened. They are colonial nesters preferring to nest in dense stands of cattails, bulrush, or blackberry thickets, often associated with aquatic features (Shuford and Gardali 2008).

Two CNDDB occurrences of this species are recorded within 5 miles of the Study Area with the closest situated approximately 3.8 miles to the northwest on the north side of Twelve Bridges Drive about 2.7 miles east of its intersection with Highway 65 south of Lincoln (Occurrence #907) (CNDDB 2021).

The thickets of Himalayan blackberry along Antelope Creek represent marginally suitable nesting habitat while the ruderal grasslands provide marginally suitable foraging habitat within the range of this species. There is a low potential for occurrence of this species within the Study Area.

5.4.2 Burrowing Owl

Burrowing owl (*Athene cunicularia*) is not listed pursuant to either the California or federal Endangered Species Acts; however, it is designated as a species of special concern by the CDFW. They typically inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel, but may also use man-made structures such as culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement. The breeding season extends from February 1 through August 31 (CBOC 1993, CDFG 2012).

Though the CNDDB records no occurrences of burrowing owl within 5 miles of the Study Area, it was included in this discussion since the site is located within its established range. Ground squirrel burrows and debris piles within the parcel potentially provide marginal breeding habitat, and the ruderal grasslands provide marginally foraging habitat due to high levels of human activity in and around the Study Area. There is a low potential for the occurrence of this species within the Study Area.

5.4.3 Swainson's Hawk

Swainson's hawk (*Buteo swainsoni*) is a raptor species that is not federally listed, but is listed as threatened under CESA. Breeding pairs typically nest in tall trees associated with riparian corridors, and forage in grassland, irrigated pasture, and cropland with a high density of rodents. The Central Valley populations breed and nest in the late spring through early summer before migrating to Central and South America for the winter (Shuford and Gardali 2008). Swainson’s hawks nest sparsely in Placer County with all CNDDB-recorded records being west of the City of Lincoln (CNDDB 2021).

The Study Area is located along the eastern edge of the historically known range of the species, however the annual grassland within the Study Area represents marginal foraging habitat for Swainson's hawk, and the larger trees within the Study Area provide marginally-suitable nesting habitat. Swainson's hawk nesting has not yet been recorded in the CNDDB within 5 miles of the Study Area (CNDDB 2021), however, the species has been documented by Madrone biologists within the last two years less than 2-miles east of the Study Area. Development in western Placer County has been widespread over the last several decades, which has resulted in extensive biological surveys in the area. Given the lack of recorded occurrences of nesting/foraging Swainson's hawks in the area, Madrone believes that the newly documented nest is likely an outlier, and that this portion of Placer County is at the edge of the range for the species, and it is unlikely Swainson's hawks regularly utilize the Study Area for nesting or foraging. None have been observed using the site to date..

5.4.4 Northern Harrier

The northern harrier *(Circus cyaneus)* is not listed pursuant to either the CESA or FESA; however, it is considered to be a species of special concern by the CDFW. This species is known to nest within the Central Valley, along the Pacific Coast, and in northeastern California. The northern harrier is a ground nesting species, and typically nests in emergent wetland/marsh, open grasslands, or savannah habitats. Foraging occurs within a variety of open habitats such as marshes, agricultural fields, and grasslands (Shuford and Gardali 2008).

Though the CNDDB records no occurrences of northern harrier with 5 miles of the Study Area within 5 miles of the Study Area, it was included in this discussion since the site is located within its known range. The Study Area, which reflects a high level of human activity, does not represent suitable nesting habitat; however, the ruderal grasslands provides marginal foraging habitat. There is a low potential for the occurrence of this species within the Study Area.

5.4.5 White-Tailed Kite

White-tailed kite (*Elanus leucurus*) is not federally or state listed, but is a CDFW fully protected species. This species is a yearlong resident in the Central Valley and is primarily found in or near foraging areas such as open grasslands, meadows, farmlands, savannahs, and emergent wetlands. White-tailed kites typically nest from March through June in trees within riparian, oak woodland, and savannah habitats of the Central Valley and Coast Range (Shuford and Gardali 2008). This species was observed foraging the Study Area during the field survey. The trees within the Study Area provide suitable nesting habitat for this species.

5.6 Bats

An assessment of bat habitat within the Study Area, including all potential roosting habitat features, was performed in the field to determine the likelihood of the presence of the following species.

5.6.1 Pallid Bat

Pallid bat (*Antrozous pallidus*) is not federally or state listed, but is considered a CDFW species of special concern, and is classified by the WBWG as a High priority species. It favors roosting sites in crevices in rock outcrops, caves, abandoned mines, loose bark, hollow trees, and human-made structures such as barns, attics, and sheds. Though pallid bats are gregarious, they tend to group in smaller colonies of 10 to 100 individuals. It is a nocturnal hunter and captures prey in flight, but unlike most American bats, the species has been observed foraging for flightless insects, which it seizes after landing (WBWG 2021). Pallid bat has not been documented in the CNDDB within 5 miles of the Study Area.

The Antelope Creek riparian corridor provides this species with roosting trees with loose bark and rocky outcrops with potential crevices. There is a high probability of pallid bat occupying the Study Area since it is within the known range of the species and supports suitable habitat.

5.6.2 Silver-Haired Bat

Silver-haired bat (*Lasionycteris noctivagans*) is not federally or state listed, but is classified by the WBWG as a Medium priority species. Primarily considered a coastal and montane forest species, the silver-haired bat occurs in more xeric environments during winter and seasonal migrations. It roosts in abandoned woodpecker holes, under bark, and occasionally in rock crevices. This insectivore's favored foraging sites include open wooded areas near water features (WBWG 2021). Silver-haired bat has not been documented in the CNDDB within 5 miles of the Study Area.

The Antelope Creek riparian corridor provides this species with roosting trees with loose bark and rocky outcrops with potential crevices. There is a high probability of silver-haired bat occupying the Study Area since it is within the known range of the species and supports suitable habitat.

5.6.3 Western Red Bat

Western red bat (*Lasiurus blossevillii*) is not federally or state listed, but is considered a CDFW species of special concern, and is classified by the WBWG as a High priority species. Western red bat is typically solitary, roosting primarily in the foliage of large-leafed trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (WBWG 2021). Western red bat has not been documented in the CNDDB within 5 miles of the Study Area.

The Antelope Creek riparian corridor provides this species with roosting trees including willows, oaks, and cottonwoods. There is a high probability of western red bat occupying the Study Area since it is within the known range of the species and supports suitable habitat.

5.6.4 Hoary Bat

The hoary bat (*Lasiurus cinereus*) is not federally or state listed, but is classified by the WBWG as a Medium priority species. It is considered to be one of the most widespread of all American bats with a range extending from Canada to central Chile and Argentina as well as Hawaii (WBWG 2021). Hoary bats are solitary and roost primarily in foliage of both coniferous and deciduous trees, near the ends of branches at the edge of clearings (WBWG 2021). This species may also occasionally roost in caves, beneath rock ledges, in woodpecker holes, in grey squirrel nests, under wood planks, or clinging to the side of buildings (WBWG 2021). Hoary bat has not been documented in the CNDDB within 5 miles of the Study Area.

The Study Area provides suitable potential roosting habitat along the edges of the ruderal grasslands in the form of deciduous and coniferous trees. There is a high probability of hoary bat occupying the Study Area since it is within the known range of the species and supports suitable habitat.

5.3 Protected Trees

According to the *Pre-Development Arborist Report & Tree Inventory* (Arborist Report) prepared by California Tree and Landscape Consulting, Inc. dated 16 December 2020, the Study Area encompasses a total of 48 trees which are protected by size and species according to the Rocklin Tree Preservation Ordinance. (**Attachment F**).

6.0 IMPACTS TO SENSITIVE BIOLOGICAL RESOURCES

This section details potential project impacts to the sensitive biological resources discussed above.

6.1 Terrestrial Vegetation Communities

Though no construction is currently proposed and no detailed site plans are available, for the sake of this document, it is assumed that the entire site will be impacted by future residential development with the exception of an approximately 50' buffer off Antelope creek and/or the 100 year floodplain. Ultimately, the size of the buffer will be determined after consultation with the City, but will likely be consistent with the referenced riparian policy discussed above in Section 2.3.2. Up to the total amount of each land cover type will be impacted, with the exception of Antelope Creek and associated wetlands and upland buffer (**Figure 4**).

6.2 Aquatic Resources

No impacts to Antelope Creek or its adjacent riparian wetlands are proposed or anticipated (**Attachment A**).

6.3 Water Quality

Though the Project proposes no construction at this time, mass grading associated with site improvements will result in the disturbance of the existing vegetation cover and potentially could result in the deposition of sediment- or chemical-laden run-off in down-stream or down-slope aquatic features including Antelope Creek.

Similarly, completion of improvements such as buildings and roads will result in the creation of new impervious surfaces and thereby potentially increase stormwater run-off from the Study Area. This potentially could adversely affect down-slope aquatic features including Antelope Creek.

6.4 Nesting Raptors and Songbirds

Swainson's hawk, white-tailed kite, and tricolored blackbird have the potential to nest within the Study Area, as do other more common bird species protected by the MBTA. If they were nesting on-site, removal of the nests would impact these species. Furthermore, birds nesting in avoided areas adjacent to construction could be disturbed by construction, which could result in nest abandonment.

6.5 Foraging Raptors

The ruderal annual grassland within the Study Area provides limited suitable foraging habitat for Swainson's hawk, white-tailed kite, northern harrier, and other more common raptors. Future development of the site would result in the reduction of foraging habitat for these species.

6.6 Burrowing Owl

The open disturbed areas throughout the Study Area provides marginally suitable foraging habitat; however, no potential nesting habitat was observed. Future ground disturbing activities would most likely drive away any foraging burrowing owls.

6.7 Roosting Bats

Trees throughout the Study Area are habitat for various special-status bat species. Injury or death may result from tree removal if these species are present.

6.8 Individual Native Tree Impacts

It is anticipated that all trees will be impacted with the exception of those in the Antelope Creek riparian corridor and its associated upland buffer, however it is possible that some trees outside the riparian corridor may be avoided in place if it is possible to do so while meeting Project objectives.

7.0 MITIGATION FOR IMPACTS TO SENSITIVE BIOLOGICAL RESOURCES

The following are mitigation measures that are often required by CEQA lead agencies for impacts to sensitive biological resources that may be associated with construction of the Project. Madrone believes that implementation of these mitigation measures would reduce impacts to a less than significant level.

7.1 Aquatic Resources

No impacts to Antelope Creek are anticipated; however, if impacts did occur the following authorizations would be required prior to the start of work:

- Department of the Army permit from the USACE under Section 404 of the Clean Water Act;
- Section 401 Water Quality Certification from the RWQCB; and
- Section 1600 Lake or Streambed Alteration Agreement from CDFW.

7.2 Water Quality

Water Quality

The project will minimize impacts to water quality through the implementation of appropriate Best Management Practices (BMPs) during construction and post-construction. The project will comply with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit and will utilize appropriate scheduling, erosion control, sediment control, and non-visible pollutant BMPs during construction, which may include the following:

- All exposed soils and other fills will be permanently stabilized at the earliest practicable date with the use of hydroseeding and/or other means of revegetation or erosion control.
- The applicant is concurrently applying for a Clean Water Act Section 401 water quality certification from the Central Valley Regional Water Quality Control Board (RWQCB) and will comply with the terms and conditions (including erosion and sediment controls) specified by the RWQCB.
- Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) will be employed for disturbed areas. No disturbed surfaces will be left without erosion control measures in place during the winter and spring months.
- Sediment shall be retained on site by the detention basin, onsite sediment traps, or other appropriate measures.
- A spill prevention and countermeasure plan shall be developed which would identify proper storage, collection and disposal measures for potential pollutants used onsite. The plan will also require the proper storage, handling, use, and disposal of petroleum products.
- Construction activities shall be scheduled to minimize land disturbance during peak runoff periods and to the immediate area required for construction. Soil conservation practices shall be completed during the fall or winter to reduce erosion during spring runoff. Existing vegetation will be retained where possible. To the extent feasible, grading activities shall be limited to the immediate area required for construction.

- Surface water runoff shall be controlled by directing flowing water away from critical areas and by reducing runoff velocity. Diversion structures such as terraces, dikes, and ditches shall collect and direct runoff water around vulnerable areas to prepared drainage outlets. Surface roughening, berms, check dams, hay bales, or similar devices shall be used to reduce runoff velocity and erosion.
- Sediment shall be contained when conditions are too extreme for treatment by surface protection. Temporary sediment traps, filter fabric fences, inlet protectors, vegetative filters and buffers, or settling basins shall be used to detain runoff water long enough for sediment particles to settle out. The applicant will store, cover, and isolate construction materials, including topsoil and chemicals, to prevent runoff losses and contamination of groundwater.
- Topsoil removed during construction shall be carefully stored. Berms shall be placed around topsoil stockpiles to prevent runoff during storm events.
- Fuel and vehicle maintenance areas will be established away from all drainage courses and will be designed to control runoff.
- Disturbed areas shall be revegetated after completion of construction activities.

A stormwater pollution prevention plan (SWPPP) will be prepared prior to initiation of grading activities and will provide site specific measures for the Project. Initial measures typically include stabilized construction entrances, tackified mulch, 3-step hydroseeding, spray-on soil stabilizers, and anchored blankets. Sediment controls could include rock bags to protect storm drain inlets, staked or weighted straw wattles/fiber rolls, and silt fences. BMPs may also include filtering water from dewatering operations, providing proper washout areas for concrete trucks and stucco/paint contractors, containing wastes, managing portable toilets properly, and dry sweeping instead of washing down dirty pavement.

7.3 Nesting Raptors and Other Birds

The following nest survey requirements apply if construction activities take place during the bird breeding/nesting season (typically February 1 through September 1).

7.3.1 Swainson's Hawk

A targeted Swainson's hawk nest survey shall be conducted throughout all accessible areas within ¼ mile of the proposed construction area no later than 14 days prior to construction activities. If active Swainson's hawk nests are found within ¼ mile of a construction area, construction shall cease within ¼ mile of the nest until a qualified biologist (Project Biologist) determines that the young have fledged, or it is determined that the nesting attempt has failed. If the Applicant desires to work within ¼ mile of the nest, the Applicant shall consult with CDFW and the City to determine if the nest buffer can be reduced. The Project Applicant, the Project biologist, the City, and CDFW shall collectively determine the nest avoidance buffer, and what (if any) nest monitoring is necessary. If an active Swainson's hawk nest is found within the Project site prior to construction and is in a tree that is proposed for removal, then the Project Applicant shall implement additional mitigation recommended by a qualified biologist based on CDFW guidelines and obtain any required permits from CDFW.

