

SANTA CLARA VALLEY WATER DISTRICT

Rancho Cañada de Pala Preserve Areas 1 & 2 Long-term Management Plan

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I. BACKGROUND

1.0 INTRODUCTION

1.1 *Purpose of Property Purchase*

In December 2015, the Santa Clara Valley Water District (SCVWD) purchased the Rancho Cañada de Pala Preserve (Preserve) from The Nature Conservancy (TNC) in part for the purpose of providing mitigation in perpetuity for impacts associated with the SCVWD's 2002 Multi-Year Stream Maintenance Program (SMP) under the Stream and Watershed Protection Program (S&WPP). The Preserve may also provide mitigation for other SCVWD projects to be identified in the future, pending prior agency approval. The agencies that required the mitigation (Permitting Agencies) associated with the 2002 S&WPP are the California Department of Fish and Wildlife (CDFW), U.S. Army Corps of Engineers (Corps), and San Francisco Regional Water Quality Control Board (SF RWQCB).

The Preserve is divided into three Areas (Areas 1, 2, and 3) that collectively total 1,758 acres (Figure 1). Areas 1 and 2, which encompass 1,221 acres, are the subject of this Long-term Management Plan (LTMP). In 2000, an easement on a portion of the Preserve (Area 1) was transferred by the Kammerer family to Catellus Land Development Corporation to be used as mitigation for impacts on the California tiger salamander (CTS; *Ambystoma californiense*) elsewhere (G. Kammerer pers. comm.; SF RWQCB 1999). Catellus Land Development Corporation recorded a Conservation Easement (CE) on the approximately 840-acre Area 1 of the Preserve in favor of TNC (as the Grantee). Two years later, TNC purchased the underlying fee from the Kammerer family and until December 2015, owned the entire Preserve. The SCVWD obtained ownership of the Preserve (including Areas 1, 2, and 3) in December 2015, with a perpetual CE held by TNC on Area 1.

In December 2015, the SCVWD recorded a CE (also held by TNC) on the entirety of Area 3 (320 acres) to provide mitigation for the 2002 SMP. Area 3 includes 6.6 miles of S&WPP-designated streams (waters of the U.S./State and California Fish and Game Code Section 1600 jurisdiction) and their associated buffers (219.89 acres), for which the SCVWD is claiming 2002 SMP mitigation credit. The long-term management of Area 3 is described in a separate LTMP. The SCVWD is not recording any additional CEs on the Preserve at this time.

Because a CE is already present on Area 1, this portion of the Preserve will not provide mitigation for current or future SCVWD projects. Area 2 of the Preserve may provide mitigation for other SCVWD projects, either currently identified or to be identified in the future. If Area 2 is proposed for future mitigation, it would be subject to the requirements of the regulatory agencies governing that mitigation.

1.2 *Purpose of this Long-term Management Plan*

The existing Area 1 CE and Kammerer Ranch CTS Management Plan (Catellus Development Corporation et al. 2000), which TNC and CDFW are currently working to update, require TNC to implement certain management, monitoring, and reporting activities (and restrict certain other activities) in Area 1 to benefit the CTS. These CTS-specific activities in Area 1 will continue to be performed by TNC. This LTMP for Areas 1 and 2 will supplement TNC's management, monitoring, and reporting activities. The purpose of this LTMP is to ensure that Areas 1 and 2 of

the Preserve are monitored, maintained, and managed in a manner that preserves all of their conservation values (not just those associated with CTS) and is consistent with the existing Area 1 CE.

The conservation values of Areas 1 and 2 are as follows:

- Over 23 miles of seasonal and intermittent streams, as well as 10 ponds (four seasonal and six perennial)
- A mosaic of open rangeland and varied vegetation types (i.e., blue and valley oak woodland, California annual grassland, foothill pine/oak woodland, mixed oak forest, northern mixed/chamise chaparral, and valley oak savanna) that provide habitat for a wide variety of birds, mammals, reptiles, amphibians, and invertebrates
- Potential breeding and upland dispersal habitat for the federally threatened California red-legged frog (CRLF; *Rana draytonii*), also a state species of special concern; potential breeding and upland dispersal habitat for the state and federally threatened CTS; potential breeding and foraging habitat for the western pond turtle (WPT; *Actinemys marmorata*) and American badger (*Taxidea taxus*), state species of special concern; and potential foraging habitat for the foothill yellow-legged frog (FYLF; *Rana boylei*), also a state species of special concern
- Ecological connectivity to the surrounding open space and watershed land network

This LTMP establishes objectives, priorities, and tasks to monitor, manage, maintain, and report on the overall conservation values within Areas 1 and 2, which will be managed according to the LTMP.

The LTMP Goals are to:

- Preserve and allow for the improvement of the conservation values of Areas 1 and 2
- Provide coordinated, unified management for Areas 1 and 2
- Provide feasible and effective conservation guidelines, standards, and priorities for resource management, monitoring, and adaptive management
- Be compatible with and promote cooperation among the various land owners/managers within the upper ends of the Upper Penitencia Creek and Alameda Creek watersheds (e.g., with respect to grazing regimes and invasive species control) and to help ensure the survival of viable populations of sensitive species and healthy biotic communities in the area as a whole
- Provide flexibility as needed to adapt management practices in response to monitoring and field observations, and to meet revised or newly established mitigation goals for Areas 1 and 2 over time

No initial site improvement plans are included with this LTMP, as no initial site improvements were determined to be needed to ensure the long-term function of infrastructure in Areas 1 and 2 or to facilitate land management.

1.3. Land Manager and Responsibilities

The land manager (Land Manager) is the SCVWD. The SCVWD will implement this LTMP, managing, monitoring, and maintaining Areas 1 and 2 to preserve their habitat and conservation values. As Land Manager, the SCVWD will be responsible for maintaining Areas 1 and 2 in their current condition and consistent with the CE for Area 1. The SCVWD may implement additional, optional resource management activities, such as pond enhancement or creation, not included in this LTMP that improve environmental conditions. These may include site improvement projects or long-term management activities that enhance or improve habitat for particular species or communities. If such additional activities are proposed within the 840-acre Area 1 CE area, these will need to be consistent with the restrictions and allowed uses in the CE, and may require written approval of the CDFW. In response to changing conditions, and as part of adaptive management, the SCVWD may employ new or different management techniques to meet the objectives of this LTMP. Any new subsequent grading, or alteration of the site's hydrology and/or topography by the Land Manager or its representatives, depending on the nature and location of impacts, may require resource agency permits, such as a Streambed Alteration Agreement with the CDFW, a California Endangered Species Act 2081 Incidental Take Permit, a Clean Water Act Section 404 permit from the Corps, and/or a Clean Water Act Section 401 certification with the SF RWQCB.

1.4. Responsibilities of Area 1 Conservation Easement Holder

TNC will continue to hold the existing 840-acre CE on Area 1 and will continue to be responsible for management of Area 1 to comply with this CE. The Kammerer Ranch CTS Management Plan identifies all of the management and monitoring responsibilities for habitat preservation for the CTS in perpetuity within Area 1 (Catellus Development Corporation et al. 2000). As the holder of the CE, TNC is responsible for all ongoing monitoring and management activities required by the CTS Management Plan, which are:

- Performing easement maintenance. TNC performs one inspection of Area 1 per year to monitor perimeter and pond fencing and perform ordinary wear and tear repair on fences and remove trash accumulated within the fenced areas around the CTS ponds.
- Monitoring of CTS and pond biological status. Two qualified TNC biologists conduct one survey per year during approximately the first week of May to monitor and measure pond turbidity, temperature, eutrophication and dissolved oxygen levels, CTS reproduction, CTS numbers, available CTS aestivation habitat, and vegetative cover within 200 feet surrounding the ponds.
- Performing aquatic predator monitoring and control. Two qualified TNC biologists perform one inspection of Area 1 per year to determine whether predators are present in the CTS ponds. If predators are present, TNC drains the ponds after 1 September and removes or eradicates aquatic CTS predators.
- Submitting annual reports. Once annually, TNC submits a letter report and data sheets documenting the results of the maintenance and monitoring activities described above within 30 days upon request from the CDFW.
- Additional fencing. If CDFW determines that additional fencing around the ponds is necessary to protect the CTS or its habitat, TNC or the CDFW (depending on the availability of funds) may erect such fencing.

TNC has been unable to conduct these management activities due to insufficient funds provided in their Management Fee (A. Ramsden, pers. comm.). TNC and CDFW are working to resolve this matter, but regardless of the resolution, the SCVWD will not be responsible for carrying out or funding the management activities specified in the Area 1 CE or CTS Management Plan.

2.0 PROPERTY DESCRIPTION

2.1. Location, Setting, Topography, Hydrology, and Soils

2.1.1. Location and Setting

Areas 1 and 2 of the Preserve comprise approximately 1,221 acres, and are located 8 miles northeast of downtown San José in unincorporated Santa Clara County (Figure 1) on portions of Assessor Parcel Numbers 627-22-011, 042-07-019, 042-07-020, 042-07-021, 042-07-023, 042-07-024, 042-07-025, 042-07-026, 042-07-027, 042-07-028, 042-08-001. Areas 1 and 2 lie on west, east, and south-facing slopes of the Diablo Range, approximately 6 miles northwest of Mount Hamilton. The Diablo Range extends 180 miles from Mount Diablo in the northwest to the Polonio Pass in the southeast; it is largely undeveloped and supports a diverse mix of grassland, scrubland and woodland communities. Cattle ranching and passive recreation are the predominant human uses throughout most of the Diablo Range. Protection of Areas 1 and 2 will add to a growing and increasingly contiguous swath of open space and conservation lands in the Mount Hamilton region that currently include San Francisco Public Utilities Commission lands to the north; Santa Clara County Open Space Authority's (OSA) lands, the SCVWD's Upper Penitencia Creek Property (with Area 3 of the Rancho Cañada de Pala Preserve to be preserved via a CE), and the City of San José's Cherry Flat Reservoir to the west; and the University of California's (UC's) Blue Oak Ranch Reserve (BORR) and Santa Clara County's Joseph D. Grant County Park to the south (Figure 1).

2.1.2. Topography and Hydrology

Elevations on Areas 1 and 2 range from approximately 1900 feet National Geodetic Vertical Datum (NGVD) 29 along Upper Penitencia Creek a stream that runs along the western edge of the Preserve to 3100 feet NGVD29 on the northern border of Area 1 atop Poverty Ridge (Figure 2). Areas 1 and 2 are primarily composed of the steeply sloping hillsides of Poverty Ridge, which are bisected by ephemeral and intermittent drainages that flow down the south- and west-facing slopes into Upper Penitencia Creek, and down the east-facing slopes into Arroyo Hondo (Figure 3). Arroyo Hondo is the only perennial stream on the Preserve, and is located in Area 3 to the east of Areas 1 and 2. Upper Penitencia Creek is a stream that drains a 24 square mile area within the larger Coyote Creek watershed; it runs for approximately 11 miles from its headwaters in the Diablo Range to its confluence with Coyote Creek. Downstream from Areas 1 and 2, Upper Penitencia Creek enters Cherry Flat Reservoir, which was constructed in 1936 to supply water to Alum Rock Park during the summer and prevent floods during the winter. Upper Penitencia Creek then flows through Alum Rock Park before exiting the hills onto the valley floor. From Alum Rock Park, Upper Penitencia Creek flows westward across the Santa Clara Valley floor and through the City of San Jose for about four miles before joining Coyote Creek approximately 10 miles upstream of the San Francisco Bay.

The estimated 30-year (1981–2010) mean annual precipitation at Areas 1 and 2 is 24.83 inches (PRISM 2016), most of which occurs between the months of November and April. Precipitation is the main source of water for the ephemeral and intermittent streams in Areas 1 and 2;

however, natural seeps and springs at the headwaters of drainages where the groundwater table approaches or tops soil surface are present in Areas 1 and 2.

2.1.3. Soils

Areas 1 and 2 are underlain by four soil types within the Gaviota Series and Los Gatos-Gaviota Complex: (1) Gaviota loam 30 to 75 percent slopes; (2) Gaviota gravelly loam 30 to 75 percent slopes, severely eroded; (3) Gaviota-Los Gatos complex, 30 to 50 percent slopes; and (4) Los Gatos-Gaviota complex, 50 to 75 percent slopes (Figure 4). These soils are derived from hard sandstone and shale from the Franciscan formation and younger (Miocene age) marine sediments. The Gaviota series consists of shallow soils that are well-drained and somewhat excessively drained, moderately to severely eroded, low fertility, and may be subject to burning. Serpentine soil inclusions of the Henneke series are common throughout (Natural Resource Conservation Service [NRCS] 2016), in addition to inclusions of the Los Gatos and Vallecitos series (U.S. Soil Conservation Service 1974). Soil complexes on Areas 1 and 2 generally include the Gaviota series on ridges and south-facing slopes, and soils within the Los Gatos series on north-facing slopes. The Los Gatos-Gaviota complex generally includes soils within the Gaviota series on ridges and south-facing slopes, as well as soils within the Los Gatos series on north-facing slopes. The Los Gatos series is well-drained, subject to sheet erosion, and moderately fertile. The complex may also include small areas of Vallecitos rocky loam, Los Osos clay loam, and Altamont clay. Rock outcrops and talus are also scattered across Areas 1 and 2.

2.2. *General History and Land Use of Areas 1 and 2*

Areas 1 and 2 are largely undeveloped with minimal existing infrastructure. Similar to the rest of the region, Areas 1 and 2 have historically been used for cattle grazing. Information on historic grazing in the region and recent grazing activity within Areas 1 and 2 is provided for context below.

2.2.1. Historic Land Management in the Region

Livestock grazing has existed in Santa Clara County, including in the foothill areas of the Diablo Range, for over 200 years. During the Spanish Period (1722-1822), lands outside of the missions and pueblo settlements in the county were utilized primarily for grazing of livestock and limited agriculture (County of Santa Clara 2004).

With the establishment of large private land grants during the Mexican Period (1822-1846), local residents were able to own and oversee immense acreages of land (a “rancho”), typically thousands of acres in size. Large herds of cattle were allowed to range freely across these immense tracts of land on a year-round basis and were rounded up twice a year during rodeo. Within a rancho, only the existing infrastructure (e.g., house, corral, garden, small orchard) was fenced, while the remainder of the ranch where the cattle roamed was unfenced (County of Santa Clara 2004).

Rancho land ownership continued until this system was challenged by frontier settlers during the American Period (1846-1900). As smaller farms were established throughout the County, open range methods changed, pasture land was reduced, and cattle ranching became concentrated in the foothills. This period included more intensive cattle operations with fencing and water developments being installed, as well as intensive stock farming, with cattle being moved from foothill pastures to valley feed yards to await marketing. With these more intensive

methods, hay production became a necessity (County of Santa Clara 2004). Year-long grazing was probably conducted in most areas.

From the end of the American Period until more recently, year-long and/or seasonal grazing is presumed to have been the strategy of many area ranches with extensive fencing and water developments to utilize all available feed that grew annually. Maximizing livestock numbers was the objective of many area ranches. This strategy still exists on many local ranching operations.

2.2.2. Recent Land Use of Areas 1 and 2

From 1976 until 2001, Areas 1 and 2 were part of a 2,000-acre ranch owned by the Kammerer family. The Kammerer family used the ranch primarily for cattle grazing, but also enjoyed the ranch for wildlife-related uses, including fishing and hunting. Grazing activity on the ranch consisted of a relatively conservative grazing regime (G. Kammerer pers. comm.). In the six years prior to 2001, grazing activity on the ranch consisted of the following:

- 1995 – 59 cow/calf pairs
- 1996 – 73 cow/calf pairs, 4 yearlings, 4 bulls
- 1997 – 47 cow/calf pairs, 4 yearlings, 4 bulls
- 1998 – 45 cows, 39 calves, 3 bulls
- 1999 – 45 cows, 39 calves, 3 bulls
- 2000 – 45 cows

Because the Preserve was obtained by TNC, a grazing regime at or below 50 animal units (AUs) per year has been maintained on the Preserve as a whole (including Areas 1, 2, and 3 collectively) per the requirements of the Management Plan (Exhibit C) of the CE for Area 1 (TNC 2000). This is consistent with the CE for Area 1, which does not require grazing within Area 1 but limits grazing to a maximum of 50 AUs per year (TNC 2000). Although some fencing bisects portions of Area 2, no fencing separates the remaining portions of the Preserve, and livestock grazing is managed for all three areas as a single unit.

2.3. Existing Infrastructure

The existing infrastructure in Areas 1 and 2 is shown on Figure 5. The main drivable road within these areas extends from the southernmost end of Area 2 north through the center of Areas 1 and 2, and then forks east and west along the northern edge of Area 1. The western fork continues to a pond in the northwestern corner of Area 1. The eastern fork road creates two loop roads, one within Areas 1 and 2 and one that extends into Area 3.

The roads within Areas 1 and 2 cross ephemeral and intermittent streams at 16 locations (SC 1–SC 16, Figure 5). Culverts convey flows beneath the road at two locations (SC 9 and SC 10), and wooden retaining walls have been constructed on the downstream sides of road crossings at two locations (SC 3 and SC 6), but otherwise these stream crossings are not associated with any infrastructure. Instead, water travels across the road as sheet flow, and when it is present, it is very shallow (a few inches deep at most). Minor erosional damage is present at the locations of the two retaining walls (SC 3 and SC 6), and additional erosional features, such as large gullies, were observed at SC 1 and SC 2. The infrastructure and/or erosional features at each stream crossing are described below in Table 1.

Table 1. Stream Crossings

Stream Crossing	Infrastructure and/or Erosional Features
SC 1	A gully (approximately 4 feet wide and 6 feet deep) has formed downstream of the road in the stream channel (Photos 1–2, Appendix B). This erosional feature is not currently impacting the roadway itself. No infrastructure is present.
SC 2	A gully (approximately 3 feet wide and 5 feet deep) has formed downstream of the road in the stream channel (Photos 3–4, Appendix B). This erosional feature is not currently impacting the road itself. No infrastructure is present.
SC 3	A nonfunctional culvert is buried next to the road. The inlet and outlet are filled with sediment and the culvert no longer conveys flows. A wooden retaining wall stabilizes the downstream side of the roadway, and has some visible (minor) damage from erosion (Photos 5–6, Appendix B).
SC 4	No infrastructure and/or erosional features present.
SC 5	No infrastructure and/or erosional features present.
SC 6	The road crosses over Upper Penitencia Creek. A small wooden retaining wall stabilizes the downstream side of the roadway, and has some visible (minor) damage from erosion (Photo 7, Appendix B).
SC 7	No infrastructure and/or erosional features are present.
SC 8	No infrastructure and/or erosional features are present.
SC 9	The road crosses over a seasonal wetland/seep at the headwaters of an ephemeral drainage. A culvert passes under the road (Photo 8, Appendix B).
SC 10	The road crosses over a seasonal wetland just upstream of Pond 7. A culvert passes under the road (Photo 9, Appendix B).
SC 11	No infrastructure and/or erosional features are present.
SC 12	No infrastructure and/or erosional features are present.
SC 13	A pig fence intersects the stream channel, just upstream of the road (Photo 10, Appendix B).
SC 14	No infrastructure and/or erosional features are present.
SC 15	No infrastructure and/or erosional features are present.
SC 16	No infrastructure and/or erosional features are present.

Seven segments of abandoned road are present within Areas 1 and 2. These roads have not been driven in the recent past. Most of these road segments spur off of the main drivable roads and follow ridgelines, although one abandoned road segment travels down a steep hillside to Upper Penitencia Creek in the western portion of the site (Figure 5).

There are various fences (e.g., 4- and 5-strand barbed wire fence and pig fence) present along the boundaries of and within Areas 1 and 2 (Figure 5; Photos 10–12, Appendix B). Barbed wire fencing is present along the northern boundary of Area 1 and the western boundary of Areas 1 and 2, and pig fencing is present near the southern boundaries of Areas 1 and 2 between these areas and the BORR to the south. Additional barbed wire fencing is present in the southern portion of the site, mostly within Area 2, encircling three smaller areas, one of which holds a livestock corral. Pond 4 is also surrounded by fencing. The eastern boundary of Area 1 is not separated from Area 3 by fencing. Likewise, Areas 1 and 2 are not separated by fencing. Eleven gates were observed along the fences within or bordering Areas 1 and 2. Portions of the western and southwestern fencelines within Areas 1 and 2 were mapped using aerial photography, and the condition of this fencing is unknown. However, all fencing seen on the site during the field survey was observed to be in good condition.

There are 10 artificial stock ponds located on Areas 1 and 2; six of these ponds are perennial (Ponds 1 and Ponds 4–8, Figure 5), and four are seasonal (Ponds 2, 3, 9, and 10, Figure 5) (Photos 13–14, Appendix B). These numbered ponds are referred to by various names in site-specific documents (e.g., the CTS Management Plan for Area 1); those names are provided in Table 2). A network of perennial ponds connected by streams and wetlands is present in the center of Areas 1 and 2, providing a year-round source of water for cattle. Eight livestock water troughs are dispersed across the western portions of Areas 1 and 2 (Figure 5). Two of the troughs are associated with the livestock corral and ranch house. All of the troughs are directly abutting or adjacent to ephemeral and intermittent streams (Figure 5), and are fed by piping water to the trough from a nearby spring box (Photos 15–16, Appendix B). Leaky pipes and/or overflowing water troughs have created artificial hydrological conditions in small, discrete patches that are able to support wetland plants.

Table 2. Pond Designations

Pond Number	Pond Name(s)
1	Tule Lake
2	CTS Pond
3	Basin Pond
4	Wood Duck Lake
5	Trout Lake
6	Little Trout or Mallard Lake
7	Leaky, Upper Leaky, or Eagle Lake
8	Lower Leaky Lake
9	Close Gorge Pond
10	Far Gorge Pond

A small ranch house is present in Area 2 (Figure 5). This small house has only one room and was historically used for overnight stays on the Preserve by the Kammerers and their guests (Photo 17, Appendix B). This house has not been used recently. A retaining wall is present between the house and the nearby stream, but no erosional features were observed at this location. A minimal outhouse is located adjacent to the ranch house.

2.4. Adjacent Land Uses

Most properties in the general vicinity of Areas 1 and 2 are undeveloped and have been used long-term for cattle grazing; however, not all properties in the vicinity continue to implement cattle grazing. Lands adjacent to Areas 1 and 2 include a combination of public and private ownership for private ranching, parks, research, and mitigation purposes (Figure 1).

Several protected open space areas abut Areas 1 and 2, including Area 3 of the Preserve, which is located immediately east of Area 1. In addition, the UC's BORR is located immediately to the south, and the SCVWD's Upper Penitencia Creek Property, which is protected by a CE, is located immediately to the west. The remaining properties to the north and northwest of Areas 1 and 2 are owned by private landowners who use those lands for cattle ranching (Figure 1).

2.4.1. Blue Oak Ranch Reserve

The BORR, which is a part of the UC Natural Reserve System (NRS), abuts the southern boundaries of Areas 1 and 2 (Figure 1). The 3,260-acre BORR has been administered by the UC Regents and UC Berkeley as a teaching and research area since the BORR became a part of the NRS in 2007 (University of California at Berkeley [UCB] 2013). TNC holds a CE on the property and the County of Santa Clara has an open space agreement with the UC for the area as well (BORR 2013).

Habitats at the BORR are similar to those within Areas 1 and 2 and include non-native and native grassland, oak woodland/savanna (e.g., blue oak, valley oak, black oak and coast live oak) and scrub. In addition, the BORR has extensive riparian habitat, a series of streams, and 17 ponds (UCB 2013).

