

**Biological Review for Geringer's Capitol "Tierra Robles Ranch"**

**Shasta County, California**

**Prepared for:**

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## **Introduction**

This Biological Review has been prepared by Wildland Resource Managers (WRM) at the request of S2 ~ J2 Engineering of Cottonwood, California for the 720 acres of the Tierra Robles property located in central Shasta County, California. The property area is located in portions of Sections 19 and 30 of Township 32 North, Range 3 West, and portions of Sections 24 and 25 of Township 32 North, Range 4 West, MDBM, just southwest of the town of Bella Vista, California (Figure 1). The purpose of this review is to identify the biological resources associated with the property area and to identify any related issues that may need to be addressed in order to develop the property into a residential sub-division. Tierra Robles Ranch is owned by Geringer Capitol, an investment corporation headquartered in Hollywood, California.

Tierra Robles, originally named Chatham Ranch, historically was a working cattle ranch characterized as a cow/calf operation. The present owners lease the property for winter/spring cattle grazing and for bee yards. There are no improvements on the property except for unimproved access roads, a set of corrals, and line and limited cross fences.

Small lot sub-divisions surround the property on the east, south and west sides. The Stillwater Gun Club is the adjacent owner on the north side.

With approval from the county, the intent of the present owners is to subdivide the property into small acreage lots suitable for home sites and the associated infrastructure.

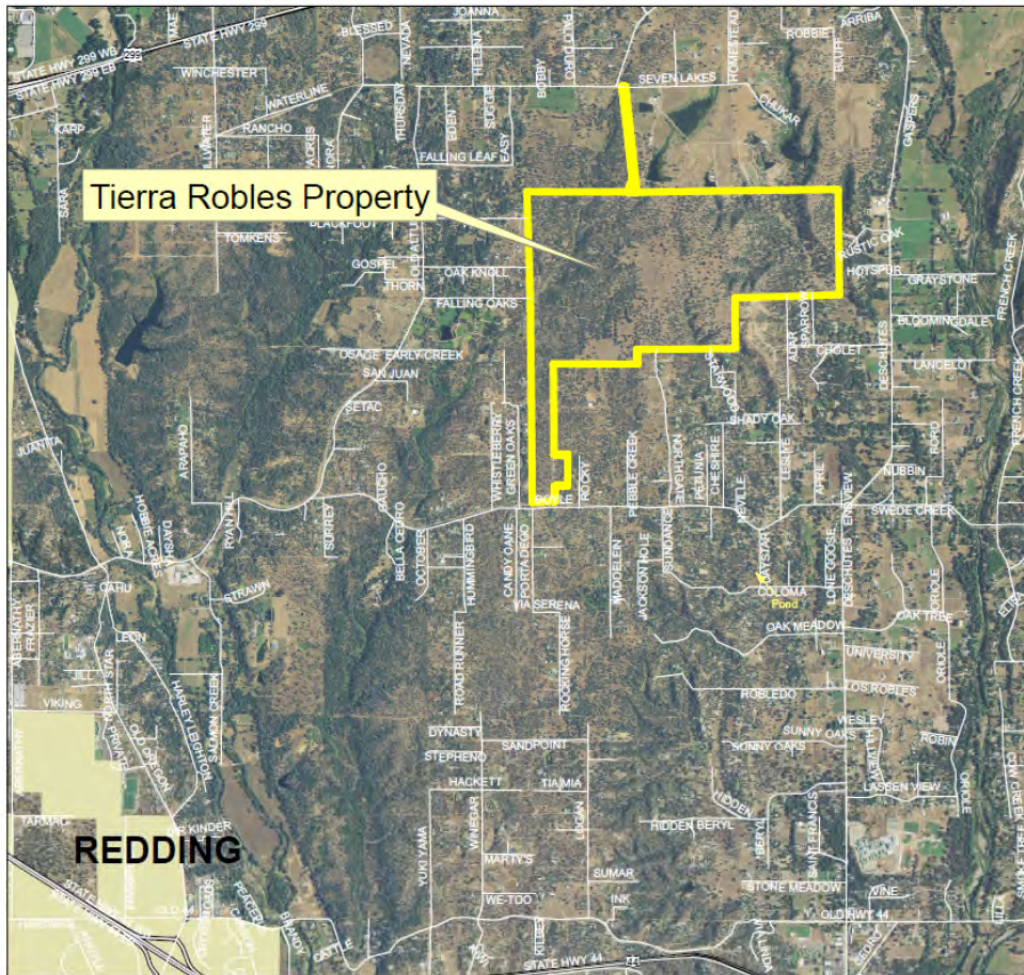
From Redding the property may be accessed by traveling east on State Highway 44 to Palo Cedro. At Palo Cedro, go north on Deschutes Road to Boyle Road. Go west on Boyle Road to Northgate Road. At Northgate, go north to the end of the road at the property line.

This report is divided into two sections. Section I is an inventory of the physical and biological resources found on the project area. Section II is the regulatory setting, impacts analysis and suggested mitigation measures.

March 19, 2015

# Tierra Robles Vicinity Map

Figure 1



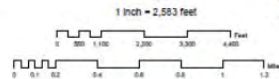
Projection: California State Plane, ZONE 1, NAD 83



Sources:  
 Wildland Resource Managers  
 NAIP Program for Imagery  
 www.atlas.ca.gov  
 NAIP DOQQ/CIR  
 July 2009  
 1 meter spatial resolution



Figure 1



Field Work and Project Management  
 by Wildland Resource Managers  
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GIS and Cartography  
 HABARON GEOservices  
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## **Section I**

### **1. Research Methods**

The field work on this project was originally begun in 2005 when WRM was contacted by Lehman and Associates of Redding to provide biological input into the original planning process for a large lot subdivision. At that time, property and contour maps were provided to WRM by Lehmann and Associates that showed the geographic features and property boundaries of the project area. Subsequent to that time, the property was sold to the current owners who exchanged some acreage with an adjacent owner resulting in the current property boundary. Lehman and Associates then provided new maps detailing the current property boundary. These new maps were used by WRM to conduct site reviews in 2008, 2009 and then subsequently in 2011, 2012, 2015 and 2016. During the course of field work, WRM conducted botanical surveys along with a wetlands delineation which was submitted to and verified by the Army Corp of Engineers in 2011. An oak stand density study of proposed road corridors was done by WRM in 2012 and a study of the oak stand densities within the proposed lot building envelopes was completed in 2015 (see “Tierra Robles Oak Tree Assessment Study” 2012 and “Oaks of Tierra Robles” 2015 by WRM). A final report, “Tierra Robles Oak Management Plan” was completed in 2016. This plan detailed management strategies designed to enhance the oaks stands through silvacultural practices. The methods and results sections of these reports are summarized in this report. During the course of these studies every drainage and upland area was examined numerous times on foot, horseback and ATV’s. In addition to WRM’s investigations, contributions to the understanding of the environmental issues has been provided by Frank Lehmann, California licensed surveyor and registered professional forester of Lehmann and Associates, Steve Nelson, California licensed civil engineer of S2~J2 Engineering, Dr. Phil McDonald, PH.D Forest Science, registered forest ecologist, USDA Forest Service, Pacific Southwest Research Station and Dr. Jerry Walters, PH.D agronomy and soil science, research forester, USDA Forest Service, Pacific Southwest Research Station. In the fall of 2012 the project was put on hold until reactivated in 2015. Background research included a query of the California Department of Fish and Wildlife’s Natural Diversity Data Base for the Enterprise quadrangle.

### **2. Environmental Resources**

Tierra Robles is situated on a high terrace of shallow soils southwest of the town of Bella Vista. This high terrace is dissected by two major drainage systems with several smaller supporting tributaries. Clough Creek is the most significant drainage being an intermittent stream that flows from north to south across the western portion of the property. Several smaller

tributaries to this stream drain the northwestern portion of the property. The main channel is fairly wide (10-15 feet) and is comprised of a gravel bottom with pools and shallow runs. There is no significant riparian habitat associated with this stream, however there are clumps of isolated willow shrubs scattered along the stream at various locations (see photo section of this report).

Running from north to south along the eastern side of the property, through a shallow valley, is another intermittent stream that drains the properties to the north of Tierra Robles. This stream is unnamed (henceforth we refer to it as East Creek) and not as prominent as Clough Creek being between eight and twelve feet in width. The stream bed is gravelly with a shallow gradient. Between this stream and Clough Creek are three other small ephemeral drainages that originate on the ranch and drain its central portion.

In the upland areas the vegetative composition is uniformly blue oak/grey pine (*Quercus douglasii*, *Pinus sabiniana*) with the blue oaks being most abundant. Tree canopy cover within this area ranges from 10 to nearly 100% in some areas, with the majority of the trees being greater than 6" DBH. Annual grasses and forbs comprise the understory with patches of manzanita (*Arctostaphylos spp*), coffee-berry (*Rhamnus californica*), and poison oak (*Rhus diversiloba*) being the predominant shrubs. Within the steeper draws of the drainage in the northeast corner of the property the vegetation is dominated by interior live oak (*Quercus wislizenii*) with a scattered mid-story of poison oak, coffee berry, and manzanita. In places, the overstory canopy closure within in these steeper gulches ranges to nearly 90%, resulting in a nearly non-existent understory.

#### A. Soils Resource

Soils within the project area are diverse and are considered part of the Newton-Red Bluff association (Figure 2). These soils are on nearly level to steep, well-drained and moderately well-drained clays and clay loams formed in old alluvium on high terraces (Shasta County soil survey, 1974). On-site soils include:

Ad: Anderson gravelly sandy loam

Ae: Anderson gravelly sandy loam, moderately deep

CgB: Clough gravelly loam: well-drained soils with a hardpan, runoff slow.

leD: Inks-Pentz complex: well-drained with moderate permeability.

leE: Inks-Pentz complex: 30 to 50 percent slopes, very stony loam.

NeC: Newton gravelly loam, 8 to 15 percent slopes, slow permeability.

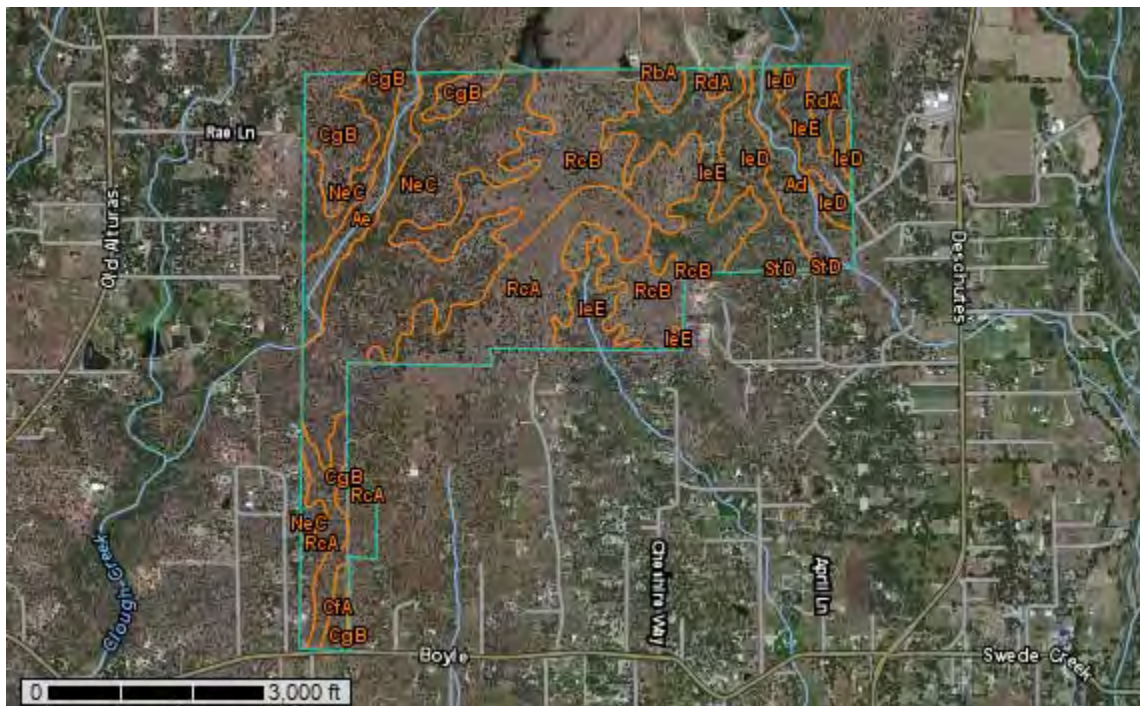
RcA: Red Bluff gravelly loam, moderately deep, moderately well-drained.

RcB: Red Bluff gravelly loam, moderately deep, 3 to 8 percent slopes, moderately well-drained

RdA: Redding gravelly loam, 0-3 percent slopes, with hardpan at 10-30 inches.

The Ae soils are found along the Clough Creek flood plain while the Ad soils are found along the flood plain of the unnamed gulch in the northeast corner of the project area. The RcA soil forms the tableland areas in the central portion of the property and it is within these areas that the vernal complexes seem to be present. Overstory oaks and pines are absent on portions of this soil type. It is probable that a hardpan layer is relatively close to the surface in this area. The NeC series forms the dissected side slopes of the Clough Creek drainage and supports a fairly dense oak overstory with brush and grass understory. This combination forms suitable forage and escape habitat for deer. The Ie series consists of well-drained and somewhat excessively drained soils that are underlain by cemented tuffaceous sediment. These soils are on upland portions of the property. The Cg series consists of moderately well-drained soils that have a hardpan and are found on high terrace areas. (See Soil Survey of Shasta County Area, California. USDA Soil Conservation Service for detail description of soils resource. ). Figure 2, below, is taken from the NRCS web page and displays the location of the soils resource on the project area.