7.3.2 Burrowing Owl

A targeted burrowing owl nest survey shall be conducted of all accessible areas within 500 feet of the proposed construction area within 14 days prior to construction activities utilizing 60 foot transects as outlined in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012) (Staff Report). If an active burrowing owl nest burrow (i.e., occupied by more than one adult owl, and/or juvenile owls are observed) is found within 250 feet of a construction area, construction shall cease within 250 feet of the nest burrow until a qualified biologist (Project Biologist) determines that the young have fledged or it is determined that the nesting attempt has failed. If the Applicant desires to work within 250 feet of the nest burrow, the Applicant shall consult with CDFW and the City to determine if the nest buffer can be reduced.

7.3.3 Other Birds

A pre-construction nesting bird survey shall be conducted by a qualified biologist on the project site and within a 500-foot radius of proposed construction areas, where access is available, no more than 14 days prior to the initiation of construction. If there is a break in construction activity of more than two (2) weeks then subsequent surveys shall be conducted.

If active raptor nests, other than those for Swainson's hawk or burrowing owl, are found, no construction activities shall take place within 500 feet of the nest until the young have fledged. If active songbird nests are found, a 100-foot no disturbance buffer will be established. These no-disturbance buffers may be reduced if a smaller buffer is proposed by the Project Biologist and approved by the City (and CDFW if it is a tricolored blackbird nesting colony) after taking into consideration the natural history of the species of bird nesting, the proposed activity level adjacent to the nest, habituation to existing or ongoing activity, and nest concealment (are there visual or acoustic barriers between the proposed activity and the nest). A qualified biologist can visit the nest as needed to determine when the young have fledged the nest and are independent of the site or the nest can be left undisturbed until the end of the nesting season.

7.3.4 Survey Report

A report summarizing the survey(s), including those for Swainson's hawk and burrowing owls, shall be provided to the City within 30 days of the completed survey. Pre-construction surveys must occur within 14 days of construction, as detailed above. If no nests are found, no further mitigation is required.

7.4 Loss of Foraging Habitat

7.4.1 Swainson's Hawk

CDFW considers five or more vacant or fallow acres located within 10 miles of an active nest, including nests that have been active within the previous five years, to represent significant foraging habitat for Swainson's hawk, the conversion of which is considered a significant impact, in accordance with the *Staff Report Regarding Mitigation for Impacts to Swainson's Hawk (Buteo swainsoni) in the Central Valley of California*

(Staff Report on Swainson's Hawk) (CDFW 1994). However, the Staff Report on Swainson's Hawk also states that small disjunct parcels of habitat seldom provide foraging habitat needed to sustain the reproductive effort of a Swainson's hawk pair.

The Staff Report on Swainson's Hawk does not recommend mitigation pursuant to CEQA nor a Management Authorization by the CDFW for infill (within an already urbanized area) projects in areas which have less than 5 acres of foraging habitat and are surrounded by existing urban development, unless the Study Area is within 0.25 mile of an active nest tree. The Study Area supports only approximately 3.04 acres of potential foraging habitat (ruderal annual grasslands), is surrounded by existing development, and there are no nests recorded within 0.25 mile of the Project site. As such, the Project does not trigger mitigation pursuant to CEQA based on available CDFW guidance.

Additionally, as the Study Area is located along the margin of the historically known range (both nesting and foraging), it is likely that the recently documented nest in Rocklin is an outlier, and that this species is not likely to utilize the site. Therefore, we believe that a pre-construction nest survey is sufficient to reduce impacts to this species to a less than significant level.

Prior to Project construction, a qualified biologist shall conduct a review of Swainson's hawk nest data available in the CNDDB and contact CDFW to determine if they have any additional nest data. If desired by the Project proponent, the biologist may conduct a survey of these nests to determine if they are still present. The biologist shall provide the City with a summary of his/her findings.

If it is determined that the project site is within 0.25 mile of an active Swainson's hawk nest (an active nest is defined as a nest with documented Swainson's hawk use within the past 5 years), the Applicant will mitigate for the loss of suitable Swainson's hawk foraging habitat by protecting one acre of suitable foraging habitat for each acre of suitable foraging habitat developed. Protection shall be via purchase of mitigation bank credits or other land protection mechanism acceptable to the City. Currently, the CNDDB records no nests, active or otherwise, within 0.25 mile of the Study Area. If this remains the case just prior (14 days or less) to the start of construction, no further mitigation will be required.

7.5 Roosting Bats

To protect bats potentially roosting within the Study Area, the following mitigation measures shall be implemented:

- A qualified biologist shall conduct a bat habitat assessment of all potential roosting habitat features, including trees within the proposed development footprint. This habitat assessment will identify all potentially suitable roosting habitat and is recommended to be conducted up to a year prior to the start of construction;
- If potential roosting habitat in the form of cavities in trees is identified within the areas proposed for development, the biologist will survey the potential roosting habitat during the active season (generally April through October or from January through March on days with temperatures in

excess of 50 degrees F) to determine presence of roosting bats. These surveys are recommended to be conducted utilizing methods that are considered acceptable by bat experts. Methods may include evening emergence surveys, acoustic surveys, inspecting potential roosting habitat with fiberoptic cameras or a combination thereof;

- If cavity roosting bats are identified within any of the trees planned for removal, or if presence is assumed, trees should be removed outside of pup season only on days with temperatures in excess of 50 degrees F. Pup season is generally during the months of May through August. Two-step tree removal shall be utilized under the supervision of the qualified biologist. Two-step tree removal involves removal of all branches of the tree that do not provide roosting habitat on the first day, and then the next day cutting down the remaining portion of the tree;
- To avoid potential impacts to foliage-roosting bat species (as opposed to the above-described cavity roosting species), it is recommended that all other tree removal be conducted from January through April on days with temperatures in excess of 50 degrees F.

7.6 Protected Trees

According to the Arborist Report, the Study Area encompasses a total of 48 trees which are protected by size and species according to the City's Tree Ordinance. The Tree Ordinance requires a permit for any activity that results in the physical removal of a Tree from the ground or the willful injury, trimming, disfiguring or other harmful action which leads directly to physical removal or creates such a condition that makes disease likely or results in a significant risk of injury to persons or property.

Additionally, all Protected Trees within 50 feet of any development activity must be depicted on the site plan map. The site plan map shall indicate the exact location of the base and dripline of all Protected Trees within the Study Areas. A survey of the exact locations of the Protected Trees should be conducted by a California professional engineer or California professional land surveyor. The tree numbers should be shown on both the site plan and grading plan. The base elevation of each Protected Tree shall be shown on the grading plan.

Efforts should be made to save trees where feasible. This may include the use of retaining walls, planter islands, pavers, or other techniques commonly associated with tree preservation. The Improvement Plans shall include a note and show placement of temporary construction fencing around trees to be saved: The Applicant shall install a four foot tall, brightly colored (typically orange), synthetic mesh material fence (or an equivalent approved by the DRC at the following locations prior to any construction equipment being moved on-site or any construction activities taking place: at the limits of construction; outside the Protected Zone of all single-trunk trees six inches DBH or greater, or 10 inches DBH aggregate for multi-trunk trees; within 50 feet of any grading, road improvements, underground utilities, or other development activity; or as otherwise shown on the Tentative Subdivision Map.

7.7 Riparian Areas

As discussed in Section 2.3.2 above, the *City of Rocklin Draft General Plan* requires that an open space easement be recorded over all areas within 50 feet (or as otherwise approved by the City) of the edge of the bank of all perennial and intermittent streams and creeks providing natural drainage such as the reach of Antelope Creek within the Study Area. This easement would protect most of the Antelope Creek riparian area present within the Study Area.

7.8 Worker Environmental Awareness Training

Prior to any ground-disturbing or vegetation-removal activities, a Worker Environmental Awareness Training (WEAT) shall be prepared and administered to the construction crews. The WEAT will include the following: discussion of the state and federal Endangered Species Act, the Clean Water Act, the Project's permits and CEQA documentation, and associated mitigation measures; consequences and penalties for violation or noncompliance with these laws and regulations; identification of special-status wildlife, location of any avoided Waters of the U.S; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a special-status wildlife species. The WEAT will also discuss the different habitats used by the species' different life stages and the annual timing of these life stages. A handout summarizing the WEAT information shall be provided to workers to keep on-site for future reference. Upon completion of the WEAT training, workers will sign a form stating that they attended the training, understand the information presented and will comply with the regulations discussed. Workers will be shown designated "avoidance areas" during the WEAT training; worker access should be restricted to outside of those areas to minimize the potential for inadvertent environmental impacts. Fencing and signage around the boundary of avoidance areas may be helpful.

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U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2021. *IPaC Trust Resource Report for the Study Area.* Generated from http://ecos.fws.gov/ipac/ January 2021.

U.S. Geological Survey (USGS). 2018. *"Rocklin, California"* 7.5-Minute Series Topographic Quadrangle Map. U. S. Geological Survey. Denver, Colorado.

Western Bat Working Group (WBWG). 2021. *Species Matrix and Species Accounts*. Accessed on-line at http://wbwg.org/ in January 2021.

Figures

Figure 1. Site and Vicinity

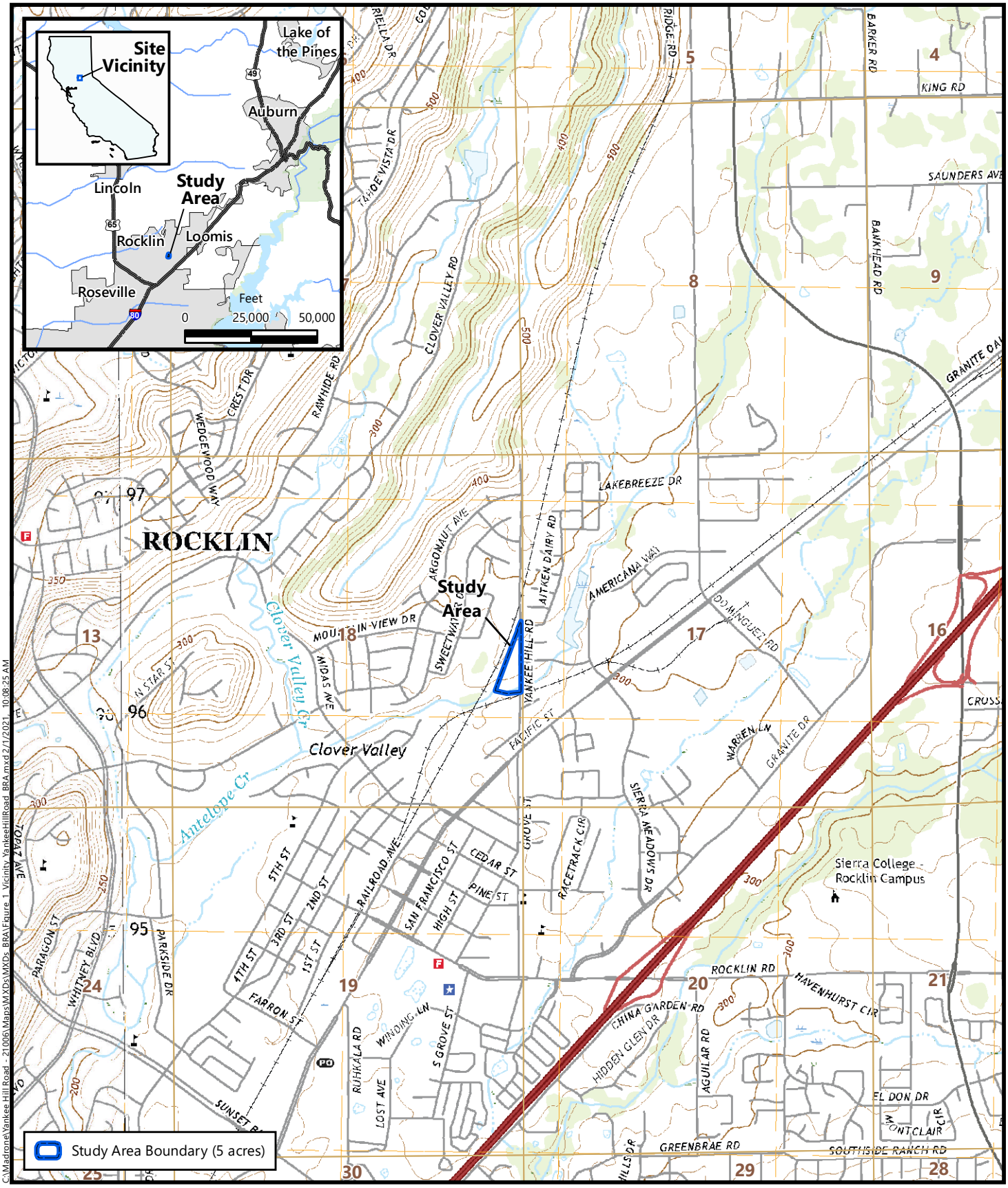
Figure 2. California Natural Diversity Database Occurrences of Plant Species

