
IRISH HILLS NATURAL RESERVE CONSERVATION PLAN ~ WADDELL RANCH ADDITION

Public Hearing Review Draft



City of San Luis Obispo
City Administration
Office of Sustainability
Natural Resources Protection Program



October 2018

Irish Hills Natural Reserve Conservation Plan ~ Waddell Ranch Addition

Public Hearing Review Draft

Prepared by:

Robert Hill
Natural Resources Manager & Interim Deputy Director
(805) 781-7211

City of San Luis Obispo
City Administration
Office of Sustainability
Natural Resources Protection Program
990 Palm Street
San Luis Obispo, CA 93401

Technical Assistance:

Terra Verde Environmental Consulting
California Polytechnic State University, San Luis Obispo, Biological Sciences



Table of Contents

	PAGE
List of Figures & Tables	3
Executive Summary	4
1. History	9
2. Inventory	9
2.1 Physical Inventory	9
2.2 Legal Agreements	10
2.3 Soils	10
2.4 Species Inventory	10
2.5 Vegetation Communities	17
2.6 Natural Resources Protection	18
3. Goals and Policies	19
4. Conservation Plan	20
4.1 Naming	20
4.2 Land Use Designations	20
4.3 Photo-Monitoring Points	21
5. Wildfire Preparedness Plan	23
6. Implementation	23
7. Fiscal Statement	23
8. Updates and Amendment	24
Appendix	
A. Photo Monitoring	
B. Soils Report for Waddell Ranch	
C. <i>Results of a Botanical Inventory and Wildlife Surveys Completed at the Waddell Ranch Property, Irish Hills Natural Reserve, City of San Luis Obispo, California (Terra Verde Environmental, June 30, 2017)</i>	
D. <i>Results of Focused Botanical Surveys for Irish Hills Spineflower (Chorizanthe aphanantha) Completed in the Irish Hills Natural Reserve, City of San Luis Obispo, California (June 19, 2018)</i>	

List of Figures & Tables

	PAGE
FIGURES	
Figure 1: Panoramic View of Waddell Ranch	4
Figure 2: Waddell Ranch Property Boundary Site Map	6
Figure 3: Waddell Ranch & Irish Hills Natural Reserve Property Boundary Site Map	7
Figure 4: Waddell Ranch, Irish Hills Natural Reserve & the City of San Luis Obispo Greenbelt	8
Figure 5: Map of Sensitive Resources	15
Figure 6: Map of Vegetation Communities	16
Figure 7: Waddell Ranch Management Areas & Combined Trail Map	22
TABLES	
Table 1: Representative Special Status Species Observations at Waddell Ranch	10
Table 2: Photo Monitoring	25

Maps and Photos by City of San Luis Obispo staff and Terra Verde Environmental.

Executive Summary

The Waddell Ranch Open Space is a hidden gem located in a secluded setting within the Irish Hills area at the southern boundary of the City of San Luis Obispo and its Greenbelt. The upper extents of the property feature spectacular 360° panoramic views of the City to the north and the Pacific Ocean to the south, as well as the surrounding region. Waddell Ranch also hosts exceptional plant and wildlife diversity, an interesting cultural resource legacy, and is well-suited to offer pleasant hiking, biking, and passive recreational opportunities. The Waddell Ranch is contiguous with the existing Irish Hills Natural Reserve and represents the capstone piece of a long-standing conservation vision to establish permanent protection of the area's outstanding natural resource values including a suite of rare plants, artesian springs, and important wildlife habitat. The acquisition of Waddell Ranch allows for the completion of a loop trail through the *Irish Hills Natural Reserve* along the top of Mine Hill where outstanding views of the Pacific Ocean can be gained and enjoyed.

The *Irish Hills Natural Reserve Conservation Plan – Waddell Ranch Addition* ("the Plan") is intended to incorporate the Waddell Ranch into the existing Irish Hills Natural Reserve, all of which is owned by the City of San Luis Obispo, in order to guide the conservation and stewardship of both properties together as a single management unit. This process will also formally designate the Waddell Ranch as a City Open Space property in accordance with the City's Open Space Regulations (1996), the *Conservation Guidelines for Open Space Lands of the City of San Luis Obispo* (2002), and the Conservation and Open Space Element of the City's General Plan (2006).