Livestock grazing is no longer used as a management tool at BORR. Prescribed burning, conducted in collaboration with the California Department of Forestry and Fire Protection (CAL FIRE), is used instead, as necessary, to reduce thatch accumulation and protect against large, damaging fires; to control invasive plant species; and to enhance wildlife habitat (M. Hamilton pers. comm.).

2.4.2. Rancho Cañada de Pala Preserve Area 3

Vegetation types within Area 3 of the Preserve are similar to those within Areas 1 and 2; they include large tracts of oak forests and woodland, valley oak savanna, and small patches of California annual grassland and chaparral habitat. Dominant tree, shrub, and herbaceous species are similar across the entire Preserve, although portions of Areas 1 and 2 to the west of Poverty Ridge (i.e., within Area 2 and approximately half of Area 1) lack foothill pine (*Pinus sabiniana*), whereas it is a major component of the tree canopy to the east of the ridgeline and on Area 3. Ephemeral and intermittent streams in Area 3 are similar to those in Areas 1 and 2, and lack much distinctive riparian tree development. Streams to the west of Poverty Ridge drain into Upper Penitencia Creek, while streams to the east (i.e., within Area 3 and approximately half of Area 1) drain into Arroyo Hondo, the only perennial stream on the Preserve. Due to the steep gradient and rocky slopes leading down to Arroyo Hondo as well as the dense woody vegetation within much of Area 3, livestock more heavily utilize Areas 1 and 2. As a result, both human- and livestock-related disturbances are greater, and occurrences of non-native invasive plant species are more frequent on Areas 1 and 2 of the Preserve. In addition, water features utilized by cattle are more abundant on Areas 1 and 2, all of which have been artificially created to support ranching activities. No ponds are present in Area 3.

TNC has implemented a managed grazing program within all areas of the Preserve since 2001. With the exception of livestock grazing, TNC has not implemented other measures (e.g., use of herbicides) to manage invasive vegetation or weed infestations (S. Gennet pers. comm.).

2.4.3. Upper Penitencia Creek Property

From 1976 until December 2012, the 222-acre Upper Penitencia Creek Property was part of the larger 2,000-acre ranch owned by the Kammerer family. In December 2012, the OSA purchased this 222-acre area surrounding the upper end of Cherry Flat Reservoir with the intention of partnering with the SCVWD. Ownership was transferred to the SCVWD in December 2014 for the purpose of providing mitigation in perpetuity for impacts associated with the SCVWD's 2002 Multi-Year SMP under the S&WPP. The SCVWD retains ownership of the Upper Penitencia Creek Property, with a perpetual CE held by OSA on an approximately 201-acre portion of the property.

Similar to the Preserve, the Upper Penitencia Creek Property was historically used for cattle grazing. From the mid-1970s (or earlier) until December 2012, no formal grazing regime was implemented on the property, and it was lightly grazed using a seasonal grazing strategy. One perennial pond, three seasonal ponds, and one developed spring are present on the Upper Penitencia Creek Property. The property is currently managed by OSA per the 2014 LTMP and CE (SCVWD 2014). Cattle grazing Areas 1 and 2 of the Preserve also graze the eastern side of the Upper Penitencia Creek Property, which is not separated from the Preserve by fencing (Figure 5).

2.4.4. Other Surrounding Lands

Areas 1 and 2 of the Preserve are bordered by private ranch lands to the north and northwest (Figure 1). In the larger surrounding area, the Preserve is surrounded by private ranch lands and a growing, increasingly contiguous swath of open space and conservation lands in the Mount Hamilton region that currently includes San Francisco Public Utilities Commission lands to the north, OSA lands to the west, and Joseph D. Grant County Park to the south (Figure 1). These conservation lands include the OSA's Moore Property located downstream of Cherry Flat Reservoir, purchased in part for the S&WPP, and with a CE held by the SCVWD.

3.0 HABITAT AND SPECIES DESCRIPTIONS

3.1. Vegetation Types

The majority of Areas 1 and 2 is characterized by the steep hillsides of Poverty Ridge. Dense oak forest occurs along the streams that drain to Upper Penitencia Creek, but generally, more open woodland and savanna vegetation types are present on the majority of Areas 1 and 2. Large tracts of California annual grassland and two small patches of northern mixed/chamise chaparral also cover the south-facing slopes on Areas 1 and 2. In addition, small areas of rock outcroppings, talus, and unstable mélange are interspersed across all terrestrial vegetation types. The hillslopes are bisected by ephemeral and intermittent streams that flow down the south- and west-facing slopes into Upper Penitencia Creek, and down the east-facing slopes through Area 3 and eventually to Arroyo Hondo (Figure 3). Ten perennial and seasonal ponds are associated with these drainages, and several wetlands occur along the stream channels and around the edges of ponds. The vegetation types within Areas 1 and 2 are provided in Table 3 and depicted on Figure 6.

Table 3. Vegetation Types

Vegetation Type	Overall Acreages (ac)
Blue and Valley Oak Woodland	447.7
Valley Oak Savanna	280.8
Mixed Oak Forest	196.6
California Annual Grassland	194.4
Foothill Pine/Oak Woodland	88.0
Northern Mixed/Chamise Chaparral	4.5
Perennial Pond	6.1
Seasonal Pond	0.7
Wetland	2.6
Total acreage	1,221.4

The vegetation map (Figure 6) and vegetation type descriptions below are based on surveys conducted by H. T. Harvey & Associates in May and June 2015. In addition to field observations, vegetation signatures visible on aerial photographs (Google Inc. 2016) and information from the Santa Clara Valley Habitat Plan (VHP; ICF International 2012) were used to assist in the creation of the vegetation map and vegetation type descriptions for Areas 1 and 2. The *Jepson Manual, second edition* (Baldwin et al. 2012) was the principal taxonomic reference used for the botanical work. The vegetation type descriptions that follow also indicate the corresponding habitat classifications designated by the VHP (ICF International 2012), Holland (1986), and the California Wildlife Habitat Relationships System (CWHR) (California Department of Fish and Game [CDFG] 1988), where appropriate. Holland's (1986) habitat classifications were developed as a "coarse filter" to capture the majority of the state of California's biota for the purpose of including natural communities in the California Natural Diversity Database (CNDDB), and it is patterned after TNC's Natural Heritage Program methodology. The CWHR System is a wildlife information system and predictive model for the state's common amphibian, reptile, bird, and mammal species (CDFG 1988).

3.1.1. Blue and Valley Oak Woodland

This vegetation type occurs west of the topmost edge of Poverty Ridge in Areas 1 and 2 (Figure 6; Photos 18–19, Appendix B). The tree canopy of this woodland vegetation type is airy and less dense compared to forest vegetation types. The dominant species include blue oak (*Quercus douglasii*) and valley oak (*Quercus lobata*), and black oak (*Quercus kelloggii*) and California buckeye (*Aesculus californica*) are also quite common throughout. The shrub layer in the understory is also sparse in comparison to forested habitats, and includes poison oak (*Toxicodendron diversilobum*), California coffeeberry (*Frangula californica*), various species of snowberry (*Symphoricarpos mollis* and *S. albus* var. *laevigatus*), and coyotebrush (*Baccharis pilularis* ssp. *consanguinea*).

Beneath a dense tree canopy and shrub layer, the ground is largely covered by pine needles and oak leaf litter. The composition of vegetation in the herbaceous layer, where it exists under canopy openings, is almost identical to that of the California annual grassland vegetation type described below under Section 3.1.4, which intergrades with woodlands and savanna on Areas 1 and 2. Grassy areas are dominated by a suite of non-natives that are common across much of Areas 1 and 2, such as wild oats (*Avena fatua* and *A. barbata*), annual dogtail (*Cynosurus*

echinatus), rattail sixweeks grass (*Festuca microstachys*) soft chess (*Bromus hordeaceus*), and Spanish brome (*Bromus madritensis* ssp. *rubens*). Small patches dominated by native grasses are also present in the foothill pine/oak woodland vegetation type, and are composed of wildrye (*Elymus glaucus* and *E. triticoides*), various species of melicgrass (*Melica imperfecta*, *M. torreyana*, and *M. californica*), one-sided bluegrass (*Poa secunda* ssp. *secunda*), purple needlegrass (*Stipa pulchra*), and foothill needlegrass (*Stipa lepida*). The composition of forbs in the understory will shift throughout the growing season, and at the time of the field surveys, common and identifiable species included spreading hedgeparsley, common Pacific pea (*Lathyrus vestitus* var. *vestitus*), Ithuriel's spear (*Triteleia laxa*), yellow mariposa (*Calochortus luteus*), smooth cat's ear (*Hypochaeris glabra*), and gumweed madia (*Madia gracilis*). Serpentine inclusions of the Henneke soil series may occur within open grassy areas of blue and valley oak woodland, as several of the common native bunchgrasses observed in this habitat are serpentine-adapted, including one-sided bluegrass, foothill needlegrass, and purple needlegrass (Holland 1986).

Both the VHP and CWHR include a blue oak woodland habitat type (ICF International 2012 and CDFG 1988). Holland (1986) habitat types also include a blue oak woodland/blue oak series classification.

3.1.2. Valley Oak Savanna

Valley oak savanna occurs on the south- and west-facing slopes of Areas 1 and 2, and is characterized by widely scattered trees and a grassy understory (Figure 6; Photos 20–21, Appendix B). Tree cover is typically 25 percent or less, and is dominated by valley oak, although blue oaks also occur in this vegetation type. Valley oak savanna intergrades with other woodland, chaparral, and grassland vegetation types in Areas 1 and 2. Shrubs are generally lacking in the understory. The herbaceous layer is similar to that of the blue and valley oak woodland (Section 3.1.1), California annual grassland (Section 3.1.4), and foothill pine/oak woodland (Section 3.1.5).

This vegetation type is classified as valley oak woodland in the VHP (ICF International 2012), Holland (1986), and in the CWHR habitat classification scheme (CDFG 1988). Furthermore, it is considered a sensitive natural community the CDFW and is listed in the CNDDDB (2016).

3.1.3. Mixed Oak Forest

Stands of mixed oak forest generally occur along ephemeral and intermittent streams in Areas 1 and 2 (Figure 6; Photo 22, Appendix B). This vegetation type is distinct from other oak woodland vegetation types in that it has a relatively closed canopy, and the vegetation signature on aerial photographs shows a variety of colors and textures indicative of co-dominant evergreen and deciduous tree species (Google Inc. 2016). The canopy is composed of a variety of evergreen trees, such as coast live oak (*Quercus agrifolia*); as well as deciduous trees including California bay (*Umbellularia californica*), blue oak, valley oak, and black oak. The relative abundance of the dominant species varies according to ecological gradients. For example, coast live oak and California bay are the most shade tolerant; they thrive in mesic conditions and occur toward the interior of stands of mixed oak forest. In contrast, blue oak and valley oak are the least shade tolerant tend to grow in more open woodland settings on the outer edges of this vegetation type. Blue oak is more tolerant of dry and rocky sites, whereas valley oak requires fertile soils that are common in bottomlands or the lower foothills of the Diablo Range. Interior live oak and black oak are intermediate with regard to shade and moisture tolerance (UC 2015).

The understory cover and composition of shrubs and herbaceous vegetation within Areas 1 and 2 is variable, with greater cover in areas of less dense overstory. Dominant shrub species include poison oak, various species of snowberry, California coffeeberry, and toyon (*Heteromeles arbutifolia*). A thick layer of leaf litter generally covered the ground, precluding the growth of herbaceous species, although trailing blackberry (*Rubus ursinus*) and spreading hedgeparsley (*Torilis arvensis*) were scattered throughout.

The mixed oak forest vegetation type most closely resembles the mixed oak woodland and forest habitat described in the VHP (ICF International 2012) and the coastal oak woodland habitat type designated by the CWHR (CDFG 1988). The coast live oak woodland of Holland (1986) best matches this vegetation type, as it tends to be distributed in patches on protected slopes and in shaded ravines.

3.1.4. California Annual Grassland

Several large tracts of California annual grassland occur on Areas 1 and 2 on south- and west-facing slopes; however, this vegetation type is also a significant component in woodland, savanna, and chaparral vegetation types (Figure 6; Photos 21 and 23, Appendix B). California annual grassland lacks both trees and shrubs. It is dominated by a suite of non-native grasses including wild oats, rattail sixweeks grass, annual dogtail grass, soft chess, and Spanish brome. As previously mentioned (see Section 3.1.1 above), patches dominated by native grasses, some of which are serpentine-adapted species (such as one-sided bluegrass, purple needlegrass, and foothill needlegrass) are also interspersed within this vegetation type. Many of the forbs in this vegetation type had senesced by the time of the May and June 2015 field surveys; however, small areas of grassland were dominated by California cudweed (*Pseudognaphalium californicum*). In addition, smooth cat's ear (*Hypochaeris glabra*), Ithuriel's spear, yellow mariposa, and gumweed media were common throughout. Rock outcroppings and talus were also observed across this area.

Overall, grasslands in Areas 1 and 2 are typical of lightly disturbed grasslands in the region and are similar to the California annual grassland habitat described by the VHP (ICF International 2012), the non-native grassland type described by Holland (1986), and the annual grassland designation in the CWHR habitat classification scheme (CDFG 1988). However, small areas within grasslands on Areas 1 and 2 are dominated by serpentine-adapted native grasses, such as one-sided bluegrass, purple needlegrass, and foothill needlegrass. These areas would correspond to serpentine bunchgrass grassland habitat described by both the VHP (ICF International 2012) and Holland (1986).

3.1.5. Foothill Pine/Oak Woodland

Foothill pine/oak woodland is co-dominated by gray pine (*Pinus sabiniana*), blue oak, and valley oak (Photos 24–25, Appendix B). The shrub and herbaceous layers of this vegetation type are identical to the blue and valley oak woodland described above under Section 3.1.1. Serpentine inclusions of the Henneke soil series likely occur within this vegetation type, as foothill pine is tolerant of serpentine edaphic conditions, and several of the common native bunchgrasses observed in Area 3 are serpentine-adapted, including one-sided bluegrass, foothill needlegrass, and purple needlegrass (Holland 1986 and Safford et al. 2005).

Both the VHP and CWHR include a foothill pine/oak woodland habitat (ICF International 2012 and CDFG 1988). Holland (1986) habitat types also include a “digger pine”/oak woodland/blue oak series classification.

3.1.6. Northern Mixed/Chamise Chaparral

Two small, discrete patches of chaparral are present on the dry south-facing slopes of Areas 1 and 2 on rocky, well-drained soils. Very few trees are present in this vegetation type; the shrub layer is a dense thicket of chamise (*Adenostema fasciculatum* var. *fasciculatum*). Patches of chaparral on Areas 1 and 2 are relatively inaccessible as a result of steep slopes, and being surrounded by oak forest with a dense understory of poison oak. Biologists were able to view the chaparral through binoculars from the opposing hillside during the field surveys, and to visit this habitat in Area 3 of the Preserve where it is accessible. Aerial photographs (Google Inc. 2016) also assisted in mapping and determining the dominant vegetation, as the color signature of chamise is dark green and distinct from other shrubs that commonly dominate chaparral habitats in vicinity, such as coyotebrush and California sage (*Artemisia californica*). In Area 3 of the Preserve, the chaparral vegetation type is dominated by chamise (Photo 26, Appendix B). Various species of buckwheat, such as slender woolly buckwheat (*Eriogonum gracile*) and coyote mint (*Monardella villosa* ssp. *villosa*) were observed in the herbaceous layer at the time of the field surveys. Grass species observed in the woodland, savanna, and grassland vegetation types on the Preserve (see Section 3.1.1 above for a detailed description) were also common along the edges of chaparral in areas lacking shrubs.

The VHP (ICF International 2012) and Holland (1986) also include a northern mixed/chamise chaparral habitat classification that matches the vegetation type observed on the Preserve, and it most closely resembles the chamise/redshank chaparral habitat classification under the CWHR, which includes impenetrable stands composed entirely of chamise (CDFG 1988).

3.1.7. Perennial Pond

There are six perennial, artificial stock ponds (Ponds 1 and 4–8, Figures 5 and 6) in Areas 1 and 2 (Photos 13 and 27–31, Appendix B). All of these ponds held surface water during the May and June 2015 field surveys. The depth of these ponds is highly variable. Most range from several feet to approximately 15 feet deep over the course of the year; however, Pond 7 can approach depths of 40 feet (L. Serpa, pers. comm.). Seasonal wetlands and perennial marshes surround the edges of the perennial ponds (see Section 3.1.9 below), and also occur in the ephemeral and intermittent stream networks to which the ponds are connected. All of the perennial ponds were man-made to provide a year-round water source for cattle, although Pond 5 is currently surrounded by fencing to exclude livestock (Figure 5). These ponds are fed by runoff from streams and some are connected to groundwater. In addition, water is piped in and out of the ponds as needed to maintain desired water levels. Berms have been constructed around the perimeters of the ponds and serve as dams to prevent water from escaping. In some cases, water leaks through these berms, creating wetlands downstream.

The VHP includes a pond habitat classification (ICF International 2012), whereas the CWHR includes a lacustrine habitat classification that is described as an inland depression that contains standing water (CDFG 1988). While Holland (1986) includes marsh and vernal pool habitat types, open water is not addressed under this habitat classification scheme, and there is no equivalent to the perennial ponds in Areas 1 and 2.

3.1.8. Seasonal Pond

There are four seasonal, artificial stock ponds (Ponds 2, 3, 9, and 10, Figure 6) located in Areas 1 and 2 (Photos 14 and 32–34, Appendix B). Ponds 3 and 10 were completely dry during the

May and June field surveys, while Ponds 2 and 9 still held up to 1 foot of surface water but are expected to completely dry out over the course of the dry season (May through October). A seasonal wetland was evident in the center of Pond 3, and hydrophytic vegetation is likely to become apparent in other seasonal ponds as the water level recedes. All of the seasonal ponds are man-made to provide a water source for cattle during the wet season, and berms have been constructed around their perimeters to help retain water. Each of the ponds is located along an ephemeral or intermittent stream (with the exception of Pond 10) and is partially supported by runoff and potentially also by groundwater. All of the ponds are located in open areas of woodland, savanna, and grassland vegetation types.

The VHP includes a pond habitat classification (ICF International 2012), whereas the CWHR includes a lacustrine habitat classification that resembles the seasonal pond description (CDFG 1988). While Holland (1986) includes marsh and vernal pool habitat types, open water and seasonal wetlands are not addressed under this habitat classification scheme, and there is no equivalent to the seasonal ponds on Areas 1 and 2.

3.1.9. Wetland

Several small patches of wetland habitat are scattered across Areas 1 and 2, all of which are associated with ephemeral and intermittent streams and/or ponds (Figure 6). Perennial marsh wetlands surround the perimeter of perennial ponds in narrow bands that are several feet wide (Photos 27–31, Appendix B), and are also present within and directly abutting streams (Photos 35–36, Appendix B). Various forbs and graminoids that are known to occur in wetlands at least 67 percent of the time (Environmental Laboratory 1987), such as seep monkeyflower (*Mimulus guttatus*), watercress (*Nasturtium officinale*), common spikerish (*Eleocharis macrostachya*), toadrush (*Juncus bufonius*), Pacific rush (*Juncus effusus* ssp. *pacificus*), and Mexican rush (*Juncus mexicanus*) co-dominate these wetlands. Least duckweed (*Lemna minuta*) also coats the surface of the water in many locations (Photo 37, Appendix B). Seasonal wetlands occur at the headwaters of streams and within seasonal ponds (Photo 33, Appendix B); they are dominated by plant species that are equally likely to occur in wetlands and uplands, such as Italian ryegrass (*Festuca perennis*) and seaside barley (*Hordeum marinum*). Seasonal wetlands exhibit a connection to surface water during and immediately following large storm events or during the wet season, and may also be found in areas where groundwater is seeping from the soil surface. For instance, a seep was identified at the headwaters of a stream at SC 9 (Photo 38, Appendix B). Although wetlands were mapped during the field surveys, their full extent within Areas 1 and 2 could not be assessed, and thus, it is likely that additional perennial marsh and seasonal wetlands are present in Areas 1 and 2.

The VHP describes a coastal and valley freshwater marsh habitat classification that closely matches the wetland habitat in Areas 1 and 2; it is dominated by emergent herbaceous plants with either intermittent flooded or perennially saturated soils (ICF International 2012). The wetlands on the site resemble the freshwater marsh/duckweed series and freshwater seep/spikerush series habitats described by Holland (1986), and correspond to the wet meadow habitat classification under the CWHR, which is dominated by rushes (*Juncus* spp.) (CDFG 1988).

3.2. Stream Corridor Characteristics

3.2.1. Vegetation

Vegetation types along ephemeral and intermittent streams within Areas 1 and 2 are consistent with the terrestrial habitats described above under Section 3.1, without any distinctive riparian community. These streams primarily flow through dense mixed oak forest, and the majority of vegetation observed in drainages during the field surveys was composed of native woody species. However, some stream reaches traverse woodland, savanna, and grassland habitats, and their channels support herbaceous species. In addition, the wetlands on the site (see Section 3.1.9) are associated with stream networks, particularly those which connect Ponds 4–8 (Figure 6).

3.2.2. Physical Characteristics

Stream networks consisting of ephemeral and intermittent drainages are spread across Areas 1 and 2, totaling approximately 23.1 miles in stream length (Figure 3). None of the streams on Areas 1 and 2 are mapped as perennial; however, a portion of Upper Penitencia Creek contained substantial flowing water at the time of the May–June 2015 surveys, and this section of the stream may be perennial, especially in years of high local rainfall.

Upper Penitencia Creek drains a 24 square mile area within the larger Coyote Creek watershed; it originates from Poverty Ridge, less than 1 mile from the Preserve, and provides water to Cherry Flat Reservoir (Figure 6; Photo 39, Appendix B). Access to much of the mainstem of Upper Penitencia Creek in Areas 1 and 2 is precluded by steep slopes and dense cover of poison oak. However, at the time of the May–June field surveys, biologists could hear substantial flowing water in a portion of the channel near the southwest corner of the Preserve (Photo 40, Appendix B). Farther downstream on the neighboring Upper Penitencia Creek Preserve to the west (Section 2.5.3), the biologists were able to access the channel during the May–June surveys and determined that the streambed was dry just above Cherry Flat Reservoir. Thus, streamflow goes belowground in some areas. The Cherry Flat dam can be opened and closed to control water flows downstream, and is used to provide a summer water source for Upper Penitencia Creek, which flows through Alum Rock Park, and prevents flooding downstream during the winter. During the field surveys, several inches of surface water were observed in the reach of Upper Penitencia Creek just below Cherry Flat Reservoir. After Upper Penitencia Creek flows through Alum Rock Park it is joined by Arroyo Aguague, another perennial stream. The creek then continues westward across the Santa Clara Valley floor and through the City of San José and joins Coyote Creek approximately 10 miles upstream of San Francisco Bay.

The substrate of Upper Penitencia Creek within Areas 1 and 2 consists of a mosaic of boulders, rock, and soil, although some segments of the channel near the top of Poverty Ridge, where a drivable road crosses the stream, support upland grasses (SC 6, Figure 6; Photo 7, Appendix B). Mixed oak forest is sustained by the water supply, and native woody species occur along the edge of the low-flow channel. Steep ravines on either side of the channel within Areas 1 and 2 prevent the channel from meandering. As a result of the surrounding terrain, cattle cannot access much of Upper Penitencia Creek or its riparian corridor. Moreover, little to no evidence of anthropogenic disturbance was observed in and around the stream during the field surveys.