Figure 3. California Natural Diversity Database Occurrences of Wildlife Species

Figure 4. Terrestrial Vegetation Communities

Figure 5. Aquatic Resources

Figure 6. NRCS Soils



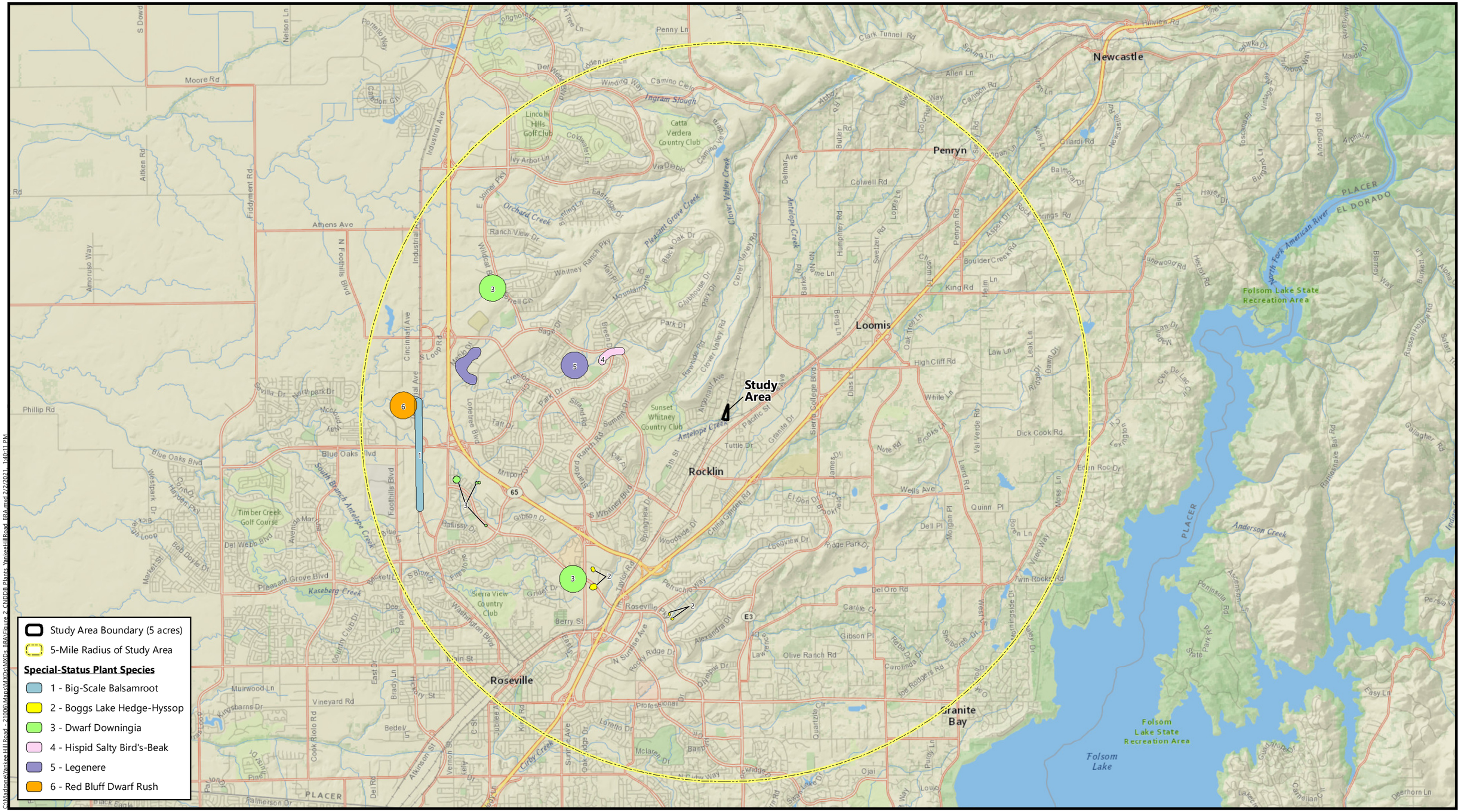
C:\Madrone\Yankee Hill Road - 21006\Maps\MXDs\MXDs_BRA\Figure 1_Vicinity_YankeeHillRoad_BRA.mxd 2/1/2021 10:08:25 AM

Source: United States Geologic Survey, 2018
Section 18, Township 11 North, Range 7 East, MDB&M
"Rocklin" California 7.5-Minute Topographic Quadrangle
Longitude -121.229287, Latitude 38.801395

Figure 1
Site and Vicinity

Yankee Hill Road
Rocklin, Placer County, California

MADRONE ECOLOGICAL CONSULTING



Source: *California Department of Fish and Wildlife*, January 2021.
Basemap Source: *National Geographic* and *ESRI*

Figure 2
California Natural Diversity Database
Occurrences of Plant Species

Yankee Hill Road
Rocklin, Placer County, California

MADRONE ECOLOGICAL CONSULTING

C:\Madrone\Yankee Hill Road - 21006\Maps\MXDs\MXDs RBA\Figure 2_CNDDB Plants_YankeeHillRoad_RBA.mxd 2/2/2021 1:40:11 PM

Study Area Boundary (5 acres)

5-Mile Radius of Study Area

Wildlife Species

Amphibians and Reptiles

- 1 - Western Pond Turtle
- 2 - Western Spadefoot

Birds

- 3 - California Black Rail
- 4 - Osprey
- 5 - Purple Martin
- 6 - Tricolored Blackbird
- 7 - White-Tailed Kite

Fish

- 8 - Steelhead - Central Valley DPS

Invertebrates

- 9 - An Andrenid Bee
- 10 - California Linderiella
- 11 - Ricksecker's Water Scavenger Beetle
- 12 - Valley Elderberry Longhorn Beetle
- 13 - Vernal Pool Fairy Shrimp

Study Area

Newcastle

Penryn

Loomis

Rocklin

Roseville

Granite Bay

Folsom Lake State Recreation Area

Folsom Lake

PLACER

EL DORADO

North Fork American River

N

0 1 2 Miles

Source: *California Department of Fish and Wildlife*, January 2021.
Basemap Source: *National Geographic* and *ESRI*

Figure 3
California Natural Diversity Database Occurrences of Wildlife Species

Yankee Hill Road
Rocklin, Placer County, California

MADRONE ECOLOGICAL CONSULTING

C:\Madrone\Yankee Hill Road - 21006\Maps\MXDs\MXDs BBA\Figure 3_CNDDB Wildlife YankeeHillRood BBA.mxd 2/2/2021 20111 PM

D:\1AAAAA - Projects\000001 - Matts File\Maps\Yankee Hill Road Project\Maps\Figure_4_TerrestrialVegComm_YankeeHillRoad_BRA_V2.mxd 4/9/2021, 6:16:05 AM

N

Feet
0 70 140

Figure 4
Terrestrial Vegetation Communities

Yankee Hill Road
Rocklin, Placer County, California

MADRONE ECOLOGICAL CONSULTING

Aerial Source: Aerial Source: City of Rocklin, 19 April 2018.

N

Feet
0 70 140

Figure 5
Aquatic Resources

Yankee Hill Road
Rocklin, Placer County, California

MADRONE ECOLOGICAL CONSULTING

Aerial Source: Aerial Source: City of Rocklin, 19 April 2018.

N

Feet
0 70 140

Figure 6
Natural Resources Conservation Service Soils

Yankee Hill Road
Rocklin, Placer County, California

MADRONE ECOLOGICAL CONSULTING

Soil Survey Source: *USDA, Soil Conservation Service.*
Soil Survey Geographic (SSURGO) database for Placer County, California, Western Part
Aerial Source: Aerial Source: City of Rocklin, 19 April 2018.

Attachments

Attachment A. Tentative Parcel Map for the Yankee Hill Road Property

Attachment B. IPaC Trust Resource Report for the Study Area

Attachment C. CNPS Inventory of Rare and Endangered Plants Query for the "Rocklin, California" USGS Quadrangle and Eight Surrounding Quadrangles

Attachment D. Wildlife List

Attachment E. Aquatic Resources Delineation Map

Attachment F. Pre-Development Arborist Report & Tree Inventory

Attachment A

Tentative Parcel Map for the Yankee Hill Road Property

TENTATIVE PARCEL MAP FOR:
YANKEE HILL ROAD PROPERTY

CITY OF ROCKLIN
MARCH 2021

STATE OF CALIFORNIA
SCALE 1" = 50'

CNA ENGINEERING INC.
SHEET 1 OF 5

TECHNICAL REPORTS

ARBORIST

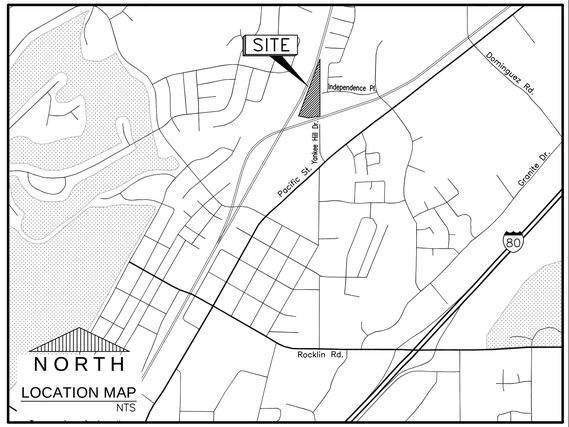
ABACUS
NICOLE HARRISON
ISA CERTIFIED ARBORIST #WE-6500AM
P.O. BOX 4248
AUBURN, CA 95604
(530) 305-0165

NOISE

BOLLARD & BRENNAN, INC.
PAUL BOLLARD
1293 LINCOLN WAY, SUITE A
AUBURN, CA 95603
(530) 745-0191

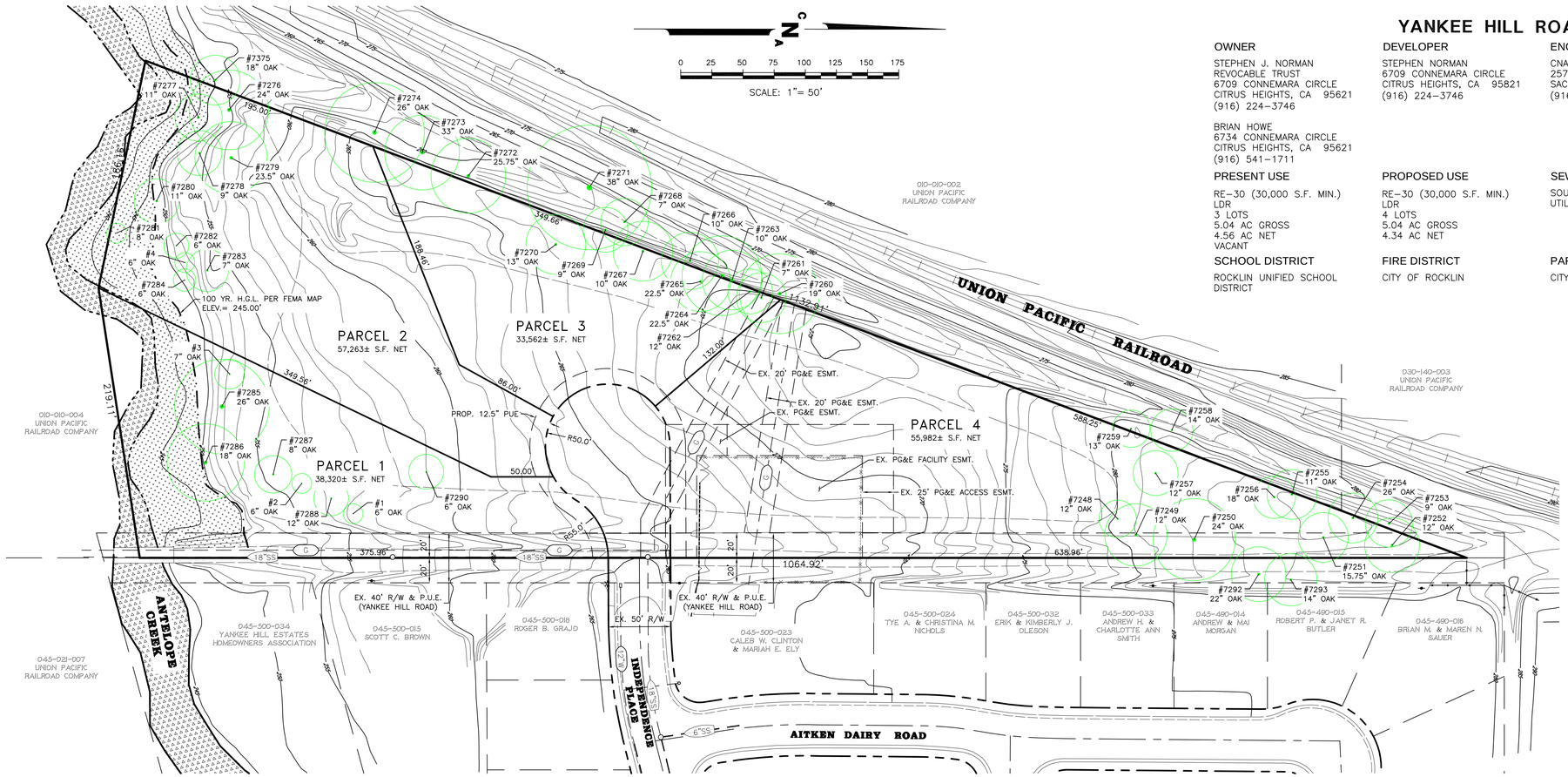
BIOLOGICAL

TETRA TECH EM INC.
CRAIG HUNTER
2969 PROSPECT PARK DRIVE, STE. 100
RANCHO CORDOVA, CA 95670
(916) 852-8300



SHEET INDEX

NO.	DESCRIPTION
1.	TENTATIVE PARCEL MAP
2.	BUILDABLE ENVELOPE AND OAK TREE PRESERVATION PLAN
3.	PRELIMINARY GRADING PLAN
4.	STORMWATER CONTROL EXHIBIT
5.	UTILITY PLAN



SITE PLAN
SCALE: 1"= 50'

STREAM AND FRESH EMERGENT WETLAND AREA

VALLEY FOOTHILL RIPARIAN HABITAT AREA (OPEN SPACE AREA EASEMENT)

YANKEE HILL ROAD PROPERTY

OWNER

STEPHEN J. NORMAN REVOCABLE TRUST
6709 CONNEMARA CIRCLE
CITRUS HEIGHTS, CA 95621
(916) 224-3746

BRIAN HOWE
6734 CONNEMARA CIRCLE
CITRUS HEIGHTS, CA 95621
(916) 541-1711

DEVELOPER

STEPHEN NORMAN
6709 CONNEMARA CIRCLE
CITRUS HEIGHTS, CA 95821
(916) 224-3746

ENGINEER

CNA ENGINEERING
2575 VALLEY ROAD
SACRAMENTO, CA 95821
(916) 485-3746

PARCEL NO.