Figure 2 Soils Resource of Tierra Robles



## B. Vegetative Resource

Methods: A complete botanical survey of the property was conducted in April of 2005. This was done by establishing 200 foot transects through the eight vegetative community found on the property. Each transect consisted of 10 one-meter plots spaced twenty feet apart. All plant species within the plots were identified. In addition, any other plants found outside the plots were also identified and recorded. Transects were established in the blue oak grassland type, open herbaceous area dominated by wet depressions type, annual grassland type, treeless herbaceous opening type, blue oak woodland type, banks of Clough Creek area, riparian areas adjacent to Clough Creek and the side slope oak woodland type. Within each of these areas the overstory, mid-story and understory vegetation was recorded.

Results: There are four predominant vegetative communities on the project area. These include the blue oak grasslands type, annual grassland type, blue oak woodland/grey pine type, and the interior live oak/blue oak type. Associated with these are blue oak/brush inclusions. For a listing of the species found by type, see “Botanical Survey of Chatham Ranch – April 11, 2005” in the appendix of this report. In 2012, while examining the site, Enplan found the Red Bluff dwarf rush growing in the wet swale area called “East Center Creek.” They also found elderberry bushes at four locations in the East Creek drainage area. Since 2005 the vegetation on the property has remained essentially the same and no significant events, such as a fire, have impacted the area. Site reviews of the site in 2015 found the vegetative patterns across the ranch to be the same as were recorded in 2005.

Oak stand structure and density studies: California oaks are a vital resource of the north state and have value to the general ecology of the entire north state region. In order to assess the impacts of this project to the oak resource it is necessary to understand the extent of that resource on the project area. Oak structure and density studies were conducted by WRM in 2012 and 2015. The 2012 study focused on the oak stands within the proposed 6.73 miles of access roads on the property. The 2015 study focused on the oaks within the building envelopes of each proposed lot (the “building envelope” is that area within a lot in which a structure may be placed). As a result of these studies, in 2016 WRM completed the “Tierra Robles Oak Management Plan.” This plan describes management guidelines for five different oak stands on the property to produce an “ideal oak stand.” To produce this stand management objectives were described in three foremost attributes. The first attribute is that the oak stands need to be healthy in terms of individual tree health with the ability for continual propagation of the stands by means of recruitment of new trees. Individual tree health is understood to mean trees that have well-developed crowns capable of acorn production with a relatively small degree of decadency. Second, the oak stands must provide



for the associated wildlife niches found in the blue oak woodland habitats. Third, the stand must be fire safe if it is to continue to exist in a fire prone ecosystem. A fourth attribute, which is indirectly related to all other three, is aesthetic appeal. The Tierra Robles project is a residential development project. Therefore, the ability to have a thriving oak resource that is aesthetically pleasing to homeowners is a key element within the management objectives. It is important to note that these attributes need to be maintained in order to comply with state and county environmental quality planning requirements.

Methods that were considered for these studies included the use of LiDAR which utilizes laser technology to assess the tree canopy closure. However, such a methodology has limitations for this project as on the project area a single tree canopy can often be a “canopy cluster” made up of from 1 to 23 trees with an average of 2.205 trees per canopy cluster. Such clusters would not be discernible using LiDAR. The 2.2 figure includes the open prairie areas where a canopy cluster is truly one tree as well as the more densely timbered area where a “canopy cluster” is really multiple trees of varying sizes. Another limitation of LiDAR is that it cannot differentiate between species when one smaller tree is masked by a larger tree of a different species within the same cluster. We found multiple cases in which blue and live oaks were growing together, with one species overtopping the other. We determined the best technique was to determine the basal area of the oaks within the road and building envelope area through on-ground measurements.

In terms of providing accurate and quantifiable data by specie the forest manager typically determines the basal area of a species per acre. Basal area is the term used to define the area of a given section of land that is occupied by the cross-section of tree trunks and stems at their base. To determine basal area an actual tree count by specie and size is made within a sample area and then this data is extrapolated to the surrounding like areas. This was the method used for this assessment. For the 2012 study, the sample area was the proposed road corridors. For the 2015 study, the sample area was the building envelopes. This methodology also allows for the determination of how many trees and the associated basal area would be impacted by the development of the road system and the building of the new residences

With the completion of the field work the data was entered into an Excel software program which allowed for multiple assessments to be made.

*Oak study methods:* The following general methods were used for the 2012 and 2015 studies. For a detail description of the study methods, see the reports.

Initially, roads and individual lot layouts were done systematically to avoid as many oaks as possible. Then, to understand the stand character and growth dynamics of the oak resource, every tree within the proposed building envelopes and road right-of-ways was measured and

counted. This was accomplished by sending crews into the field and measuring the diameter of each tree at the “diameter breast height” (dbh) within the road right-of-way and the building envelopes. Building envelopes were located in the field using an I-phone GPS feature that had the building envelopes overlaid onto a Google mapping program. Using this GPS system, each building envelope was located in the field, flagged and numbered and then every oak within that envelope was counted and marked with orange tree marking paint. Each tree was measured at “diameter breast height” using Biltmore stick technology or a diameter tape on the larger trees. If a tree was multi-forked but connected above the ground level, only the largest stem was measured. If the stems were originating from a parent root crown but had soil between the stems, each stem was counted as a tree. Any tree, regardless of size, over 1’ tall was counted. As closely as possible the location of each tree was plotted on the lot maps and the data subsequently recorded in an Excel program to allow for the calculation of the amount of basal area for each building envelope. Knowing the amount of basal area for each building envelope allows for the calculation of the impacts to the oak resource for any building that takes place on any given lot.

*Results:*

2012 Road Network Study: There are 3445 trees within the total road system footprint of 52.33 acres, with a total basal area of 1,476.68 square feet. There are three distinct timber stocking densities on the project site as follows:

300.39 acres of heavily stocked with an average basal area of 44.68 sq ft/acre\* = 13,421.42 sq ft. There are 326.91 acres of moderately stocked, average basal area of 26.62 sq ft/acre = 8,702.34 sq ft.; and there are 81.1 acres of lightly stocked, average basal area of 13.12 sq ft/acre = 1,064.03 sq ft.

From these figures the total basal area for the project area is approximately 23,187.79 sq ft.

\* (basal area calculated from a sample of two roads averaged within each stocking area)

2015 Building Envelope Study: Both the 2012 and the 2015 studies found that oaks are not evenly distributed across the Tierra Robles landscape. Part of the goals of the 2015 study was to determine the best management prescription for the oak stands in order to comply with the State and County Fire Marshal requirements as well as maintaining wildlife habitat, the property was divided into five Resource Management Area (RMA’s). The RMA’s are determined by the vegetative composition of each area. Table 1 below is a summation of the number of oaks and of the basal area within each RMA. See Tierra Robles Wildland Fuel/Vegetation Management Plan for a complete analysis of the oaks within the RMA’s.

**TABLE 1**

| <b>RMA Number</b> | <b>Total Area of RMA Building Envelopes (Sq.Ft.)</b> | <b>Number of Trees</b> | <b>Basal Area (Sq.Ft.)</b> |
|-------------------|--|------------------------|----------------------------|
| 1                 | 1,001,133.00   | 225.00                 | 193.12                     |
| 2                 | 3,582,289.00   | 13,614.00              | 5,441.77                   |
| 3                 | 825,228.00   | 358.00                 | 236.75                     |
| 4                 | 345,908.00   | 184.00                 | 109.13                     |
| Totals            | 5,754,558.00   | 14,381.00              | 5,980.77                   |

**C. Wildlife Resource**

1. Wildlife of note:

Birds and raptors: Over the course of several years of field work, WRM crews have noticed the presence of numerous bird species on the property. Cooper's and red-tailed hawks have been observed on-site soaring over the oak woodland areas and perched in trees. Cooper's hawks have been seen within the heavier timbered areas of East Creek. Mallard and wood ducks have both been observed raising broods within the Clough Creek drainage when water is present. Canada geese are using the East Creek drainage as a flyway between the reservoirs to the north (on the Stillwater Sportsman's Club) and foraging areas to the south. Flocks of between 10 and 25 birds have been seen moving north and south over this drainage during early morning and late evening hours. Mourning doves frequent the Clough Creek drainage in the spring and early summer months. Two flocks of turkeys have been frequently seen in the Clough Creek drainage and in the woodlands northwest of East Creek. Both flocks range between ten and twenty birds. Valley quail were noted throughout the entire property but are especially common in the East Creek drainage where mid-story shrub growth is abundant. In the late spring of 2015, WRM crews frequently observed red-tailed hawks in the area of the corrals and to the northwest along Clough Creek. On 6/17 the crews were successful in finding a red-tail nest in a grey pine 60 feet north of the Tierra Robles property line. Both adults were present at the nest tree. That same morning they found a juvenile bird on the ground just west of Clough Creek, on Tierra Robles. On July 8<sup>th</sup> the juvenile bird was again seen perched in an oak in the same vicinity. To date, no raptor nests have been found on the property.

Deer: On three occasions during the course of the field work in 2012, two albino deer were seen on the property just east of where the southern panhandle connects to the rest of the property. Both deer were female and running with four to six other deer. Deer utilize the property throughout the year, with a resident herd being present even during the hot summer months. The combination of water presence, abundant oak mast and corn crops in the fall, coupled with the juxtaposition of the oaks that provide escape and thermal cover, makes the property ideal habitat for deer. Four and five-point bucks have also been seen on the property within the Clough Creek drainage.

Gophers and ground squirrels: Numerous burrows and mounds give evidence to gopher and ground squirrel populations that are excessive across the property. Their presence gives rise to prime hunting habitat for coyotes, fox, bobcats, and raptors, all of which have been seen on the property.

Owls: Owls are also known to roost (and probably nest) on the property. Owl pellets were found under the limb of a 12" dbh oak in the western portion of the property. The size of the pellets would indicate the species being either a great-horned or barn owl. The numerous cavities and hollows within many of the larger oaks provide excellent owl nesting habitat and the abundance of small rodents form a significant prey base. Retaining the larger oaks on the property will insure that owl habitat will be retained through time. Where the pellets were found, fox scat had also been deposited overtop some of the pellets.

Burrows and dens: The larger trees, 10" dbh and greater, often have numerous hollows, cavities, and broken dead limbs. These are being used by a variety of bird species for nesting. There is at least one raccoon using such a burrow. WRM crews observed, in the early morning hours, a raccoon climb a 25" dbh blue oak and crawl into a cavity and down into the hollow of a broken limb.

Woodpeckers: Woodpeckers, principally acorn and Lewis', are common on the property. Numerous snags, both hard and soft, are being utilized as grainery trees and their nesting cavities are numerous and are found in both the blue oaks and gray pines.

## 2. Additional surveys:

On March 26<sup>th</sup> and April 2<sup>nd</sup> 2015 the property was surveyed during the early evening and nighttime hours for the presence of wildlife species. On the 26<sup>th</sup> the Clough Creek area was surveyed by walking the length of the stream and surrounding area between 1500 and 2030 hours. On the 2<sup>nd</sup>, the East Creek drainage and surrounding area was likewise surveyed from 1530 to 2030 hours. Table 3 lists the species noted during these surveys. Though carefully looked for in both streams, no pond turtles were found and no bats were observed in either drainage.

**Table 3**

## Wildlife Species Observed During Afternoon and Evening Surveys

**March 26<sup>th</sup> Survey****Clough Creek Drainage Area**

| <u>Species Observed</u> | <u>Notes</u>                            |
|-------------------------|---|
| Turkeys                 | Clough Creek basin                      |
| Jack rabbits            |   |
| Lewis woodpeckers       |   |
| Acorn woodpeckers       |   |
| Mourning doves          |   |
| Ground squirrels        |   |
| Red-tailed hawk, female | perched in oak just north of corrals    |
| Turkey vultures         | soaring over Clough Creek area          |
| Robins                  |   |
| Brewers black birds     |   |
| Brown towhees           |   |
| Mallard ducks, pair     | in ponds of Clough Creek                |
| California quail        | Covey in blackberrys, Clough Creek area |
| Pigeon, domestic flock  | over Clough Creek                       |
| Starlings               |   |
| Western wood peeves     |   |
| Western fence lizard    |   |

**April 2<sup>nd</sup> Survey****East Creek Drainage Area**

| <u>Species</u>        | <u>Notes</u>                            |
|-----------------------|---|
| Starlings             |   |
| Turkey vultures       | several soaring over area               |
| Acorn woodpeckers     |   |
| Jackrabbit, pair      | mating                                  |
| Ground squirrels      | several in the area                     |
| Western tree squirrel |   |
| Valley quail          |   |
| Mourning doves        |   |
| Scrub jays            |   |
| Canada geese          | two flights moving up and down drainage |
| Great horned owl      | heard calling east of East Creek        |

No pond turtles or spade foot toads were found at any wetland areas on the property during the surveys.

### 3. Natural Diversity Data Base Search:

Tierra Robles is located in the USGS Enterprise quadrangle. A query of the California Natural Diversity Data Base for that quadrangle indicates that a number of listed species or species of special concern are found within the quadrangle as shown in Table 2 (reprinted here). Only the Enterprise Quadrangle was searched as the surrounding quadrangles have dissimilar habitats due to the impacts of housing subdivisions.