Intermittent and ephemeral stream networks have a seasonal connection to groundwater or convey flows during and immediately following large storm events, respectively, but all are usually dry by summer. Representative reaches of these streams are depicted in Photos 2, 7, and 10 (Appendix B). These streams originate from the hillsides of Poverty Ridge. Streams that flow down the east-facing slopes of Areas 1 and 2 drain to Arroyo Hondo, a perennial stream that flows along the eastern boundary of Area 3 of the Preserve. In contrast, streams that flow

down the west- and south-facing slopes of Areas 1 and 2 drain to Upper Penitencia Creek. These ephemeral and intermittent streams are primarily fed by surface water from precipitation; however, natural seeps or springs may occur at the headwaters of these drainages where the groundwater table approaches or tops the soil surface. First-order streams are the smallest on Areas 1 and 2; these streambeds have a soil substrate with little rock or cobble that may support upland, annual herbaceous vegetation, and most only carry water during and just after storms. Second-order or greater streams are fed by networks of first-order tributaries and are typically higher gradient, steep-sided, and incised. Their beds and banks consist of a mosaic of cobbles and boulders. Exposed roots and woody debris are variously distributed within second-order streams.

The drivable roads in Areas 1 and 2 cross these streams at 16 locations (SC 1–SC 16, Figure 5). Most of these stream crossings are ford crossings that lack infrastructure, although culverts and wooden retaining walls are present at SC 3, SC 6, SC 9, and SC 10 (Table 1). The majority of the ephemeral and intermittent streams within Areas 1 and 2 appear laterally stable with the exception of large gullies near SC 1 and SC 2 that have been formed by past storm events (Photos 1–4, Appendix B). However, no significant erosional damage was observed at any of the stream crossings in Areas 1 and 2. Limited areas of path formation due to use by cattle and wildlife are present on the stream banks and beds, in addition to some evidence of grazed and/or browsed vegetation by cattle and deer.

The San Francisco Bay Basin (Region 2) Water Quality Control Plan identifies the following beneficial uses within Upper Penitencia Creek: cold freshwater habitat, groundwater recharge, freshwater replenishment, fish migration, preservation of rare and endangered species, fish spawning habitat, warm freshwater habitat, and wildlife habitat (California Regional Water Quality Control Board 2015). The stream habitat in Upper Penitencia Creek in Areas 1 and 2 supports resident rainbow trout (*Oncorhynchus mykiss*) (Leidy et al. 2005, Smith 2013) that use these habitats, but does not support anadromous salmonids or other rare and endangered fish species (see Section 3.3 below).

3.3. Sensitive Species

There are several sensitive species known or expected to utilize Areas 1 and 2, including the CTS, a state and federally threatened species; the CRLF, a federally threatened species and a state species of special concern; and the FYLF and WPT, which are California species of special concern.

The federally threatened Central California Coast steelhead (*Oncorhynchus mykiss*) occurred historically in Upper Penitencia Creek (Leidy et al. 2005). However, the dam at Cherry Flat Reservoir is an impassable barrier to the migration of anadromous fish above the dam. As a result, anadromous fish such as steelhead no longer occur upstream of the dam and are absent from Areas 1 and 2 (Leidy et al. 2005, Smith 2013). Critical habitat for steelhead is not designated within any streams above Cherry Flat Reservoir (National Marine Fisheries Service 2005).

3.3.1. California Tiger Salamander (CTS)

The CTS, which is state and federally listed as threatened, was observed (eggs and larvae) in nine of the 10 ponds in Areas 1 and 2 in January 2015, and in seven of these 10 ponds in February 2016 (L. Serpa pers.comm.). The species is also known to occur in the surrounding region, including at the adjacent BORR (CNDDDB 2016, M. Hamilton pers. comm.). All of Area 1

and most of Area 2 include U.S. Fish and Wildlife Service (USFWS) designated critical habitat for this species (Unit 5, Poverty Ridge Unit; Figure 7).

Based on the May–June site surveys and a review of aerial topography, no major barriers or substantial impediments to dispersal occur between ponds known to be occupied by CTS on and off-site and all portions of Areas 1 and 2. Thus, CTS have the potential to occur anywhere on Areas 1 and 2 and to disperse between nearby populations and Areas 1 and 2.

All of the ponds in Areas 1 and 2 are at least several feet deep when full and provide potential breeding habitat for CTS in years of adequate rainfall. At least 20 bullfrogs (*Lithobates catesbeianus*) and several red-eared sliders (*Trachemys scripta*) were observed in Pond 1 during the May–June surveys, and mosquitofish (*Gambusia affinis*) are known to occur in Pond 7 (L. Serpa, pers. comm.). Although these non-native species may prey upon and/or compete with CTS, they do not necessarily preclude the presence of CTS or attempted breeding by CTS. No aquatic predators were observed in other ponds on the site during the May–June surveys.

The ephemeral and intermittent streams within Areas 1 and 2 do not provide suitable breeding habitat for CTS; these streams do not provide water long enough for larval development, and flow in all streams on the Preserve is flashy enough that eggs or larvae would be washed away if eggs were laid in the streams.

CTS depend on burrows of California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gophers (*Thomomys bottae*) to provide moist subterranean refugia during the non-breeding (dry) season as well as during overland movements to and from breeding areas during the wet season. The uplands within Areas 1 and 2 consist of woodland habitats interspersed with grasslands. Burrows of California ground squirrels were observed in extremely high abundance throughout Areas 1 and 2 during the May–June 2015 site visits, and many burrows of Botta's pocket gophers were observed as well. Thus, these uplands provide high-quality habitat CTS breeding in the on-site ponds.

3.3.2. California Red-legged Frog (CRLF)

The CRLF, a federally threatened species and a state species of special concern, is known to occur in the surrounding region (CNDDDB 2016). Although no CRLF have been documented within Areas 1 and 2 or the larger Preserve (S. Gennet, L. Serpa pers. comm.), the western halves of Areas 1 and 2 overlap USFWS-designated critical habitat for this species (Unit STC-1; Figure 7).

CRLF have been documented in a number of locations within dispersal distance¹ of Areas 1 and 2 (Figure 7). CRLF are known to occur in at least one pond at the BORR property immediately south of the Preserve (M. Hamilton pers. comm.). Based on a review of aerial topography, no major barriers or substantial impediments to dispersal occur between Areas 1 and 2 and known CRLF occurrences or other potential breeding ponds in the vicinity of the Preserve. Thus, if CRLF are present in the vicinity of Areas 1 and 2, they could disperse to the site from adjacent areas.

¹ The USFWS considers one mile to be typical of the CRLF's dispersal capabilities (USFWS 2005), although CRLF have been recorded dispersing more than 2 miles between aquatic habitats (Bulger et al. 2003).

If CRLF were currently breeding in Areas 1 or 2, they likely would have been detected during CTS monitoring surveys performed by TNC, yet CRLF have not been recorded during such surveys (L. Serpa pers. comm.). However, all of the ponds within Areas 1 and 2 are at least several feet deep when full and provide potential breeding habitat for CRLF in years of adequate rainfall. Although the bullfrogs, mosquitofish, and red-eared sliders present in Ponds 1 and 7 may prey upon CRLF, their presence does not preclude the presence of CRLF or breeding by CRLF.

The ephemeral and intermittent streams within Areas 1 and 2 provide potential non-breeding foraging and dispersal habitat and aquatic refugia for CRLF when they contain water. Although dense vegetative cover is absent from most of these stream reaches, rock crevices and debris provide suitable refugia for CRLF. During the wet season, when most CRLF dispersal occurs, these streams would facilitate dispersal of CRLF across the landscape. In addition, upland habitat surrounding streams and ponds within Areas 1 and 2 includes numerous small mammal burrows which can be used by CRLF as upland refugia.

Based on the known occurrences of CRLF near Areas 1 and 2 and the lack of barriers to dispersal between these occurrences/ponds and Area 1 and 2 streams and ponds, it is likely that CRLF occur within Areas 1 and 2 at least on occasion, and the species may breed in ponds in Areas 1 and 2 in the future.

3.3.3. Foothill Yellow-legged Frog (FYLF)

The FYLF, a state species of special concern, is known to occur in Arroyo Hondo at the southeast corner of Area 3 and within the BORR to the south (CNDDDB 2016, Figure 7), and has been observed by TNC staff along the entire section of Arroyo Hondo within Area 3 (L. Serpa pers. comm.). TNC staff have not observed FYLF in Areas 1 or 2, but the CNDDDB occurrence of this species slightly overlaps the southernmost portion of Area 1 and the westernmost portion of Area 2 (Figure 7). Based on a review of aerial topography, no barriers to dispersal are present between this occurrence and Areas 1 and 2 and FYLF could potentially disperse upstream into Areas 1 and 2 from Arroyo Hondo.

No perennial streams are present on Areas 1 and 2 to provide breeding habitat or high-quality foraging habitat for FYLF. The ephemeral and intermittent streams within Areas 1 and 2 provide potential nonbreeding habitat for FYLF when they contain water. No pools were observed along these streams during the May–June 2015 site visit; however, if pools were present along these streams, which may occur in wet years and/or during the wet season, they would provide suitable dispersal and foraging habitat for FYLF. FYLF are known to travel up ephemeral and intermittent streams when there is abundant water, and they may use small, isolated pools for foraging and predator avoidance. Thus, FYLF may occur along these streams to some extent when water is present, although they are expected to occur primarily along perennially stream habitats outside of Areas 1 and 2.

3.3.4. Western Pond Turtle (WPT)

The WPT, a state species of special concern, is known to occur in lower reaches of Arroyo Hondo far downstream from the site, and a record from Isabel Creek is present approximately 4.1 miles to the southeast upstream of Area 3 in Isabel Creek (CNDDDB 2016). This species has been observed along the entire reach of Arroyo Hondo within Area 3 by TNC staff, and in 2016 was observed in Areas 1 and 2 in Ponds 1, 6, and 7 by TNC staff (L. Serpa, pers. comm.).

The perennial ponds in Areas 1 and 2 provide high-quality habitat for WPT, as these ponds contain year-round water with suitable basking sites and foraging opportunities. Potentially suitable nesting habitat for WPT occurs in upland areas surrounding these ponds. WPT may disperse across upland habitats in Areas 1 and 2. Streams in these areas also provide potential dispersal habitat for WPT when they contain water, and both seasonal ponds and pools along streams (potentially present in wet years) provide limited foraging habitat for this species. Thus, WPT may occur in upland portions of Areas 1 and 2 and along ephemeral and intermittent drainages when dispersing or nesting, but are primarily expected to occur in perennial ponds.

3.3.5. American Badger

The American badger, a state species of special concern, has been observed in Area 2 of the Preserve by TNC staff (L. Serpa, pers. comm.). Suitable denning and foraging habitat for badgers is present in open habitats throughout Areas 1 and 2, and areas of expansive open grasslands with high concentrations of California ground squirrels (one of the principal prey of the badger) provide high-quality habitat for this species. Badgers denning in the vicinity could potentially occur within Areas 1 and 2 year-round.

3.3.6. Other Sensitive Species

Eleven special-status plant species potentially occur in Areas 1 and 2 for the following reasons: (1) suitable habitat for the species is present; (2) specific edaphic requirements, possibly including serpentine soils, are present; (3) the species is known to occur within the vicinity of Areas 1 and 2 (defined as a 5-mile radius surrounding the Preserve), and (4) Areas 1 and 2 are within the known elevation range of the species. Potentially occurring special-status plant species and their corresponding federal and state listing and the California Native Plant Society rank (CRPR) are presented in Table 4.

Historically, arcuate bush mallow (*Malacothamnus arcuatus*) and fragrant fritillary (*Fritillaria liliacea*) have been recorded approximately 2 miles west of Areas 1 and 2 near Alum Rock Park and Upper Penitencia Creek (CNDDDB 2016). Other historical records of special-status plant species in the vicinity of Areas 1 and 2 include Mount Day rockcress (*Boechea rubicundula*), known from only one population on Oak Ridge near the summit of Mount Day, directly east of Arroyo Hondo (CNDDDB 2016). The current status of this historical population is not known, as the majority of the steep hillsides and ravines of Mount Hamilton and the surrounding mountains are privately owned, and thus survey effort on these lands has been low. There is some potential for arcuate bush mallow and Mount Day rockcress to be present on rocky slopes or chaparral vegetation types on Areas 1 and 2, whereas fragrant fritillary may occur in open grassy areas, seeps, or on serpentine inclusions, as it is a weak indicator of serpentine soils.

Extant populations of several special-status plant species have been recorded in the vicinity of Areas 1 and 2 more recently (i.e., within the past two decades) (CNDDDB 2016). Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*) has been observed on the Preserve by TNC staff (L. Serpa, pers. comm.). Santa Cruz mountain pussy paws (*Calyptridium parryi* var. *hesseae*) is known from fewer than 20 occurrences across the state of California, and an extant population occurs near Black Mountain to the northeast of Areas 1 and 2. Several extant populations of most-beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*) have also been observed to the north of Areas 1 and 2 in the Arroyo Hondo canyon. Along Kincaid Road to the southeast of Areas 1 and 2, near the Lick Observatory and Mount Hamilton, showy madia (*Madia radiata*), bent-flowered fiddleneck (*Amsinckia lunaris*), chaparral harebell (*Campanula exigua*), and Santa Clara red ribbons have all been recently documented (CNDDDB 2016). Chaparral harebell has

been recently observed at several other locations in the vicinity of Areas 1 and 2; on Furtado Open Space Preserve near Alum Rock Falls Road to the west, in the vicinity of Mount Day and Oak Ridge, and on the BORR (CNDDDB 2016 and Bainbridge 2008). Other special-status plants found on the BORR include Santa Clara red ribbons, Santa Clara thorn mint (*Acanthomintha lanceolata*), and serpentine leptosiphon (*Leptosiphon ambiguus*) (Bainbridge 2008).

Showy madia has the potential to occur on clayey soils or shale in open grassy areas on Areas 1 and 2; it is often (but not always) found on serpentine soils (Baldwin et al. 2012). Santa Cruz mountain pussy paws may be present on gravelly soils in all woodland and chaparral vegetation types on Areas 1 and 2 Santa Clara red ribbons could potentially occur in wooded or forested areas of the Preserve. Chaparral harebell, most-beautiful jewelflower, and Santa Clara thorn mint are all strong indicator species of serpentine soils, and may be present on chaparral vegetation types, open grassy areas, or on rock/talus slopes. Serpentine leptosiphon is a strict serpentine endemic, and would only be expected to occur on the Henneke soil inclusions within grassy areas of Areas 1 and 2.

In addition to the species mentioned above, a number of special-status wildlife species could potentially occur within Areas 1 and 2, based on the presence of suitable habitat and/or documented occurrences nearby. Table 4 provides a comprehensive list of all special-status plant and wildlife species that may occur within Areas 1 and 2. Species that have been observed within Areas 1 and 2 are indicated in bold type.

Table 4. Potential Sensitive Species¹

Common Name	Scientific Name	Federal Status²	State Status²	Other Status²
<i>AMPHIBIANS</i>				
California tiger salamander	<i>Ambystoma californiense</i>	Threatened	Threatened	
California red-legged frog	<i>Rana draytonii</i>	Threatened	SSC	
Foothill yellow-legged frog	<i>Rana boylei</i>	None	SSC	
<i>REPTILES</i>				
Western pond turtle	<i>Emys marmorata</i>	None	SSC	
<i>BIRDS</i>				
Cooper's hawk	<i>Accipiter cooperii</i>	None	WL	IUCN:LC
Sharp-shinned hawk	<i>Accipiter striatus</i>	None	WL	
Golden eagle	<i>Aquila chrysaetos</i>	BCC	FP	IUCN:LC
Ferruginous hawk	<i>Buteo regalis</i>	BCC	WL	IUCN:LC
Northern harrier	<i>Circus cyaneus</i>	None	SSC	IUCN:LC
White-tailed kite	<i>Elanus leucurus</i>	None	FP	IUCN:LC
Bald eagle	<i>Haliaeetus leucocephalus</i>	BCC	Endangered, FP	IUCN:LC
Osprey	<i>Pandion haliaetus</i>	None	WL	IUCN:LC
Merlin	<i>Falco columbarius</i>	None	WL	IUCN:LC
Prairie falcon	<i>Falco mexicanus</i>		WL	IUCN:LC
American peregrine falcon	<i>Falco peregrinus anatum</i>	BCC	FP	

Common Name	Scientific Name	Federal Status ²	State Status ²	Other Status ²
Vaux's swift	<i>Chaetura vauxi</i>	None	SSC	IUCN:LC
Nuttall's woodpecker	<i>Picoides nuttallii</i>	BCC	None	IUCN:LC
American dipper	<i>Cinclus mexicanus</i>	None	None	IUCN:LC
Loggerhead shrike	<i>Lanius ludovicianus</i>	BCC	SSC	IUCN:LC
Yellow-billed magpie	<i>Pica nuttalli</i>	BCC	None	IUCN:LC
Oak titmouse	<i>Baeolophus inornatus</i>	BCC	None	IUCN:LC
Grasshopper sparrow	<i>Ammodramus savannarum</i>	None	SSC	IUCN:LC
MAMMALS				
Pallid bat	<i>Antrozous pallidus</i>	None	SSC	IUCN:LC
Yuma myotis	<i>Myotis yumanensis</i>	None	None	IUCN:LC
American badger	<i>Taxidea taxus</i>	None	SSC	IUCN:LC
Ringtail	<i>Bassariscus astutus</i>	None	FP	IUCN:LC
PLANTS				
Arcuate bush mallow	<i>Malacothamnus arcuatus</i>	None	None	CRPR 1B.2
Bent-flowered fiddleneck	<i>Amsinckia lunaris</i>	None	None	CRPR 1B.2
Chaparral harebell	<i>Campanula exigua</i>	None	None	CRPR 1B.2
Fragrant fritillary	<i>Fritillaria liliacea</i>	None	None	CRPR 1B.2
Most-beautiful jewelflower	<i>Streptanthus albidus</i> ssp. <i>peramoenus</i>	None	None	CRPR 1B.2
Mount Day rockcress	<i>Boechera rubicundula</i>	None	None	CRPR 1B.1
Santa Clara red ribbons	<i>Clarkia concinna</i> ssp. <i>automixa</i>	None	None	CRPR 4.3
Santa Clara thorn mint	<i>Acanthomintha lanceolata</i>	None	None	CRPR 4.2
Santa Cruz mountain pussy paws	<i>Calyptridium parryi</i> var. <i>hesseae</i>	None	None	CRPR 1B.1
Serpentine leptosiphon	<i>Leptosiphon ambiguus</i>	None	None	CRPR 4.2
Showy madia	<i>Madia radiata</i>	None	None	CRPR 1B.1

¹ Bold indicates species observed within Areas 1 and 2

² Status codes –

BCC = USFWS Birds of Conservation Concern;

SSC = California Species of Special Concern;

FP = Fully Protected;

WL= Watch List;

IUCN:LC = The World Conservation Union- Least Concern Species;

CRPR:

Rank 1A = Plants considered extinct.

Rank 1B = Plants rare, threatened, or endangered in California and elsewhere.

Rank 2A = Plants considered extinct in California and elsewhere.

Rank 2B = Plants rare, threatened, or endangered in California but more common elsewhere.
Rank 3 = Plants about which more information is needed - review list.
Rank 4 = Plants of limited distribution - watch list.

These rankings are further described by the following threat code extensions:

- 1: seriously endangered in California.
- 2: fairly endangered in California.
- 3: not very endangered in California

II. LONG-TERM MANAGEMENT AND MONITORING PLAN

4.0 LONG-TERM MANAGEMENT GOAL AND APPROACH

The overall goal of long-term management is to maintain the overall conservation values of Areas 1 and 2 (Section 1.2). This goal will be met through routine monitoring and management of the conditions that support biological resources in Areas 1 and 2, by maintaining existing management infrastructure, and by providing for security as detailed below. The SCVWD will obtain all necessary permits and approvals prior to the initiation of management and maintenance actions requiring such permits and approvals.

The management practices for Areas 1 and 2 include managed livestock grazing, road maintenance, invasive weed control, monitoring, and adaptive management. These areas of focus are expected to support all conservation values of Areas 1 and 2. The SCVWD, as owner and manager of Areas 1 and 2, will monitor the Areas' condition as described in the sections below, focusing on aspects that may warrant management actions. The SCVWD will also coordinate with TNC regarding the results of TNC's monitoring efforts and management activities, as described in Section 1.4, to ensure that SCVWD and TNC efforts are complementary and consistent.

This LTMP has been written with the intent to ensure that the conservation values of Areas 1 and 2 are protected. The LMTP tasks listed below are all the responsibility of the Land Manager.

4.1. *Adaptive Management*

While it is not anticipated that major additional management actions will be needed, an objective of long-term management and monitoring is to identify any issues that arise and use an adaptive management approach to determine what follow-up actions might be appropriate. Adaptive management is an approach to natural resource management which incorporates monitoring to determine the effectiveness of, and what changes may be needed to enact appropriate management practices over time, including corrective actions when needed to support the conservation values of Areas 1 and 2.

The management objectives and approaches described in this LTMP were established based on existing information on the condition and resources of Areas 1 and 2, the effects of past management activities, and the experience of natural resource professionals in designing resource management approaches. The management approach described in this LTMP will be adapted as necessary to maintain existing biological resource value based on monitoring results.

In addition, adaptive management may involve the implementation of new measures to protect natural resource values as new problems are noted, new research and techniques become available, or as problems are noted in new areas. For each of the resource issues described below, specific criteria will be monitored. These criteria are related primarily to resource management issues that are related to the SCVWD's management activities, such as grazing, rather than those outside the SCVWD's control, such as proliferation of feral pigs. The monitoring results will be reviewed not only in the context of whether or not there are potential management problems, but also in comparison to prior monitoring results to identify trends in resource management issues. Persistent problems or adverse trends will trigger an adaptive management decision-making process. First, based on the type and severity of the problem,

and an assessment regarding whether the issue is within the SCVWD's control, experienced land management staff will determine whether an on-the-ground corrective action is necessary, or whether further monitoring (perhaps at an increased frequency) is appropriate to determine the extent or persistence of the problem. Second, if corrective action is needed, those staff will identify the most appropriate adaptive management response, tailored to the resource issue. Those staff chosen to accomplish monitoring and adaptive management decision-making responsibilities will have the knowledge, training, and experience to accomplish these responsibilities. Agencies and the Area 1 CE Holder will be consulted for approval of any such adaptive management changes or corrective actions.

5.0 BIOLOGICAL RESOURCE MANAGEMENT AND MONITORING

Areas 1 and 2 currently support sensitive habitats (i.e., streams and ponds) and provide habitat for a number of plant and animal species, including special-status species. As a result, monitoring for potential signs of habitat degradation (e.g., erosion at streams) and for sensitive resources (such as sightings of special-status species) will occur. Each of the sections below includes a detailed description of the management and monitoring approaches for individual resources, stressors (such as invasive species), and management measures (such as managed grazing). In addition, more general monitoring for site conditions will occur during quarterly inspections by the Land Manager. A General Site Monitoring Checklist (see Appendix C) will be used during routine (e.g., quarterly) site visits to record information that will be monitored on a quarterly basis and to record incidental observations of species or issues of interest.