010-010-009
010-010-040
010-010-041
010-010-042
010-010-043
010-010-044
030-140-004

PRESENT USE

RE-30 (30,000 S.F. MIN.)
LDR
3 LOTS
5.04 AC GROSS
4.56 AC NET
VACANT

PROPOSED USE

RE-30 (30,000 S.F. MIN.)
LDR
4 LOTS
5.04 AC GROSS
4.34 AC NET

SEWER DISPOSAL

SOUTH PLACER MUNICIPAL UTILITY DISTRICT

ELECTRICITY

PG&E

SCHOOL DISTRICT

ROCKLIN UNIFIED SCHOOL DISTRICT

FIRE DISTRICT

CITY OF ROCKLIN

PARK DISTRICT

CITY OF ROCKLIN

WATER

PLACER COUNTY WATER DISTRICT

LEGEND

- RIGHT-OF-WAY
- CENTER LINE
- BOUNDARY LINE
- LOT LINE
- OFFSITE P/L
- EASEMENT LINE
- CURB, GUTTER & SDWK
- FENCE
- JOINT POLE
- TREES (PER ARBORIST) — #1 8" OAK — DRIPLINE — TREE NUMBER — TRUNK SIZE — TREE TYPE
- TREES TO BE REMOVED

REGISTERED PROFESSIONAL ENGINEER — CHRIS OLIVEIRA — NO. C 33407 — EXP. 6-30-22 — CIVIL — STATE OF CALIFORNIA

NO.	DESCRIPTION	APPROVED BY	DATE
1			
2			
3			
4			

REVISIONS

CNA ENGINEERING INC.
CIVIL ENGINEERING: LAND SURVEYING
PLANNING: STRUCTURAL DESIGN
2575 VALLEY ROAD, SACRAMENTO, CA 95821
PHONE: (916) 485-3746
www.cnaeng.com

PREPARED BY: DRAFTED BY: JERELL O. | DESIGNED BY: STEVE N. | CHECKED BY: CHRIS O.

SCALE: HORIZ. 1"= 50' | VERT. 1"= N/A | FLD BK.: N/A

A.P.N.: 010-010-008, 010-010-009 & 030-140-004

TENTATIVE PARCEL MAP FOR: YANKEE HILL ROAD PROPERTY

CITY OF ROCKLIN — STATE OF CALIFORNIA

DATE : 4/8/2021

FN.:18006_12.DWG

SHEET 1 OF 5 SHEETS

Attachment B

IPaC Trust Resource Report for the Study Area

Endangered species

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries [2]).
Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

Additional information on endangered species data is provided below.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. 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.

The following species are potentially affected by activities in this location:

Species Guidelines

Thumbnails List

Reptiles

- NAME
  STATUS
- Giant Garter Snake Thamnophis gigas

  Wherever found

  Threatened

Amphibians

- NAME
  STATUS
- California Red-legged Frog Rana draytonii

Wherever found

Threatened

Fishes

- NAME
  STATUS
- Delta Smelt Hypomesus transpacificus

  Wherever found

  Threatened

Insects

- NAME
  STATUS
- Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus

  Wherever found

  Threatened

Crustaceans

- NAME
  STATUS
- Vernal Pool Fairy Shrimp Branchinecta lynchi

  Wherever found

  Threatened
- Vernal Pool Tadpole Shrimp Lepidurus packardi

  Wherever found

  Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

1 and the Bald and Golden Eagle Protection Act

2.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

The Migratory Birds Treaty Act of 1918.

The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php

Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Related links

Birds of Conservation Concern

Measures for avoiding and minimizing impacts to birds

Nationwide conservation measures for birds

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location,

desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

Probability of Presence Summary

Thumbnails List

BCC Rangewide (CON)

California ThrasherToxostoma redivivum

BCC - BCR

Common YellowthroatGeothlypis trichas sinuosa

BCC Rangewide (CON)

Lawrence's GoldfinchCarduelis lawrencei

BCC - BCR

Nuttall's WoodpeckerPicoides nuttallii

BCC Rangewide (CON)

Oak TitmouseBaeolophus inornatus

BCC Rangewide (CON)

Rufous Hummingbirdselasphorus rufus

BCC - BCR

Song SparrowMelospiza melodia

BCC - BCR

Spotted TowheePipilo maculatus clementae

BCC Rangewide (CON)

Tricolored BlackbirdAgelaius tricolor

BCC Rangewide (CON)

Yellow-billed MagpiePica nuttalli

Name / Level of Concern

Breeding Season

California Thrasher Toxostoma redivivum

BCC Rangewide (CON)

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Jan 1 to Jul 31

Common Yellowthroat Geothlypis trichas sinuosa

BCC - BCR

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

https://ecos.fws.gov/ecp/species/2084

Breeds May 20 to Jul 31

Lawrence's Goldfinch Carduelis lawrencei

BCC Rangewide (CON)

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9464

Breeds Mar 20 to Sep 20

Nuttall's Woodpecker Picoides nuttallii

BCC - BCR

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

https://ecos.fws.gov/ecp/species/9410

Breeds Apr 1 to Jul 20

Oak Titmouse Baeolophus inornatus

BCC Rangewide (CON)

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9656

Breeds Mar 15 to Jul 15

Rufous Hummingbird selasphorus rufus

BCC Rangewide (CON)

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/8002

Breeds elsewhere

Song Sparrow Melospiza melodia

BCC - BCR

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Feb 20 to Sep 5

Spotted Towhee Pipilo maculatus clementae

BCC - BCR

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

https://ecos.fws.gov/ecp/species/4243

Breeds Apr 15 to Jul 20

Tricolored Blackbird Agelaius tricolor

BCC Rangewide (CON)

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/3910

Breeds Mar 15 to Aug 10

Yellow-billed Magpie Pica nuttalli

BCC Rangewide (CON)

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9726

Breeds Apr 1 to Jul 31

×

California ThrasherToxostoma redivivum

Level of Concern	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description	No description available

×

Common YellowthroatGeothlypis trichas sinuosa

Level of Concern	This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description	Adult males are bright yellow below, with a sharp black face mask and olive upperparts; a thin whitish line sets off the black mask from the head and neck. Immature males show traces of the full mask of adult males. Females are a plain olive brown, usually with yellow brightening the throat and under the tail; they lack the black mask.

References cited in Species Profile

Cornell Lab of Ornithology. 2015. Common Yellowthroat. All About Birds. http://www.allaboutbirds.org/guide/Common_Yellowthroat/id

Crawford, R. L. 1980. Wind direction and the species composition of autumn TV tower kills in northwest Florida. Auk 97:892-895.

James, P. 1956. Destruction of warblers on Padre Island, Texas, in May, 1951. Wilson Bull. 68:224-227.

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California.

Tordoff, H. B. and R. M. Mengel. 1956. Studies of birds killed in nocturnal migration. Univ. Kans. Publ., Mus. Nat. Hist. 10:1-44.

For more information, visit the ECOS species profile

×

Lawrence's GoldfinchCarduelis lawrencei

Level of Concern	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description The Lawrence's Goldfinch is a small songbird with a gray back and sides, yellow patch on the chest, yellow wingbars and a dusky or black face. Adult males have a black face, gray nape and mantle, black wings with broad yellow bars, yellow edges on primary feathers and a yellow patch on the breast. Adult females are gray overall and have subtle yellow wing bars, edges of primary feathers, and breast patch. Juveniles are similar to adult females, but have even less yellow, and sometimes appear all brownish gray.

References cited in Species Profile

Cornell Lab of Ornithology. 2015. Lawrence's Goldfinch. All About Birds. : http://www.allaboutbirds.org/guide/lawrences_Goldfinch/id

Coutlee, E. L. 1968. Comparative breeding behavior of Lesser and Lawrence's goldfinches. Condor 70:228-242.

Culbertson, A. E. 1946. Lawrence Goldfinches feed on jumping galls. Condor 48:40.

Davis, Jeff N. 1999. Lawrence's Goldfinch (Spinus lawrencei), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/480

Garrett, K. and J. Dunn. 1981. Birds of southern California: status and distribution. Artisan Press, Los Angeles, CA.

Linsdale, J. M. 1957. Goldfinches on the Hastings Natural History Reservation. Am. Midl. Nat. 57:1-119.

Linsdale, J. M. 1950. Observations on the Lawrence's Goldfinch. Condor 52:255-259.

Ortega, J. L. 1945. Lawrence Goldfinch eating egg of Mourning Dove. Condor 47:41.

Unitt, P. 1984. The birds of San Diego County. San Diego Nat. Hist. Soc. San Diego, CA.

For more information, visit the ECOS species profile

×

Nuttall's WoodpeckerPicoides nuttallii

Level of Concern	This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description Small black-and-white woodpecker. Head with black ear-coverts and malar stripe, which both connect with black nape. Upperparts, including wings and tail black with white barring; underparts white with some black spots and barring on sides, flanks, and under tail-coverts. Sexes alike, except male has forehead black becoming streaked with white on center of crown and entirely red on rear crown and upper nape, while female has these areas entirely black with some white streaking. Juveniles resemble adults but have slightly more grayish to buffy underparts, whiter upperparts, and, unlike adults, both sexes show red in crown (usually a small patch in center of crown in males, while females have fewer and more scattered red-tipped feathers).

References cited in Species Profile

Lowther, Peter E. 2000. Nuttall's Woodpecker (Picoides nuttallii), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/555

Miller, A. H. and C. E. Bock. 1972. Natural history of the Nuttall Woodpecker at the Hastings Reservation. Condor 74:284-294.

Pyle, P. 1997. Identification guide to North American birds: Pt. I: Columbidae to Ploceidae.Slate Creek Press, Bolinas, CA.

Sauer, J. R., J. E. Hines, I. Thomas, J. Fallon, and G. Gough. 1999. The North American Breeding Bird Survey, results and analysis 1966-1998. Version 98.1, USGS Patuxent Wildl. Res. Center, Laurel, MD. [Online.] http://www.mbr-pwrc.usgs.gov/bbs/

Short, Jr., L. L. 1982. Woodpeckers of the world. Del. Mus. Nat. Hist. Monogr. Ser. 4.

For more information, visit the ECOS species profile

×

Oak TitmouseBaeolophus inornatus

Level of Concern	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Presence

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description Oak Titmice are gray-brown, small songbirds with short, stubby bills, a short crest on the head, and a medium-long tail. They are slightly darker above than below, and may show a slight buffy wash on the flanks.

References cited in Species Profile

Cicero, Carla. 2000. Oak Titmouse (Baeolophus inornatus), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/485a

Cornell Lab of Ornithology. 2015. Oak Titmouse. All About Birds. http://www.allaboutbirds.org/guide/Oak_Titmouse/id

Gilligan, J., M. Smith, D. Rogers, and A. Contreras. 1994. Birds of Oregon: status and distribution. Cinclus Publ. McMinnville, OR.

Partners in Flight. 2012. Species assessment database. http://rmbo.org/pifassessment/Database.aspx

Small, A. 1994. California birds: their status and distribution. Ibis Publ. Co. Vista, CA.

USGS Patuxent Wildlife Research Center. 2012. North American Breeding Bird Survey 1966 - 2010 analysis. http://www.mbr-pwrc.usgs.gov/bbs/specl10.html

Wilbur, S. R. 1987. Birds of Baja California. Univ. of California Press, Berkeley.

For more information, visit the ECOS species profile

×

Rufous Hummingbirdselasphorus rufus

Level of Concern	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description	A fairly small hummingbird with a slender, nearly straight bill, a tail that tapers to a point when folded, and fairly short wings. In good light, males glow like coals: bright orange on the back and belly, with a vivid iridescent-red throat. Females are green above with

rufous-washed flanks, rufous patches in the green tail, and often a spot of orange on the throat.

References cited in Species Profile

Cornell Lab of Ornithology. 2015. Rufous Hummingbird. All About Birds. http://www.allaboutbirds.org/guide/Rufous_Hummingbird/id

Great Basin Bird Observatory. 2015. Rufous Hummingbird. http://www.gbbo.org/pdf/bcp/53_Rufous%20Hummingbird.pdf

Healy, Susan and William A. Calder. 2006. Rufous Hummingbird (Selasphorus rufus), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/053

Partners in Flight. 2012. Species assessment database. http://rmbo.org/pifassessment/Database.aspx

USGS Patuxent Wildlife Research Center. 2012. North American Breeding Bird Survey 1966 - 2010 analysis. http://www.mbr-pwrc.usgs.gov/bbs/specl10.html

For more information, visit the ECOS species profile

×

Song SparrowMelospiza melodia

Level of Concern	This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description No description available

×

Spotted TowheePipilo maculatus clementae

Level of Concern This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description The Spotted Towhee is a large sparrow with a thick, pointed bill, short neck, chunky body, and long, rounded tail. Males have jet-black upperparts and throat; their wings and back are spotted bright white. The flanks are warm rufous and the belly is white. Females have the same pattern but are warm brown where males are black. In flight, look for white corners to the black tail.

References cited in Species Profile

Cornell Lab of Ornithology. 2015. Spotted Towhee. All About Birds. http://www.allaboutbirds.org/guide/Spotted_Towhee/id

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Shuford, W. D. 1993. The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds. California Avifauna Series 1. Bushtit Books, Bolinas, CA.

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USGS Patuxent Wildlife Research Center. 2012. North American Breeding Bird Survey 1966 - 2010 analysis. http://www.mbr-pwrc.usgs.gov/bbs/specl10.html

For more information, visit the ECOS species profile

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Tricolored BlackbirdAgelaius tricolor

Level of Concern	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description The Tricolored Blackbird is a medium-sized (18-24cm total length), sexually dimorphic North American passerine (Beedy, Edward, and Hamilton III 1999). Adult males are typically larger than females, and are black with bright red and white plumage on the wing shoulder. Adult females have sooty brown-black plumage with distinct grayish streaks, a relatively white chin and throat, and a smaller reddish shoulder-patch. Banding studies indicate a lifespan of 12-13 years (DeHaven and Neff 1973, Kennard 1975).

Citations:

Beedy, Edward C. and William J. Hamilton III. 1999. Tricolored Blackbird (Agelaius tricolor), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/423

Beedy, E. C. and W. J. Hamilton III. 1997. Tricolored Blackbird status update and management guidelines. September. (Jones & Stokes Associates, Inc. 97-099.) Sacramento, CA. Prepared for U.S. Fish and Wildlife Serv., Portland, OR, and Calif. Dept. of Fish and Game, Sacramento, CA.