**Table 2**

Results of CDDB query for the Enterprise Quadrangle

| Rec<br>ord | <u>QUAD</u><br><u>NAME</u> | <u>ELM</u><br><u>CODE</u> | <u>SCINAME</u>                                | <u>COMNAME</u>   | <u>FEDST</u><br><u>ATUS</u> | <u>CALST</u><br><u>ATUS</u> | <u>DFGST</u><br><u>ATUS</u> | <u>RAREPLA</u><br><u>NTRANK</u> |
|------------|----------------------------|---------------------------|---|--|-----------------------------|-----------------------------|-----------------------------|---------------------------------|
| 1          | Enter<br>prise             | ABNKC10<br>010            | Haliaeetus<br>leucocephalus                   | bald eagle   | Delist<br>ed                | Endan<br>gered              | FP                          |                                 |
| 2          | Enter<br>prise             | ABPAU0<br>8010            | Riparia riparia                               | bank swallow   | None                        | Threat<br>ened              |                             |                                 |
| 3          | Enter<br>prise             | AFCHA02<br>05A            | Oncorhynchus<br>tshawytscha                   | chinook salmon -<br>Central Valley<br>spring-run ESU   | Threat<br>ened              | Threat<br>ened              |                             |                                 |
| 4          | Enter<br>prise             | AFCHA02<br>05B            | Oncorhynchus<br>tshawytscha                   | chinook salmon -<br>Sacramento River<br>winter-run ESU | Endan<br>gered              | Endan<br>gered              |                             |                                 |
| 5          | Enter<br>prise             | AMACCO<br>2010            | Lasionycteris<br>noctivagans                  | silver-haired bat                                      | None                        | None                        |                             |                                 |
| 6          | Enter<br>prise             | ARAAD0<br>2030            | Emys marmorata                                | western pond<br>turtle                                 | None                        | None                        | SSC                         |                                 |
| 7          | Enter<br>prise             | CTT6141<br>OCA            | Great Valley<br>Cottonwood Riparian<br>Forest | Great Valley<br>Cottonwood<br>Riparian Forest          | None                        | None                        |                             |                                 |

|    |                |                |  |   |                |                |      |
|----|----------------|----------------|--|---|----------------|----------------|------|
| 8  | Enter<br>prise | CTT6143<br>OCA | Great Valley Valley<br>Oak Riparian Forest | Great Valley Valley<br>Oak Riparian<br>Forest | None           | None           |      |
| 9  | Enter<br>prise | CTT6341<br>OCA | Great Valley Willow<br>Scrub               | Great Valley<br>Willow Scrub                  | None           | None           |      |
| 10 | Enter<br>prise | ICBRA03<br>030 | Branchinecta lynchi                        | vernal pool fairy<br>shrimp                   | Threat<br>ened | None           |      |
| 11 | Enter<br>prise | ICBRA06<br>010 | Linderiella<br>occidentalis                | California<br>linderiella                     | None           | None           |      |
| 12 | Enter<br>prise | ICBRA10<br>010 | Lepidurus packardi                         | vernal pool<br>tadpole shrimp                 | Endan<br>gered | None           |      |
| 13 | Enter<br>prise | IICOL480<br>11 | Desmocerus<br>californicus<br>dimorphus    | valley elderberry<br>longhorn beetle          | Threat<br>ened | None           |      |
| 14 | Enter<br>prise | IMGASA2<br>030 | Trilobopsis roperi                         | Shasta chaparral                              | None           | None           |      |
| 15 | Enter<br>prise | PDBOR0<br>AOQ0 | Cryptantha crinita                         | silky cryptantha                              | None           | None           | 1B.2 |
| 16 | Enter<br>prise | PDCAM0<br>C010 | Legenere limosa                            | legenere                                      | None           | None           | 1B.1 |
| 17 | Enter<br>prise | PDFAB25<br>101 | Lathyrus sulphureus<br>var. argillaceus    | dubious pea                                   | None           | None           | 3    |
| 18 | Enter<br>prise | PMJUN0<br>11L2 | Juncus leiospermus<br>var. leiospermus     | Red Bluff dwarf<br>rush                       | None           | None           | 1B.1 |
| 19 | Enter<br>prise | PMPOA0<br>40K0 | Agrostis hendersonii                       | Henderson's bent<br>grass                     | None           | None           | 3.2  |
| 20 | Enter<br>prise | PMPOA4<br>G050 | Orcuttia tenuis                            | slender Orcutt<br>grass                       | Threat<br>ened | Endan<br>gered | 1B.1 |

4. Habitat requirements for the above “listed” wildlife species above and an analysis of the potential presence of the specie on the project site.

#### Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is one of North America's largest birds, weighs about 8 to 14 pounds and has a wingspan of 6½ to 8 feet. Females are larger than males and birds of the northern states and provinces tend to be larger than those from the southern portions of the breeding range. Adults are dark brown with a pure white head and tail. Juvenile birds are mostly brown and mottled with varying amounts of white. They acquire their adult plumage at 4 or 5 years of age.

Bald eagles may be found in winter throughout most of California at lakes, reservoirs, rivers, and some rangelands and coastal wetlands. The state's breeding habitats are mainly in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers. Most breeding territories are in northern California, but the eagles also nest in scattered locations in the central and southern Sierra Nevada Mountains and foothills, in several locations from the central coast range to inland southern California, and on Santa Catalina Island.

Bald eagles build their large stick nests in the upper canopy of the tallest trees in the area. The adults may repair the same nest annually, increasing its size over time, or they may build a new nest in their territory or repair one they had used formerly. In many cases, the territory of a pair of eagles may include several nests in addition to the one they most recently used.

On June 4<sup>th</sup> 2015 WRM crews observed a pair of bald eagles flying from south to north up the Clough Creek drainage. No other observations of eagles have been made on the property.

#### Bank Swallow

The Bank Swallow occurs as a breeding species in California in a hundred or so widely distributed nesting colonies in alluvial soils along rivers, streams, lakes, and ocean coasts. As its scientific name, *Riparia riparia*, implies, the Bank Swallow is largely found in riparian ecosystems, particularly rivers in the larger lowland valleys of northern California. Nesting colonies are located in vertical banks or bluffs in friable soils and these colonies can support dozens to thousands of nesting birds.

Nesting habitat is particularly prone to erosion and habitat in some areas such as the Sacramento and Feather rivers is threatened with loss by flood control and bank protection projects. The bank swallow has one of the widest ranges of any bird in the world with a breeding distribution that is largely holarctic and a wintering distribution that is largely confined to the Southern Hemisphere.



On the project area there are no large vertical banks associated with riparian habitat and thus no breeding habitat exists on the project area. Within the course of five years of field work, no bank swallows have been seen on-site. With the lack of suitable nesting habitat it is unlikely that this project could possibly impact the bank swallow.

#### Chinook salmon, steelhead

Four distinct runs of Chinook salmon spawn in the Sacramento-San Joaquin River system, named for the season in which the majority of the run enters freshwater as adults. The adult winter-run pass under the Golden Gate Bridge from November through May and pass into the Sacramento River from December through early August. Winter-run Chinook spawn in the upper main stem Sacramento River from mid-April through August. Fry and smolts emigrate downstream from July through March, reaching the delta from September through June.

Historically, winter-run Chinook spawned in the upper reaches of Sacramento River tributaries, including the McCloud, Pit, and Little Sacramento Rivers. Shasta and Keswick dams now block access to the historic spawning areas. Winter-run Chinook, however, were able to take advantage of cool summer water releases downstream of Keswick Dam. The run was classified as endangered under the state Endangered Species Act in 1989 and as endangered under the federal Endangered Species Act in 1994.

#### Bats:

The California Department of Fish and Wildlife has expressed concern for three species of bats within Shasta County. These include the Townsend's big-eared bat (*Corynorhinus townsendii*, a state candidate species) the pallid bat (*Antrozous pallidus*, California species of special concern), and the western red bat (*Lasiurus blossevillia*, California species of special concern). A brief description of the habitat needs for these species is as follows (taken from web sources):

*Townsend's big-eared bat:* Townsend's big-eared bats, although found throughout most of California including deserts, the coastal redwood forests, and the forests and woodlands in the Sierra Nevada range, are concentrated in areas with caves and cave-like roosting habitat, such as mines, buildings, bridges and basal hollows in big old-growth trees.

*Pallid bat:* This species occurs in arid and semi-arid regions across much of the American west, up and down the coast from Canada and Mexico, although a few isolated colonies have been found in northern Oklahoma and southern Kansas. Their habitat ranges from arid regions with rocky outcroppings to open, sparsely vegetated grasslands. Water must be available close to all sites. They typically will use three different types of roosts: a day roost

which can be a warm such as in attics, shutters and crevices; the night roost which is typically in the open with foliage nearby; and the hibernation roost mentioned above, which is often in buildings, caves, or cracks in rocks.

*Western red bat*: This bat is locally common, occurring from Shasta County, to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts. The winter range includes western lowlands and coastal regions south of San Francisco Bay. There is migration between summer and winter ranges and migrants may be found outside the normal range. Roosting habitat includes forests and woodlands from sea level up through mixed conifer forests. The species feeds over a wide variety of habitats including grasslands, shrub lands, open woodlands and forests, and croplands. They are not found in desert areas. During warm months, sexes occupy different portions of the range. They roost primarily in trees, less often in shrubs. Roost sites often are in edge habitats adjacent to streams, fields, or urban areas. Their preferred roost sites are protected from above, open below, and located above a dark ground-cover. Such sites minimize water loss. Roosts may be from 0.6-13 m (2-40 ft) above ground level. Females and young may roost in higher sites than males. Day roost sites for bats are found in defoliating bark and other cavities within the trunk and limbs of larger declining trees and standing snags.

WRM crews conducted field inspections for bats on 6/9, 6/17, 7/14/15 and 4/22, 4/25 and 5/31 of 2016 by listening and watching for bats at various locations on the property. Surveys were conducted prior to first light and in the evening hours until after dark. Crews positioned themselves in areas of higher snag densities and larger trees and carefully observed the sky. Bats were observed on the evening of 4/22/16 when several bats were seen flying over the meadow areas of the central portion of the project area (McKinley, field notes). Follow-up surveys were done in the evening hours on 4/25 and 5/31/16. No bats were observed on the 25<sup>th</sup> but two were seen on the 31<sup>st</sup>. Of these, one was observed flying over the corral area at 2106 hours and the second in the same area at 2112 hours. Both circled over the corral area then flew south over the woodlands (Rowe, field notes). This is the same general area where bats were seen on 4/22. The flight patterns of these individuals are indicative of foraging behavior. While these observations were not in the woodland areas of the project, the tree structure of the larger trees in the woodlands contains bat habitat roosting features such as cavities, defoliating bark and other crevices in the bowls and limbs. These features most often occur in standing snags and trees with a diameter breast height (dbh) greater than 12" and which are in a declining condition.

### Western pond turtle

The western pond turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and absent from desert regions except in the Mojave Desert along the Mojave River and its tributaries. Elevation range extends from near

sea level to 4690 ft. These turtles are associated with permanent or nearly permanent water in a wide variety of habitat types.

The species is considered omnivorous as aquatic plant material (pond lilies), beetles and a variety of aquatic invertebrates as well as fish, frogs, and even carrion have been reported among their food sources.

Pond turtles require basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks. Turtles slip from basking sites to underwater retreats at the approach of humans or potential predators. Hibernation in colder areas is passed underwater in bottom mud.

Individuals normally associate with permanent ponds, lakes, streams, irrigation ditches or permanent pools along intermittent streams. Hatchlings may be subject to rapid death by desiccation if exposed to hot, dry conditions.

#### Western spadefoot toad:

This small toad (*Spea hammondi*) lives in a wide range of habitats, from lowlands to foothills and in grasslands, open chaparral and pine-oak woodlands. It is fossorial and breeds in temporary rain pools and slow-moving streams (for example, in areas flooded by intermittent streams). It also breeds in stock tanks and other artificial water bodies. Such habitat exists on the study area in the form of the shallow swales and ephemeral streams. In order to support metamorphosis breeding pools must remain filled long enough to accommodate at least the minimum larval period, about 30 days. There is almost always substantial mortality due to desiccation among larvae born in pools lasting fewer than 35 days after the eggs are laid (Feaver, 1971; Morey, 1998).

Habitat for the specie is described as: “open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rain pools which do not contain bullfrogs, fish, or crayfish are necessary for breeding” (CAHerp. 2016). “Western spadefoot toads typically inhabit lowland habitats such as washes, river floodplains, alluvial fans, playas, and alkali flats” (Stebbins 1985). Soil character on the project site, in general, would not be considered ideal spadefoot habitat due to the stony nature of the table lands (Shasta County Soil Survey, 1974). However there may be inclusions of soil structure in association with wetland features that meet the species habitat requirements.

WRM conducted six site visits during March, April, and May of 2016 in an attempt to locate any toads. Vernal swales and other streams were walked in the morning and late evening hours as the toads were looked and listened for. These visits were done during a very wet spring with abundant surface water on the site. No toads were detected.

### Vernal Pool fairy shrimp

The vernal pool fairy shrimp was listed as threatened in September 1994. Critical habitat was designated in 2003. A recovery plan was published in 2005. A five-year review was conducted in 2007 (USFWS 1994, 2005, 2006).

This species is currently found in 28 counties in California where it occupies a variety of vernal pool habitats. In Shasta County it has been found south of Highway 44 near Shasta Bible College, near the intersection of Highway 44 and Millville Plains Road and south near the Redding airport. The shrimp *“generally inhabit vernal pools with clear to tea-colored water in grass or mud bottomed swales or basalt flow depression pools in unplowed grasslands, although there are a few populations in sandstone rock outcrops and alkaline vernal pools”* (USFWS 1994). *“Vernal pool depressions are typically part of an undulating landscape, where soil mounds are interspersed with basins, swales and drainages. Water movement within complexes allows vernal pool fairy shrimp to move between individual pools. These movement patterns, as well as genetic evidence, indicate that vernal pool fairy shrimp populations exist within, and are defined by, entire vernal pool complexes, rather than individual vernal pools”* (USFWS 2005, 2006).

There are no vernal pools found on the project area (ACOE verified delineation), however there are a number of vernal swales that flow water during and immediately after a storm event. These areas are at best marginal habitat although there is the remote chance that this species may be present. As designed, the project will not impact the species habitat as a 30' set back protection area, where no activity is allowed, is in place around every wetland feature.

### Vernal pool tadpole shrimp

*Habitat requirements:* Vernal pool tadpole shrimp occur in a wide variety of vernal pool habitats. They have been found in pools with water temperatures ranging from 50 degrees to 84 degrees F. Specifically, *“vernal pools, swales and other ephemeral wetlands and depressions of appropriate sizes and depths that typically become inundated during winter rains and hold water for sufficient lengths of time necessary for vernal pool tadpole shrimp incubation, reproduction dispersal, feeding and sheltering, but which are dry during the summer and do not necessarily fill with water every year.”* Also, geographic, topographic and edaphic features that support aggregations of systems of hydroponically interconnected pools, swales and other ephemeral wetlands and depressions within a matrix of surrounding uplands that together form hydrologically and ecologically functional units called vernal pool complexes. (Federal Register 9/24/2002).