TNC is responsible for certain monitoring and management activities in Area 1 required by the existing Area 1 CE and Kammerer Ranch CTS Management Plan (listed in Section 1.4 above). Some of these activities overlap with the responsibilities of the SCVWD specified in this long-term management and monitoring plan discussed below (e.g., fence maintenance within Area 1). The SCVWD and TNC will communicate closely to share information that may be useful to both parties, avoid any management conflicts or inconsistencies, and avoid redundancy in monitoring, reporting, and management. The discussion of biological resource management and monitoring that follows assumes that information collected by TNC will be shared with the SCVWD and that any necessary management activities that are the responsibility of TNC will not have to be performed by the SCVWD.

5.1. *Element A. Streams, Springs, and Ponds (Waters of the U.S./State)*

Objective: *Monitor, conserve, and manage the streams and ponds in Areas 1 and 2.*

As described above in Sections 3.1 and 3.2, ephemeral and intermittent streams and seasonal and perennial ponds are present throughout Areas 1 and 2. Despite the history of moderate grazing on the Preserve, the streams and ponds in Areas 1 and 2 show few signs of adverse livestock impacts and provide habitat for a variety of plants and animals. The ponds in Areas 1 and 2 support substantial wetland vegetation. Upper Penitencia Creek is relatively inaccessible to both humans and livestock due to topography and density of vegetation, and thus, the drainage and the associated riparian corridor are in good condition. The majority of the ephemeral and intermittent streams show little or no evidence of excessive trampling, inappropriate livestock grazing, or other adverse conditions related to livestock grazing. Erosional features were noted at two locations where ephemeral and intermittent streams cross a drivable road on Areas 1 and 2 (SC 1 and SC 2, Figure 5; see Section 3.2.2). Large gullies have formed near SC 1 and SC 2, but they do not hinder vehicle access (Photos 1–4, Appendix

B). The conditions of these resources in Areas 1 and 2 will be described in detail, to serve as the baseline for comparison of future monitoring results, as discussed under Task A1.1 below.

The majority of the ephemeral and intermittent streams within Areas 1 and 2 appear laterally stable (i.e. there was little to no evidence of erosion within the stream channel or on the stream banks). The drivable roads in Areas 1 and 2 cross drainages at 16 locations (SC 1–SC 16, Figure 5; Table 1). Culverts convey flows beneath the road at two locations (SC 9 and SC 10), but otherwise water travels across roads as sheet flow, and when it is present, it is very shallow (a few inches deep at most). Wooden retaining walls have been constructed on the downstream side of the road at two other locations (SC 3 and SC 6) and are exhibiting some minor damage from erosion. Limited areas of path formation due to use by cattle and wildlife are present on the stream banks and bed, in addition to some evidence of grazed and/or browsed vegetation by cattle and deer were observed during the field surveys.

Four manageable sources of potential impacts on the streams, ponds, and springs within Areas 1 and 2 have been identified (though not yet observed): (1) inappropriate livestock use of the watershed, which could lead to increased runoff and erosion; (2) intrusion by cattle into sensitive areas; (3) sediment input into streams from road erosion; and (4) trespassing impacts such as trampling of vegetation. A potential future management action that may be appropriate if impacts to pond-associated wetlands increase would be excluding livestock from ponds in Areas 1 and 2 to prevent livestock from foraging on pond vegetation, which reduces cover and foraging opportunities for aquatic wildlife species. Less controllable impacts to these areas may also occur from use by wildlife, such as deer and feral pigs. Management of such regional issues is not covered by this LTMP; however, on-site efforts to control nuisance wildlife species that cause damage to resources and/or infrastructure in conjunction with regional efforts and consistent with plan goals and objectives would be allowed (control of feral pigs, for example).

The approach to protecting, managing, and enhancing stream and pond conditions in Areas 1 and 2 is to:

1. Monitor and maintain residual dry matter (RDM) at levels sufficient to protect the soils (see Section 5.2.3 below). Ensure sufficient vegetative cover, thus reducing the potential for watershed lands erosion and for increased runoff into streams.
2. Implement a grazing strategy, as presented in Section 5.2.2, to provide relatively low grassland vegetation with appropriate conditions for burrowing mammals and the species (such as CTS) that utilize their burrows while minimizing the potentially adverse effects of livestock grazing during the hot/dry summer season (once grass forage is dried) when livestock tend to congregate near water sources. This will minimize routine cattle intrusion into the vicinity of ponds and streams in Areas 1 and 2. In addition, maintain the existing watering troughs and install new troughs if they are determined to be needed in the future. Ensure troughs are present in sufficient numbers and locations to provide an adequate and preferred water source for cattle, thus deterring cattle utilization of the natural water sources in Areas 1 and 2. Similarly, mineral and protein supplements for cattle will be located well away from sensitive aquatic resources.
3. Conduct annual monitoring of sensitive areas (i.e., streams and ponds) that are accessible to cattle to determine that the identified conservation values of Areas 1 and 2 are being met.

4. Take additional measures (e.g., installation of additional troughs and mineral and protein supplements) that may be needed to adapt the grazing plan in a manner that better supports the conservation values of Areas 1 and 2.
5. Institute a regular road maintenance program to properly configure roads to minimize erosion potential (Section 6.2).

Task A1. Stream and pond condition monitoring. Conduct annual late spring (May–June) qualitative monitoring to assess the condition of streams, springs, ponds, and associated wetland habitats. Tasks include:

A1.1. Conduct pre-implementation monitoring. Start-up monitoring will begin in late spring 2016. In spring 2016, identify stream and pond areas most susceptible to degradation over the long term. Such areas will include areas accessible to cattle near roads or heavily used cattle paths. Identify and map these monitoring stations with GPS/GIS and prepare a monitoring location base map for use in subsequent years. Photograph each monitoring station and GPS-locate the photo point so that photos taken in subsequent years will be comparable to the baseline photos. Although these monitoring stations will focus on areas most susceptible to degradation, they will also be stratified across Areas 1 and 2 using the following criteria: (1) proximity to troughs on adjacent lands of the Preserve (i.e., Area 1) and other areas that may concentrate cattle; (2) habitat/vegetation type, such as ephemeral or intermittent stream or seasonal or perennial pond, and (3) stream order. These criteria will ensure that aquatic monitoring stations are representative of various conditions across Areas 1 and 2. It is anticipated that approximately 20 monitoring stations will be established.

At each aquatic habitat monitoring station, an Aquatic Habitat Monitoring Checklist will be completed (see Appendix C). This checklist contains features associated with habitat condition and quality, focusing on presence or absence of potential adverse conditions that are manageable by the SCVWD and that can be used to determine whether problems are occurring over the long term. In combination with comparison of site photos from one monitoring effort to the next, the information on this checklist will allow for site conditions to be tracked over time with minimal error resulting from observer interpretation. The Aquatic Habitat Monitoring Checklist and photos from spring 2016 will serve as the description of the baseline condition of each monitoring station.

Based on these baseline conditions, the SCVWD will identify a general goal for the long-term management of aquatic resources at each station. For stations where baseline conditions are undegraded and existing habitat quality is high, the goal will be to maintain existing conditions over the long term. For stations where some existing problem or degradation is evident, and the source of that degradation can be feasibly managed by the SCVWD, the goal will be to improve habitat conditions. The individual items in the Aquatic Habitat Monitoring Checklist will serve as the measures of habitat condition for purposes of determining management success, as described in Section A1.2.

A1.2. Conduct implementation monitoring. Annual field review of the stream and pond monitoring stations will be conducted in May–June by completing the Aquatic Habitat Monitoring Checklist and taking photos from the same locations and facing the same directions as the baseline photos for each station.

Following each monitoring effort, the Aquatic Habitat Monitoring Checklist and photos for each station will be compared both to the baseline information described in Task A1.1 above and to

the monitoring results from the immediately prior monitoring effort to determine whether any evidence of adverse conditions has appeared, and to determine trends in habitat conditions. Because the individual items in the Aquatic Habitat Monitoring Checklist will serve as the measures of habitat condition, success of management activities will depend on (a) the goal of management (i.e., maintain or improve conditions), (b) the trends in habitat conditions, and (c) whether any observed management issue is within the SCVWD's control, as follows:

- Habitat conditions are being maintained – this would indicate successful management for stations where the goal was maintenance of conditions, but unsuccessful management at stations where the goal was improvement of conditions. If the goal at a given station is improvement of conditions, and improvement in a feature that is manageable by the SCVWD is not noted for two consecutive monitoring periods (i.e., the third monitoring effort after a problem was first noted), this would trigger the need for adaptive management action, as described in Task A2 below.
- Habitat conditions are improving – this would indicate successful management for any station.
- Habitat conditions are degrading – if the condition of a manageable issue (i.e., one related to grazing or trespass) is degrading, this would indicate unsuccessful management for any station and would trigger the need for adaptive management action, as described in Task A2 below. If the issue is not within the SCVWD's control (e.g., fire), then the SCVWD will review what management actions it might be able to take, but this would not necessarily indicate unsuccessful management.

In addition, issues pertaining to the condition of aquatic resources, and trends in condition, will be noted incidentally during other monitoring activities and site visits. The General Site Monitoring Checklist contains entries designed to facilitate the recording of observations regarding potential problems related to aquatic resources anywhere on Areas 1 and 2. Due to the geographic breadth of the various monitoring activities proposed on Areas 1 and 2, incidental monitoring using the General Site Monitoring Checklist will allow for issues outside of the monitoring stations to be adequately detected and addressed.

Task A2. Stream and pond adaptive management actions. If goals of habitat management in a given area are not being met as determined by monitoring at aquatic resource monitoring stations or incidental observations (i.e., due to degradation of aquatic resource condition relative to baseline levels or persistence of an undesirable condition related to manageable activities), adaptive management activities would be triggered. The precise adaptive management activity employed will depend on a number of factors, including the nature of the problem itself (e.g., erosion, proliferation of invasive species), the cause of the problem (e.g., whether erosion is due to trespassers), the severity of the problem (e.g., whether the problem warrants an immediate change in management or more frequent monitoring to determine whether the problem will be corrected naturally), and whether the problem is within the SCVWD's management control. Consideration will be given, in particular, to conditions potentially detrimental to streams, springs, and ponds. For example, relocation of mineral or protein supplements or watering troughs may be adequate to encourage cattle to move away from sensitive areas. Temporary electric fencing may be used to exclude livestock from problematic areas on a short term or seasonal basis. Permanent fencing may be utilized if problems persist, especially in sensitive resource areas based on comparison of monitoring data to baseline conditions and the goals for a given station. Any new permanent fencing needed within Area 1 will be coordinated with TNC, and will be the responsibility of the SCVWD to maintain.

5.2. Element B. Livestock Grazing Management

5.2.1. Objective/Overview

The objective of the LTMP is to implement a livestock grazing strategy that maintains and may improve the conservation values that currently exist within Areas 1 and 2. Within oak woodland and annual grassland habitats in California, moderate amounts of livestock grazing have been shown to positively contribute toward a variety of rangeland ecosystem services such as water quality, forage production, habitat for native species of plants and animals including special-status species such as the CTS and CRLF, and other ecosystem services (Hormay 1946; Heady 1956; Bartolome et al. 1980; Barry et al. 2011; Ford et al. 2013).

Without livestock grazing, many of the ecosystem services typically provided by California's oak woodland and annual grassland rangelands (described above) could be expected to be adversely affected (Barry et al. 2011). These adverse effects could include reduced grassland species diversity (Heady 1956), increased accumulation of thatch from non-native, annual grasses that would increase wildfire fuel loads and wildfire risk and decreased habitat values for California ground squirrels (Horn and Fitch 1942), whose burrows provide critical aestivation habitat for CTS and refugia for CRLF during the dry season (Barry et al. 2011, Ford et al. 2013, OSA 2013).

As described above in Section 2.2.2, grazing throughout the Preserve (i.e., including Areas 1, 2, and 3) has been held at or below 50 AUs per year since 2001, when the TNC acquired the Preserve from the Kammerer family. Although some fencing is present in Area 2, no fencing separates the remaining portions of the Preserve and livestock grazing in Areas 1 and 2 is managed in conjunction with grazing management throughout the Preserve. Such grazing management has appropriately maintained high-quality upland habitat conditions throughout the Preserve. Livestock grazing has affected wetland habitats in Areas 1 and 2 (e.g., due to trampling and grazing of wetland vegetation) to some extent. However, these wetland habitats continue to provide high ecological values, and although some improvements could be achieved (e.g., by installing protective fencing if needed in the future), no changes to the approach (e.g., installation of fencing to allow for independent grazing management of Areas 1, 2, and/or 3) are proposed at this time.

The SCVWD will administer the grazing lease for the Preserve (i.e., including Areas 1, 2, and 3), and all grazing management will be the responsibility of the SCVWD. If the SCVWD proposes future changes to the grazing regime (e.g., the installation of new fencing), the SCVWD will coordinate with TNC as needed to ensure that the requirements for the Area 1 CE and CTS Management Plan continue to be met.

5.2.2. Grazing Management Prescriptions

Grazing management prescriptions for Areas 1 and 2 are described below. These prescriptions apply to the entire Preserve, because Areas 1, 2, and 3 are managed together and will thus be grazed as a single unit in conjunction with the grazing prescriptions for the existing CE on Area 1. The Land Manager will work cooperatively with the CE holder and the grazing tenant to ensure that Areas 1 and 2 are managed consistently with the goals and objectives of this LTMP. Regular RDM monitoring (see Section 5.2.3) will occur in Areas 1 and 2 to verify that the grazing management objectives defined for these areas are being met. In the event that the RDM objective is not being met for these areas, the Land Manager will implement remedial measures (such as increased coordination with the CE holder and, if necessary, installation of

fencing to allow for independent management of Areas 1 and 2) to ensure that the objective is achieved. The SCVWD may also implement additional measures in the future, such as the installation of livestock exclusion fencing to allow for the recruitment of valley oak seedlings, in conformance with this LTMP.

5.2.2.1. *Grazing Intensity*

In California's oak woodlands and annual grasslands, grazing intensity is typically measured by RDM that exists in the fall (September–October) prior to fall rains (Bartolome et al. 2006). Due to factors such as variations in topography, soils, rainfall, and patchy forage use, a variety of RDM values are expected, but in general the RDM goal for Areas 1 and 2 will be 1,000–1,500 pounds per acre (lbs/acre). This RDM goal is approximately twice the recommended minimum RDM level for regions of California with climate and vegetation similar to Areas 1 and 2 (Bartolome et al. 2006) and corresponds to Conservative Stocking (see Barry et al. 2011), which is thought to positively contribute to a variety of rangeland ecosystem services and would additionally contribute to the identified livestock grazing management objective (see Section 5.2.1). Conservative stocking rates, as expressed by a target RDM range of 1,000 to 1,500 lbs/acre, would also minimize livestock use of streams in an effort to protect the conservation values of these areas from the potentially adverse effects of inappropriate livestock grazing.

5.2.2.2. *Animal Kind and Class*

Cow/calf pairs are the recommended kind and class of grazing animals for Areas 1 and 2. Cow/calf pairs are readily available and are already used to graze Areas 1, 2, and 3 of the Preserve.

5.2.2.3. *Livestock Grazing Season-of-use*

Currently, livestock graze the Preserve year-round, due in part to the difficulty of transporting animals to and from the Preserve and in part because such year-round grazing has not compromised the ecological values of the Preserve (grazing effects on Area 3 are addressed in the separate Rancho Cañada de Pala Preserve Area 3 Long-term Management Plan). Thus, the permitted season of grazing use for the Preserve will be year-round provided that the overall conservation values of Areas 1 and 2 are being maintained as determined through regular monitoring and minimum RDM standards are met at the end of the grazing season (i.e., September–October, generally).

5.2.2.4. *Stocking Rate*

Given a recommended fall RDM of approximately 1,000 to 1,500 lbs/acre and an approximate average annual forage production of 1,300 to 1,500 lbs/acre across most of Areas 1 and 2 (NRCS 2014), Areas 1 and 2 could support approximately 15 AUs for a 12-month grazing period in a year with average forage production (assuming continuous grazing during that 12-month period). Because Areas 1, 2, and 3 are shared, and thus will be grazed by the SCVWD's grazing lessee in conjunction, there is no practical way to ensure a specific stocking rate in Areas 1 and 2. Further, because the cows would only have calves for 6 or 7 months, the numbers of cows that could be supported is higher than this estimate. Thus, continuing year-round grazing of the entire Preserve with up to 50 AUs is proposed, as this stocking rate and seasonality have been maintaining high-quality habitat conditions.

Minor adjustments in stocking rate by the operator may be permitted (taking into account the 50 AUs per year limitation) with the prior approval of the Land Manager. Any adjustments in target RDM levels will need to be evaluated by a California-licensed Certified Rangeland Manager (CRM) to determine if the proposed changes will still allow accomplishment of LTMP objectives. Periodic observations of site conditions will be completed by the Land Manager throughout the grazing period to confirm that actual RDM levels are similar to target levels and to proactively identify years where the permitted grazing period may need to be reduced to meet RDM targets.

5.2.2.5. *Other Considerations*

All existing infrastructure and livestock facilities (Figure 5) will be retained, monitored, and maintained as presented in Section 6.1.

Supplemental feeding of hay will not be allowed within Areas 1 and 2. Supplemental feeding can concentrate soil disturbance and introduce invasive plants via contaminated hay.

The placement of salt, other mineral blocks, and molasses or other protein supplements may occur to assist in livestock health and distribution. The placement of mineral supplements will be only at designated sites that are approved by the Land Manager, after surveys are conducted to assure sensitive habitats are avoided and undesirable concentrations of livestock are minimized. Utilization of supplemental elements for purposes of ecological management is discussed further in Section 5.1, Streams and Ponds.

5.2.3. **Livestock Grazing Monitoring**

Two types of grazing monitoring will be conducted. First, implementation monitoring will be conducted to determine if the grazing prescriptions are being implemented as presented in the LTMP. Second, grazing intensity (RDM) monitoring will be conducted to determine if RDM goals are being achieved. Monitoring methods are adapted from Wildland Solutions (2008), Guenther (2007) (Appendix E) and practices used on nearby OSA-managed lands (McGraw 2012, OSA 2013).

Monitoring may be performed by a technician, biologist, or the operator if that person has been trained in such monitoring. Although RDM monitoring does not need to be performed by a CRM, a CRM will be involved in decisions regarding long-term changes in management (i.e., revisions to the LTMP, such as stocking rates or timing) made as a result of RDM monitoring. Inter-annual changes in management (such as stocking rates or timing to meet yearly RDM goals) made as a result of RDM monitoring will be made at the judgment of the Land Manager, but will be in conformance with this LTMP.

5.2.3.1. *Implementation Monitoring*

Task B1. Livestock grazing implementation monitoring. Conduct implementation monitoring to confirm that the grazing strategy is being conducted as specified in the LTMP.

A grazing log will be maintained by the Land Manager staff with the assistance of the grazing lessee. The Land Manager will visually inspect Areas 1 and 2 quarterly, as access allows, to confirm the presence of cattle and to inspect range conditions.

The log, which will be maintained in a spreadsheet to facilitate use, will include:

1. The number of AUs known on the Preserve (based on records provided from the grazing lessee, if available) and within Areas 1 and 2 (based on incidental observations of livestock in favored grazing conditions).
2. The quarterly and annual weather conditions (i.e., rainfall)
3. A checklist for the general phenology and productivity of key forage plants (i.e., annual grasses), including the onset of the germinating rains, the date when 1 inch of new growth was observed, and senescence of the forage plants
4. The approximate amount of forage growth and remaining RDM to aid in the determination of proactively reducing the permitted grazing period and/or number of grazing animals to meet the RDM target.

This information can help managers track the various factors that influence inter-annual variability in grazing within Areas 1 and 2.

5.2.3.2. *RDM Monitoring*

Information regarding RDM is collected in a practical manner that is adequate to assess how well the RDM goals have been met. The monitoring program is designed to provide the Land Manager useful information on RDM levels as they relate to objectives. The goal is that 80% of Areas 1 and 2 meet the RDM objective (see Grazing Intensity, Section 5.2.2.1).

Two types of RDM monitoring will be conducted annually: (1) RDM reference plot monitoring and (2) Areas 1 and 2 RDM status monitoring. For this process to be most useful, the same field personnel must first conduct the reference site monitoring followed by the RDM zone evaluation.

All RDM sampling is conducted once per year in mid to late September or early October, prior to the onset of seasonal rains.

Task B2. RDM reference plot monitoring. Detailed information will be collected at selected RDM reference plot monitoring sites to validate visual RDM estimates collected in Task B3, below. Information collected at the reference sites is not intended to be extrapolated as representing the entirety of Areas 1 and 2; however, the reference sites will be located in areas expected to receive preferential livestock use (e.g., relatively flat areas of annual grassland or valley oak savanna with adequate water) and reflect the general conditions of the area in which it is located. The information is intended to represent that portion of the field being surveyed and serve as a reference for documenting the RDM status of Areas 1 and 2.

Ten RDM reference plot sites have been identified within Areas 1 and 2 (Figure 8). These reference sites are located in areas that are as large as possible given surrounding conditions, and were sited in locations that are likely to receive typical livestock use (e.g., areas that are relatively flat and open grassland or oak savanna or near water sources). These areas include grassy openings in mixed oak woodland and open areas of annual grassland that are relatively flat (Figure 6). Areas with a dense tree canopy in foothill pine/oak woodland and mixed oak forest vegetation types are unlikely to meet the RDM target even in the absence of livestock grazing, and will thus be excluded from RDM monitoring. Such areas have dense stands of live oaks or brush, which will suppress forage production irrespective of livestock use (Frost et al. 1997) and are typically lightly used by livestock because they provide relatively little forage. However, visual monitoring of cattle use of Areas 1 and 2 will be conducted concurrently with

other monitoring activities to ensure that cattle are not using these densely vegetated areas. If cattle are observed to be regularly using these areas, an additional reference plot will be added that is representative of the areas the cattle are using. The ten RDM reference sites are distributed across Areas 1 and 2 to the extent feasible based on accessibility. The sites are representative of the general grazing area in Areas 1 and 2, capable of responding similarly to management actions, and capable of producing herbage representative of these areas.

At each RDM reference plot:

1. Confirm that the location is representative of the general area that year. If not, relocate to a nearby suitable location. GPS any modified location.
2. Take overview photographs in all four cardinal directions from the sample point from approximately 5' above the ground. This is intended to both record vegetation characteristics in the vicinity of site and to provide overview scenes of Areas 1 and 2 at standardized locations over time.
3. Photograph the RDM plot using "second step" (Robel pole monitoring) as described in Appendix D.
4. Clip and collect all herbage within a 13.25-inch diameter circular or 12-inch square frame plot. Weigh the herbage in grams and convert to lbs/acre using the following formulas (Wildland Solutions 2008):

Circular 13.25-inch diameter hoop plot:
(grams clipped) x 100 = lbs/acre of RDM

Square 12-inch frame plot
(grams clipped) x 96 = lbs/acre of RDM

5. Note the estimated amount of herbage remaining on ground after the plot is clipped.
6. Note the general botanical composition of sample (annual or perennial grasses, forbs, weeds).
7. Air dry any wet or green samples 2–3 days prior to weighing.

Task B3. Areas 1 and 2 RDM Status Monitoring Protocol. After conducting the RDM reference site monitoring and obtaining the results, the amount of RDM can be visually estimated in Areas 1 and 2 according to seven RDM classes listed in Table 5.