Collier, G. 1968. Annual cycle and behavioral relationships in the Red-winged and Tricolored Blackbirds of southern California. Phd Thesis. Univ. of California, Los Angeles.

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Dehaven, R. W. 1975. Plumages of the Tricolored Blackbird. West. Bird Bander 50:59-61.

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Neff, J. A. 1942. Migration of the Tricolored Red-wing in central California. Condor 44:45-53.

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For more information, visit the ECOS species profile

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Yellow-billed MagpiePica nuttalli

Level of Concern	This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Presence	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

no data survey effort breeding season probability of presence

What's this?

Description	Yellow-billed Magpies are large black-and-white songbirds with a long dark tail as well as bright yellow around their bill and eye. Juveniles are similar to adults, but are less iridescent and have a brownish wash on their head and back.

References cited in Species Profile

Cornell Lab of Ornithology. 2015. Yellow-billed Magpie. All About Birds. http://www.allaboutbirds.org/guide/Yellow-billed_Magpie/id

Crosbie, S.P., L.E. Souza, and H.B. Ernest. 2014. Abundance and distribution of the Yellow-billed Magpie. Western Birds 45:100-111.

Koenig, Walt and Mark D. Reynolds. 2009. Yellow-billed Magpie (Pica nuttalli), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/180

Partners in Flight. 2012. Species Assessment Database. http://rmbo.org/pifassessment/Database.aspx

Verbeek, N. A. M. 1970. The exploitation system of the Yellow-billed Magpie. Phd Thesis. Univ. of California, Berkeley.

For more information, visit the ECOS species profile

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

"BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);

"BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

"Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive

Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

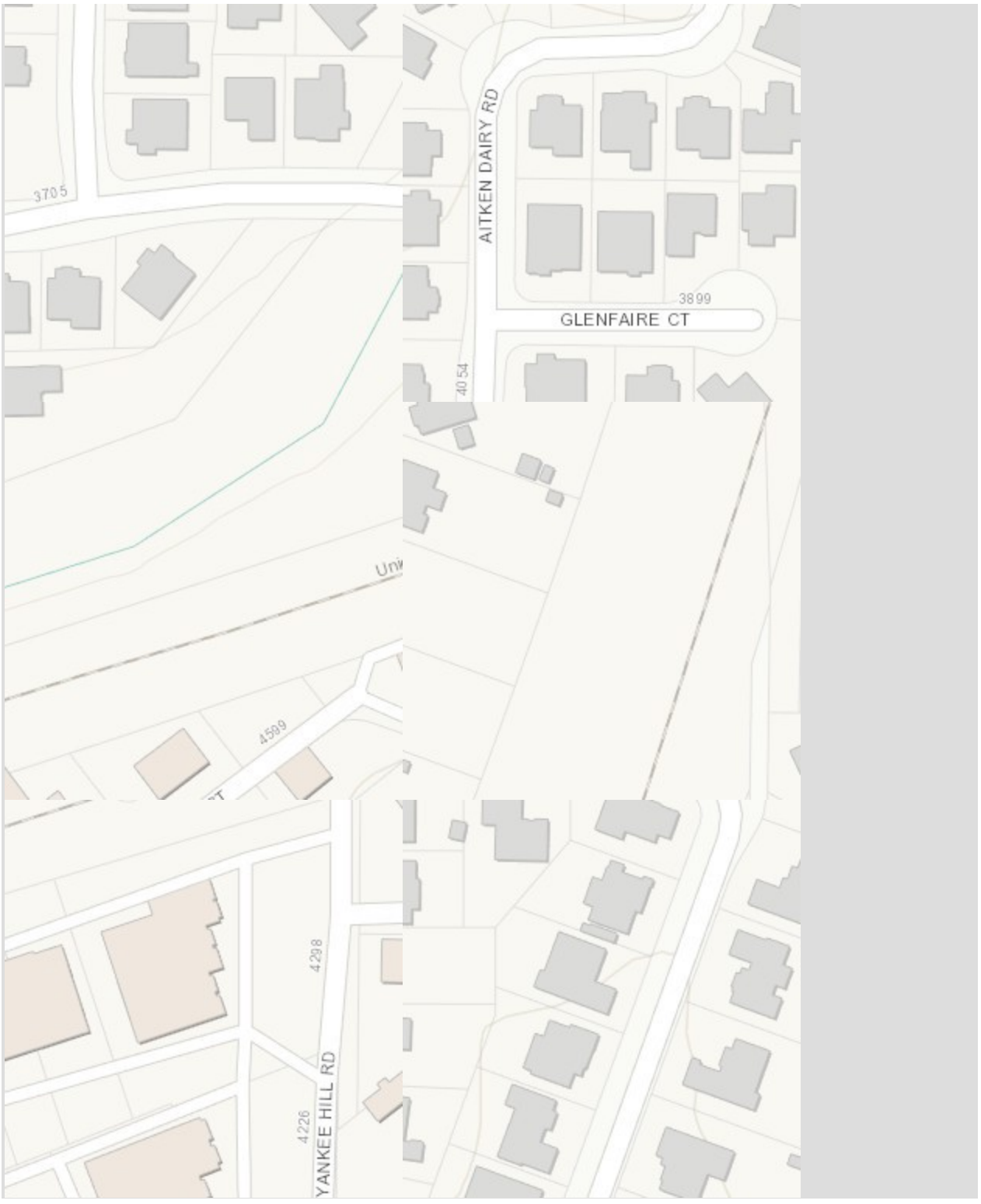
Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site. Other limitations, exclusions, and precautions are listed below.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

- PFOC


BALTIC CIR
Antelope Creek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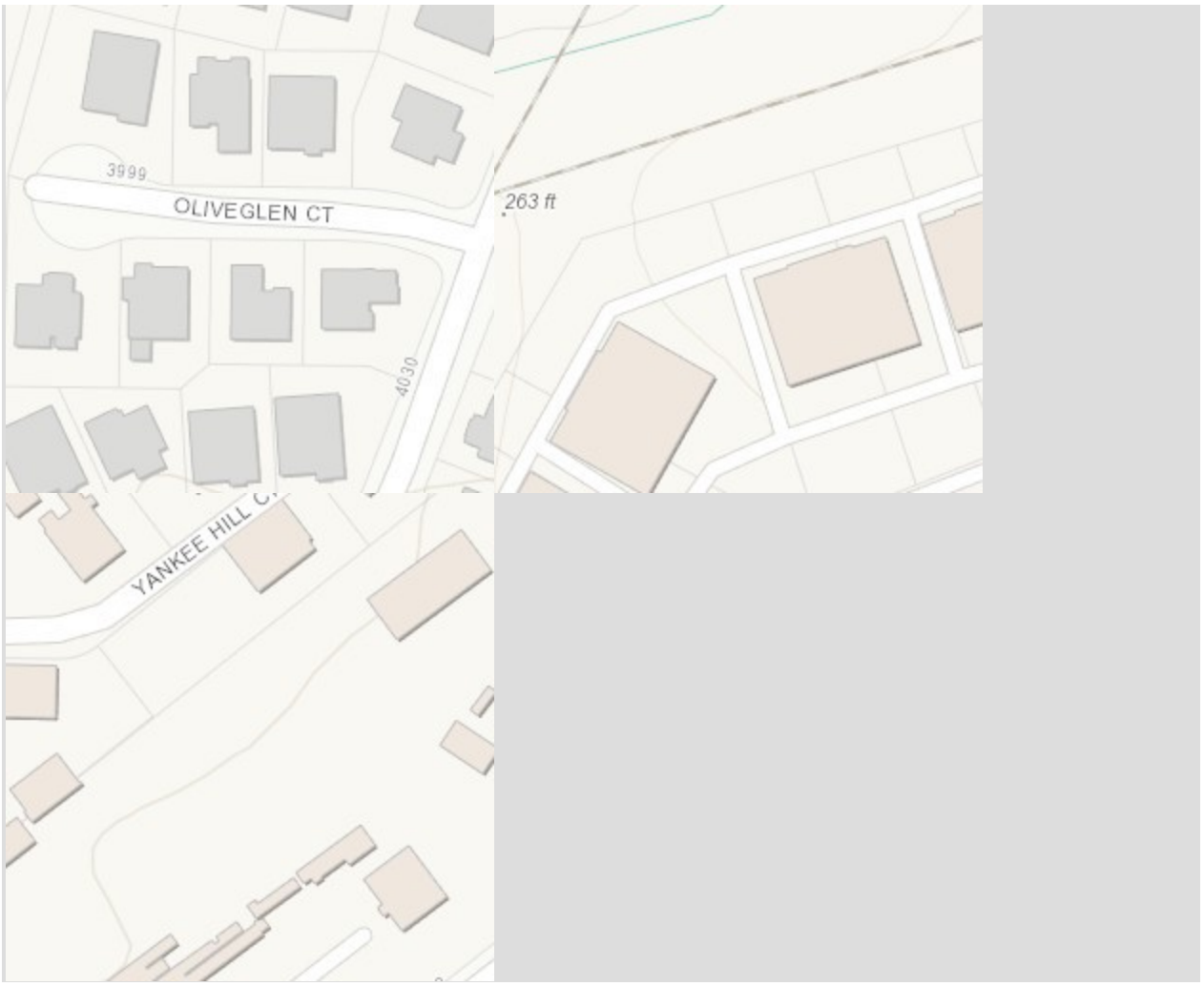
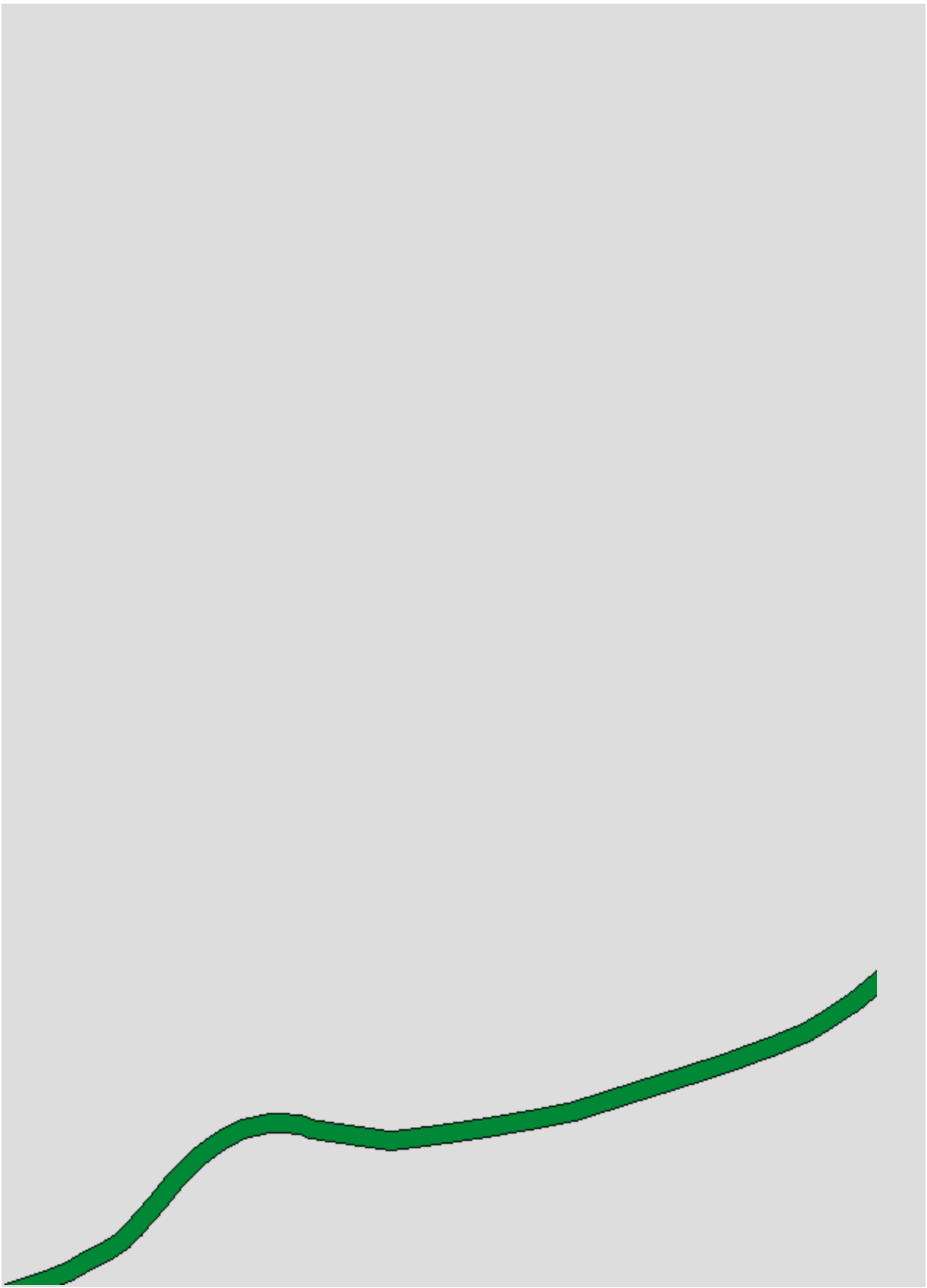
GLENFAIRE CT
4054
4599
4298
4226
YANKEE HILL RD


3999
OLIVEGLEN CT
4030
263 ft
YANKEE HILL



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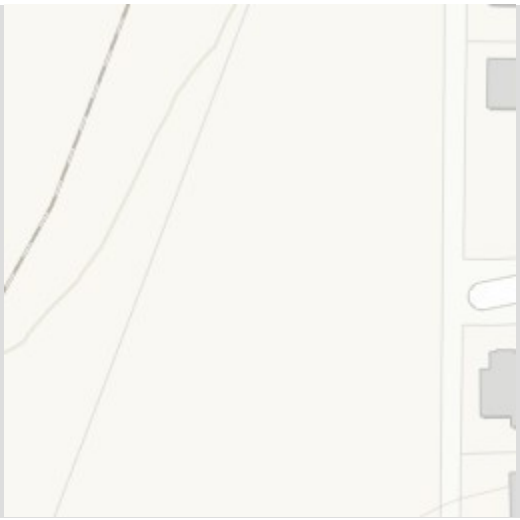


Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas

should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment C

CNPS Inventory of Rare and Endangered Plants Query for the "Rocklin, California" USGS Quadrangle and Eight Surrounding Quadrangles