*Life history:* “Although the vernal pool tadpole shrimp is adapted to survive in ephemeral vernal pool habitat, the species has a relatively long life span compared to other vernal pool crustaceans. The tadpole shrimp continue growing throughout their lives, periodically molting their shells. These shells can often be found in vernal pools where the species occurs. Helm (1998) found that vernal pool tadpole shrimp took a minimum of 25 days to mature and the mean for the first reproduction was 54 days. Other researchers have observed that vernal pool tadpole shrimp generally take between 21 to 28 days to mature” (Federal Register 9/24/2002).

As stated there are no vernal pools on the project area, only vernal swales that constitute marginal habitat. While it is possible that tadpole shrimp are present it is unlikely. Nevertheless, with the 30 foot setback protection zone, there will be no impact on the potential habitat.

Valley long-horned elderberry beetle:

The Valley Elderberry Longhorn Beetle (Coleoptera: Cerambycidae) is a medium-sized (about 2 cm long) beetle that is listed as threatened by the U.F. Fish and Wildlife Service . There is a variation in appearance between the male and female. The forewings of the male are primarily red with dark green spots, whereas those of the female are dark metallic green with red margins.

The beetle is associated with elderberry shrubs (*Sambucus* spp.) in California's Central Valley during its entire life cycle. The adults emerge in the spring from pupation inside the wood of these shrubs as they begin to bloom. The exit holes made by the emerging adults are distinctive, small oval openings. Often these holes are the only clue that the beetles occur in an area. The adults eat the elderberry foliage until about June when they mate. The females lay their eggs in crevices in the bark. Upon hatching, the larvae then begin to tunnel into the tree where they will spend 1-2 years eating the interior wood, their sole source of food (Federal Register Vol 45, No 155, Friday, August 8, 1980). As the species is listed the habitat for the species, the elderberry shrub must be protected.

During a field visit to the site, personnel from Enplan located five elderberry clusters, as reported in their letter to the RBF Consulting dated July 18, 2012. All clusters were located within the steep draws of the open space area. This project will not impact the open space area and therefore there will be no impact to the elderberry plants. A systematic search of the entire property by WRM in the spring of 2016 found only two elderberry clusters.

## 5. Migratory routes and travel corridors:

As mentioned in the environmental setting section, the property is surrounded on three sides by small acreage subdivisions and on the north by the Stillwater gun club and more subdivisions. These features along with the relatively open nature of the vegetative canopy may be causing wildlife to move in a more random fashion rather than through a specific corridor. The Clough Creek and East Creek drainages basins appear to be used more extensively by wildlife than the rest of the property (WRM crew observations). The presence of water within these two drainages for most of the year and the greater diversity of vegetative composition are natural attractions for wildlife. Though not quantified, deer, turkey, raccoon, fox, bobcat, ducks and various song bird species have all been seen in greater numbers within these drainage areas as opposed to the upland area. This is not surprising as the increased plant diversity and water presence in these drainages provide more habitat diversity than does the more monotypic nature of the upland oak woodlands. Canada geese are using the East Creek drainage as a flyway between the ponds on the Stillwater Sportsmen's Club and foraging areas to the south.

## 8. Red Bluff dwarf rush:

The Red Bluff dwarf rush (*Juncus leiospermus*) inhabits vernal moist habitats, including vernal pools, within valley grassland, chaparral, and foothill woodland habitats (CNPS 2008). Hickman (1993) described habitat as "vernal pool margins and wet places in chaparral and woodland." The species is generally found between elevations from 300 to 1,000 feet (90 to 305 meters), but reaches 3,350 feet (1,020 meters) in the Goose Valley area of Tehama County (BLM 2008). It is often found in sparsely vegetated habitats (BLM 2008).

Common plant associates of Red Bluff dwarf rush include tricolor monkey flower (*Mimulus tricolor*), stalked popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*), winged water starwort (*Callitriche mariginata*), Great Valley eryngo (*Eryngium castrense*), common monkey flower (*Mimulus guttatus*), Oregon wooly-heads (*Psilocarphus oregonus*), meadowfoam (*Limnanthes alba*), and Pacific foxtail (*Alopecurus saccatus*). Red Bluff dwarf rush also often grows with leafybract dwarf rush (*Juncus capitatus*), toad rush (*Juncus bufonius*), and twelfth rush (*Juncus uncialis*). Invasive nonnative species include Italian ryegrass (*Lolium multiflorum*) (CNDDB 2008).

On Tierra Robles, the species has only been found in Basin "G" (See Figure 3).

Tierra Robles  
 Red Bluff Dwarf Rush Area of Presence June 1, 2016

Figure 3

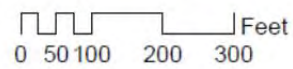


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, Swisstopo, and the GIS User Community

**Legend**

|                            |                   |
|----------------------------|-------------------|
| Property Boundary          | Stream Course     |
| Proposed Road Right of Way | Proposed Lot Line |
| Red Bluff Dwarf Rush Area  | Basin G           |

Sources:  
 Wildland Resource Managers  
 S2-J2 Engineering, INC



#### D. Wetland Resource

##### General Hydrology:

As previously mentioned, there are three intermittent streams and several ephemeral stream complexes on the project area. The Clough Creek drainage is a fairly large watershed that originates several miles north of the project area and flows south, emptying into Stillwater Creek 2 ½ miles south of the project area. Stillwater Creek flows 7.5 miles south-southeast before emptying into the Sacramento River.

On the property, the Clough Creek drainage is situated between two low hills that are highly dissected by short tributary drainages. These tributaries, ephemeral in nature, flow from the upland areas on the east and west of the drainage into the creek. Clough Creek cuts southwesterly across the northwest corner of the project area for 1,497 feet. The northwest portion of the project area is drained by the tributaries that flow west into Clough Creek. The Clough Creek drainage is approximately 3,495 acres in size with 346 acres (9.8%) within the property. Along portions of the creek there is a narrow belt of riparian habitat interspersed with more upland vegetation with annual grasses. This habitat appears in pockets of vegetation and as individual plants rather than a continuous belt of riparian vegetation. Common species found within these areas are willows (*Salix spp.*), black cottonwood (*Populus trichocarpa*), and scattered alders (*Alnus sp.*). California wild grape (*Vitis californica*), Himalayan blackberry (*Rubus discolor*), spike rush (*Eleocharis macrostachya*), and nutsedge (*Cyperus eragrostis*) are also present. True riparian habitat does not really exist due to the scattered occurrence of the riparian species.

East Gulch originates as a shallow ephemeral stream in the north central uplands of the project area, draining the tableland of that area. As the stream flows south it falls into a fairly deep gorge that drains the eastern portion of the project area through a series of short ephemeral side streams. These streams converge to form an intermittent stream in the gulch that flows south off the property and ultimately empties into Little Cow Creek approximately 3 miles south of the project area. Little Cow Creek joins Cow Creek downstream and then Cow Creek empties into the Sacramento River another seven miles to the south, nearly 10 miles from the project area. The East Gulch drainage is approximately 718 acres of which 112 (15%) are on the property.

East Creek, located on the northeastern side of the property, is also intermittent and drains the eastern half of the project area. This stream originates in the upland terraces two miles north of the project area, flows through the property, and then continues another one and one-half miles prior to emptying into Little Cow Creek. Little Cow Creek then flows south for three miles prior to emptying into Cow Creek. Cow Creek then flows another six and one-half miles prior to



emptying into the Sacramento River. There are 908 acres within this watershed of which approximately 224 (24%) are on the property. There are thirteen ephemeral streams that drain the upland terraces of the property. As with the west side, these vary in length but are generally not over several hundred feet long. Within this basin there is one stream that does not connect to the intermittent creek, but rather appears to go underground prior to reaching the main stream.

Draining the central portion of the project area are two narrow and shallow ephemeral streams that originate on or very near the project area and flow generally southward. The western most, which we call "Center Creek," originates near the southern edge of the project area and flows in and out of the project area before leaving the area through a culvert under Boyle Road. From there, the stream continues to flow southward ultimately emptying into Stillwater Creek approximately 3.5 miles south of the project area. Stillwater Creek in turn flows an additional eight miles south before emptying into the Sacramento River. The stream to the east of Center Creek originates on the tableland directly north of the project area. As with Center Creek this stream is shallow and narrow with few tributaries. It drains the north central portion of the project area and flows south on a parallel course to Center Creek. Leaving the project area it continues south for another mile before converging with Center Creek. The property reach of these two streams are approximately 11.5 miles from the Sacramento River, the nearest traditional navigable waterway (TNW).

The north central portion of the project area is drained by four relatively short ephemeral streams that originate on the project area and flow northwesterly from the area then meander to the west, ultimately emptying into Clough Creek either on or just north of the project area.

None of the waters on the project area are suitable for transport of interstate or foreign commerce. However, Clough Creek, East Gulch and East Creek flow continuously during the rainy season for more than three months and are tributaries to Stillwater Creek, which is a tributary to the Sacramento River. As such, they meet the significant nexus criteria for jurisdictional waters.

Center Creek and the stream east of Center Creek may be considered "relatively permanent waters" (RPW's) as they typically flow seasonally for more than three months out of the year. Both of these streams flow for over three miles prior to reaching Stillwater Creek. Neither of these streams flow directly into a TNW nor do they support a fisheries population associated with a TNW, although they do meet the requirements as jurisdictional waters by being RPW's.

The ephemeral streams that flow into Clough Creek and East Gulch generally flow only for a short period of time (hours) after a storm event, the duration of flow being dependant upon storm intensity and amount of rainfall. These stream courses are small channels that are

evidenced by very shallow cut banks, slight shelving and/or waterlines. As they drain rural grasslands there is no real source of pollutants within their respective drainages and limited amounts of water. However, given the right storm event, the water they carry could contribute to downstream flooding. Habitat for aquatic organisms is essentially non-existent due to the limited duration of flow and the lack of any aquatic or riparian habitat. While it may be argued that there is a capacity to transport nutrients and organic carbon, any such transport to a TNW would be very limited due again to the short duration of flow, low water volumes and distance to the TNW.

Methods: The wetland delineation method used followed the Corps of Engineers Wetland Delineation Manual, Technical Report Y-87-1, January 1987. The location and reach of the stream courses was determined by using a Garmin GPS 12 hand held unit and Bushnell “Yardage Pro” range finder and a Keyson two hundred foot tape measure. Working up-stream from the downstream end of a watercourse, the stream was mapped by moving upstream until either the direction or the width of the stream changed or a tributary was found. At each stream course change or tributary confluence a GPS numbered waypoint was recorded. Between each GPS point, the width and length of that reach was recorded. When a tributary was encountered, the tributary was mapped from the confluence of the main stream to the head of the tributary. Mapping was then continued on the main stream until the next tributary was reached. This process was continued until the entire reach of the stream and all joining tributaries were mapped. Stream courses were flagged at junctions of tributaries. GPS points were taken at stream junctions and where stream courses changed direction or width. Stream courses were defined by flow lines or the “ordinary high water mark” (OHWM). The OHWM mark was usually determined by cut banks, shelving, the presence of clear natural lines on the bank and the removal of vegetation. In the upper reaches the presence of litter and debris and water movement was noted (Pierce, Robert J. 1999). The distance across the OHWM was measured using the flexible 200' measuring tape. Widths were recorded for each stream reach of a given width. Table 4 lists the amounts of each type of wetland feature.

Results: A wetlands delineation report was developed from the data collected and submitted to the Army Corp of Engineers for verification in May of 2011. Verification of the wetlands mapping was received from the ACOE dated October 24, 2011. Table 4, taken from the verified wetland delineation, is a summary of the wetland features by drainage basin.

**Table 4**

Summary of wetland features of Tierra Robles as of December 2010

\*(Note: Main streams are intermittent in nature, tributaries are ephemeral in nature)

| <u>Drainage Basin</u> | <u>Wetland feature type</u> | <u>Acres</u> |
|-----------------------|-----------------------------|--------------|
| Clough Creek          | Main stream                 | 1.982        |
|                       | Tributaries                 | 1.031        |
|                       | Pond                        | 0.010        |
|                       | Wet swales                  | 0.124        |
|                       | Non-connecting tribs        | 0.013        |
| Center Creek          | Main stream                 | 0.107        |
|                       | Tributaries                 | 0.006        |
|                       | Wet swales                  | 0.188        |
| East Center Creek     | Main stream                 | 0.039        |
|                       | Tributaries                 | 0.021        |
| <u>Drainage Basin</u> | <u>Wetland feature type</u> | <u>Acres</u> |
|                       | Wet swales                  | 0.265        |
| East Gulch            | Main stream                 | 0.161        |
|                       | Tributaries                 | 0.235        |
| East Creek            | Main stream                 | 0.816        |
|                       | Tributaries                 | 0.992        |
|                       | Pond                        | 0.137        |
|                       | Non-connecting tribs        | 0.191        |
| North East Corner     | Stream 1                    | 0.025        |
|                       | Stream 2                    | 0.051        |
|                       | Stream 3                    | 0.033        |
|                       | Seep                        | 0.002        |
|                       | Non-connecting tribs        | 0.023        |

North Panhandle

|          |       |
|----------|-------|
| Stream 1 | 0.003 |
| Stream 2 | 0.004 |
| Stream 3 | 0.003 |
| Stream 4 | 0.013 |
| Stream 5 | 0.019 |

Total Acreage                      6.494 acres

Section II follows this page.

## Section II

### 1. Regulatory Setting

#### A. Federal

##### 1. Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (ESA) provides protection for federally listed endangered and threatened species and their habitats. An “endangered” species is a species in danger of extinction in a significant portion of its natural range. A “threatened” species is one that is likely to become endangered in the foreseeable future without protection. Other special status species include “proposed” species and “species of special concern.” Proposed species are those that have been officially proposed (published in the Federal Register) for listing as threatened or endangered. “Species of concern” are those species for which not enough scientific information has been gathered to support a listing proposal, but still may be appropriate for listing in the future should evidence for listing be obtained. A “delisted” species is one whose population has reached its recovery goal and is no longer in jeopardy. The United States Fish and Wildlife Service (USFWS) administers the Federal ESA. Under the FESA, it is unlawful to “take” any listed species. “Take” is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct.” Harm has been broadly defined by regulation to include significant habitat modification that actually kills or injures wildlife (by significantly impairing essential behavior patterns like breeding, feeding or sheltering) (50 CFR 17.3). Protection under the FESA also extends to species and habitat proposed for listing.