Table 5. RDM Evaluation Classes for Grazed Area 1 and 2 Lands¹

Vegetation type	RDM objective for Site	Residual Dry Matter (RDM) Level		
		RDM range of values		RDM Class
		% of objective for Areas 1 and 2	Lbs/acre	
		Exceeds 400%	Exceeds 4,000	Very High
		200-400%	2,000-4,000	High
		150-200%	1,500-2,000	Exceeds

Annual grasslands and oak savanna	1,000 -1,500 lbs/acre RDM	100-150%	1,000-1,500	Meets
		50-100%	500-1,000	Below
		<50%	<500	Low
		<10%	<100	Fire

¹Classes were developed in a manner described in “Monitoring Annual Grassland Residual Dry Matter” (Wildland Solutions 2008).

The general location and extent of those areas within Areas 1 and 2 at least 20 acres in size (or as large as possible) and *not* meeting the target RDM levels will be determined in the field either by field measurement, GPS, or mapping onto paper or other field copy (such as the LTMP vegetation map) and then incorporating those data into a GIS system. Vegetation is naturally patchy, and grazing use is patchy as well. The predominant condition in an area will determine that RDM level, despite inclusions of smaller areas with either higher or lower levels. The goal is that at least 80% of the areas with the potential to meet the RDM target in Areas 1 and 2 will meet the RDM target.

Task B4. Grazing adaptive management actions. If less than 80% of Areas 1 or 2 meets the designated goal, a qualitative assessment will first be performed to determine whether the RDM levels are a problem (i.e., whether the density of the vegetation is preventing the site from achieving the management goals). If site conditions are favorable despite high or low RDM levels, the Land Manager may choose to continue to monitor the RDM levels without implementing further adaptive management actions. However, if the vegetation density is preventing the site from achieving management goals, the Land Manager may implement the adaptive management actions described below.

If adaptive management actions are determined to be needed, an evaluation will be conducted to determine probable causes, assess if and how the condition is potentially detrimental or not to the stated goals, and determine if any corrective actions are needed. If corrective actions are recommended, they will then be implemented as described. Inter-annual fluctuations will occur due to many factors such as excessive rains, drought, timing of rainfall, variable temperatures, and differences in grazing animals and their knowledge of the site, so results from just one year should not be relied upon heavily.

As described previously, the Land Manager will have limited control over livestock grazing in Areas 1 and 2 and will rely on cattle grazing the Preserve as a whole to meet the LTMP’s livestock grazing management objectives. Because there is no fencing between Areas 1, 2, and 3 and these areas are grazed together as a unit, cattle will not necessarily be present in all portions of Areas 1 and/or 2 year-round even though the Preserve may be grazed by the grazing lessee year-round. Further, the CE and CTS Management Plan for Area 1 limit the number of cattle on Area 1 to 50 AUs. Thus, the Land Manager will ensure that the grazing prescription described above (e.g., season of use, utilization target) is followed to the maximum extent practical and will coordinate with TNC as the CE holder for Area 1 to ensure that the requirements of the Area 1 CE and CTS Management Plan continue to be met. In the event that the LTMP’s grazing management objectives are not met, the Land Manager will attempt to have grazing intensity reduced or increased as necessary, in coordination with TNC as needed. If RDM values consistently and significantly deviate from the management objectives for Areas 1 and 2, the Land Manager may install temporary electric fencing or permanent barbed wire fencing to allow for independent management of Areas 1, 2, and/or 3.

If any changes to grazing management are proposed in the future, they will be coordinated between the SCVWD and TNC as the CE holder for Area 1.

5.3. Element C. Non-Native Invasive Plant Species Management

Objective 1: Minimize the spread of existing non-native invasive plants.

The focus of this objective is:

- Prevention or control of new introductions of high or moderate-ranked California Invasive Plant Council (Cal-IPC) species to Area 3
- Control of existing infestations of high-ranked Cal-IPC species
- Control of those existing Cal-IPC moderate-ranked species that have potential to further degrade Areas 1 and 2 and have a reasonable potential for successful control.

5.3.1. Invasive Plants

The degree of invasiveness of invasive plants is rated by the Cal-IPC as “limited,” “moderate”, or “high” based on the severity of their ecological impacts (Cal-IPC 2016). The most effective approach to wildland weed management is to focus on early detection and control of invasive species populations, prioritizing high-ranked species with the greatest potential to degrade wildlands, and if feasible, control of moderate-ranked species at a minimal level.

Five invasive plant species have been observed to be present in Areas 1 and 2. Two invasive species, Spanish brome and spreading hedgeparsley, are present in several vegetation types in Areas 1 and 2 (see Section 3.1 Vegetation Types). Spanish brome is ranked by the Cal-IPC as “highly” invasive, and occurs as a co-dominant species with other non-native annual grasses in some open areas within both large and small patches of grassland in blue and valley oak woodland and California annual grassland vegetation types (Photo 41, Appendix B). Spreading hedgeparsley is considered “moderately” invasive, and was observed in mixed oak forest and foothill pine/oak woodland vegetation types during the May and June field surveys.

Spanish brome and spreading hedgeparsley are not specifically included in the invasive species control efforts because their presence in Areas 1 and 2 reflects a larger, regional invasion that is not feasible to control at a site-wide level for Areas 1 and 2 (or for any similar site in the region). Because these are common dominant species in grassland and woodland communities in California, their presence does not degrade the habitat on the site, which was observed to be of very high quality, relative to other sites in the region. Therefore, although these invasive species are present in certain vegetation types in Areas 1 and 2, the management efforts described below are expected to reduce the occurrence of these species within Areas 1 and 2, even though these species are not the focus of the management efforts.

Other noteworthy invasive species that were observed on Areas 1 and 2 in lesser quantities include tocalote (*Centaurea melitensis*; “moderately” invasive) and Italian thistle (*Carduus pycnocephalus*; “moderately” invasive), both of which are present in open grasslands and valley oak savanna (Photo 42, Appendix B). In addition, medusahead (*Elymus caput-medusae*; “highly” invasive) was noted in open, grassy areas within California annual grassland, valley oak savanna, blue and valley oak woodland, and foothill pine/oak woodland vegetation types in Areas 1 and 2, and Medusahead will be the primary focus of invasive species control efforts because it is considered to be one of the most threatening invasive annual grasses to rangeland production and wildland plant diversity; it often forms near monotypic stands and is an aggressive competitor for soil moisture (DiTomasio 2003). Small, disjunct patches of 5 to 20 individual medusahead plants were observed in Areas 1 and 2 and these small, emerging

populations will be the primary focus of initial invasive species control efforts. For instance, individuals were observed across the tract of California annual grassland to the north of Pond 4 in Area 1, and in openings within the foothill pine/oak woodland on near the border of Area 1 and 3 (see Figure 6). This species is present in higher density on other surrounding lands (SCVWD 2014) than on Areas 1 and 2, and in lower density on Area 3 of the Preserve. Distributional observations of these species within Areas 1 and 2 will be documented, and control will be prioritized based on extent, threat and feasibility.

Integrated Pest Management techniques (biological, mechanical, chemical, combination, etc.) will ensure the most effective control method is utilized for each invasive species while providing the greatest amount of protection to the natural resources within Areas 1 and 2. Management of particular invasive species will be prioritized based on their potential to cause harm to the natural resources in Areas 1 and 2 as well as the ability to effectively control the species.

If goat or sheep grazing is used for invasive plant control, animals will be brought in during the specific season useful to control the target problematic species. Goats and sheep will be concentrated in a specific location for a short duration, contained by an electric fence or similar means within a relatively small area, and allowed to graze with the coordination and oversight of a professional shepherd in order to achieve the weed control objective.

Livestock grazing has been used effectively to help minimize invasive plants on conservation properties but may not be adequate to address all issues. Where cattle grazing is not sufficient, the next preferred line of defense will be the use of non-herbicide methods (i.e., mechanical and hand removal, goats and sheep, and if available, effective biocontrols approved by the California Department of Food and Agriculture's Biological Control Program). In select areas, herbicides may be used where the type of species, size of population or terrain makes the use of other techniques either hazardous or ineffective. For example, in rocky areas whipping and mowing may damage resources and equipment, and hand pulling can be a safety risk due to uneven, steep ground.

Use of herbicides will only be permitted in Areas 1 and 2 if all of the following standards are met:

- Use occurs specifically for control of invasive, non-native plant species.
- Herbicide use shall be guided by label restrictions and any advisories published by the California Department of Pesticide Regulation or the County Agricultural Commission.
- Only herbicides and surfactants registered for aquatic use by the United States Environmental Protection Agency (USEPA) shall be applied within 20 feet of any waterway.
- All non-target plant species will be avoided.
- Herbicide drift will be minimized by complying with all label restrictions.
- Application will be avoided if significant rainfall is predicted in the subsequent 48-hour period.
- The lowest recommended and efficacious rate of herbicide will be used.
- The USEPA pesticide injunction for use of pesticides in CTS and CRLF habitat will be followed, as applicable.
- Unless specifically justified for a particular species (e.g., due to periods of highest effectiveness), application will occur between June 15th and October 15th to avoid application during the wet season when special-status amphibians are most likely to be dispersing across upland areas where invasive plants occur. Application will be made by or under the direct supervision of a state-certified applicator with a minimum of a

Qualified Applicator Certificate license that is under the direction of a licensed pest control advisor with a Pesticide Recommendation for Areas 1 and 2.

- Use will be in accordance with all guidelines and requirements from the Department of Pesticide Regulation.

Prescribed fire can be an effective invasive species management tool and has been successfully employed on other properties, including the adjacent BORR, to control weeds and maintain a natural vegetation mosaic. Typically done in conjunction with other agencies and/or research institutions, prescribed fire may be used as a management tool in Areas 1 and 2. In such cases protocols established by CAL FIRE will be followed, and the necessary permits will be obtained as required from the Bay Area Air Quality Management District. Prior to instituting the use of fire within Areas 1 and 2, a proposal for its use will be submitted for review and approval by the agencies overseeing the required mitigation in the subject areas.

Task C1. Invasive plant monitoring. Perform observational surveys to monitor known moderate to high ranking invasive plant species populations and document new occurrences, or new invasive plant species that have been identified by Cal-IPC as new threats.

C1.1. Conduct a comprehensive survey every 5 years beginning in 2016 to identify the locations of invasive plants. Determine the approximate area (square feet) of each occurrence by field measurement of average width and length, GPS polygon mapping, or other suitable means. Estimate percent cover within each occurrence to the nearest cover class (1-10%, 11-25%, 25-50%, 50-75%, 76-100%) and document locations with GPS. Produce an invasive species occurrence GIS map for documentation and use in the field based on the results. Surveys will focus on those areas known to account for the majority of invasive plant introductions and infestations on wildland sites including along roads, trails, and other known impact areas (e.g., cattle troughs, cattle bedding areas). Surveys will be conducted once during the survey year, in late June or early July, timed to occur when the target plants are flowering, making for easy identification and mapping.

Make incidental observations of invasive plants in conjunction with routine quarterly patrols and other site monitoring. Produce and update an invasive species occurrence GIS map annually, as needed, for documentation and use in the field.

Task C2. Conduct invasive weed control activities. Conduct control activities at appropriate intervals (annually, if needed) in accordance with the procedures listed above. Prioritize management of particular invasive species based on their potential to cause harm to the site's natural resources as well as the ability to effectively control the species. Following Cal-IPC best management practices to stop the spread of invasive plants to new locations, high-ranked invasive species along roads and trails will be of highest priority. Appropriately document and report control activities to the County Agricultural Commissioner as required.

5.4. Element D. California Tiger Salamander (CTS)

Objective: Conserve and allow for improvement of existing habitat that may be suitable for CTS within Areas 1 and 2.

The prescribed monitoring and management activities in Elements A–C above will assist in determining whether the aquatic and upland habitats in Areas 1 and 2 are being maintained in good condition. As discussed in Task A1, damage to sensitive resources will be recorded, and

in Task A2 if detrimental effects of livestock are observed in a particular location, various methods may be used to exclude livestock on a short term, seasonal, or permanent basis.

Task D1. Incidental CTS observations. In the course of all monitoring conducted for Elements A–C and quarterly patrols, surveyors will look for CTS via passive observation. Any sightings of CTS will be documented and reported to the CNDDDB. Surveyors will be qualified biologists or other qualified professionals with the training and ability to identify sensitive amphibians in their various life stages. This information will supplement the results of monitoring performed in Area 1 by TNC.

For the CTS, as well all other resources in Areas 1 and 2, the SCVWD reserves the right to perform additional monitoring and habitat enhancement activities as required to determine suitability for or compliance with current or future mitigation needs or other regulatory requirements.

5.5. Element E. California Red-Legged Frog (CRLF)

Objective: Conserve and allow for improvement of existing habitat that may be suitable for CRLF within Areas 1 and 2.

Following the prescribed monitoring and management activities in Elements A–C above will assist in determining whether the aquatic and upland habitat is being maintained in good condition. As discussed in Task A1, damage to sensitive resources will be recorded, and in Task A2 if detrimental effects of livestock are observed in a particular location, various methods may be used to exclude livestock on a short term, seasonal, or permanent basis.

Task E1. Incidental CRLF observations. In the course of all monitoring conducted for Elements A–C and quarterly patrols throughout the Preserve, surveyors will look for CRLF via passive observation. Any sightings of CRLF on the Preserve will be documented and reported to the CNDDDB. Surveyors will be qualified biologists or other qualified professionals with the training and ability to identify sensitive amphibians in their various life stages.

For the CRLF, as well all other resources in Areas 1 and 2, the SCVWD reserves the right to perform additional monitoring and habitat enhancement activities as required to determine suitability for or compliance with current or future mitigation needs or other regulatory requirements. These activities would be subject to review and approval by the appropriate regulatory agencies.

5.6. Element F. Other Sensitive Species

Objective: Document observations of other sensitive wildlife and plant species within Areas 1 and 2.

As listed in Table 4, Areas 1 and 2 support or have the potential to support several other sensitive wildlife and plant species. Preserve management practices will build upon techniques which have been favorable in the past, and implementation of the prescribed monitoring and management activities in Elements A–E above will ensure that habitat is being maintained in good condition for these species.

Task F1. Sensitive wildlife and plant observations. In the course of all monitoring conducted for Elements A–E and quarterly patrols, note any incidental observations of other sensitive

wildlife or plant species. Any occurrences of federally listed, state-listed, or CNPS-Rare Plant Rank 1A or 1B species not previously documented will be reported to the CNDDDB.

6.0 INFRASTRUCTURE AND FACILITIES

The SCVWD will obtain all necessary permits and approvals prior to the initiation of any infrastructure and facilities maintenance actions requiring such permits and approvals.

Construction materials needed in support of infrastructure and facilities management are expected to include items such as base rock for road maintenance, fencing supplies (t-posts, steel posts, barbed wire rolls, electric fencing wire, grounding rods), and possibly troughs. Materials are not brought in until a week before work is to begin, with project extent roughly one month or less. BMPs for such projects would include silt fencing and wattles around rock and soil piles to prevent materials from leaving the work site, storage of materials in an area that has little to no grade to prevent transport of material, and storage sites located outside of any sensitive species or habitat areas, as well as any additional best management practices denoted in CEQA or permits covering these actions.

6.1. *Element G. Grazing Infrastructure: Fencing, Gates, and Troughs*

Objective 1: Monitor condition of fences, gates, and troughs to ensure they are maintained to facilitate the grazing regime and management, prevent unauthorized public access and allow necessary access for quarterly patrols and management of Areas 1 and 2.

Objective 2: Allow for future installation of new, or modification or removal of existing fencing, gates, troughs, and other grazing-related infrastructure if indicated for adaptive management of grazing or other resource-related purpose. No new fencing, gates, or troughs are recommended initially.

Objective 3: Utilize temporary means, such as electric fencing, for short-term exclusion or inclusion needs.

- Maintenance of gates and troughs as necessary to allow for appropriate grazing management of the entire Preserve will occur.
- As part of operations, the grazing tenant conducts routine maintenance of fencing. Fences will be maintained as necessary by replacing posts and/or wires. All replaced or additional fencing will adhere to current wildlife-friendly fencing standards, such as those used in nearby areas by the OSA (Appendix E). Signage will be installed at potential access points to indicate Preserve boundaries and/or areas closed to public access. No areas requiring new fencing are currently known. However, fencing may be added adaptively in the future if necessary to control grazing within Areas 1 and 2, which are currently open to cattle grazing with each other and the rest of the Preserve. If additional fencing is needed, the SCVWD will coordinate with the TNC so that grazing limitations within Area 1 continue to be met. The SCVWD will be responsible for maintaining any new fencing that is installed to meet requirements of this LTMP.
- BORR maintains the pig fencing along the southern boundary of Areas 1 and 2 between the Preserve and the BORR.
- TNC maintains the fencing along the northern and western boundaries of Area 1, as well as all fencing around CTS ponds in Area 1.

- The SCVWD will monitor and maintain all remaining fencing along its boundaries, including the barbed-wire livestock fences along western and southwestern boundaries of Area 2, and within the central portions of Area 2. Several of these fences are located outside of the Preserve boundary. However, this is due to the need to locate fences based on topographical features instead of property lines, and it is the responsibility of the SCVWD to maintain these fences.
- If any new troughs are placed within Areas 1 and 2 in the future, they will:
 - Have float valves to minimize water usage;
 - Have protection of the float valves to minimize breakage due to cattle;
 - Be cleaned, as needed, during the summer and early fall to avoid cleaning during the amphibian breeding season (November–July); and
 - Have mechanisms that allow wildlife to escape and avoid drowning.
 - Any new troughs will be constructed per NRCS Stock Watering specifications (Appendix E).
- Low ground pressure, four-wheel all-terrain vehicles (ATVs) may be used off-road for facilities monitoring, maintenance, or installation purposes, but are otherwise not permitted for off-road use within Areas 1 and 2. ATV use would be limited to the dry season when soils would not be impacted, would only be in upland areas, and would not be permitted in sensitive areas (such as along streams, with the exception of existing road crossings).

Task G1. Annual monitoring. Annually assess, in conjunction with grazing tenant, the condition of fences and troughs to confirm that all are properly maintained. Record the location, type, and recommendations if a fence or trough needs repair or replacement.

Task G2. Adaptive management actions. New fencing, gates, troughs, and other grazing-related infrastructure such as weather stations will be installed as needed for further site improvement as indicated by adaptive management, and as funding allows.

6.2. *Element H. Roads*

Objective: Monitor and maintain roads to provide access and minimize erosion and sedimentation issues

Task H1. Road monitoring. Inspect road conditions annually each May (after the rainy season) to determine the condition of the road surfaces and stream crossings. During year 1 May monitoring, the conditions of all road crossings (i.e., gullies or erosion present, culvert intact, damaged, % clogged) will be noted for use in subsequent years. The location and nature of issues observed at or away from stream crossings will be noted.

Task H2. Routine road maintenance. Maintain the existing drivable and abandoned roads as frequently as needed to preserve them in good condition. It is expected that the roads will need to be mowed approximately two times a year. It is also expected that the roads will require re-grading approximately once every five years. To maintain the surface, the upper few inches of the roads will be disced, tilled, or otherwise loosened prior to grading, and the loosened material will then be graded back into the road. This will ensure that no spoils are deposited on road edges, all materials will be re-incorporated into the road, and the road elevation will not decline over time. Roads will be out-sloped where appropriate or otherwise graded to facilitate sheet flow and minimize concentration of water and formation of rills and gullies. When necessary, some road segments may be rocked or otherwise armored to reduce the potential for erosion.

Where erosion is present on the sides of roads these areas may be re-graded and re-shaped to prevent further erosion.

When the roads are wet and tread damage could occur from a vehicle, vehicles will not be used by those parties having vehicle access rights. Alternative means of road access during wet conditions will be used, such as access by foot, horse, or an ATV/SxS (Side by Side vehicle). Following this practice will minimize road damage.

Task H3. Minor woody vegetation removal. Remove or trim live trees, dead trees, brush, and/or woody debris where required by fire protection agencies, for treatment of disease, for public and Land Manager staff safety, for patrol vehicle access, for recreational access as allowed under this LTMP, or for fire breaks for defensible space purposes at utility lines or at the property lines.

6.3. Element I. Pipelines and Spring Boxes

Objective: Monitor and maintain any pipelines or spring boxes used to supplement water flow to troughs or on-site ponds.

Task I1. Annual monitoring. Annually assess the use and condition of any pipelines and spring boxes associated with troughs or on-site ponds. Record location, type and requirements for repair, and ensure that the Land Manager meets all terms of use and maintenance as described in the CE.

6.4. Element J. Existing Ranch House

Objective: Monitor the condition of the existing ranch house.

Task J1. Annual monitoring. Annually assess the use and condition of the existing ranch house, which could potentially be used by trespassers. Record any evidence of use or structure deterioration and determine if action is needed.

Task J2. Adaptive management actions. If trespassers are detected using the existing ranch house or if the condition of the structure deteriorates (e.g., due to earthquake damage) and becomes unsafe, the SCVWD may board up or demolish the structure.

7.0 SECURITY, SAFETY AND PUBLIC ACCESS

7.1. Element K. Public Access

Objective: To allow public recreation and scientific study consistent with the terms of the conservation easement for Area 1 and the resource management objectives of this LTMP.

While no public access to Areas 1 and 2 is planned at this time, the SCVWD may allow public access to these areas in the future. Such public access not only provides recreational opportunities to the public but is also important in public education on issues of biodiversity and the importance of conservation, and in allowing scientific research within Areas 1 and 2. Such access and education helps to maintain public support of conservation and assistance in obtaining public funds and grants for land acquisition and management. Potential future trail

locations would only consist of the existing drivable roads within Areas 1 and 2; these trails would include 36,536 linear feet (6.9 miles) of trail on the existing, drivable ranch roads.

The existing drivable roads within Areas 1 and 2 will be maintained to facilitate site patrol and resource management projects (Section 6.2); however vehicular access to this road will be limited to Land Manager and CE holder staff, contractors, and invitees, and will not be available for public vehicular use. Drivable roads are those roads up to 10 feet wide with natural or baserock surfaces that can accommodate maintenance and emergency vehicles.

The CE holder plans to conduct educational and natural history tours of the Preserve. These tours or studies would occur not more than four times a year and would consist of not more than 30 people each entry.

If public access beyond use by occasional researchers is proposed in the future, the SCVWD would coordinate with the CE Holder for Area 1 regarding the type and amount of public access and any appropriate conditions, restrictions, or additional monitoring related to public access. Any future public access will be consistent with the CE for Area 1.

7.2. Element L. Trash and Trespass

Objective 1: Monitor sources of trash and trespass.

Objective 2: Collect and remove trash, repair vandalized structures and rectify trespass impacts to prevent degradation of Areas 1 and 2 from unauthorized human uses.

Task L1. Ongoing patrol monitoring. If observed during each site visit, remove and record occurrences of trash and/or trespass; record type, location and management recommendations to avoid, minimize, or rectify impacts. This task will be conducted quarterly. Because TNC monitors and removes trash only on an annual basis, and only on Area 1, the SCVWD's trash removal will be performed in addition to TNC's trash removal. Trash and trespass issues will be monitored using the General Site Monitoring Checklist (Appendix C).

Task L2. Annually remove or rectify problems. Conduct an annual trash and trespass results review, identify any patterns, and determine if adaptive management actions are needed.

8.0 ELEMENT M. REPORTING

Objective: Compile monitoring results for Areas 1 and 2.