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period
Allium jepsonii	Jepson's onion	1B.2	None	None	Apr-Aug
Balsamorhiza macrolepis	big-scale balsamroot	1B.2	None	None	Mar-Jun
Calystegia stebbinsii	Stebbins' morning-glory	1B.1	CE	FE	Apr-Jul
Carex xerophila	chaparral sedge	1B.2	None	None	Mar-Jun
Ceanothus roderickii	Pine Hill ceanothus	1B.1	CR	FE	Apr-Jun
Chlorogalum grandiflorum	Red Hills soaproot	1B.2	None	None	May-Jun
Chloropyron molle ssp. hispidum	hispid bird's-beak	1B.1	None	None	Jun-Sep
Crocanthemum suffrutescens	Bisbee Peak rush-rose	3.2	None	None	Apr-Aug
Downingia pusilla	dwarf downingia	2B.2	None	None	Mar-May
Fremontodendron decumbens	Pine Hill flannelbush	1B.2	CR	FE	Apr-Jul
Fritillaria eastwoodiae	Butte County fritillary	3.2	None	None	Mar-Jun
Galium californicum ssp. sierrae	El Dorado bedstraw	1B.2	CR	FE	May-Jun
Gratiola heterosepala	Boggs Lake hedge-hyssop	1B.2	CE	None	Apr-Aug
Juncus leiospermus var. ahartii	Ahart's dwarf rush	1B.2	None	None	Mar-May
Juncus leiospermus var. leiospermus	Red Bluff dwarf rush	1B.1	None	None	Mar-Jun
Lathyrus sulphureus var. argillaceus	dubious pea	3	None	None	Apr-May
Legenere limosa	legenere	1B.1	None	None	Apr-Jun
Navarretia myersii ssp. myersii	pincushion navarretia	1B.1	None	None	Apr-May
Orcuttia viscida	Sacramento Orcutt grass	1B.1	CE	FE	Apr-Jul(Sep)
Packera layneae	Layne's ragwort	1B.2	CR	FT	Apr-Aug
Sagittaria sanfordii	Sanford's arrowhead	1B.2	None	None	May-Oct(Nov)
Viburnum ellipticum	oval-leaved viburnum	2B.3	None	None	May-Jun
Wyethia reticulata	El Dorado County mule ears	1B.2	None	None	Apr-Aug

Attachment D

Wildlife List

Wildlife Species Observed within the Yankee Hill Road BRA Study Area

Species Name	Common name
Birds	
Accipiter cooperii	Cooper's hawk
Agelaius phoeniceus	Red-winged blackbird
Aphelocoma californica	California scrub jay
Buteo jamaicensis	Red-tailed Hawk
Cathartes aura	Turkey vulture
Columbia livia	Rock dove
Charadrius vociferous	Killdeer
Corvus brachyrhynchos	American crow
Elanus leucurus	White-tailed kite
Mimus polyglottos	Northern mockingbird
Zonotrichia leucophrys	White-crowned sparrow
Mammals	
Lepus californicus	Black-tailed hare
Mephitis mephitis	Striped skunk
Otospermophilus beecheyi	California ground squirrel

Attachment E

Aquatic Resources Delineation Map

AQUATIC RESOURCE FEATURES

OTHER WATERS

Antelope Creek and Adjacent Riparian Wetland

Feature ID	Acreage	Linear Feet
AC-1	0.257	390
Total Other Waters:	**0.257**	**390**

Aquatic Resources Total: 0.257 acre

-121.228872/
38.803492

Union Pacific Railroad

Aiken Dairy Road

Independence Place

Dp3

Dp2

Dp1

AC-1

-121.230288/
38.800597

-121.228893/
38.800578

Antelope Creek

DATA\AAAA - Projects\0000001 - Matts File\Maps\Yankee Hill Road Project\Maps\USACE ARD_YankeeHillRoad_v2.mxd 3/19/2021 12:33:02 PM

Notes:
Map Scale: 1 inch = 80 feet
Coordinate System: NAD 1983 State Plane California II
Datum: NAD83
Projection: Lambert Conformal Conic
Vertical Data: NAVD88
Aerial Base: City of Rocklin
Aerial Base Flown: 19 April 2018
Topographic Contours: USGS NED 1/3 arc-second Contours for Sacramento W, California. 1 October 2018
Date Map Prepared: 19 March 2021
Map Prepared by: N. Bente/M. Hirkala
Delineation Performed by: M. Hirkala

Prepared For:

Mr. Stephen Norman
CNA Engineering
2575 Valley Road
Sacramento, CA 95821

N

Feet
0 20 40 80

Study Area Boundary (5 acres)
Reference Point
Data Point

Aquatic Resources (0.257 acre)

Other Waters (0.257 acre)

Antelope Creek and Adjacent Riparian Wetland (0.597 acre)

Aquatic Resources Delineation

Yankee Hill Road

Rocklin, Placer County, California

MADRONE ECOLOGICAL CONSULTING
8421 Auburn Boulevard, Suite 248
Citrus Heights, California 95610
(916) 822.3230 | www.madroneeco.com

Attachment F

Pre-Development Arborist Report & Tree Inventory

California Tree and Landscape Consulting, Inc.

December 16, 2020

Steve Norman
CNA Engineering, Inc.
2575 Valley Road
Sacramento, CA, 95821
Via email: steve@cnaeng.com

PRE-DEVELOPMENT ARBORIST REPORT & TREE INVENTORY

RE: Yankee Hill Tentative Parcel Map, DL2020-0004 & Oak Tree Preservation Plan Permit, TRE2020-0003

Executive Summary

Steve Norman, the property owner, contacted California Tree and Landscape Consulting, Inc. to update the arborist report by Abacus Consulting Arborists dated February 27, 2018, and provide information regarding the trees protected by the Oak Tree Preservation code, chapter 17.77. The property is Yankee Hill Road, APN # 010-010-008-000, 010-010-009-000, and 030-140-004-000. All located in Rocklin, California. See Supporting Information –Tree Location Map.

Gordon Mann, ISA Certified Arborist WE-0585 AM, Nicole Harrison, ISA Certified Arborist #WE-6500AM, TRAQ, and Nicholas McNamara, arborists assistant, of Abacus Consulting Arborists were on site February 13th, 2018 to February 27th, 2018 to evaluate the trees. Nicole Harrison of California Tree and Landscape Consulting (formerly with Abacus Consulting Arborists) visited the site on December 10, 2020, to spot check for tree diameter growth, decline in the mature trees, and removals pursuant to the client's observations.

A total of 48 trees are included in the inventory, of which all are protected by size and species according to the City of Rocklin Tree Preservation ordinance. 8 trees meet the criteria for Heritage status. No trees are proposed for removal as a part of this process[1].

Tree Species	Trees Inventoried	Heritage Trees	Proposed for Removal for Development	Proposed for Retention with Impacts[2]
Interior Live Oak, Quercus wislizeni	37	7	0	-
Blue Oak, Quercus douglasii	5	1	0	-
Valley Oak, Quercus lobata	6	0	0	-
	48	**8**	**0**	**-**

See Appendices for specific information on each tree

[1] Tentative Parcel Map by CNA Engineering, Inc. "Yankee Hill Road Property" dated January 5, 2021.

[2] Impacts occur when development activities, including grading or trenching, are within the protected root zone defined for each tree in Chart B. The impact result and/or additional protection measures can be found in the conclusion of this report.

Methods

Appendix 2 in this report is the detailed inventory of the trees. The following terms will further explain our methods and findings.

The protected trees evaluated as part of this report have a numbered tag that was placed on each one with a pre-stamped tree number and Tree Tag. They are attached with a nail, installed at approximately 5 feet above ground level on the approximate south side of the fence.

A Level 2 – Basic Visual Assessment was performed in accordance with the International Society of Arboriculture's best management practices. This assessment level is limited to the observation of conditions and defects which are readily visible. Additional limiting factors, such as blackberries, poison oak, and/or debris piled at the base of a tree can inhibit the visual assessment.

Tree Location: The GPS location of each tree was collected using the ESRI's ArcGIS collector application on an Apple iPhone or Samsung. The data was then processed in ESRI's ArcMap by Julie McNamara, M.S. GISci, to produce the tree location map.

Tree Measurements: DBH (diameter breast high) is normally measured at 4'6" (above the average ground height for "Urban Forestry"), but if that varies then the location where it is measured is noted in the 'Measured at' column. A steel diameter tape was used to measure all of the trees. A laser distance meter was used to measure distances. Canopy radius measurements may also have been estimated due to obstructions, such as steep slopes or other trees.

Terms

Field Tag #	The pre-stamped tree number on the tag which is installed at approximately 6 feet above ground level on the north side of the tree.
Old Tag #	If additional field tags are found on the trees and are legible, they are listed here.
Species	The species of a tree is listed by our local and correct common name and botanical name by genus (capitalized) and species (lower case). Oaks frequently cross-pollinate and hybridize, but the identification is towards the strongest characteristics.
DBH	Diameter breast high' is normally measured at 4'6" (above the average ground height for "Urban Forestry"), but if that varies then the location where it is measured is noted in the next column "measured at"
Measured at	Height above average ground level where the measurement of DBH was taken
Canopy radius	The farthest extent of the crown composed of leaves and small twigs. Most trees are not evenly balanced. This measurement represents the longest extension from the trunk to the outer canopy. The dripline measurement is from the center point of the tree and is shown on the Tree Location Map as a circle. This measurement can further define a protection zone if specified in the local ordinance as such or can indicate if pruning may be required for development.
Arborist Rating	Subjective to condition and is based on both the health and structure of the tree. All of the trees were rated for condition, per the recognized national standard as set up by the Council of Tree and Landscape Appraisers and the International Society of Arboriculture (ISA) on a numeric scale of 5 (being the highest) to

0 (the worst condition, dead) as in Chart A. The rating was done in the field at the time of the measuring and inspection.

Rocklin Rating	Arborist	Rating	
Healthy	Excellent	**5**	No problems found from a visual ground inspection. Structurally, these trees have properly spaced branches and near perfect
Healthy	Good	**4**	The tree is in good condition and there are no apparent problems that can be seen from a visual ground inspection.
Healthy	Fair	**3**	The tree is in fair condition. There are some minor structural or health problems that pose no immediate risk of death or failure. When the recommended actions in an arborist report are completed correctly the defect(s) can be minimized or eliminated and/or health can be improved.
Dead, Diseased, Dying Category (2)	Poor	**2**	The tree has major problems. If the option is taken to preserve the tree, additional evaluation to identify if health or structure can be improved with correct arboricultural work including, but not limited to: pruning, cabling, bracing, bolting, guying, spraying, mistletoe removal, vertical mulching, fertilization, etc. Additionally, risk should be evaluated as a tree rated 2 may have structural conditions which indicate there is a high likelihood of failure. Trees rated 2 should be removed if these additional evaluations will not be performed.
Dead, Diseased, Dying Category (1)	Very Poor	**1**	The problems are extreme. This rating is assigned to a tree that has structural and/or health problems that no amount of work or effort can change. The issues may or may not be considered a high risk.
Dead, Diseased, Dying Category (1)	Dead	**0**	This indicates the tree has no significant sign of life.

Notes: Provide notable details about each tree which are factors considered in the determination of the tree rating including: (a) condition of root crown and/or roots; (b) condition of trunk; (c) condition of limbs and structure; (d) growth history and twig condition; (e) leaf appearance; and (f) dripline environment. Notes also indicate if the standard tree evaluation procedure was not followed (for example - why dbh may have been measured at a location other than the standard 54”). Additionally, notes will list any evaluation limiting factors such as debris at the base of a tree.

Actions Recommended actions to increase health and longevity.

Development Status Projected development impacts are based solely on distance relationships between tree location and grading. Field inspections and findings during the project at the time of grading and trenching can change relative impacts. Closely followed guidelines and requirements can result in a higher chance of survival, while requirements that are overlooked can result in a dramatically lower chance of survival. Impacts are measured as follows:

Impact Term	Long Term Result of Impact

Negligible	Tree is unlikely to show any symptoms. Chance of survival post development is excellent. Impacts to the Protected Root Zone are less than 5%.
Minor	Tree is likely to show minor symptoms. Chance of survival post development is good. Impacts to the Protected Root Zone are less than 15% and species tolerance is good.
Moderate	Tree is likely to show moderate symptoms. Chance of survival post development is fair. Impacts to the Protected Root Zone are less than 35% and species tolerance is good or moderate.
Severe	Tree is likely to show moderate symptoms annually and a pattern of decline. Chance of long term survival post development is low. Impacts to the Protected Root Zone are up to 50% and species tolerance is moderate to poor.
Critical	Tree is likely to show moderate to severe symptoms annually and a pattern of decline. Chance of long term survival post development is negligible. Impacts to the Protected Root Zone are up to 80%.

Discussion

Trees need to be protected from normal construction practices if they are to remain on the site and are expected to survive long term. While construction damage in the root zone is often the death of a tree, the time from when the damage occurs to when the symptoms begin and/or the tree dies can be years. Our recommendations are based on experience and the local ordinance requirements to enhance tree longevity. It requires the calculated root zone must remain intact as an underground ecosystem despite the use of heavy equipment to install foundations, driveways, underground utilities, and landscape irrigation systems. Simply walking and driving on soil can have serious consequences to tree health. The Tree Preservation Requirements and General Development Guidelines should be incorporated into the site plans and enforced onsite. The project arborist should be included in the development team during construction to provide expertise and make additional recommendations if additional impacts occur or tree response is poor.

Root Structure

The majority of a tree's roots are contained in a radius from the main trunk outward approximately two to three times the canopy of the tree. These roots are located in the top 6" to 3' of soil. It is a common misconception that a tree underground resembles the canopy. The correct root structure of a tree is in the drawing below. All plants' roots need both water and air for survival. Poor canopy development or canopy decline in mature trees after development is often the result of inadequate root space and/or soil compaction.

The reality of where roots are generally located (Menzer, 2008)

Pruning Mature Trees for Risk Reduction and/or Development Clearance

There are few good reasons to prune mature trees. Removal of deadwood, directional pruning, removal of decayed or damaged wood, and end-weight reduction as a method of mitigation for structural faults are the only reasons a mature

tree should be pruned. Live wood over 3" should not be pruned unless absolutely necessary. Pruning cuts should be clean and correctly placed. Pruning should be done in accordance with the American National Standards Institute (ANSI) A300 standards.