Section 7(a) of the ESA requires that federal agencies responsible for authorizing projects (authorizing agencies) which could adversely affect a listed species or could adversely modify listed critical habitat designated for such a species, undertake consultation with the USFWS. Consultation could be informal or formal. Informal consultation is a process that includes all discussions and correspondence between the authorizing agency and the USFWS and is designed to determine if formal consultation is required. Unless it is readily apparent that formal consultation is necessary, the authorizing agency would typically first consult informally on all actions that could affect a listed species or its listed critical habitat. The authorizing agency would also typically seek recommendation for modification of actions that would avoid the likelihood of adverse effects and contribute to achieving recovery objectives for the listed species or its critical habitat.

Formal consultation is initiated by the authorizing agency through the preparation and submittal to the USFWS of a Biological Assessment prepared by the authorizing agency for the

“proposed action.” The Biological Assessment would be utilized in association with other informational resources by the USFWS to prepare a Biological Opinion. The Biological Opinion would determine if the proposed action is likely to jeopardize the continued existence of a listed species. A section of the Biological Opinion would specify the terms and conditions under which the listed species could be taken. This section also determines appropriate levels of take, as defined by individuals of the species killed, injured or moved and the amount critical habitat subject to temporary and or permanent disturbance. If the Biological Opinion determines that the proposed action could jeopardize the continued existence of a listed species then the authorizing agency must notify the USFWS in writing prior to its final decision on the proposed action.

## 2. Migratory Bird Treaty Act

Provisions of the Migratory Bird Treaty Act (1918) (16 USC 701.718h) are applicable to birds within the proposed area of operations. The act prohibits the killing of any migratory birds without a permit. Any activity which contributes to unnatural migratory bird mortality could be prosecuted under the Act. With few exceptions, most birds are considered migratory under the Act. Measures to prevent bird mortality must be incorporated into the project design.

## 3. Bald and Golden Eagle Protection Act

The Bald Eagle Protection Act (PL 92-535) provides federal protection to the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*). The act prohibits the direct or indirect take of an eagle, eagle part, product or nest. The golden eagle is not listed under the ESA as a threatened or endangered species, however, it is a protected species under the provisions of this act and under the California Endangered Species Act (CESA) as a look-alike species to the bald eagle. The proposed area of operations is within the range of the bald eagle.

## 4. Clean Water Act

Section 404 of the Clean Water Act (CWA) charges the United States Army Corp of Engineers with the regulatory authority over the discharge of dredged or fill material into waters of the United States. “Waters of the United States” include a range of wet environments such as lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, and wet meadows. “Discharge or fill material” is defined as the addition of fill material into “waters of the U.S.” including but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site

development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. (s)328.2(f). In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into “waters of the U.S.” to obtain a certification that the discharge will comply with the applicable state effluent limitations and water quality standards.

## B. State

### 1. California Endangered Species Act

The California Endangered Species Act of 1984 (CESA) and the California Native Plant Protection Act of 1977 (CNPPA) provide the framework for protection of California listed rare and endangered plant and animal species. The state also affords protection to candidate species which have been accepted for review for potential listing as rare, threatened or endangered species. CESA status definitions include:

Endangered: A native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant which is in serious danger of becoming extinct throughout all, or a significant portion of its range due to one or more causes, including loss of habitat, change of habitat, overexploitation, predation, competition, or disease.

Threatened: A native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant that although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter (Fish and Game Code Chapter 1.5).

Rare: A species, subspecies or variety is rare when, although not presently threatened with extinction, it is in such small numbers throughout its range that it could become endangered if its present environment worsens.

Candidate: A native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant that the Fish and Game Commission has given formal notice as being under review by the California Department of Fish and Wildlife (CDFW) for addition to either the list of endangered species or the list of threatened species, or a species for which the Commission has published a notice of proposed regulation to add the species to either list.

Species of Special Concern: Native species or subspecies that have become vulnerable to extinction because of declining population levels, limited ranges, or rarity.

The goal is to prevent these species from becoming endangered by addressing the issues of concern early enough to secure long term viability for these species.

The CESA prohibits a taking of species listed as endangered or threatened by the Fish and Game Commission (California Fish and Game Code (s)2080). It also requires lead state agencies to consult with the CDFW to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any T/E species or result in the destruction or adverse modification of habitat essential to the continued existence of any T/E species.

## 2. California Fish and Game Code

Several sections of the California Fish and Game Code that apply to projects: sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) provide that designated fully protected species may not be taken or possessed without a permit. Incidental take of these species is not authorized by law.

Pursuant to Section 3503.5 of the code, it is unlawful to take, possess or destroy any birds of prey; or to take, possess, or destroy any nest or eggs of such birds. Birds of prey refer to species in the orders of Falconiformes and Strigiformes.

Pursuant to Section 1602 of the code, CDFW regulates all diversions, obstructions or changes to the natural flow or bed, channel, or bank or any river, stream, or lake that supports fish or wildlife. Any changes in these areas require authorization from the CDFW by means of entering into an agreement pursuant to Section 1602 of the code.

## 3. Porter-Cologne Water Quality Control Act

California's primary statute governing water quality and water pollution issues (surface and groundwater) is the 1970 Porter-Cologne Water Quality Control Act. The act grants the State Water Board the power to protect water quality and is the primary vehicle for implementation of California's responsibilities under the federal CWA. The act grants the State Water Board authority and responsibility to adopt plans and policies to regulate discharges of waste to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. It also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, oil or petroleum products.

## 4. Oak Woodlands

California public Resources Code Section 21083.4 requires a county, as part of the CEQA process, to consider whether a project would impact oak woodlands, including trees



that are 5 inches or more in diameter at breast height. If a project may have a significant effect on oak woodlands (defined in the Fish and Game Code Section 1361 (h) as “an oak stand with a greater than 10% canopy cover or that may have historically supported greater than 10 percent canopy cover”) the code requires implementation of specific mitigation measures to reduce impacts to oak woodlands, but also provides for mitigation through county-designed measures. Such measures include conservation of existing oaks woodlands, planting new trees, contribution of funds to the Oak Woodland Conservation Fund, or any other measures developed by the county.

#### 5. California Environmental Quality Act (CEQA)

CEQA requires identification of a project’s potentially significant impacts on biological resources and feasible mitigation measures and alternatives that could avoid or reduce significant impacts. The CEQA Environmental Checklist (Appendix G) (14 CCR 15000 et. Seq.) is used to analyze the potential significance of the projects impacts. Candidate, sensitive or special status species are analyzed through Section IV(a) of Appendix G. This report considers the following special-status species: California SSC designated by CDFW, mammals and birds that are California fully protected species, and species designated by the USFWS as a general equivalent to SSCs.

Section IV (b) of Appendix G also requires identification of a project’s potentially significant impacts on riparian habitats (such as wetland, bays, estuaries, and marshes) and other sensitive natural communities including habitats occupied by endangered, rare or threatened species.

#### C. County

The Shasta County General plan contains goals and policies to protect and/or preserve biological resources including:

1. Protection of significant fish, wildlife and vegetation resources.
2. Provide a balance between wildlife habitat protection and enhancement, and the need to manage and use agricultural, mineral extraction and timber land resources.
3. Recognition that classification of some fish, wildlife and vegetation resources designated and used as timberlands, mineral resources, croplands or grazing lands does, in most cases, protect habitat resources. However, if there is a conflict, the timber, mineral extraction, or agricultural land use classifications mentioned above shall prevail in a manner consistent with State and Federal laws.

4. Projects that contain or may impact endangered and/or threatened plant or animal species, as officially designated by the California Fish and Game Commission and/or the U.S. Fish and Wildlife Service, shall be designated or conditioned to avoid any net adverse project impacts on those species.
5. Significant river and creekside corridors of Shasta County shall be designated on the General plan maps. The primary purpose of this designation is to protect the riparian habitats from development and from adverse impacts from conflicting resources use. The purpose is also to encourage open space and recreation (policy OSR-e). Mapping of significant waterway corridors in areas designated as resource protection lands is not required since it is assumed that resource land uses will also act to protect such waterway corridors. Riparian habitat protection along the significant river and creek-side corridors, as designated on the plan maps shall be achieved, where appropriate, by the following measures:
  - a. Regulation of vegetation removal
  - b. Design of grading and road construction to restrict sediment input to all streams
  - c. Establishment of a development set-back
  - d. The siting of structures, including clustering
  - e. Recreation plans for the Sacramento River, Clear Creek and other feasible waterway resources.

## **2. Thresholds of Significance**

The Shasta County CEQA Environmental Checklist based on Appendix G of the CEQA Guidelines state that a project could potentially have a significant effect if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local, or regional plans, policies, regulations or by the CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of any adopted habitat conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

### **3. Environmental Impacts, Mitigation Measures, and Significance Determinations**

#### 1. Effects on the Oak Resource:

The proposed residential development of the Tierra Robles project will impact the oak resource that is present on 46.48 acres of road right-of-ways and 138 acres of building site locations. By necessity, some oaks in these areas will be removed for development purposes.

*Level of Significance before mitigation:* Potentially significant

#### *Suggested Mitigation:*

Mitigation Measure 1: In 2016 WRM produced the “Tierra Robles Oak Management Plan” which sets forth a management strategy for oaks across the landscape that would result in an “ideal oak stand” (See Tierra Robles Oak Management Plan, 2016). Details of how to manage five resource management areas found on the project area are detailed in the plan. By implementing this plan the oak resource will be enhanced through stand improvement steps, including stand thinning. This will result in increased stand vigor, increases in basal area and crown canopy which in turn will result in increases in mast production, and nesting/denning opportunities. Implementation of the plan will also result in decreases in fire fuels, thus reducing the opportunity for destructive fires in the area.

Mitigation measure 2: Utilize the Tierra Robles Community Service District to implement the Tierra Robles Oak Management plan. A Community Service District is formed through an “order of formation” by the Shasta County Local Agency Formation Commission (SCLAFCO) which is a governing agency as directed by Government Code §61000-61250 with the latent powers as stated in the order of formation. One of the proposed orders will be to:

*“Own, maintain, and operate land within the district for habitat mitigation or other environmental protection purposes to mitigate the effects of projects undertaken by the district. To include, but not limited to the Tierra Robles Oak Woodlands Management Plan, Tierra Robles Wildland Fuel/Vegetation Management Plans, Open Space Management and Resource*

*Management Area management and oversight.” (Government Code-Gov. Title 6, Div.3.Community Service Districts [61000-61250]).*

*Level of Significance after mitigation:* Less than significant

## 2 .Effects on the Red Bluff Dwarf Rush:

On Tierra Robles, the dwarf rush has been found in the vernal swale area of Basin “G” (See Figure 3). Construction activities could impact the physical area of the vernal swale and the hydrology of the area through out of swale activity. Either type of disturbance could impact the Red Bluff dwarf rush.

*Level of Significance before mitigation:* Potentially significant

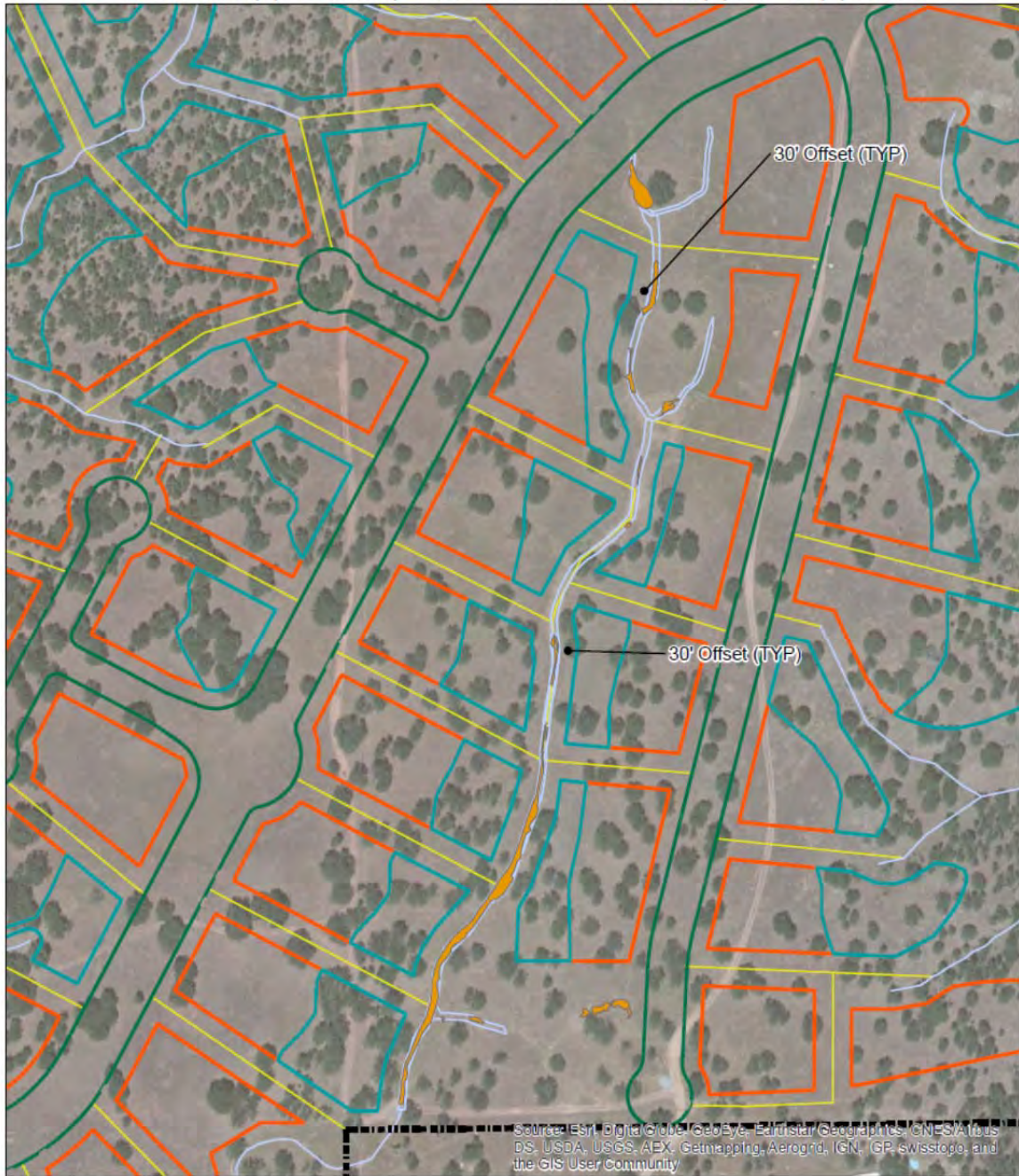
### *Suggested Mitigation:*

To protect the habitat of the rush, lot layout design should be done in such a manner as to provide a 30 foot buffer from the outside limits of the swale area to the lot perimeter. No construction or land disturbance activity should be permitted within these areas. This will result in the retention of the natural geographical and hydrological features of the habitat (See Figure 4). A hydrology analysis of the drainage basin containing the habitat shows that the post-project development increases the Basin G peak runoff flow by 3.3% (S2~J2 Engineering, 2016). The report states that the final design of the project will provide more detail of the development hydraulic conditions to reduce the post development runoff quantities to pre-development values (S2~J2 Engineering, 2016). Maintaining the pre-development geographical and hydrological features of the basin will retain the present habitat character of the swale and its associated rush habitat.