The SCVWD will compile monitoring results annually at the end of each monitoring year, including the monitoring checklists for Areas 1 and 2 (Appendix C). If the SCVWD pursues using Areas 1 and 2 for mitigation purposes in the future, additional monitoring and reporting requirements will be determined at that time.

A summary of the long term management tasks to be implemented and the timing of these activities are presented below (Table 6).

Table 6. Long Term Management Tasks and Timing

Task No.	Task	Frequency	Timing
A. Streams, Springs, and Ponds			
A1	Stream and pond condition monitoring	Annually	May/June
A2	Stream and pond adaptive management actions	As needed	Dry season
B. Livestock Grazing Management			
B1	Livestock grazing implementation monitoring	Quarterly	Quarterly
B2	RDM reference plot monitoring	Annually	Mid-Sept.–early Oct., before rains start
B3	Areas 1 and 2 RDM status monitoring protocol	Annually	Mid-Sept.–early Oct., before rains start
B4	Grazing adaptive management actions	As needed	As needed
C. Invasive Plant Species Management			
C1	Invasive plant monitoring	Comprehensive – every 5 years Incidental - annually	Late June or early July*
C2	Conduct annual invasive weed control activities	Annually, if needed	Dry season. Variable timing dependent on species and techniques
D. CTS			
D1	Incidental CTS observations	Ongoing	Conducted with other annual monitoring and quarterly patrols
E. CRLF			
E1	Incidental CRLF observations	Ongoing	Conducted with other annual monitoring and quarterly patrols
F. Other Sensitive Species			
F1	Document observations of other sensitive wildlife and plant species within Areas 1 and 2	Ongoing	Conducted with all other annual monitoring and quarterly patrols
G. Grazing Infrastructure: Fences, Gates, and Troughs			
G1	Annual monitoring	Annually	Dry season
G2	Adaptive management actions	As needed	As needed
H. Roads			
H1	Road monitoring	Once annually (general)	General - May
H2	Routine road maintenance	Approximately once/5 years	Dry season
H3	Minor woody vegetation removal	As needed	Variable
I. Pipelines and Spring Boxes			

Task No.	Task	Frequency	Timing
I1	Annual Monitoring	Annually	Dry season
J. Existing Ranch House			
J1	Annual Monitoring	Annually	Conducted with other annual monitoring patrols
J2	Adaptive management actions	As needed	Dry season
K. Public Access			
	Optional		
L. Trash and Trespass			
L1	Quarterly patrol monitoring	Quarterly	Conducted with all other annual monitoring and quarterly patrols
L2	Annually remove or rectify problems	Annually	June
M. Reporting			
M1	Compile monitoring results	Annually	By Dec. 31

*Target monitoring timing is late June or early July or based on the phenology of each invasive species.

9.0 TRANSFER, REPLACEMENTS, AMENDMENTS, AND NOTICES

9.1. Amendments

The Land Manager may revise the LTMP to better meet management objectives and preserve the habitat and conservation values of Areas 1 and 2. Such amendments will be considered required management components and shall be implemented by the Land Manager.

9.2. Notices

Any notices regarding this LTMP shall be directed as follows:

Land Manager and Property Owner:

Santa Clara Valley Water District (SCVWD)
Ms. Lisa Porcella
5750 Almaden Expressway
San Jose CA 95118
Phone: (408) 630- 2741
lporcella@valleywater.org

Area 1 CE Holder:

The Nature Conservancy
Stewardship Department
201 Mission Street, 4th Floor
San Francisco, CA 94105
Phone: (415) 777-0487
einlander@tnc.org

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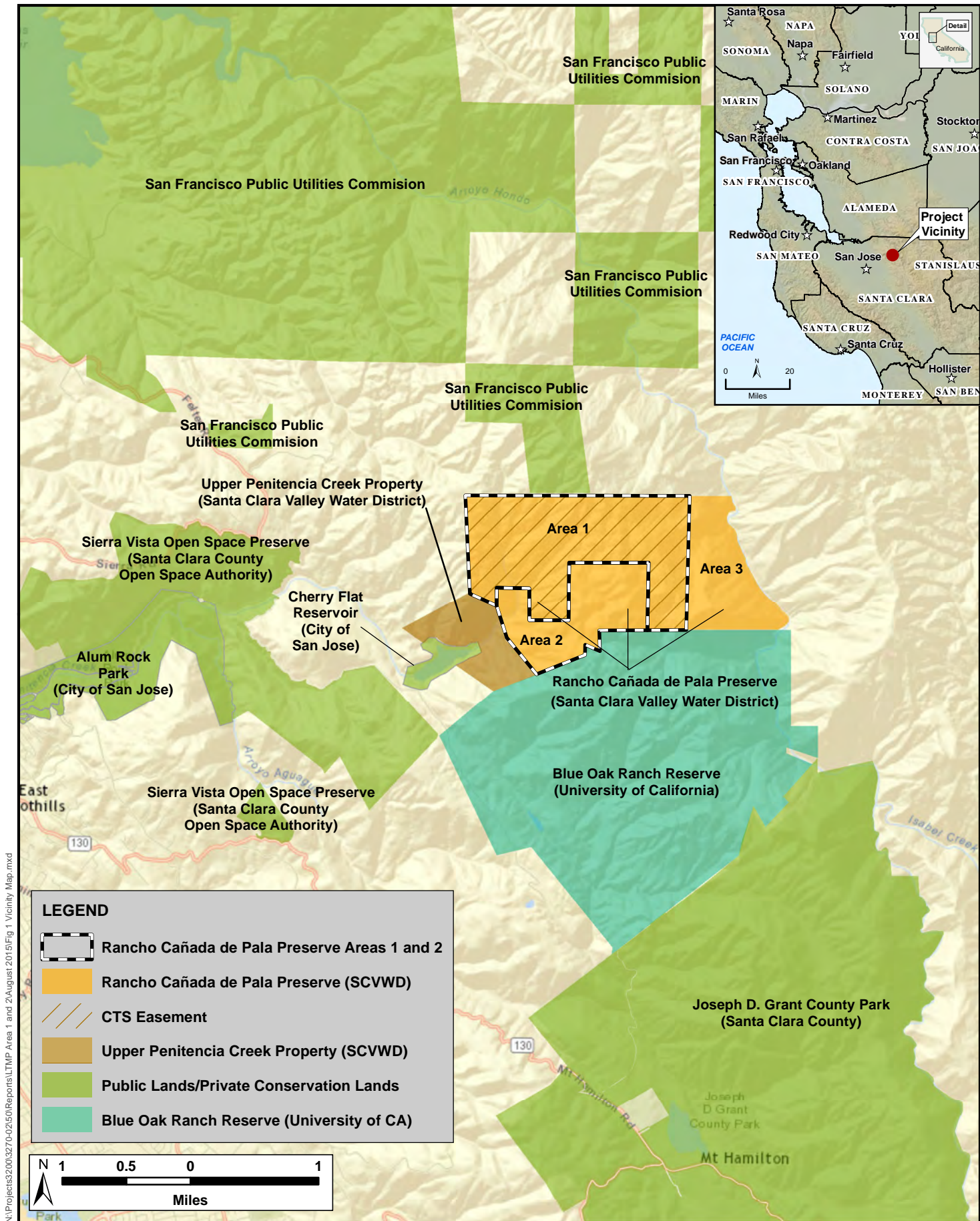
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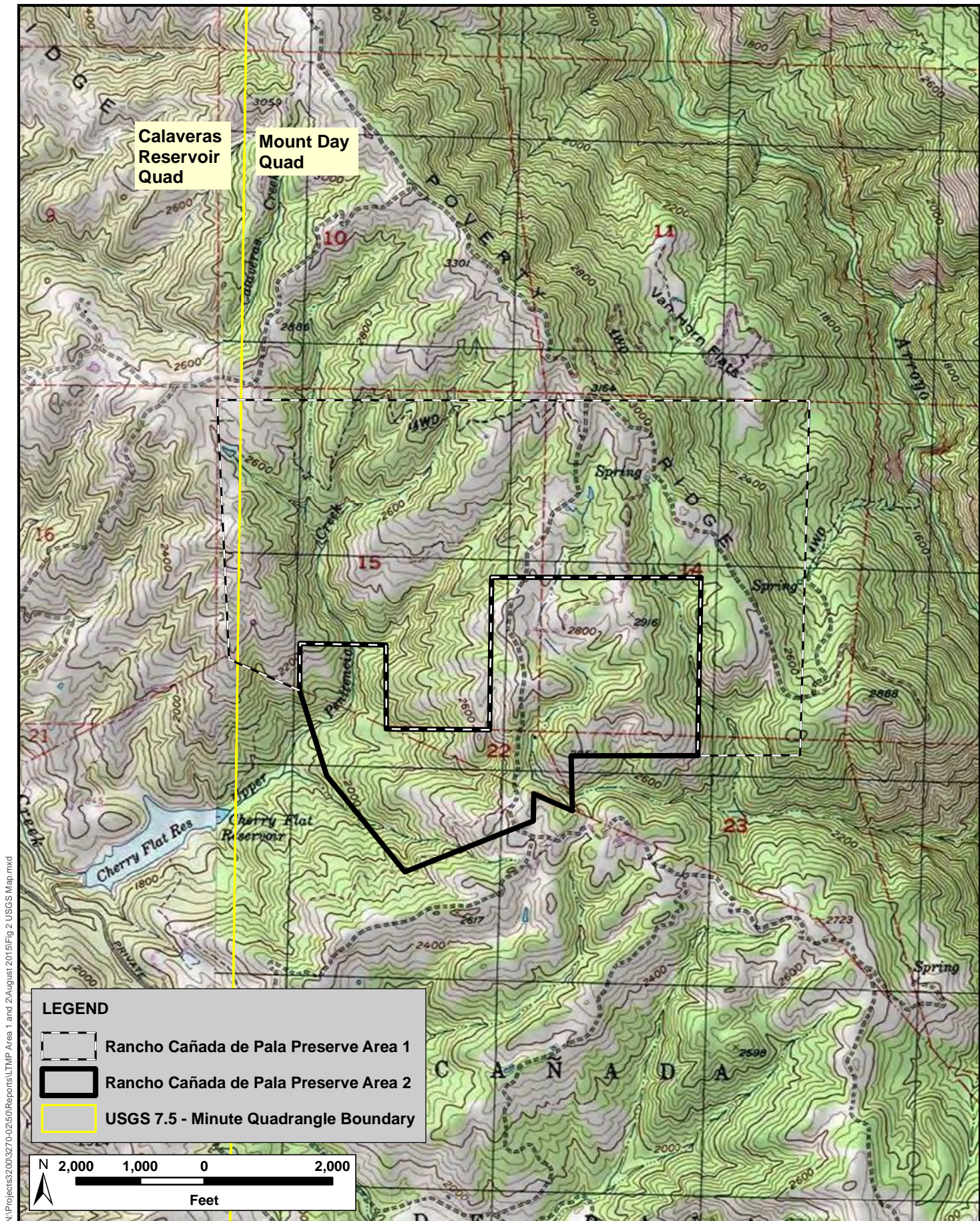
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APPENDIX A



N:\Projects\2001\3270-02\50\Reports\LTMP\Area 1 and 2\August 2015\Fig 1. Vicinity Map.mxd

Figure 1: Vicinity Map
 Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan
 August 2015



N:\Projects\2001\3270-02\501\Reports\LTMP_Area_1_and_2\August_2015\Fig 2_USGS_Map.mxd

Figure 2: USGS 7.5 - Minute Quadrangle
 Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan
 August 2015

Imagery Source: National Agricultural Imagery Program (2014)
Streams Source: Based on Bay Area Aquatic Resource Inventory (BAARI) streams

N:\Projects\3200\3270-02\50\Reports\LTMP Area 1 and 2\August 2015\Fig 3 Streams and Tributaries.mxd

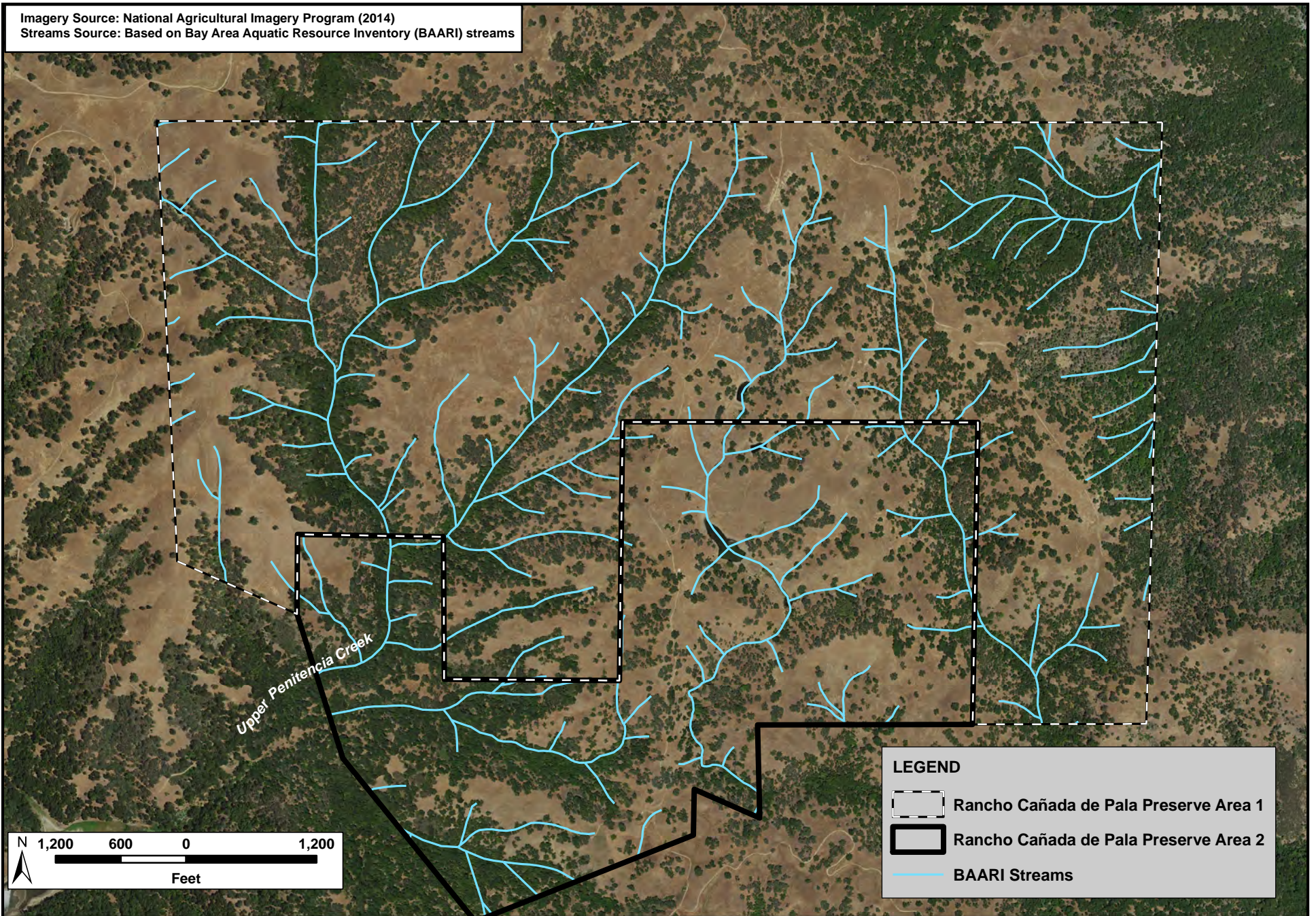
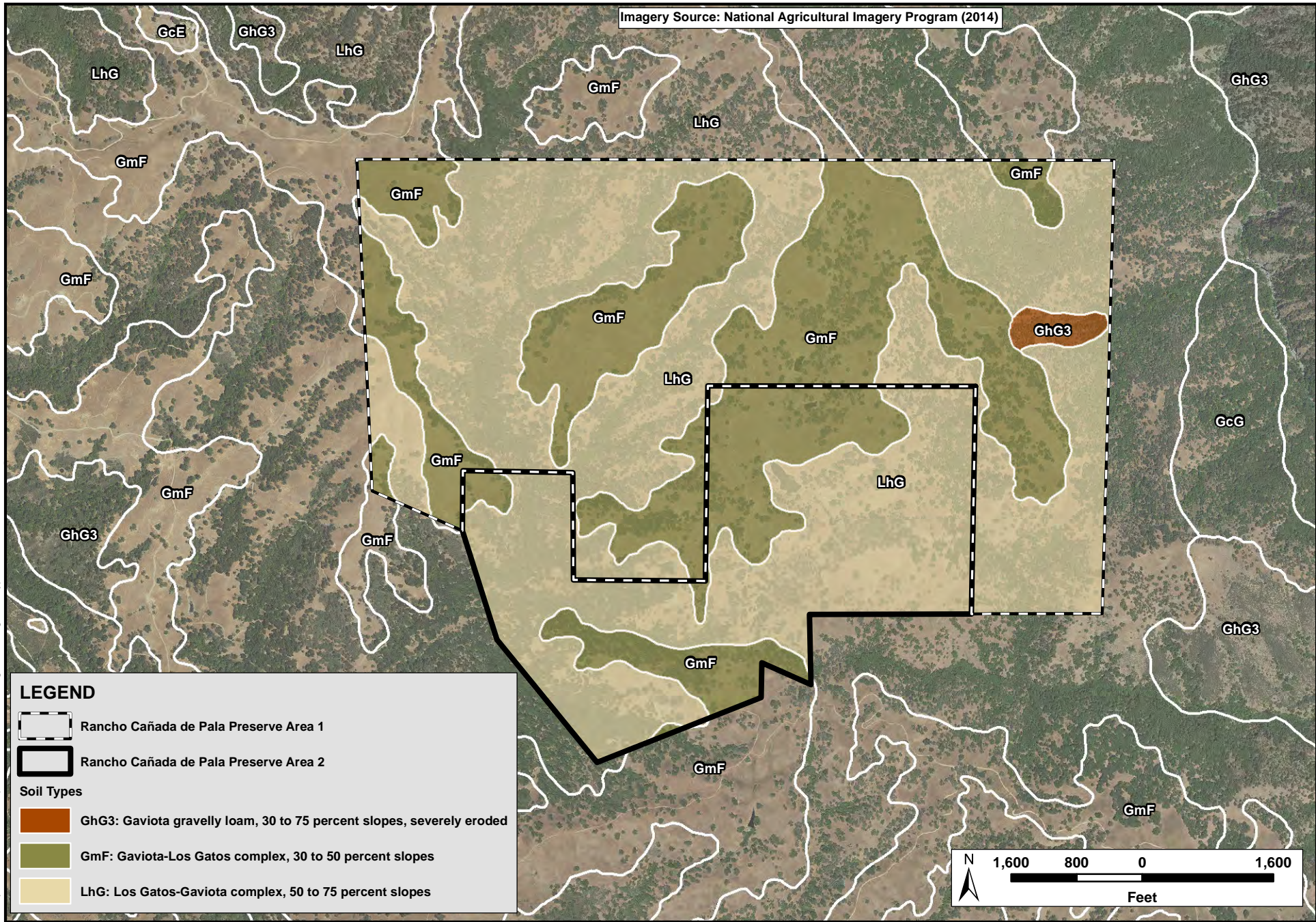


Figure 3: Streams and Tributaries
Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan
August 2015

Imagery Source: National Agricultural Imagery Program (2014)



N:\Projects\20013270-02\50\Reports\LTMP Area 1 and 2\August 2015\Fig 4_Soil Types.mxd

Figure 4: Soil Types
Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan
August 2015

N:\Projects\2015\20150802\Reports\LTWP Area 1 and 2\August 2015\Fig 5 Existing Infrastructure.mxd

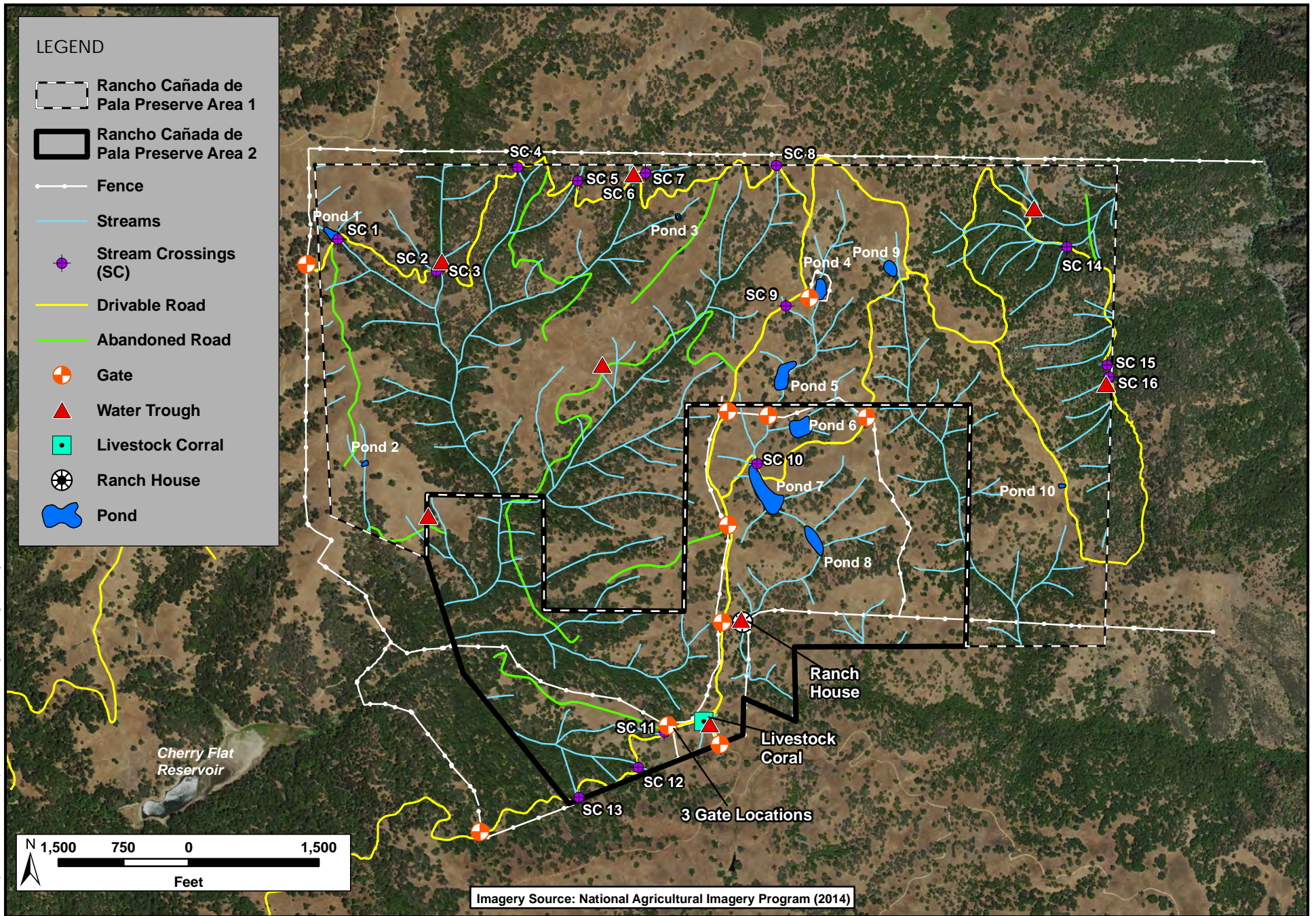
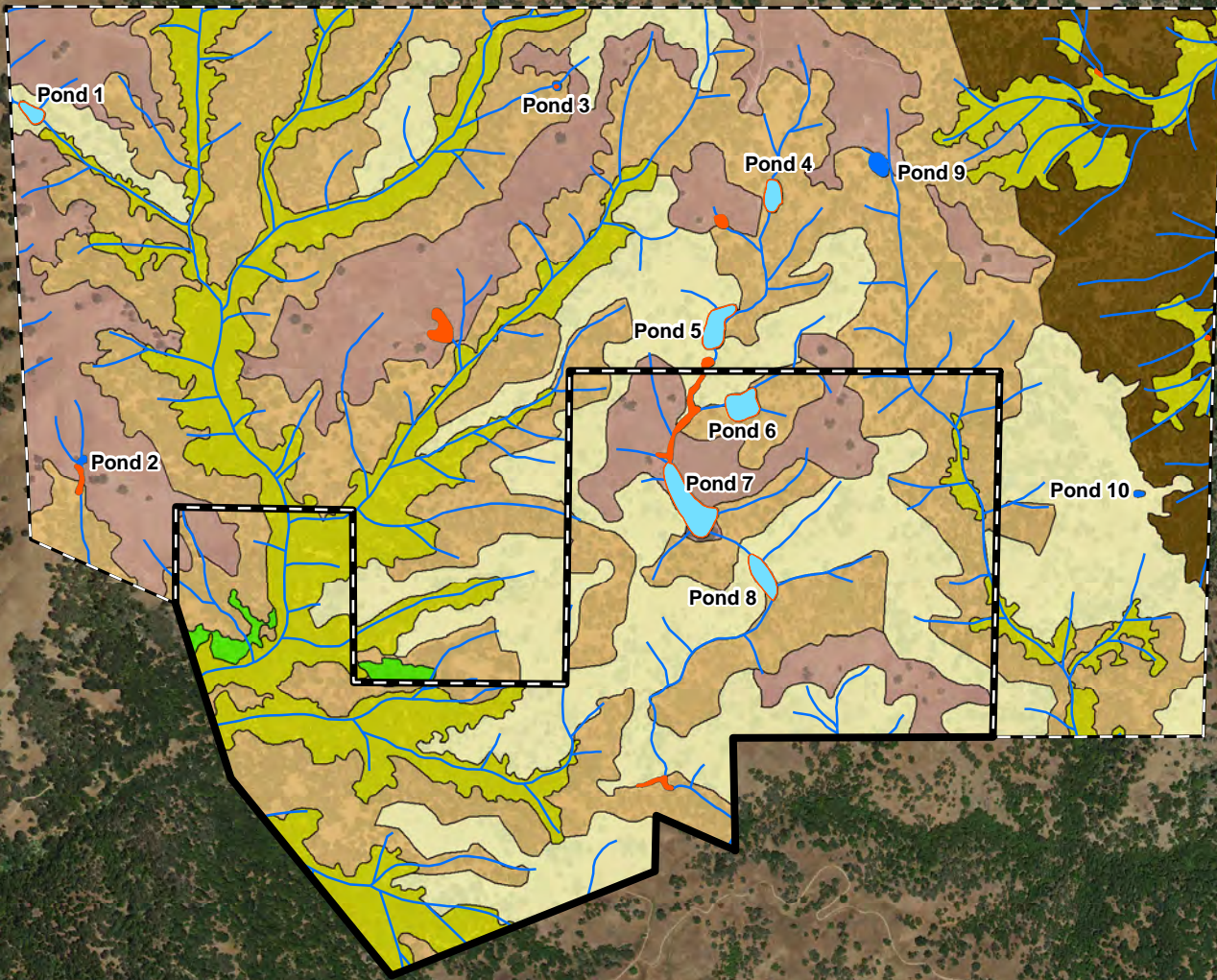