Pruning causes an open wound in the tree. Trees do not "heal" they compartmentalize. It is far better to use more small cuts than a few large cuts as small pruning wounds reduce risk while large wounds increase risk. Any wound made today will always remain, but a healthy tree, in the absence of decay in the wound, will 'cover it' with callus tissue. Large, old pruning wounds which did not close with callous tissue often have advanced decay. These wounds are a likely failure point. Mature trees with large wounds have a high risk of failure.

Overweight limbs are a common structural fault in suppressed trees. There are two remedial actions for over- weight limbs (1) prune the limb to reduce the extension of the canopy, or (2) cable the limb to reduce movement. Cables do not hold weight they only stabilize the limb and additionally require annual inspection.

Arborist Classifications

There are different types of Arborists:

Tree Removal and/or Pruning Companies: These companies may be licensed by the State of California to do business as a tree removal company, but they do not necessarily know anything about trees biology.

Arborists: Arborist is a broad term intended to mean someone with specialized knowledge of trees, but it is often used to imply knowledge that is not there.

ISA Certified Arborist: An International Society of Arboriculture Certified Arborist is someone who has trained, met the qualifications for application, and been tested to have specialized knowledge of trees. You can look up certified arborists at the International Society of Arboriculture website: isa-arbor.org.

Consulting Arborist: An American Society of Consulting Arborists Registered Consulting Arborist is someone who has been trained and then tested to have specialized knowledge of trees; and trained and tested to provide high quality reports and documentation. You can look up registered consulting arborists at the American Society of Consulting Arborists website: ASCA-consultants.org.

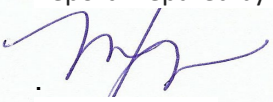
RECOMMENTATIONS: SUMMARY OF TREE PROTECTION MEASURES

The Owner and/or Developer should ensure the project arborist's protection measures are incorporated into the site plans and followed. Tree specific protection measures can be found in Appendix 2 – Tree Information Data.

- Identify the Root Protection Zones on the final construction drawings and show the placement of tree protection fencing pursuant to the arborists recommendation or city requirements.
- The project arborist should review the final construction drawings prior to submittal and identify the impacts to each tree and recommend actions to increase the likelihood of long term survival post construction.
- The project arborist should inspect the fencing prior to grading and/or grubbing for compliance with the recommended protection zones.

- The project arborist should directly supervise the clearance pruning, irrigation, fertilization, placement of mulch and chemical treatments.
- All stumps within the root zone of trees to be preserved shall be ground out using a stump router or left in place. No trunk within the root zone of other trees shall be removed using a backhoe or other piece of grading equipment.
- Prior to any grading, or other work on the site that will come within 50' of any tree to be preserved, irrigation will be required from April through September and placement of a 4-6" layer of chip mulch over the protected root zone of all trees that will be impacted. Chips should be obtained from onsite materials and trees to be removed.
- Clearance pruning should include removal of all the lower foliage that may interfere with equipment PRIOR to having grading or other equipment on site. The Project Arborist should approve the extent of foliage elevation and oversee the pruning to be performed by a contractor who is an ISA Certified Arborist.
- Clearly designate an area on the site outside the drip line of all trees where construction materials may be stored, and parking can take place. No materials or parking shall take place within the root zones of protected trees.
- Any and all work to be performed inside the protected root zone fencing shall be supervised by the project arborist.
- Trenching inside the protected root zone shall be by a hydraulic or air spade, placing pipes underneath the roots, or boring deeper trenches underneath the roots.
- Include on the plans an Arborist inspection schedule to monitor the site during (and after) construction to ensure protection measures are followed and make recommendations for care of the trees on site, as needed.

Report Prepared by:



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Nicole Harrison
Registered Consulting Arborist #719
ISA Certified Arborist #WC-6500AM, TRAQ
American Society of Consulting Arborists

Appendix 1 – Tree Location Map
Appendix 2 – Tree Data
Appendix 3 – General Development Guidelines

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ABACUS
CONSULTING ARBORISTS

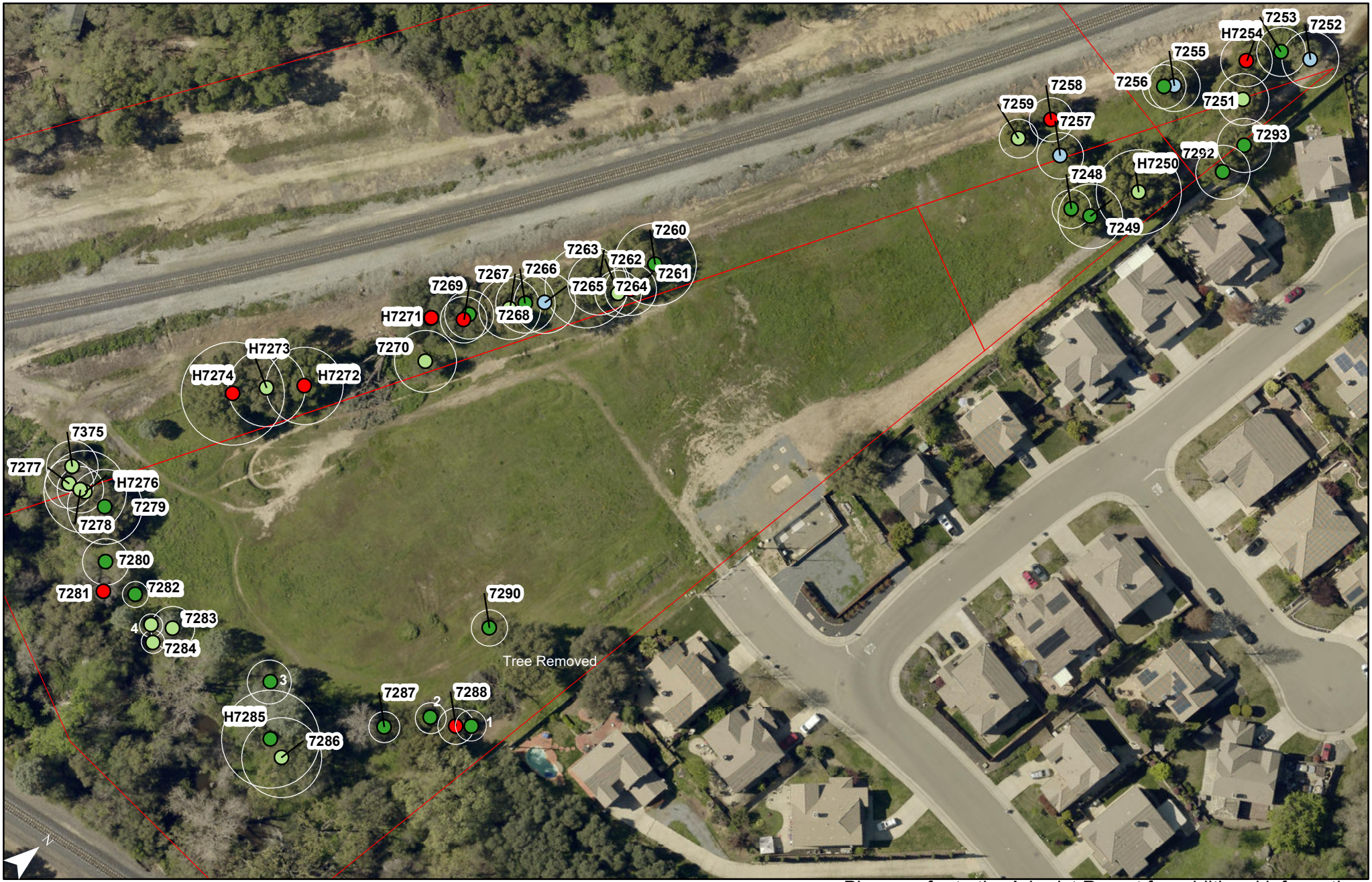
Tree Location Map

2/28/2018

Yankee Hill Rd
in
Rocklin, California

Tree Rating
- 0 Dead
- 1 Extreme Structure or Health Problems
- 2 Major Structure or Health Problems
- 3 Fair - Minor Problems
- 4 Good - No Apparent Problems

CanopyUpdated
Property Line



Please refer to the Arborist Report for additional information.
Tree locations are approximate.
Imagery - ESRI (2018)

APPENDIX 2 – TREE INFORMATION DATA

Field Tag #	Old Tag #	Off-Site	Protected	Heritage	Species Common Name	Species Botanical Name	TDBH	DBH - Other Stems	Canopy radius	Notes	Actions	Arborist Rating	Rocklin Rating	Develop-ment Status
7248	22	N	Y		Interior Live Oak	Quercus wislizenii	12	8	15	TDBH measured at base, included bark main stem at 2, good flare, epicormic growth, slight lean W, good canopy, suppressed by 7249		3 Fair - Minor Problems	Healthy	Preserve
7249		N	Y		Interior Live Oak	Quercus wislizenii	12	9, 9, 8, 7, 11	25	cavity at base, codominant leaders at base, N stems conjoined, S stems conjoined, DW, Sparse canopy	Remove deadwood reduce canopy extension	3 Fair - Minor Problems	Healthy	Preserve
7250	**21**	**N**	**Y**	**Y**	**Interior Live Oak**	**Quercus wislizenii**	**24**	**19, 19**	**33**	**codominant leaders split at base, included bark all stems, epicormic growth, canopy reaches ground, small failure S stem, lower branches not growing**	**Remove or cable immediately. Reduce canopy extension to prevent failure**	**2 Major Structure or Health Problems**	**Diseased /Dying**	**Preserve**
7251	20	N	Y		Interior Live Oak	Quercus wislizenii	15.75	12, 10	20	Decay under at base, S stem barbed wire included, poor leaf surface, Fair to poor structure	Reduce canopy extension	2 Major Structure or Health Problems	Diseased /Dying	Preserve
7252		N	Y		Blue Oak	Quercus douglasii	12		22	good flare, epicormic growth, codominant leaders at 20, ant hill at base, small cavity at base		4 Good - No Apparent Problems	Healthy	Preserve
7253	30	N	Y		Interior Live Oak	Quercus wislizenii	9	9, 8, 8	19	codominant leaders at base, included bark S stem, dead wood, hillside, 5 pruning wounds towards tracks 2-6 inches, fair canopy, epicormic growth, old 30	Wide and broad in lower canopy, poor leaf surface, decline	3 Fair - Minor Problems	Healthy	Preserve

Field Tag #	Old Tag #	Off-Site	Protected	Heritage	Species Common Name	Species Botanical Name	TDBH	DBH - Other Stems	Canopy radius	Notes	Actions	Arborist Rating	Rocklin Rating	Develop-ment Status
7254		**N**	**Y**	**Y**	**Interior Live Oak**	**Quercus wislizenii**	**26**		**20**	**TDBH measured at 2', large cavity at base E, barbed wire, abnormal growth, narrow attachments**	**Remove if target will exist**	**1 Extreme Structure or Health Problems**	**Diseased /Dying**	**Preserve**
7255		N	Y		Interior Live Oak	Quercus wislizenii	11	9	20	codominant leaders at 3, good flare, hillside, good canopy		4 Good - No Apparent Problems	Healthy	Preserve
7256		N	Y		Interior Live Oak	Quercus wislizenii	18	8, 8, 7	17	codominant leaders from the ground, small cavity E stem at base, pruning wounds E, small failures, N suppressed by 7255, abnormal growth, fair canopy		3 Fair - Minor Problems	Healthy	Preserve
7257		N	Y		Interior Live Oak	Quercus wislizenii	12	10	18	TDBH measured at 2', codominant leaders at base, included bark, good canopy, epicormic growth		4 Good - No Apparent Problems	Healthy	Preserve
7258		Y	Y		Interior Live Oak	Quercus wislizenii	14		17	hillside, large pruning wounds, failure at base, off property, good canopy		1 Extreme Structure or Health Problems	Diseased /Dying	Preserve
7259		N	Y		Interior Live Oak	Quercus wislizenii	13	7	15	growing out of a rock, epicormic growth, abnormal growth, included bark, codominant leaders at 1	Reduce to prevent failure	3 Fair - Minor Problems	Healthy	Preserve
7260		N	Y		Interior Live Oak	Quercus wislizenii	19	10, 14, 15 ,6	32	codominant leaders at base, some basal decay, wide spread canopy, north and west stems lean, fair leaf surface		3 Fair - Minor Problems	Healthy	Preserve
7261	34	N	Y		Interior Live Oak	Quercus wislizenii	7		20	conjoined stems at 5', poor structure, too many pruning	Remove if target, or	1 Extreme Structure	Diseased /Dying	Preserve

Field Tag #	Old Tag #	Off-Site	Protected	Heritage	Species Common Name	Species Botanical Name	TDBH	DBH - Other Stems	Canopy radius	Notes	Actions	Arborist Rating	Rocklin Rating	Develop-ment Status
										wounds, understory -suppressed by 7260	reduce to prevent failure	or Health Problems		
7262	16	N	Y		Interior Live Oak	Quercus wislizenii	12	10, 7	18	hillside, good flare, dead 6 inch stem, epicormic growth, included bark on S stem, sparse canopy, unhealed pruning wounds		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7263	15	N	Y		Interior Live Oak	Quercus wislizenii	10	10, 9	24	large jagged failures, pruning wounds, codominant leaders at base, decay at base at old cdl removal, widespread canopy, Sparse canopy, lean to E, included bark main stem, mistletoe, poor leaf surface		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7264	14	N	Y		Interior Live Oak	Quercus wislizenii	22.5	11, 12, 15	32	Codominant from base, north stem codominant with included bark and decay/deadwood at 2' - high risk of failure; south stem included bark at 6'. Overall poor structure, bows east	Remove if target, or reduce to prevent failure	1 Extreme Structure or Health Problems	Diseased /Dying	Preserve
7265	13	N	Y		Valley Oak	Quercus douglasii	22.5		24	good flare, included bark at 20, codominant leaders at 15', 1-4" deadwood, fair leaf surface		3 Fair - Minor Problems	Healthy	Preserve
7266		N	Y		Valley Oak	Quercus lobata	10	9	23	codominant leaders at base, included bark at base, unbalanced canopy south west, good flare		3 Fair - Minor Problems	Healthy	Preserve
7267		N	Y		Interior Live Oak	Quercus wislizenii	10	8, 9, 9, 5	24	codominant leaders at base, embedded fence post at base, pruning stubs, crossing limbs, epicormic growth, suppressed by 7266, fair leaf surface		2 Major Structure or Health Problems	Diseased /Dying	Preserve