*Level of Significance after mitigation:* Less than significant

# Tierra Robles Red Bluff Dwarf Rush Habitat Buffer Offsets

Figure 4  
June 1, 2016



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

### Legend

- Privately Owned Open Space
- Building Envelope
- Property Boundary
- Proposed Road Right of Way
- Red Bluff Dwarf Rush Area
- Stream Course
- Proposed Lot Line

Sources:  
Wildland Resource Managers  
S2-J2 Engineering, INC



### 3. Effect on Special Status Bird Species

#### 1. Bald Eagle:

Eagles typically nest in trees larger than those found on the project area. While this project will remove some trees (less than 6% of total) those trees are not generally considered suitable nesting habitat. During the course of the field work for this project over the last five years, no eagle nests were found on the property.

*Suggested Mitigation:* Prior to beginning of construction, conduct surveys for nesting raptors within areas impacted by the project. Surveys should be done under the supervision of a Certified Wildlife Biologist.

*Level of Significance after mitigation:* Less than significant.

#### 2. Bank swallow:

No suitable habitat is located on the project area

Suggested mitigation: no mitigation required

#### 4 : Effect on salmon:

The California Department of Fish and Wildlife fisheries data base does not list either salmon or steelhead in Clough Creek. DFW fisheries biologists note that Clough Creek does not have cold water habitat or refugia available at the time of migration to support populations. As such, there are no known populations of Central Valley steelhead or Chinook salmon in Clough Creek (see letter from DG&G in the appendix), and therefore no direct impacts from this project will be sustained. As the creek will be bridged to avoid impacts to the channel, there will be no indirect downstream impacts to the species.

Suggested mitigation: no mitigation required

## 5: Effect on Special Status Mammal Species

### 1. Bats:

Surveys for bats conducted in 2015 and 2016 confirmed that bats are utilizing portions of the project area for foraging during the summer months. It is probable that bats may also be utilizing the site for roosting. Construction and occupational phases of this project will impact oaks and oak snags that provide habitat for bat species.

*Level of Significance before mitigation:* Potentially significant

*Suggested Mitigation:*

Mitigation Measure 1: Retain and improve bat habitat through oak stand management. This may be accomplished through the implementation of the Tierra Robles Oak Management Plan

Mitigation Measure 2: Identify and retain all suitable bat habitat trees (such as large trees (over 12 inch dbh), standing snags, and declining trees with defoliating bark) unless they pose a public safety hazard.

Mitigation Measure 3: Within two weeks prior to start of construction, conduct evening surveys for bats within areas impacted by construction activities. Surveys will occur from sunset to dark by watching for bats utilizing the area. Should bat roost locations be found, consult with the CDFW for appropriate protection measures.

Mitigation Measure 4: Schedule tree removal on road right-of-ways and building lots to occur outside bat maternity roosting season for the site, September 1 to March 1 of any given year.

*Level of Significance after mitigation:* Less than significant.

## 6: Effect on Special Status Amphibian Species

### 1. Western Pond Turtle:

Pond turtles have not been observed on-site during the field work periods for this project. However, Clough Creek and East Creek, when flowing, provide suitable habitat in stream and pool depth.

*Level of Significance before mitigation:* Potentially significant

*Suggested Mitigation:*

Mitigation Measure 1: Avoid all wetland features during construction and development phases of the project.

Mitigation Measure 2: Design stream crossing structures to avoid all areas within the ordinary high-water mark of wetland features.

Mitigation Measure 3: Locate building envelopes a minimum of 30 feet from the ordinary high-water mark of all wetland features.

Mitigation Measure 4: All construction activities shall be conducted outside the rainy season, generally after April 30<sup>th</sup> and prior to October 1<sup>st</sup> in any given year.

Mitigation measure 5: Just prior to construction activities, conduct surveys for pond turtles that may be moving across upland areas. Surveys are to be conducted under the supervision of a Certified Wildlife Biologist. If turtles are found, relocate to the nearest riparian area.

*Level of Significance after mitigation:* Less than significant.

## 2. Western spade-foot toad:

As of the spring of 2016, no western spade-foot toads have been found on the project area. However, there is suitable habitat for the species in the form of wet swales and shallow pool following storm events. The soils of the project area are not optimum for the species but their presence is possible. If present, land disturbance during construction activities could impact the species.

*Level of Significance before mitigation:* Marginal

Mitigation 1: Avoid all wetland and stream features on the property, which are breeding habitats for the species. By doing so, the possible impact to the breeding habitat of the species (if present) will be negligible.

Mitigation 2: Just prior to beginning construction activities, survey the construction site(s) for the presence of spade-foot toads. Surveys should be conducted under the supervision of a Certified Wildlife Biologist and consist of walking the proposed construction site looking and listening for toads. Surveys should be conducted in the spring during the rainy season.

*Level of Significance after mitigation:* Less than significant.



## 7. Effect on invertebrate species

### 1. Vernal Pool fairy shrimp:

There are no vernal pools on the project area (ACOE verified delineation), however there are a number of vernal swales that flow water during and immediately after a storm event. These areas are at best marginal habitat although there is the remote chance that this specie may be present.

*Level of Significance before mitigation:* Potentially significant

#### *Suggested Mitigation:*

Mitigation Measure 1: Avoid all wetland features on the property. In doing so, vernal swales will not be impacted by any phase of the project. A hydrology analysis of the drainage basin containing the habitat shows that the post-project development increases the vernal swale runoff flow in Basin G by 3.3% (S2~J2 Engineering, 2016). The report states that the final design of the project will provide more detail of the development hydraulic conditions to reduce the post development runoff quantities to pre-development values (S2~J2 Engineering, 2016). Maintaining the pre-development geographical and hydrological features of the basin will retain the present habitat character of the swales.

*Level of Significance after mitigation:* Less than significant.

### 2. Vernal Pool tadpole shrimp:

There are no vernal pools or other suitable habitat for this species on the project area (ACOE verified delineation).

*Suggested mitigation:* No mitigation required. However, as previously stated, no wetland feature will be impacted by the project.

## 8. Effects on Insects:

### 1. Valley long horned elderberry beetle

*Level of Significance before mitigation:* As the elderberry plant clusters found on the project area are in the open space area, they will not be impacted by the project development. They

may be impacted by individual property owners during brush clearing operation or some other activity the public is engaged in. The locations of the plant clusters are on steep side slopes and not readily accessible and therefore they are not likely to be disturbed.

*Level of Significance before mitigation:* Marginal.

*Suggested Mitigation:*

Mitigation measure 1: In order to protect the elderberry plant clusters, construct permanent protective fencing enclosures around each of the known elder berry plant cluster locations. Fencing should be at a minimum of ten feet from the perimeter of the shrub cluster.

Mitigation measure 2: Sign the enclosure advising the public of the non-disturbance protected area. Signs should be a minimum of 8 ½" X 11" in size.

*Level of Significance after mitigation:* Less than significant.

#### 9. Impacts to Migratory routes and travel corridors:

Construction of a residential subdivision with associated infrastructure will impact 184.48 acres within the project. Construction equipment, materials and work crews will, by necessity, interface with many of the wildlife habitats located on the project area, including travel corridor areas.

*Level of Significance before mitigation:* Potentially significant

*Suggested Mitigation:*

Mitigation Measure 1: Design open space areas that encompass travel corridors around intermittent and ephemeral stream courses. Recommend open space area of 30 feet on either side of the stream course, thus giving a 60 foot wide travel corridor.

Mitigation Measure 2: Design open space areas between individual building lots.

Mitigation Measure 3: Within stream corridor travel corridors, retain existing vegetation consistent with the Tierra Robles Fuels Management plan.

Mitigation Measure 4: During construction phase of project development, exclude all equipment, staging areas and construction activity from travel corridor areas. Exceptions to this measure being the areas necessary for construction of stream crossing structures.

Mitigation Measure 5: Post construction, re-vegetate upland stream crossing construction areas to pre-construction condition. Generally this will consist of reseeding the area to annual grasses and forbs.

*Level of Significance after mitigation:* Less than significant.

## 10. Effects on Wetland and Riparian Resource

Construction of a residential subdivision with associated infrastructure will impact 184.48 acres within the project area. Construction equipment, materials and work crews will, by necessity, interface with many of the wetland resources within the project area.

*Level of Significance before mitigation:* Potentially significant

### *Suggested Mitigation:*

Mitigation Measure 1: Avoid all wetland features during construction and development phases of the project.

Mitigation Measure 2: Design stream crossing structures to avoid all areas within the ordinary high-water mark of wetland features.

Mitigation Measure 3: Locate building envelopes a minimum of 30 feet from the ordinary high-water mark of all wetland features.

Mitigation Measure 4: All construction activities shall be conducted outside the rainy season, generally after April 30<sup>th</sup> and prior to October 1<sup>st</sup> in any given year.

*Level of Significance after mitigation:* Less than significant.

#### 4. Summary and Conclusions

The blue oak resource over shallow soils is the distinctive vegetative feature of the property and supports associated wildlife populations as described in this report. The upland areas are subsequently drained by three stream basins that all ultimately connect to the Sacramento River. Clough Creek is the main drainage but is not considered suitable habitat for salmonids by the California Department of Fish and Wildlife (DFW email letter to WRM 9/4/12).

Nevertheless, the stream provides a dependable water source in all but the driest years. There are several vernal swales within the upland areas that support vernal associated plants. The area has had little human disturbance in the past in terms of a developed infrastructure.

Winter and spring livestock grazing has been the principal land use for the past 100+ years but the area does not show any effects of overgrazing. On occasion fire has burned over the area with little adverse impact as there is little mid-story vegetation that would act as a fuel ladder to the tree canopy. Fire is part of the natural ecology of the area and its sporadic occurrence has contributed to the vegetative health and patterns on the property.

Biologically sensitive areas include the vernal swale complexes of the uplands and the drainage systems of Clough Creek and East Creek. The Red Bluff dwarf rush is present within the vernal swale areas of the "east of center creek" drainage. There is little riparian habitat on the property, and where present is in association with deeper pool areas within the stream courses. This limited riparian habitat provides valuable diversity of vegetative composition and shading for the stream pools. As noted there were elderberry bushes located within two areas in the East Creek drainage. These bushes are in a very mature and somewhat decadent condition and are most likely of little value to the valley longhorn elderberry beetle, but should be protected nonetheless.

Perhaps the greatest asset of the property is the "open space setting" within a more congested environment of the surrounding subdivision areas. Within this setting, on several occasions during the field visits, deer were seen laying down resting under the oak canopy during the heat of the day, in the interior reaches of the property. Turkeys also were seen several times moving leisurely about foraging for insects. On more than one occasion, coyotes were seen trying to outsmart gophers to see who would survive the day. Though surrounded by small lot subdivisions, Tierra Robles plays host to a diversity of wildlife that are utilizing the blue oak woodland habitats and associated wetland habitats of the property.

Implementing the suggested mitigation measures contained within this report should enhance and maintain the existing biological resources on the project area and reduce the level of project impacts to a level of less than significant.

For further information or questions about this report, please contact:

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## 6. Photo Section



Photo 1 Looking north up vernal swale area of East Center Creek drainage



Photo 2 Typical upland area within Clough Creek drainage showing ephemeral stream



Photo 3. Clough Creek looking north. Note lack of riparian vegetation



Photo 4. Clough Creek looking south. Note willow shrub in foreground and will clumps in distance. Single shrubs and scattered clumps of willows are the extent of riparian vegetation along the stream course.



Photos 5 above and 6 below are both examples of ephemeral streams within the Clough Creek drainage area. In all cases of these streams, upland grasses extend to the ordinary high water mark without any riparian vegetation present.





Photo 7. Convergence of ephemeral stream with Clough Creek.