Figure 5: Existing Infrastructure
Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan
August 2015

Imagery Source: National Agricultural Imagery Program (2014)

LEGEND

- Rancho Cañada de Pala Preserve Area 1
- Rancho Cañada de Pala Preserve Area 2
- Streams
- Vegetation Types**
 - Blue & Valley Oak Woodland
 - Valley Oak Savanna
 - Mixed Oak Forest
 - California Annual Grassland
 - Foothill Pine/Oak Woodland
 - Northern Mixed/Chamise Chaparral
- Perennial Pond
- Seasonal Pond
- Wetlands



N:\Projects\3200\327D-02\501\Reports\LTMP\Area 1 and 2\August 2015\Fig 6_Vegetation Map.mxd

Figure 6: Vegetation Map
Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan
August 2015

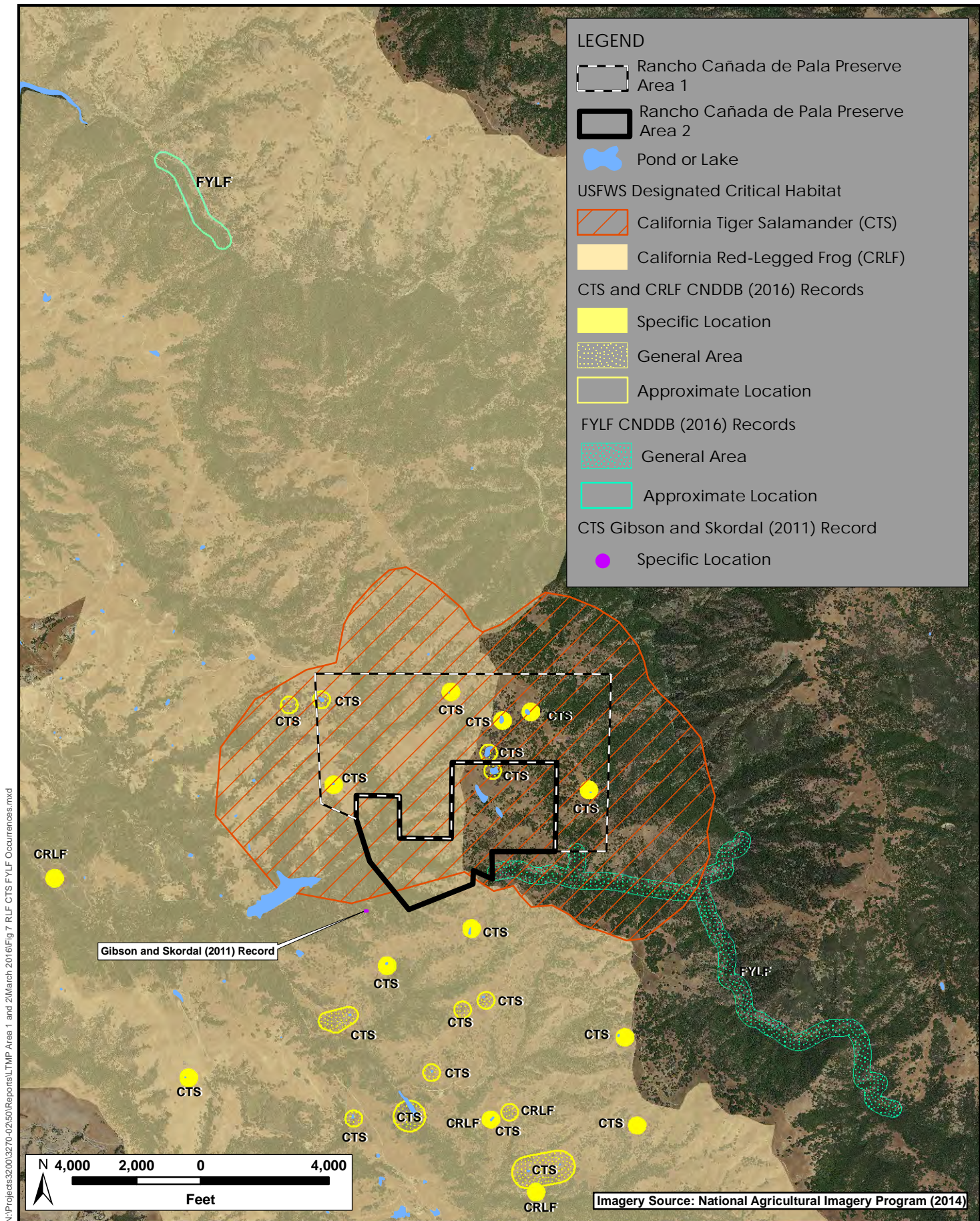


Figure 7: CTS, CRLF and FYLF Occurrences and/or Critical Habitat in the Vicinity Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan March 2016

N:\Projects\3200\3270-02\50\Reports\LTMP Area 1 and 2\August 2015\Fig 8 RDM Sampling Sites.mxd

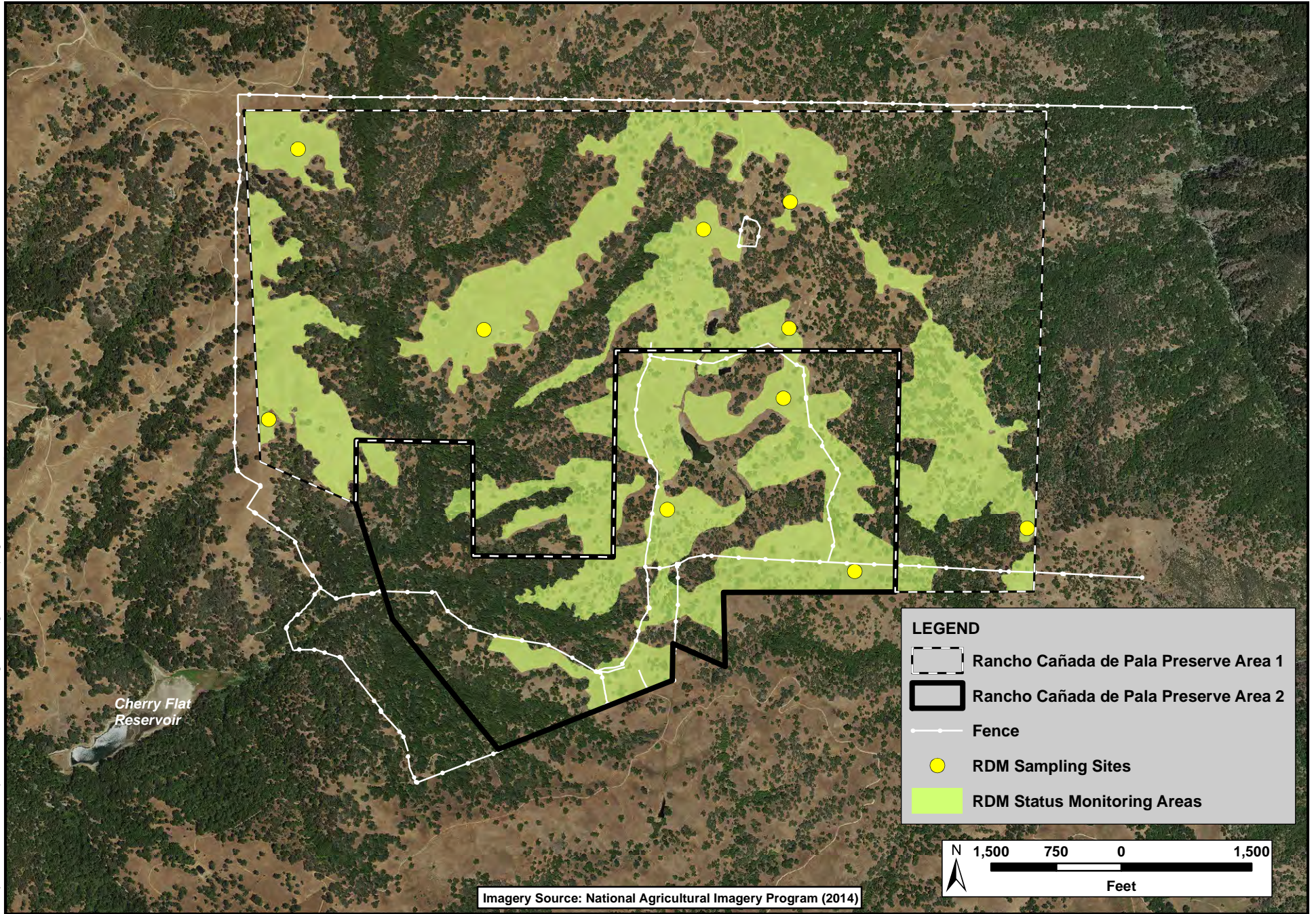


Figure 8: RDM Sampling Sites
Rancho Cañada de Pala Preserve Areas 1 and 2 Long-term Management Plan
August 2015

APPENDIX B



Photo 1. A large gully near stream crossing SC1, downstream of the road.



Photo 2. The upslope (top) end of the gully at SC1. The photo of the ephemeral drainage was taken facing downstream.



Photo 3. The upslope (top) end of the gully on the downstream side of SC2.



Photo 4. Photo of gully at SC2 taken from the road, facing downstream.



Photo 5. Nonfunctional culvert at SC3.



Photo 6. A wooden retaining wall stabilizing the downstream side of SC3.



Photo 7. The road crossing over an intermittent section of Upper Penitencia Creek at SC6 that was dry at the time of the May and June field surveys. A small wooden retaining wall stabilizes the downstream side of the road.



Photo 8. Culvert outlet at SC9.



Photo 9. Culvert outlet at SC10.



Photo 10. A pig fence crossing the ephemeral stream channel on the upstream side of SC13.



Photo 11. Barbed wire fence and gate to exclude cattle from Pond 4.



Photo 12. View of barbed wire fence in the eastern part of Area 1.



Photo 13. Pond 7 (also called Eagle Lake), which is perennial.



Photo 14. Pond 10, which is seasonal and was dry during the May and June field surveys.



Photo 15. Trough to the northwest of SC14.



Photo 16. Trough near SC16 is located in Area 1 near the border of Area 3.



Photo 17. Old one-room ranch house and adjacent retaining wall.



Photo 18. Blue and valley oak woodland vegetation type on Areas 1 and 2.



Photo 19. Blue and valley oak woodland vegetation type on Areas 1 and 2.



Photo 20. Valley oak savanna vegetation type on Areas 1 and 2.



Photo 21. View of valley oak savanna intergrading with California annual grassland on Areas 1 and 2. The tract of grassland in this photo is dominated by wild oats.



Photo 22. The understory of the mixed oak forest vegetation type on Areas 1 and 2.



Photo 23. Patch of California annual grassland dominated by rattail sixweeks grass.



Photo 24. Foothill pine/oak woodland vegetation type on Areas 1 and 2.



Photo 25. View of the foothill pine/oak woodland vegetation type on Areas 1 and 2.



Photo 26. Northern mixed/chamise chaparral on the eastern portion of the Preserve (Area 3).



Photo 27. Perennial Pond 1 with wetlands along the perimeter.



Photo 28. Perennial Pond 4 with wetlands along the perimeter.



Photo 29. Perennial Pond 5 with wetlands along the perimeter.



Photo 30. Perennial Pond 6 with wetlands along the perimeter.



Photo 31. Perennial Pond 8 with wetlands along the perimeter.



Photo 32. Seasonal Pond 2.



Photo 33. Seasonal Pond 3 with seasonal wetland in center.



Photo 34. Seasonal Pond 9.



Photo 35. Wetlands within the stream network that connects Ponds 4-8.



Photo 36. Wetlands within the stream network that connects Ponds 4-8.



Photo 37. Least duckweed on the surface of the water in wetland habitat.



Photo 38. Photo of a seep at the headwaters of the stream near SC9.



Photo 39. Facing downstream along Upper Penitencia Creek, which flows through Areas 1 and 2.



Photo 40. Dense forest and shrubs cover the steep slopes leading down to Upper Penitencia Creek. This photo was taken on a hillside above a perennial section of the stream.



Photo 41. Spanish brome growing on the Preserve.



Photo 42. Italian thistle growing on the Preserve.

APPENDIX C

General Site Monitoring Checklist – Rancho Cañada de Pala Preserve Areas 1 and 2

Monitor Name _____

Monitoring Date _____

Locations
visited _____

Resource Status and Management				
Grazing implementation monitoring being performed?				
Depth/extent of water in ponds				
California tiger salamander/red-legged frog observed?				
Other sensitive plant or animal species observed?				
Potential Adverse Conditions				
Question	Answer ¹	Type, Location, Description of Condition, Potential Cause	Comparison to Prior Monitoring Condition	Recommendations?
Invasive plant concentrations observed?				
Evidence of trash observed?				
Evidence of trespass observed?				
Problems with gates, fences, troughs, or corral?				
Problems with spring box or water conveyance systems?				
Problems with roads?				
Management Activities Undertaken				
Any repair, remediation, management activities undertaken?				
Notes:				

¹ Y = Yes, N = No, NS = Not Sure, NA = Not Applicable

Aquatic Habitat Monitoring Checklist – Rancho Cañada de Pala Preserve Areas 1 and 2

Monitor Name _____ Monitoring Date _____ Monitoring Station _____ Aquatic Feature Type _____

Resource Status				
Water present (and depth)?				
Woody vegetation present (and species)?				
Seedlings or saplings of woody plants observed?				
Potential Adverse Conditions				
Question	Answer ¹	Location, Description of Condition, Potential Cause	Comparison to Prior Monitoring Condition	Recommendations?
Cattle observed in streams or riparian areas?				
Bare soil in or along banks of feature?				
Unstable or eroding stream banks (e.g., rills, gullies)?				
Erosion at road or culvert (e.g., rills, gullies)?				
Headcuts present?				
Vegetation trampling evident?				
Excessive sedimentation evident?				
Visual water quality problems evident (debris, odor, color?)				
Damage from pigs or deer?				
Unusual disturbance (e.g., fire, ORV, trespassing)?				
Notes: 				

¹ Y = Yes, N = No, NS = Not Sure, NA = Not Applicable

APPENDIX D

Wildland Solutions

RDM Monitoring Procedure

Keith Guenther

November 2007 version

Annually create an RDM zone map and a pasture success map with supporting information collected at monitoring reference sites that shows how well each pasture/management unit meets established RDM objectives for a property. A three part process is involved.

1. Prior to monitoring there is a need to establish the RDM classes to be utilized. The RDM classes of course need to reflect RDM objectives for the site.
2. Collection of supporting information at RDM reference monitoring sites.
3. Development of an annual pasture success map.

Part 1: Establish RDM classes to be utilized in monitoring

Prior to field mapping a decision needs to be made as to what and how many RDM classes are to be utilized. There is no specific best number, some examples are:

A minimum of 2 classes is required.

- Meets the objective
- Does not meet the objective.

UCCE publication 8092 (2006) recommends the use of 3 RDM classes:

- RDM level is high (exceeds the objective)
- RDM level is moderate (meets the objective)
- RDM level is low (below the objective)

Hormay and Faucett, USFS technical note 21 (1942) used 7 classes:

- None use
- Very light use
- Light use
- Moderately light use
- Moderate use (recommended level of use)
- Close use
- Very close use

The RDM classes utilized for monitoring RDM on a typical California annual grassland site producing 1,800-2,000 lbs/acre could be as follows:

- RDM is more than 1,600 lbs/acre
- RDM is between 1,200-1,600 lbs/acre
- RDM is between 800-1,200 lbs/acre (established objective)
- RDM is between 400-800 lbs/acre
- RDM is below 400 lbs/acre
- RDM has been removed by fire and is below 100 lbs/acre

The RDM classes utilized for monitoring RDM on a highly productive coastal prairie site producing 4,000 lbs/acre could be as follows:

- *RDM exceeds 3,600 lbs/acre*
- *RDM is between 2,400-3,600 lbs/acre*
- *RDM is between 1,800-2,400 lbs/acre*
- *RDM is between 1,200-1,800 lbs/acre (established objective)*
- *RDM is between 600-1,200 lbs/acre*
- *RDM is below 600 lbs/acre*
- *RDM has been removed by fire and is below 100 lbs/acre*

Part 2: Collect supplemental supporting information at reference monitoring sites.

Supplemental information can be collected at selected reference monitoring sites to validate and document what the person conducting the RDM zone mapping is seeing. Information collected at the reference monitoring sites is not intended to be extrapolated as representing the entire management unit or pasture. The information is intended to represent that portion of the pasture being surveyed and serve as a reference for documenting the status of a specific RDM zone.

First step - Locate reference monitoring sites

Reference monitoring sites are located in a manner that samples and records the general condition of a portion of a management unit or pasture. Reference monitoring sites are used to provide supporting documentation for the RDM zone maps. The number of reference sites in a pasture depends on the size and complexity of the pasture. A minimum of one reference site is usually established in each pasture with additional monitoring sites added when pastures are over 600 acres.

Reference monitoring sites are typically:

1. Located within a uniform vegetation type, and capable of responding to management actions. *The site should have relatively uniform vegetation and preferably be 1 acre in size.*
2. Located away from water. *1/4 mile is a distance that should avoid the heavy use of sites often associated with water developments.*
3. Located for good access. *Sites should be accessible to facilitate monitoring, avoid sites that are within 20 feet of a road or 50 feet of a fence.*
4. Located on a site that is capable of producing herbage typical of the area. *For the typical California annual grassland site that would mean an area capable of producing 2,000 lbs/acre of RDM.*

Reference monitoring sites at times may be established in low use areas and high use areas to better document the actual range of impacts that may be occurring on large diverse management units. When interpreting an RDM zone map, a reference monitoring site in a potentially high use area near water that has an RDM level that meets the established RDM goal would imply that the pasture as a whole meets the RDM objective. A reference monitoring site in a potentially low use area with an RDM level that

does not meet an established RDM objective would reinforce the point that more than likely most of or all of the pasture did not meet the RDM objective.

Second step - record photo points at reference monitoring sites

1. A Robel pole is placed at a point that shows representative use of the vegetation within the vicinity of the reference monitoring site.
2. Two golf balls are placed about 6" apart on each side of the Robel pole. If vegetation is matted the golf balls are placed on the ground not on the vegetation, in a manner that helps to show herbage quantity.
3. Photos are taken looking in a northerly direction. Photos taken looking north reduce any potential glare on the camera lens and provide optimum light on vegetation.
4. A tripod is utilized to provide more stable pictures with better clarity.
5. The first picture is taken from about a 10 foot distance with tripod set at 5 feet height. With a digital camera it is zoomed in to a point that still includes all 4 golf balls.
6. A second more distant picture is taken from 20 feet with tripod set at 5 feet height. The camera is zoomed to a setting where the Robel pole height appears to be about 1/2- to 2/3 of the picture frame height.
7. The film numbers or digital photo numbers of each picture is recorded on a worksheet for each photo as the photos may all look alike at a later date. A consistent numbering system is utilized. An example is pcr023dy where pcr is the property code, the number is the reference monitoring site number the d is distance of photo N or G, Near or General and the last 2 digits are the year of photo. Consistent numbering helps transfer field data smoothly into the annual report. With digital cameras the date stamp is utilized when available. A 1.2 megapixel image size is considered adequate as photos for most reports do not need to exceed 3"x5".

Third step - estimate RDM class at monitoring reference sites

An estimate of RDM herbage is made utilizing the RDM classes established in part one of the monitoring plan. The classes are used with the desired goal usually being the middle class and 2-3 classes above and 2-3 classes below the desired level plus the burned by fire class.

Clipping and weighing of RDM is conducted as needed to confirm that estimates are being made accurately. The procedure for clipping and weighing RDM is described in the *Wildland Solutions Residual Dry Matter (RDM) Monitoring photo-guide* and the *UCCE publication 8092*. *The scales for weighing RDM are set to 0 with the bag attached or the weight of the bag that holds the RDM is subtracted after weighing.*

Fourth step - document any additional information

Additional information such as visual estimates of plant composition, weedy species, noxious weeds, perennial grasses, unusual wildlife seen, GPS coordinates, general location and anything of note that might be of use to future managers is added as comment notes on a standard form for the project. The amount and types of supplemental data collected will vary depending on the needs of each project. A sample form is shown on page 9.