Field Tag #	Old Tag #	Off-Site	Protected	Heritage	Species Common Name	Species Botanical Name	TDBH	DBH - Other Stems	Canopy radius	Notes	Actions	Arborist Rating	Rocklin Rating	Develop-ment Status
7268		N	Y		Interior Live Oak	Quercus wislizenii	7	6, 6	19	small pruning wounds, codominant leaders at base, vertical cavities in all stems at base, epicormic growth, fair canopy, suppressed, narrow attachments		3 Fair - Minor Problems	Healthy	Preserve
7269		N	Y		Interior Live Oak	Quercus wislizenii	9		18	codominant leaders at base, large failure cavity and decay at base, sparse canopy, suppressed		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7270		N	Y		Interior Live Oak	Quercus wislizenii	13		24	jagged failure with decay at 1, lean to E, healing wounds, cavity at 3 6 ", epicormic growth, codominant leaders at 5, good leaf surface		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7271		**N**	**Y**	Y	**Interior Live Oak**	**Quercus wislizenii**	**38**		**50**	**Failed and on the ground**		1 Extreme Structure or Health Problems	Diseased /Dying	Preserve
7272		**N**	**Y**	**y**	**Interior Live Oak**	**Quercus wislizenii**	**25.75**	**14, 13, 9**	**30**	**large cavities at base, good flare, abnormal growth, large failures , epicormic growth, pruning wounds, decay, bows at 15-25' - prostrate above, fair canopy**		**1 Extreme Structure or Health Problems**	**Diseased /Dying**	**Preserve**
7273		**N**	**Y**	Y	**Interior Live Oak**	**Quercus wislizenii**	**33**		**30**	**TDBH measured at 1', edge of cut roots growing down to new level, codominant leaders at 3' and 6' in both stems, large deadwood, small miscellaneous problems throughout canopy, fair leaf surface**	**Recommend advanced inspection. Remove dead wood. Reduce canopy extension to prevent failure**	**2 Major Structure or Health Problems**	Diseased /Dying	Preserve

Field Tag #	Old Tag #	Off-Site	Protected	Heritage	Species Common Name	Species Botanical Name	TDBH	DBH - Other Stems	Canopy radius	Notes	Actions	Arborist Rating	Rocklin Rating	Develop-ment Status
7274		**N**	**Y**	Y	**Interior Live Oak**	**Quercus wislizenii**	**26**	**20, 22, 13**	**40**	**Edge of cut roots growing down, codominant leaders at ground into two main stems, abnormal trunk shapes, embedded wire east, too many failures and large dwd, fair leaf surface**	**Remove if target will exist**	**1 Extreme Structure or Health Problems**	Diseased /Dying	Preserve
7276		**N**	**Y**	**y**	**Blue Oak**	**Quercus douglasii**	**24**		**32**	**TDBH measured at 2', growing over rock, deep slope south, codominant leaders at 2' into 3, Included bark, poor structure from suppression, fair leaf surface**	**Reduce canopy south, reevaluate annually for potential for structural failure due to rocks under base**	**2 Major Structure or Health Problems**	**Diseased /Dying**	**Preserve**
7277		N	Y		Interior Live Oak	Quercus wislizenii	11		19	Basal decay southside, dead branches, die back, thin crown		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7278		N	Y		Interior Live Oak	Quercus wislizenii	9 at 1'		18	codominant leaders at 1' , included bark, lean South, one sided crown, thin canopy		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7279		N	Y	N	Interior Live Oak	Quercus wislizenii	23.5	16 at 1'	29	codominant leaders at base, South leader laying 45°, north leader included bark, codominant at 10', some basal decay, rock at base	clearance prune, end weight reduction, crown clean	3 Fair - Minor Problems	Healthy	Preserve
7280		N	Y		Blue Oak	Quercus douglasii	11		18	Lean North, one sided crown North, codominant leaders at 10', blackberries at base		3 Fair - Minor Problems	Healthy	Preserve

Field Tag #	Old Tag #	Off-Site	Protected	Heritage	Species Common Name	Species Botanical Name	TDBH	DBH - Other Stems	Canopy radius	Notes	Actions	Arborist Rating	Rocklin Rating	Develop-ment Status
7281		N	Y		Interior Live Oak	Quercus wislizenii	8		0	Dead		0 Dead	Diseased /Dying	Preserve
7282		N	Y		Interior Live Oak	Quercus wislizenii	6	3, 4	10	Codominant leaders at 2', leans North East		3 Fair - Minor Problems	Healthy	Preserve
7283		N	Y		Interior Live Oak	Quercus wislizenii	7	5, 4 at 1'	17	TDBH measured at 1', codominant leaders at base, ivy, Lean Northwest, one sided crown north, growing under pine tree		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7284		N	Y		Blue Oak	Quercus douglasii	6		9	vertical growth, slight bend in trunk at 10 feet, symmetric crown. Recent beaver damage (?) possibly mostly dead, sprouting from base. Reinspect in June	Reinspect in June, 2021	2 Major Structure or Health Problems	Healthy	Preserve
7285		**N**	**Y**	Y	**Interior Live Oak**	**Quercus wislizenii**	**26**	**20**	**38**	**codominant leaders at base, 20 inch stem leans Northwest 45 deg, epicormic growth, guy thru branch, old utility pole, 1-sided crown and end weight**	**Remove all dead wood. Reduce canopy extension to prevent failure**	**3 Fair - Minor Problems**	Healthy	**Preserve**
7286		N	Y		Blue Oak	Quercus douglasii	18		31	Basal cavity east side, overdrawn by 7285, one sided crown south, old phone wire in trunk,		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7287		N	Y		Interior Live Oak	Quercus wislizenii	8		15			3 Fair - Minor Problems	Healthy	Preserve
7288		N	Y		Interior Live Oak	Quercus wislizenii	12		14	60 deg lean Southwest, basal decay, two other failed stems to the north	Recommended for Removal	1 Extreme Structure or Health Problems	Diseased /Dying	Preserve

Field Tag #	Old Tag #	Off-Site	Protected	Heritage	Species Common Name	Species Botanical Name	TDBH	DBH - Other Stems	Canopy radius	Notes	Actions	Arborist Rating	Rocklin Rating	Develop-ment Status
7290		N	Y		Valley Oak	Quercus lobata	6	6, 5	14	3 stems at base, included bark, close canopies		3 Fair - Minor Problems	Healthy	Preserve
7292		Y	Y		Interior Live Oak	Quercus wislizenii	22		22	TDBH measured at 2', trunk decay at 3' codominant leaders at 3', codominant leaders at 5'		2 Major Structure or Health Problems	Diseased /Dying	Preserve
7293		Y	Y		Interior Live Oak	Quercus wislizenii	14	12	21	codominant leaders at 1', some decay in south stem and north stem, included bark, thinning foliage, underneath communication cable.		3 Fair - Minor Problems	Healthy	Preserve
7375		N	Y		Interior Live Oak	Quercus wislizenii	18		20	Growing over rock S, covered in poison oak, leans south, poor taper, embedded fence wire old codominant leaders failure		2 Major Structure or Health Problems	Diseased /Dying	Preserve
1		N	Y		Valley Oak	Quercus lobata	6		8	Grew to size since last survey		3 Fair - Minor Problems	Healthy	Preserve
2		N	Y		Valley Oak	Quercus lobata	6		8	Grew to size since last survey		3 Fair - Minor Problems	Healthy	Preserve
3		N	Y		Interior Live Oak	Quercus wislizeni	7		12	Grew to size since last survey Codominant at 18", next to Grey Pine		3 Fair - Minor Problems	Healthy	Preserve
4		N	Y		Valley Oak	Quercus lobata	6		8	Grew to size since last survey, 5' from 7284. Extensive damage from beavers (?) sprouting from ground		2 Major Structure or Health Problems	Healthy	Preserve

APPENDIX 3
GENERAL DEVELOPMENT GUIDELINES

Definitions

Root zone: The roots of trees grow fairly close to the surface of the soil, and spread out in a radial direction from the trunk of tree. A general rule of thumb is that they spread 2 to 3 times the radius of the canopy, or 1 to 1 ½ times the height of the tree. It is generally accepted that disturbance to root zones should be kept as far as possible from the trunk of a tree.

Inner Bark: The bark on most large trees is quite thick, usually 1" to 2". If the bark is knocked off a tree, the inner bark, or cambial region, is exposed and/or removed. The cambial zone is the area where tissues responsible for adding new layers to the tree each year are located. Removing or damaging this tissue results in a tree that can only grow new tissue from the edges of the wound. In addition, the interior wood of the tree is exposed to decay fungi and becomes susceptible to decay. Tree protection measures require that no activities occur which can knock the bark off the trees.

Methods Used in Tree Protection:

No matter how detailed Tree Protection Measures are in the initial Arborist Report, they will not accomplish their stated purpose unless they are applied correctly and a Project Arborist oversees the construction. The Project Arborist should have the ability to enforce the Protection Measures. It is advisable for the Project Arborist to be present at the Pre-Construction meeting to answer questions the contractors may have about Tree Protection Measures. This also lets the contractors know how important tree preservation is to the developer.

Root Protection Zone (RPZ): Since in most construction projects it is not possible to protect the entire root zone of a tree, a Root Protection Zone is established for each tree to be preserved. The minimum Root Protection Zone is the area calculated as 1 to 1.25' for every inch of trunk diameter (ie. A 10" diameter tree will have an RPZ of 10') or the dripline, whichever is greater. The Project Arborist must approve work within the RPZ.

Irrigate, Fertilize, Mulch: Prior to grading on the site near any tree, the area within the Tree Protection fence should be fertilized with 4 pounds of nitrogen per 1000 square feet, and the fertilizer irrigated in. The irrigation should percolate at least 24 inches into the soil. This should be done no less than 2 weeks prior to grading or other root disturbing activities. After irrigating, cover the RPZ with at least 12" of leaf and twig mulch. Such mulch can be obtained from chipping or grinding the limbs of any trees removed on the site. Acceptable mulches can be obtained from nurseries or other commercial sources. Fibrous or shredded redwood or cedar bark mulch shall not be used anywhere on site.

Fence: Fence around the Root Protection Zone and restrict activity therein to prevent soil compaction by vehicles, foot traffic or material storage. The fenced area shall be off limits to all construction equipment, unless there is express written notification provided by the Project Arborist, and impacts are discussed and mitigated prior to work commencing.

> No storage or cleaning of equipment or materials, or parking of any equipment can take place within the fenced off area, known as the RPZ.

The fence should be highly visible, and stout enough to keep vehicles and other equipment out. I recommend the fence be made of orange plastic protective fencing, kept in place by t-posts set no farther apart than 6'.

In areas of intense impact, a 6' chain link fence is preferred.

In areas with many trees, the RPZ can be fenced as one unit, rather than separately for each tree.

Where tree trunks are within 3' of the construction area, place 2" by 4" boards vertically against the tree trunks, even if fenced off. Hold the boards in place with wire. Do not nail them directly to the tree. The purpose of the boards is to protect the trunk, should any equipment stray into the RPZ.

Elevate Foliage: Where indicated, remove lower foliage from a tree to prevent limb breakage by equipment. Low foliage can usually be removed without harming the tree, unless more than 25% of the foliage is removed. Branches need to be removed at the anatomically correct location in order to prevent decay organisms from entering the trunk. For this reason, a contractor who is an ISA Certified Arborist should perform all pruning on protected trees.[3]

Expose and Cut Roots: Breaking roots with a backhoe, or crushing them with a grader, causes significant injury, which may subject the roots to decay. Ripping roots may cause them to splinter toward the base of the tree, creating much more injury than a clean cut would make. At any location where the root zone of a tree will be impacted by a trench or a cut (including a cut required for a fill and compaction), the roots shall be exposed with either a backhoe digging radially to the trunk, by hand digging, or by a hydraulic air spade, and then cut cleanly with a sharp instrument, such as chainsaw with a carbide chain. Once the roots are severed, the area behind the cut should be moistened and mulched. A root protection fence should also be erected to protect the remaining roots, if it is not already in place. Further grading or backhoe work required outside the established RPZ can then continue without further protection measures.

Protect Roots in Deeper Trenches: The location of utilities on the site can be very detrimental to trees. Design the project to use as few trenches as possible, and to keep them away from the major trees to be protected. Wherever possible, in areas where trenches will be very deep, consider boring under the roots of the trees, rather than digging the trench through the roots. This technique can be quite useful for utility trenches and pipelines.

Protect Roots in Small Trenches: After all construction is complete on a site, it is not unusual for the landscape contractor to come in and sever a large number of "preserved" roots during the installation of irrigation systems. The Project Arborist must therefore approve the landscape and irrigation plans. The irrigation system needs to be designed so the main lines are located outside the root zone of major trees, and the secondary lines are either laid on the surface (drip systems), or carefully dug with a hydraulic or air spade, and the flexible pipe fed underneath the major roots.

Design the irrigation system so it can slowly apply water (no more than ¼" to ½" of water per hour) over a longer period of time. This allows deep soaking of root zones. The system also needs to accommodate infrequent irrigation settings of once or twice a month, rather than several times a week.

[3] International Society of Arboriculture (ISA), maintains a program of Certifying individuals. Each Certified Arborist has a number and must maintain continuing education credits to remain Certified.

Monitoring Tree Health During and After Construction: The Project Arborist should visit the site at least twice a month during construction to be certain the tree protection measures are being followed, to monitor the health of impacted trees, and make recommendations as to irrigation or other needs. After construction is complete, the arborist should monitor the site monthly for one year and make recommendations for care where needed.

Chemical Treatments: The owner or developer shall be responsible to contact an arborist with a pesticide applicators license to arrange for an application of a root enhancing hormone, such as Paclobutrazol, to mitigate the stress produced by the development. Additionally, at the discretion of the project arborist, an insect infestation preventative for both boring insects and leaf feeding insects and/or fungal preventative for leaf surfaces may be required. Roots pruned during the course of performing a cut may be required to be treated with a biofungicide such as Bio-Tam.