Photo 8. Annual grassland vegetative community in the center of the property



**Photo 9. Looking east into East Gulch**



**Photo 10. Looking southeast down East Creek drainage toward Palo Cedro**



**Photos 11 and 12 are looking north from Boyle Road up the Center Creek drainage. This is an unnamed ephemeral stream. The east property line road is visible in the right side of photos**



## **7. Appendix**

### **Botanical Survey of Chatham Ranch – April 11, 2005**

Botanical Survey of Chatham Ranch – April 11, 2005

Area 1: Open Blue Oak/Grassland

| Group/Family        | Common Name                         | Botanical Name                                    | Remarks   |
|---------------------|-------------------------------------|---|---|
| <b>Trees</b>        | Blue Oak<br>Digger Pine             | Quercus douglassii<br>Pinus sabiniana             |   |
| <b>Shrubs/Vines</b> | Chaparral Honeysuckle<br>Poison Oak | Lonicera interrupta<br>Toxicodendron diversilobum |   |
| <b>Forbs</b>        |                                     |   |   |
| Borage Family       | ----                                | Plagiobothrys greenei                             | Limited to wet inclusions   |
| Borage Family       | ----                                | Plagiobothrys shastensis                          | General habitat.  |
| Buttercup Family    | Western Buttercup                   | Ranunculus occidentalis                           |   |
| Carrot Family       | Bur-chervil                         | Anthriscus caucalis                               |   |
| Carrot Family       | Foothill Lomatium                   | Lomatium utriculatum                              |   |
| Evening Primrose    | Slender Clarkia                     | Clarkia gracilis ssp gracilis                     |   |
| Geranium Family     | Long-billed Filaree                 | Erodium botrys                                    |   |
| Geranium Family     | Carolina Geranium                   | Geranium carolinianum                             |   |
| Lily Family         | Paper Onion                         | Allium amplexans                                  |   |
| Lily Family         | Blue Dicks                          | Dichelostemma capitatum                           |   |
| Lily Family         | White Brodiaea                      | Tritelia hyacinthina                              |   |
| Lily Family         | Death Cammas                        | Zygadenus venosus                                 |   |
| Madder Family       | Goose Grass                         | Galium aparine                                    |   |
| Madder Family       | Climbing Bedstraw                   | Galium porrigens                                  |   |
| Madder Family       | Field Madder                        | Sherardia arvensis                                |   |
| Meadowfoam Family   | White Meadowfoam                    | Limnanthes alba ssp alba                          | Limited to wet inclusions.  |
| Mustard Family      | Wild Radish                         | Raphanus sativa                                   |   |
| Mustard Family      | Spokepod                            | Thysanocarpus radians                             |   |
| Pea Family          | Valley Sky Lupine                   | Lupinus nanus                                     | Probably <i>Lupinus bicolor</i> (smaller look-a-like also present). |
| Pea Family          | Shamrock                            | Trifolium dubium                                  |   |
| Pea Family          | Spanish Lotus                       | Lotus purshianus                                  |   |
| Pea Family          | Rose Clover                         | Trifolium hirtum                                  |   |
| Pea Family          | Crimson Clover                      | Trifolium incarnatum                              |   |
| Pea Family          | Balloon Clover                      | Trifolium depauperatum                            |   |
| Pea Family          | Tomcat Clover                       | Trifolium wildenovii                              |   |
| Pea Family          | Spring Vetch                        | Vicia sativa ssp nigra                            |   |
| Pea Family          | Winter Vetch                        | Vicia villosa ssp varia                           |   |
| Pink Family         | Grass Pink                          | Petrorhagia dubia                                 |   |
| Plantain Family     | Dwarf Plantain                      | Plantago erecta                                   |   |
| Primrose Family     | Henderson's Shooting Star           | Dodocatheon hendersonii                           |   |
| Snapdragon Family   | Valley Tassels                      | Castilleja attenuata                              |   |
| Snapdragon Family   | Monkey Flower                       | Mimulus guttatus                                  | Limited to wet inclusions.  |
| Snapdragon Family   | Indian Warrior                      | Pedicularis densiflora                            |   |
| Snapdragon Family   | Butter and eggs                     | Triphysaria eriantha                              |   |
| Sunflower Family    | Wooly Fishhooks                     | Ancistrocarphus filagineus                        |   |
| Sunflower Family    | Fremont's Tidy Tips                 | Layia fremontii                                   | Limited to wet inclusions.  |
| Sunflower Family    | Fremont's Tidy Tips                 | Microseris elegans                                |   |
| Sunflower Family    | Old Man of Spring                   | Senecio vulgaris                                  |   |
| Sunflower           | Hawkbit                             | Leontodon taraxacoides                            |   |
| Waterleaf Family    | Meadow Nemophila                    | Nemophila pedunculata                             |   |



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|                       |  |   |   |
|-----------------------|--|---|---|
| <p><b>Grasses</b></p> | <p>European Hair Grass<br/> Sweet Vernal Grass<br/> Slender Wild Oat<br/> Small Quaking Grass<br/> Large Quaking Grass<br/> Ripgut Brome<br/> Soft Chess<br/> Foxtail Chess<br/> Hedgehog Dogtail<br/> Foxtail Barley<br/> Italian Rye<br/> Bulbous Bluegrass<br/> Rattail Fescue<br/> Wheat</p> | <p><i>Aira caryophylla</i><br/> <i>Anthroxanthum odoratum</i><br/> <i>Avena barbata</i><br/> <i>Briza minor</i><br/> <i>Briza maxima</i><br/> <i>Bromus diandrus</i><br/> <i>Bromus hordeaceus</i><br/> <i>Bromus madritensis ssp rubens</i><br/> <i>Cynosurus echinatus</i><br/> <i>Hordeum murinum</i><br/> <i>Lolium multiflorum</i><br/> <i>Poa bulbosa</i><br/> <i>Vulpia myuros</i><br/> <i>Triticum aestivum</i></p> | <p>The dominant grass species.</p> <p>Annual Rye.</p> |
|-----------------------|--|---|---|

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**Area 2: Open herbaceous area dominated by wet depressions**

| Group/ Family     | Common Name             | Botanical Name                        | Remarks   |
|-------------------|-------------------------|---------------------------------------|---|
| <b>Trees</b>      | Blue Oak<br>Digger Pine | Quercus douglasii<br>Pinus sabiniana  | Border of opening<br>Border of opening                        |
| <b>Forbs</b>      |                         |                                       |   |
| Borage Family     | ----                    | Plagiobothrys fulvus                  | <u>According to Jepson's</u> : No particular moisture regime. |
| Borage Family     | ----                    | Plagiobothrys greenii                 | Wet sites, grassland-woodland.                                |
| Borage Family     | ----                    | Plagiobothrys scriptus                | Moist sites in grassland.                                     |
| Carrot Family     | Bur-chervil             | Anthriscus caucalis                   |   |
| Carrot Family     | Foothill Lomatium       | Lomatium utriculatum                  |   |
| Geranium Family   | Long-billed Filaree     | Erodium botrys                        |   |
| Lily Family       | Blue Dicks              | Dichelostemma capitatum               |   |
| Lily Family       | White Brodiaea          | Tritelia hyacinthina                  |   |
| Lily Family       | Death Cammas            | Zygadenus venosus                     |   |
| Madder Family     | Goose Grass             | Galium aparine                        |   |
| Meadowfoam Family | White Meadowfoam        | Limnanthes alba ssp alba              |   |
| Mustard Family    | Spokepod                | Thysanocarpus radians                 |   |
| Pea Family        | Balloon Clover          | Trifolium depauperatum                |   |
| Pea Family        | Rose Clover             | Trifolium hirtum                      |   |
| Pea Family        | Tomcat Clover           | Trifolium wildenovii                  |   |
| Pea Family        | Winter Vetch            | Vicia villosa ssp varia               |   |
| Pea Family        | Miniature Lotus         | Lotus micranthus                      |   |
| Pea Family        | Spanish Lotus           | Lotus purshianus                      |   |
| Phlox Family      | ----                    | Eriastrum sapphirinum                 | Only saw remains of last year?                                |
| Poppy Family      | Frying Pans             | Eschscholzia lobbii                   |   |
| Snapdragon Family | Valley Tassels          | Castilleja attenuata                  |   |
| Snapdragon Family | Butter and Eggs         | Tryphysaria eriantha                  |   |
| Snapdragon Family | Primrose Monkey Flower  | Mimulus primuloides ssp linearifolius |   |
|                   |                         | Lasthenia californica                 |   |
| Sunflower Family  | Gold Fields             | Layia fremontii                       |   |
| Sunflower Family  | Fremont's Tidy Tips     | Microseris elegans                    |   |
| Sunflower Family  | ----                    | Senecio vulgaris                      |   |
| Sunflower Family  | Old Man of Spring       | Leontodon taraxacoides                |   |
| Sunflower Family  | Hawkbit                 |                                       |   |
| <b>Grasses</b>    |                         |                                       |   |
|                   | European Hair Grass     | Aira caryophyllea                     | Dominant grass species  |
|                   | Sweet Vernal Grass      | Anthraxanthum adorum                  |   |
|                   | Soft Chess              | Bromus hordeaceus                     |   |
|                   | Foxtail Chess           | Bromus madritensis ssp. rubens        |   |
|                   | Small Quaking Grass     | Briza minor                           |   |
|                   | Annual Hair Grass       | Deschampsia danthonioides             |   |

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Area 3: Extensive treeless herbaceous opening (quite uniform vegetation distribution)

| Group/Family              | Common Name              | Botanical Name                    | Remarks                |
|---------------------------|--------------------------|-----------------------------------|------------------------|
| <b>Forbs</b>              |                          |                                   |                        |
| Geranium Family           | Long-billed Filaree      | <i>Erodium botrys</i>             |                        |
| Madder Family             | Field Madder             | <i>Sherardia arvensis</i>         |                        |
| Mustard Family            | Peppergrass              | <i>Lepidium nitidum</i>           |                        |
| Mustard Family            | Wild Radish              | <i>Raphanus sativa</i>            |                        |
| Mustard Family            | Spokepod                 | <i>Thysanocarpus radians</i>      |                        |
| Pea Family                | Miniature Lupine         | <i>Lupinus bicolor</i>            |                        |
| Pea Family                | Valley Sky Lupine        | <i>Lupinus nanus</i>              |                        |
| Pea Family                | Shamrock                 | <i>Trifolium dubium</i>           |                        |
| Pea Family                | Rose Clover              | <i>Trifolium hirtum</i>           |                        |
| Pea Family                | Subterranean Clover      | <i>Trifolium subterraneanum</i>   |                        |
| Pea Family                | Miniature Lotus          | <i>Lotus micranthus</i>           |                        |
| Pea Family                | Spanish Lotus            | <i>Lotus purshianus</i>           |                        |
| Plantain Family           | Dwarf Plantain           | <i>Plantago erecta</i>            |                        |
| Poppy Family              | Frying Pans              | <i>Eschscholzia lobbii</i>        |                        |
| Snapdragon Family         | Valley Tassels           | <i>Castilleja attenuata</i>       |                        |
| Snapdragon Family         | Butter and Eggs          | <i>Triphysaria eriantha</i>       |                        |
| Sunflower Family          | Wooly Fishhooks          | <i>Ancistrocarphus filagineus</i> |                        |
| <b>Grasses</b>            |                          |                                   |                        |
|                           | European Hair Grass      | <i>Aira caryophylla</i>           | Dominant grass species |
|                           | Sweet Vernal Grass       | <i>Anthroxanthum odoratum</i>     |                        |
|                           | Soft Chess               | <i>Bromus hordeaceus</i>          |                        |
|                           | Rattail Fescue           | <i>Vulpia myuros</i>              |                        |
|                           | Hedgehog Dogtail         | <i>Cynosurus echinatus</i>        |                        |
| <b>Grass-like monocot</b> |                          |                                   |                        |
|                           | A dwarf Rush (< 3" high) | <i>Juncus capitatus</i>           |                        |

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**Area 4: Blue Oak Woodland**

| Group/Family        | Common Name             | Botanical Name                        | Remarks                                    |
|---------------------|-------------------------|---------------------------------------|--|
| <b>Trees</b>        | Blue Oak                | <i>Quercus douglasii</i>              |  |
|                     | Interior Live Oak       | <i>Quercus wislizenii</i>             |  |
| <b>Shrubs/Vines</b> | Chaparral Honeysuckle   | <i>Lonicera interrupta</i>            |  |
|                     | Poison Oak              | <i>Toxicodendron diversilobum</i>     |  |
| <b>Forbs</b>        |                         |                                       |  |
| Borage Family       | ----                    | <i>Plagiobothrys shastensis</i>       |  |
| Buttercup Family    | Western Buttercup       | <i>Ranunculus occidentalis</i>        |  |
| Buttercup Family    | Yellowtinge Larkspur    | <i>Delphinium decorum</i>             |  |
| Carrot Family       | Bur-chevil              | <i>Anthriscus caucalis</i>            |  |
| Carrot Family       | Foothill Lomatium       | <i>Lomatium utriculatum</i>           |  |
| Carrot Family       | Venus' Needle           | <i>Scandix pectin-veneris</i>         |  |
| Geranium Family     | Long-billed Filaree     | <i>Erodium botrys</i>                 |  |
| Geranium Family     | Carolina Geranium       | <i>Geranium carolinianum</i>          |  |
| Lily Family         | Blue Dicks              | <i>Dichelostemma capitatum</i>        |  |
| Lily Family         | Death Cammas            | <i>Zygadenus venosus</i>              |  |
| Madder Family       | Field Madder            | <i>Sherardia arvensis</i>             |  |
| Mallow Family       | Checker-Bloom           | <i>Sidalcea malveflora</i>            |  |
| Mustard Family      | Wild Radish             | <i>Raphanus sativa</i>                |  |
| Mustard Family      | Spokepod                | <i>Thysanocarpus radians</i>          |  |
| Pea Family          | Valley Sky Lupine       | <i>Lupinus nanus</i>                  |  |
| Pea Family          | Miniature Lotus         | <i>Lotus micranthus</i>               |  |
| Pea Family          | Balloon Clover          | <i>Trifolium depauperatum</i>         |  |
| Pea Family          | Shamrock                | <i>Trifolium dubium</i>               |  |
| Pea Family          | ----                    | <i>Trifolium gracilentum</i>          |  |
| Pea Family          | Rose Clover             | <i>Trifolium hirtum</i>               |  |
| Pea Family          | Tomcat Clover           | <i>Trifolium wildenovii</i>           |  |
| Pea Family          | Spring Vetch            | <i>Vicia sativa ssp nigra</i>         |  |
| Phlox Family        | True Baby Stars         | <i>Linanthus bicolor</i>              |  |
| Pink Family         | Mouse-ear Chickweed     | <i>Cerastium glomeratum</i>           |  |
| Plantain Family     | Dwarf Plantain          | <i>Plantago erecta</i>                |  |
| Snapdragon Family   | Valley Tassels          | <i>Castilleja attenuata</i>           |  |
| Snapdragon Family   | Monkey Flower           | <i>Mimulus guttatus</i>               | Limited to wet swales (drainage channels). |
| Snapdragon Family   | Indian Warrior          | <i>Pedicularis densiflora</i>         |  |
| Sunflower Family    | ----                    | <i>Microseris elegans</i>             |  |
| Valerian Family     | Long-spurred Plectritis | <i>Plectritis ciliosa ssp ciliosa</i> |  |
| <b>Grasses</b>      | European Hair Grass     | <i>Aira caryophyllea</i>              |  |
|                     | Sweet Vernal Grass      | <i>Anthroxanthum odoratum</i>         |  |
|                     | Slender Wild Oat        | <i>Avena barbata</i>                  |  |
|                     | Small Quaking Grass     | <i>Briza minor</i>                    |  |
|                     | Hedgehog Dogtail        | <i>Cynosurus echinatus</i>            |  |
|                     | Rattail Fescue          | <i>Vulpia myuros</i>                  |  |