Fifth step - transfer field information to digital format.

This step provides the ability to archive the field data collected and make multiple copies for future reference and analysis. A format that uses a MS WORD based form allows efficient entry of data.

Sixth step - create a supporting report

The GIS database developed for the monitoring reference sites can be utilized to create a summary report for inclusion in the appendix of the annual RDM monitoring report.

Seventh step – add reference monitoring site locations to the RDM zone map

Placing the location of the monitoring reference sites on the RDM zones map created for the project provides the ability for anyone to easily review the data collected for specific reference sites. The ability for managers to be able to readily identify reference sites that have unusually high or unusually low levels of RDM is a very useful feature when assessing grazing patterns and making management adjustments.

Part 3: Develop RDM zone and pasture success maps

RDM zone or use-pattern maps are developed to show RDM levels that occur within a pasture at the time a survey is made. Pastures typically have a variety of soils, aspects, vegetation and non-uniform livestock use that requires interpretation when developing an RDM zone map.

First step – collect field data

A 1:24,000 scale USGS topographic map, which includes management unit or pasture boundaries and important features such as livestock water, fences and roads, is utilized as a base field map for recording data.

Mapping of RDM zones is conducted by visually examining an adequate amount of the pasture to determine and map which of the 3-7 RDM classes occur within the pasture. A combination of reference photographs, descriptive narrative and clipping and weighing RDM within representative areas is utilized to determine the RDM class for a particular portion of a pasture (Guenther 1998). Mapping units are generally no smaller than 20 acres. The RDM zones are delineated and recorded before leaving a given pasture.

When mapping RDM patterns for a property attention is focused on those areas capable of producing herbage and RDM that is typical for the area during a normal growing season. Notes

are made on the map regarding specific information obtained, especially from monitoring reference sites, and sites that have been clipped and weighed.

Livestock tend to graze in a patchy manner, heavily using small areas and lightly using an adjacent area. Boundaries between RDM zones are recorded on the map. When determining the boundary between two classes it is often necessary to decide that an area is “mostly” within a given class and an adjacent area is “mostly” in a higher or lower class. The boundary is placed on the map where one “mostly” shifts to the other “mostly”. Features such as topographic breaks in slope, changes in aspect and the resulting vegetation changes influence livestock use patterns and often can be used to help determine the boundary between two use classes. Interestingly, even though 6 classes of RDM are typically utilized, most pastures tend to only have 2-3 RDM zone classes as cattle tend to spread out and locate areas of good remaining forage before severely impacting a significant portion of any pasture. The result is that pastures tend to be mostly light-moderate use or moderate-heavy use.

Second step - input data collected into GIS database

Data from the field maps is transferred into a GIS database to allow creation and display of information as an RDM zone map (Fig 1 page 7). The ability to archive and analyze data allows the development of the annual pasture success maps (Fig 2 page 8).

Third step - calculate acreage of each mapped zone

A query of the database calculates the acreage for each RDM zone mapped within a pasture. A simple calculation then determines the percentage of a pasture that meets or does not meet a specific RDM class for the pasture.

Fourth step - determine how well each pasture meets the objective (success)

The criteria used to measure success are quantitative and color coded for visual display. An example with 2 classes above the established objective and 2 classes below the objective could be:

- *90% of pasture exceeds 3,000 lbs/acre RDM*
- *90% of pasture exceeds 2,000 lbs/acre RDM*
- *90% of pasture exceeds 1,200 lbs/acre RDM (established objective)*
- *10-35% of pasture is below 1,200 lbs/acre RDM*
- *more than 35% of pasture is below 1,200 lbs/acre RDM*

The criteria could as well have been:

Three simple classes for success described as:

- *80% of pasture exceeds objective*
- *80% of pasture meets objective*
- *More than 20% of pasture below objective*

Or five classes used to describe levels of success:

- High (RDM more than 200% of minimum)
- Exceeds the objective (RDM is 150-200% of minimum)
- **Meets the objective** (RDM is from 100-150% of minimum)
- Below the objective (10-35% of area below minimum)
- Low (more than 35% of area below minimum)

Fifth step - prepare the pasture success map with legend.

Each pasture is assigned one of 3-6 success classes depending on how well it meets the established objective. Pastures are considered to be within an identified success class if a specific percentage of the pasture is at or above the RDM level for the class (typically 80 or 90%). A GIS based map is prepared with color coded levels for pasture success to facilitate visual review and evaluation of success on a management unit or pasture basis.

Sixth step - prepare a pasture summary table

The database associated with the GIS program can be utilized to create a summary report for each pasture that is exported in a text format for inclusion in the appendix of the annual RDM monitoring report. The current year's data can then be compared to data collected for each pasture from previous years.

References:

Bartolome, James W. William E. Frost, Neil K. McDougald, Michael Connor. 2006. California Guidelines for Residual Dry Matter (RDM) Management on Coastal and Foothill Annual Rangelands. UCCE pub 8092 <http://anrcatalog.ucdavis.edu/pdf/8092.pdf>

Guenther, Keith. 1998. Residual Dry Matter (RDM) monitoring photo-guide. Wildland Solutions. <http://www.wildlandsolutions.com/rdm.html>

Hormay, A.L. and A. Fausett. 1942. Standards for judging the degree of forage utilization on California annual type ranges. CA Forest and Range Experiment Station Technical Note 21. en pastures are over 600 acres.

- Project: TNC- Mount Hamilton
- Ranch: Simon Newman
- Pasture name: **Bear Gulch**

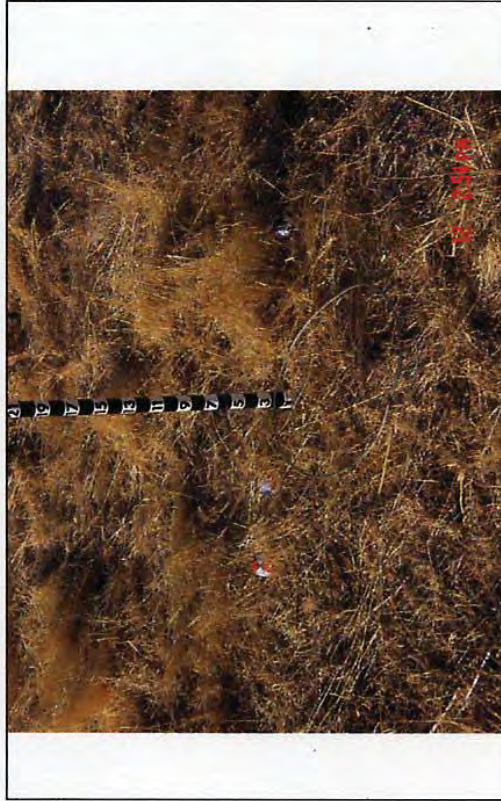
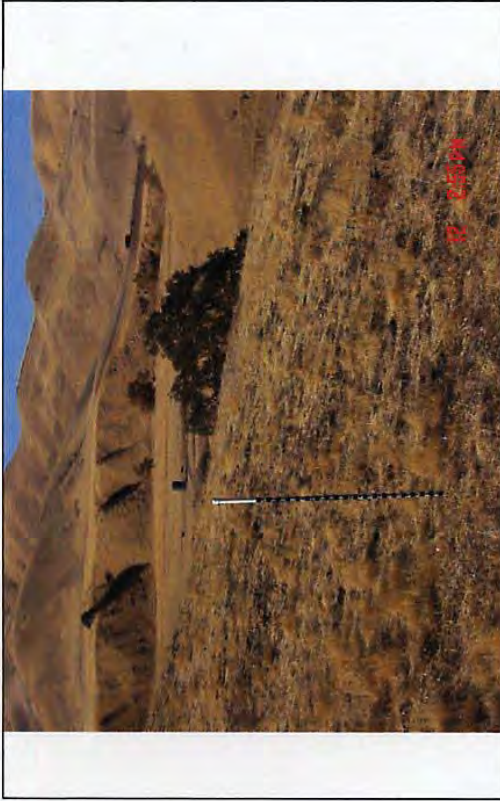
- UTM Coordinates: UTM base 27
East: 0664231 North: 4121284
- General location:

• Herbage composition:

- Perennial Grass:..... %
- Annual Grass:..... **95 %**
- Forbs:..... **4 %**
- Tree leaves:..... %
- Weeds: **1 %**

Comments:

Weeds: Scattered Mullein Weed, Tarweed and Vinegar Weed.



Monitoring Site #**smn61** Date 10/12/2004

Slope: 7 % Aspect: Northeast

Residual Dry Matter Class: **1000**

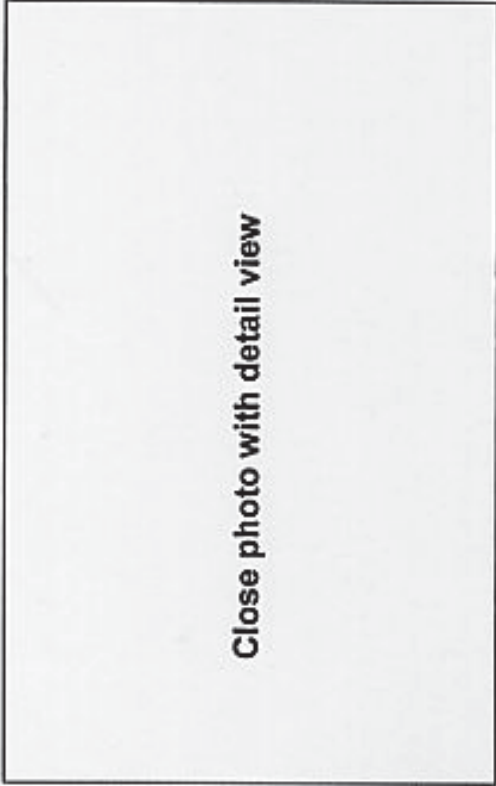
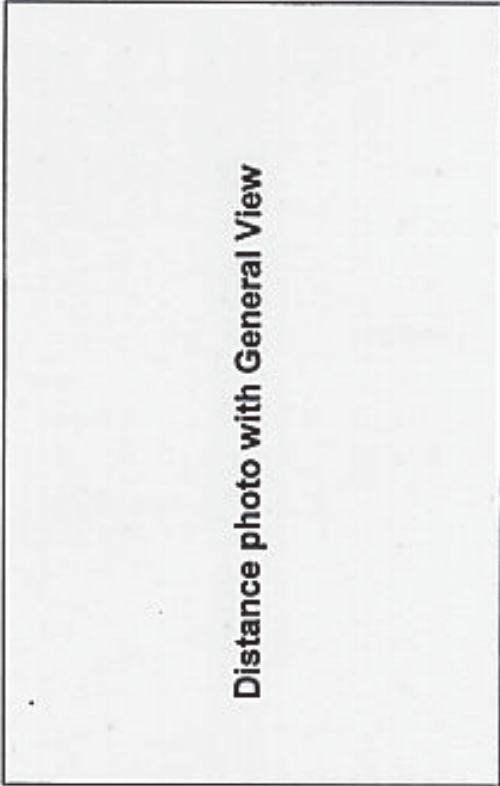
Surveyor: Keith Guenther, Wildland Solutions

- Project:
- Ranch:
- Pasture name:

- UTM Coordinates: UTM base
East: North:
- General location:

- Herbage composition:
 - Perennial Grass:..... %
 - Annual Grass:..... %
 - Forbs:..... %
 - Tree leaves: %
 - Weeds: %

Comments:



Monitoring Site # Date
Slope: % Aspect:
Residual Dry Matter Class:

Surveyor:

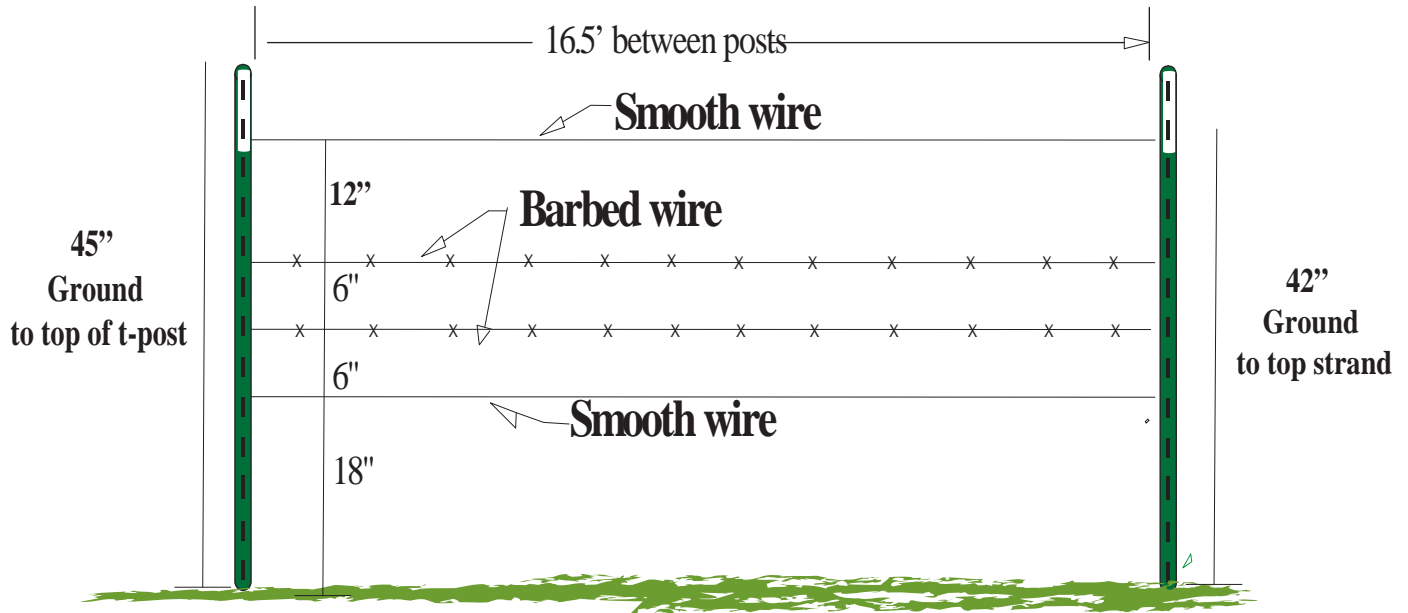
APPENDIX E

Santa Clara County Open Space Authority

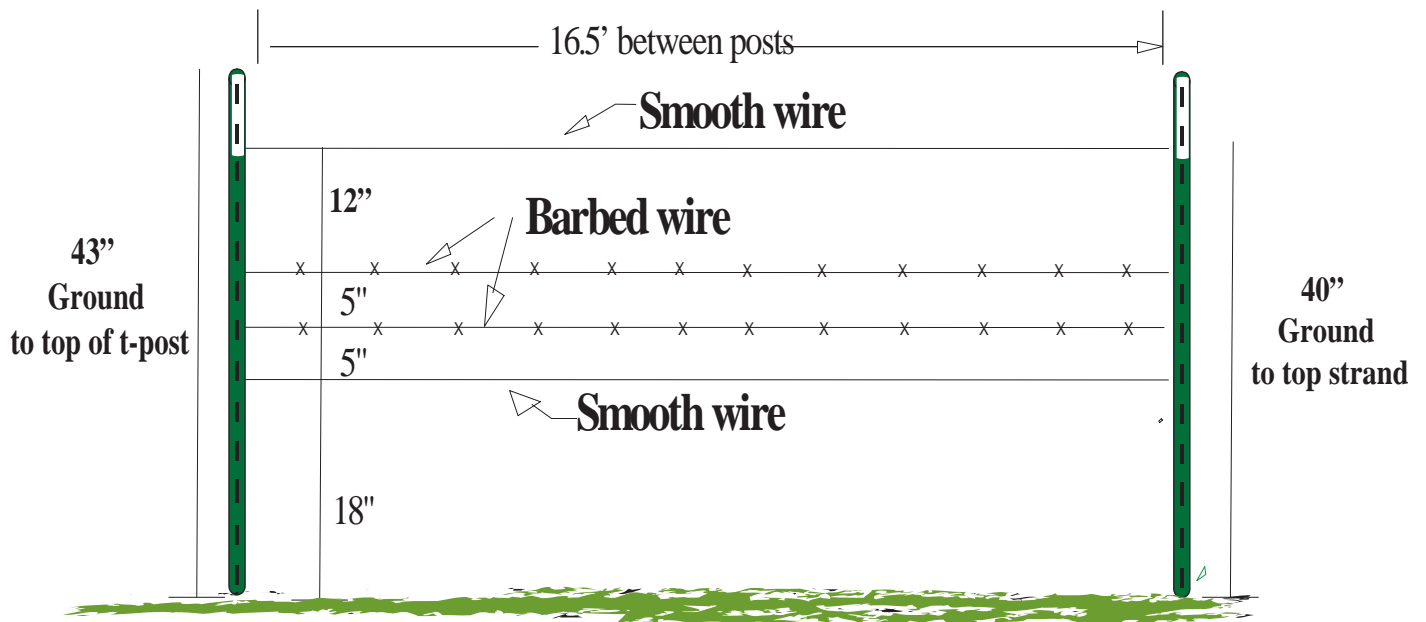
Fencing Standards

Standard Cattle Grazing

Road Side - Use 66" (5.5') t-posts



Interior Fencing - Use 60" (5.0') t-posts

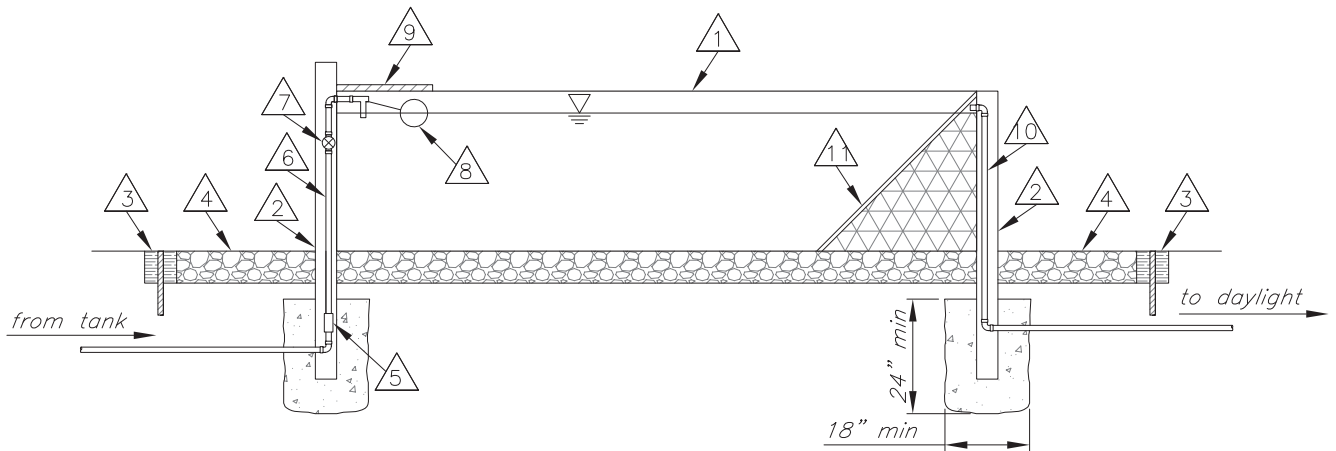
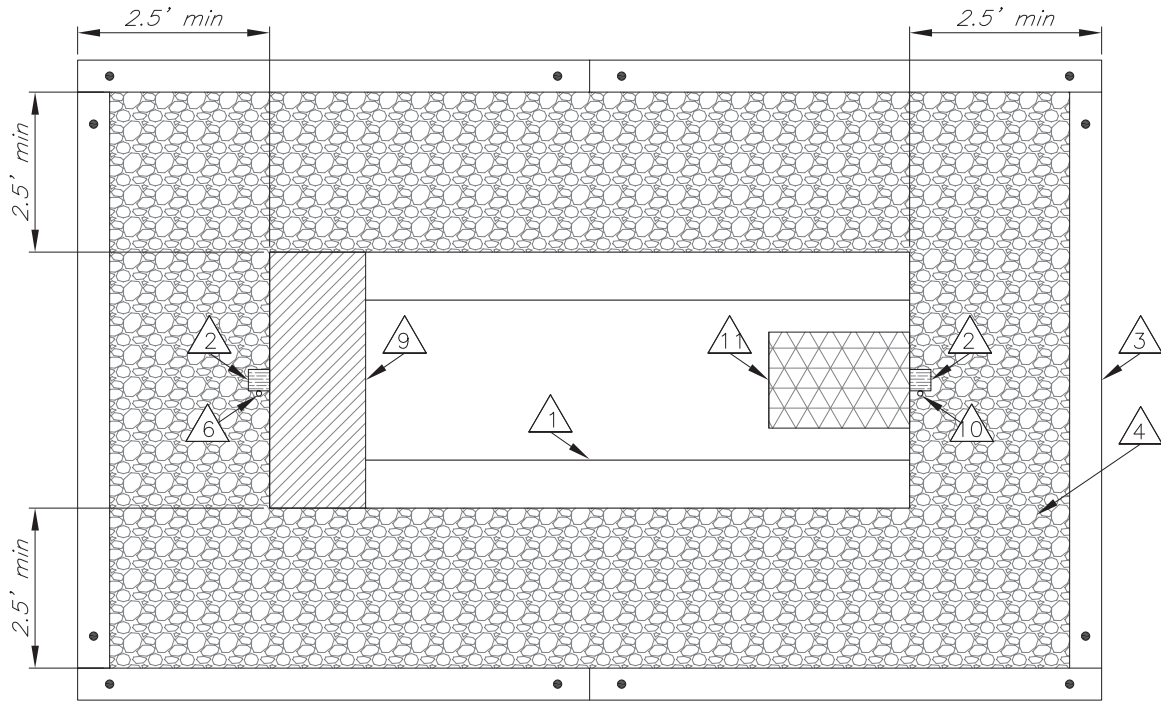


Ordering t-posts:

All t-posts are green

Roadside t-post length is 66" (5.5')

Interior t-post length is 60" (5.0')



CONSTRUCTION NOTES

- ① Provide fabricated steel trough.

② Provide steel pole anchor posts set in sack mix concrete as shown.

③ Provide pressure treated 6"x6" or railroad tie held to ground with 18" long #6 rebar or 1" steel pipe.

④ Provide 6" thick pad of 3" minus river run cobble over 6oz non-woven geotextile fabric.

⑤ Provide Coupling from 2" schedule 40 PVC to 1" galvanized steel pipe.

⑥ Provide galvanized steel pipe feed line.
- ⑦ Provide 100 psi rated gate valve.

⑧ Provide Watts ST1000 1" standard float valve or approved equal.

⑨ Provide steel float guard.

⑩ Provide 1" galvanized steel pipe overflow line. Pipe to daylight no less than 20 feet from trough onto 1'x3' stabilized pad.

⑪ Provide wildlife escape ramp. Ramp shall be expanded steel welded to a rigid frame and extend to the bottom of the trough.



Natural Resources Conservation Service
United States Department of Agriculture

CONSTRUCTION DETAIL – TROUGH
STOCKWATER SYSTEM

Grower

Santa Clara County, California

File No.
Stockwater-Details.dwg

Drawing No.
2012-1

Sheet 1 of 1