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**Area 5: Riparian Corridor adjacent Clough Creek**

| Group/Family   | Common Name  | Botanical Name  | Remarks  |
|--|--|---|--|
| <b>A. Typical Riparian Species most prevalent and representative of corridor</b>   |  |   |  |
| <b>Trees</b>   | Fremont Cottonwood<br>Narrow-leaved Willow<br>Arroyo Willow  | Populus fremontii<br>Salix exiqua<br>Salix lasiolepis   |  |
| <b>Shrubs/Vines</b>  | Himalayan Blackberry   | Rubus discolor  |  |
| <b>Forbs</b><br>Borage Family<br>Borage Family<br>Buckwheat Family<br>Buttercup Family<br>Evening Primrose Family<br>Meadowfoam Family<br>Mustard Family<br>Mustard Family<br>Pea Family<br><br>Pea Family<br><br>Snapdragon Family<br>Snapdragon Family | -----<br>-----<br>Willow Dock<br>Prickleseed Buttercup<br>-----<br>White Meadowfoam<br>American Winter Cress<br>Early Winter Cress<br>Subterranean Clover<br><br><b>Botanical Survey of Chatham<br/>Ranch – April 11, 2005</b><br>Variable Clover<br>Seep-spring Monkey Flower<br>Primrose Monkey Flower | Plagiobothrys austinae<br>Plagiobothrys greenii<br>Rumex salicifolius<br>Ranunculus muricatus<br>Epilobium species?<br>Limnanthes alba ssp. alba<br>Barbarea orthoceras<br>Barbarea verna<br>Trifolium subterraneum<br><br>Trifolium variegatum<br><br>Mimulus guttatus<br>Mimulus primuloides ssp. linearifolius | Dominant.<br><br>No flowers yet.<br>Prominent.<br>No flowers yet.<br><br><br><br><br>Atypical flowering. Some question on identification.<br>There are 5 phases. This is probably in Phase 2.<br><br>Very small and inconspicuous. |
| <b>Grasses</b>   | Annual Hair Grass<br><br>A Spikerush   | Deschampsia danthonioides<br><br>Eleocharis species?  | Dominant grass bordering stream.<br>No inflorescence yet<br>Currently partially submerged.   |

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| <b>B. Plants Adapted to Variable Habitats that are Intermingled and Associated with Riparian Species in Streamside Corridor on moist and wet soils.</b> |                     |                              |                |
|---|---------------------|------------------------------|----------------|
| <b>Group/Family</b>   | <b>Common Name</b>  | <b>Botanical Name</b>        | <b>Remarks</b> |
| <b>Forbs</b>  |                     |                              |                |
| Borage Family   | Popcorn Flower      | Plagiobothrys notholrus      |                |
| Geranium Family   | Long-billed Filaree | Erodium botrys               |                |
| Mustard Family  | Peppergrass         | Lepidium nitidum var nitidum |                |
| Mustard Family  | Spokepod            | Thysanocarpus radians        |                |
| Pea Family  | Shamrock            | Trifolium dubium             |                |
| Pea Family  | Rose Clover         | Trifolium hirtum             |                |
| Pea Family  | Tomcat Clover       | Trifolium wildenovii         |                |
| Pink Family   | Grass Pinks         | Petrorhagia dubia            |                |
| Plantain Family   | Dwarf Plantain      | Plantago erecta              |                |
| Poppy Family  | Fying Pans          | Eschscholzia lobbii          |                |
| Sunflower Family  | -----               | Microseris elegans           |                |
| <b>Grasses</b>  |                     |                              |                |
|   | European Hair Grass | Aira caryophyllea            |                |
|   | Slender Wild Oats   | Avena barbata                |                |
|   | Small Quaking Grass | Briza minor                  |                |
|   | Soft Chess          | Bromus hordeaceus            |                |

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Area 6: Treeless herbaceous opening

| Group/Family      | Common Name         | Botanical Name                   | Remarks                                |
|-------------------|---------------------|----------------------------------|--|
| <b>Forbs</b>      |                     |                                  |  |
| Geranium Family   | Long-billed Filaree | <i>Erodium botrys</i>            |  |
| Lily Family       | White Brodiaea      | <i>Tritelia hyacinthina</i>      |  |
| Lily Family       | Death Cammas        | <i>Zygadenus venosus</i>         |  |
| Pea Family        | Valley Sky Lupine   | <i>Lupinus nanus</i>             | May also be <i>Lupinus bicolor</i> .   |
| Pea Family        | Spanish Lotus       | <i>Lotus purshianus</i>          |  |
| Pea Family        | Balloon Clover      | <i>Trifolium depauperatum</i>    |  |
| Pea Family        | Shamrock            | <i>Trifolium dubium</i>          |  |
| Pea Family        | Rose Clover         | <i>Trifolium hirtum</i>          |  |
| Pea Family        | -----               | <i>Trifolium microdon</i>        | First occurrence noted.                |
| Pink Family       | Grass Pinks         | <i>Petrorhagia dubia</i>         |  |
| Plantain Family   | Dwarf Plantain      | <i>Plantago erecta</i>           |  |
| Poppy Family      | Frying Pans         | <i>Eschscholzia lobbii</i>       |  |
| Snapdragon Family | Valley Tassels      | <i>Castilleja attenuata</i>      |  |
| Snapdragon Family | Butter and Eggs     | <i>Triphysaria eriantha</i>      |  |
| Sunflower Family  | Hawkbit             | <i>Leontodon taraxacoides</i>    |  |
| <b>Grasses</b>    |                     |                                  |  |
|                   | European Hair Grass | <i>Aira caryophyllea</i>         |  |
|                   | Sweet Vernal Grass  | <i>Anthroxanthum odoratum</i>    |  |
|                   | Slender Wild Oats   | <i>Avena barbata</i>             |  |
|                   | Small Quaking Grass | <i>Briza minor</i>               |  |
|                   | Ripgut Brome        | <i>Bromus diandrus</i>           |  |
|                   | Soft Chess          | <i>Bromus hordeaceus</i>         |  |
|                   | Foxtail Chess       | <i>Bromus madritensis rubra</i>  |  |
|                   | Italian Rye         | <i>Lolium multiflorum</i>        |  |
|                   | Medusa Head         | <i>Taeniatherum caput-medusa</i> |  |
| <b>Grass-like</b> |                     |                                  |  |
|                   | A Dwarf Rush        | <i>Juncus capitatus</i>          | < 3" high associated with Vernal Pools |

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**Area 7: Oak Woodland on upper slope of canyon**

(Better drained and vernal drier surface soils than Areas 1-6)

| Group/Family            | Common Name  | Botanical Name  | Remarks  |
|-------------------------|--|---|--|
| <b>Trees</b>            | Blue Oak<br>Interior Live Oak  | Quercus douglasii<br>Quercus wislizenii   |  |
| <b>Shrubs/Vines</b>     | Common Manzanita<br>Buckbrush<br>Western Redbud<br>Yerbasanta<br>Pitcher Sage<br><br>Chaparral Honeysuckle<br>Poison Oak | Arctostophylos manzanita<br>Ceanothus cuneatus<br>Cercis occidentalis<br>Eriodictyon californicum<br>Lepechinia calycina<br><br>Lonicera interrupta<br>Toxicodendron diversilobum | Sub shrub. Aromatic. Not yet flowering, therefore identity not affirmed. |
| <b>Forbs</b>            |  |   |  |
| Carrot Family           | Bur-chervil  | Anthriscus caucalis   |  |
| Carrot Family           | Venus Needle   | Scandix pectin-veneris  |  |
| Evening Primrose Family | Slender Clarkia  | Clarkia gracilis ssp gracilis   |  |
| Geranium Family         | Long-billed Filaree  | Erodium botrys  |  |
| Geranium Family         | Carolina Geranium  | Geranium carolinianum   |  |
| Lily Family             | Wild Hyacinth  | Dichelostemma multiflorum   |  |
| Lily Family             | Hartweg's Odontostomum   | Odontostomum hartwegii  |  |
| Lily Family             | Death Cammas   | Zygadenus venosus   |  |
| Madder Family           | Goose Grass  | Galium aparine  |  |
| Mallow Family           | An annual Cherckerbloom  | Sidalcea hartwegii  |  |
| Pea Family              | Hill Lotus   | Lotus humistratus   |  |
| Pea Family              | Spanish Lotus  | Lotus purshianus  |  |
| Pea Family              | Shamrock   | Trifolium dubium  |  |
| Pea Family              | Rose Clover  | Trifolium hirtum  |  |
| Pea Family              | Tomcat Clover  | Trifolium wildenovii  |  |
| Pea Family              | Spring Vetch   | Vicia sativa ssp nigra  |  |
| Pink Family             | Grass Pinks  | Petrorhagia dubia   |  |
| Plantain Family         | Dwarf Plantain   | Plantago erecta   |  |
| Snapdragon Family       | Valley Tassles   | Castilleja attenuata  |  |
| Sunflower Family        | Wooly Sunflower  | Eriophyllum lanatum   |  |
| Sunflower Family        | Wooly Fishhooks  | Ancistrocarphus filagineus  |  |
| Sunflower Family        | Milk Thistle   | Silybum marianum  |  |
| Sunflower Family        | ----   | Microseris elegans  |  |
| Sunflower Family        | Gray Mule Ears   | Wyethia helenioides   |  |
| <b>Grasses</b>          |  |   |  |
|                         | European Hair Grass  | Aira caryophyllea   |  |
|                         | Slender Wild Oats  | Avena barbata   |  |
|                         | Ripgut Brome   | Bromus diandrus   |  |
|                         | Soft Chess   | Bromus hordeaceus   |  |
|                         | Foxtail Brome  | Bromus madratensis rubra  |  |
|                         | Hedgehog Dogtail   | Cynosurus echinatus   |  |
|                         | Rye  | Secale cereale  |  |
|                         | Rattail Fescue   | Vulpia myuros   | A very stunted specimen  |



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**Wet Lands**

| Group/Family   | Common Name               | Botanical Name            | Remarks   |
|--|---------------------------|---------------------------|---|
| <b>A. Indicator plants noted at a specific point in an ephemeral drainage (Species normally limited to vernal wet soils)</b> |                           |                           |   |
| <b>Forbs</b>   |                           |                           |   |
| Borage Family  | ----                      | Plagiobothrys bracteatus  | Other possible spp listed in C.   |
| Pea Family   | ----                      | Trifolium variegatum      | Probably Phase 5  |
| Snapdragon Family  | Seep-spring Monkey Flower | Mimulus quttatus          | Also in permanently wet areas   |
| <b>Grasses</b>   |                           |                           |   |
|  | Annual Hair Grass         | Deschampsia danthonioides | A common species on moist to drying edges of streams and ponds and vernal meadows of low areas.                                     |
| <b>B. Species with broader adaptation that are frequently associated with moist soils and noted at the above site.</b>       |                           |                           |   |
| <b>Forbs</b>   |                           |                           | <u>Habitat noted in Jepson's:</u>   |
| Lily Family  | White Brodiaea            | Tritelia hyacinthina      | Most commonly on vernal wet grassland.  |
| Poppy family   | Frying Pans               | Eschscholzia lobbii       | No particular affinity to moisture noted in Jepson's, but seem to be found on vernal moist clay soils.                              |
| <b>Grasses</b>   |                           |                           |   |
|  | Small Quaking Grass       | Briza minor               | Shaded or moist sites   |
| <b>C. Additional Wetland Species noted at other sites in project area.</b>   |                           |                           |   |
| *Noted in drainage similar to A. Other listed species may also occur in this habitat   |                           |                           |   |
| <b>Forbs</b>   |                           |                           |   |
| Borage Family  | ----                      | Plagiobothrys austinae    | Wet banks of Clough Creek.  |
| *Borage Family   | ----                      | Plagiobothrys greenii     | Drainage with running water in Area 1.  |
| *Meadowfoam Family   | White Meadowfoam          | Limnathus alba ssp alba   | Same location as above and Vernal Pool in Area 2.   |
| Snapdragon Family  | Primrose Monkey Flower    | Mimulus primuloides       | Inconspicuous tiny Monkey Flower with single terminal flower/stem. Noted in samples from Clough Creek and Area 2 vernal depression. |
|  |                           |                           | In vernal wet areas in Areas 3 and 6.   |
| Grass-like   | Small dwarf Rush          | Juncus capitatus          |   |

<sup>1</sup> *Trifolium variegatum*: most variable of California clovers, thus divided into five phases. Phase 2 limited to sites with permanently wet or inundated soils, but the local specimens keyed best to Phase 5, which is normally adapted to somewhat drier conditions. However the local plants appear to be limited to vernal wet habitats.