Site Description

Waddell Ranch offers a full host of natural landscape features and vegetative assemblages across a site of 154 acres. The site is entirely underlain by serpentinite-derived soil and rock. In the early part of the 20th century, exploration for chromite occurred in the surrounding area, giving the name "Mine Hill" that shows on United States Geological Survey (USGS) topographic maps along the top of the ridgeline that extends from the Waddell Ranch. At its lowest point the property is approximately 800 feet above sea level, rising to a high point and summit of 1,235 feet. The site has historically been grazed, with a central feature being an attractive stock watering pond that provides important habitat and also serves as a wildlife watering source. Waddell Ranch features oak woodlands, riparian areas, and steep chaparral hillsides in compliment to the grassland pasture and rock outcrop features of the site.



Figure 1: Panoramic Photo of Waddell Ranch viewed from the existing Irish Hills Natural Reserve

Management Considerations

The *Irish Hills Natural Reserve Conservation Plan – Waddell Ranch Addition* provides a framework for both properties to be managed together as a single unit, while primarily addressing property-specific site stewardship at Waddell Ranch:

- **Natural Resources Protection.** The Plan places priority on maintaining the natural ecosystem, while allowing passive public recreation as appropriate and compatible. The Waddell Ranch provides habitat for four special status wildlife species and fifteen special status plant species, including a newly discovered plant species, that shall be protected and monitored over the long-term. Protective status is given to native plant communities and habitats that persist or are establishing within the open space area for the functions and values that they provide.
- **Scenic Resources.** The upper ridgeline of the Waddell Ranch represents a scenic, if distant, visible backdrop on the south side of the City of San Luis Obispo. The conservation and protection of the property will ensure the integrity of this scenic resource.
- **Cultural Resources.** The Waddell Ranch contains two rock walls that were constructed in the first half of the 20th century to create separate livestock pastures that may be of historic significance under CEQA Guidelines §15064.5. The walls will be protected and maintained, and there are no actions in the Plan that would change or alter this potential resource in any way. The Northern Chumash also expressed interest in the land during the preparation of the Plan, and will have the opportunity for ceremonial use.
- **Erosion and Drainage.** A Custom Soil Resource Report was prepared for Waddell Ranch using the United States Department of Agriculture's Natural Resources Conservation Service (NRCS) website application. The report reveals that Waddell Ranch is comprised almost entirely of serpentine soils known as the Obispo-Rock Outcrop Complex and identified as soil map unit no. 183. This soil is excessively well drained and characterized as having severe erosion potential, especially given the 15-75% slopes. Accordingly, ongoing erosion control and water management strategies are necessarily a part of the Plan.
- **Fire Protection.** Waddell Ranch is entirely surrounded by open land uses comprised of the existing Irish Hills Natural Reserve and other larger ranch holdings. The Irish Hills landscape, in general, represents a significant wildland fire hazard and there is no significant recorded fire history in this system. A key component of the Plan is to address fire hazard that could result in unacceptable safety risk and property loss. This is due to prevailing westerly winds; presence of annual grassland, chaparral, oak woodland, and mixed ornamental trees and vegetation; and the Waddell Ranch's adjacency with the larger Irish Hills landscape.
- **Trails and Passive Recreation.** An existing system of old jeep trails provide access through the Waddell Ranch. The Plan calls for maintenance of existing trails, as well as the addition of two new trail segments; one will allow for access to the southerly areas of the property where panoramic views of the Pacific Ocean can be enjoyed, while the other provides a return route back to the existing Irish Hills Natural Reserve. A short section is also mapped to avoid the existing in-stream crossing of Froom Creek during the wet season with the installation of a narrow, fiberglass kit bridge that can be easily assembled and installed on site, while this trail will also encourage use away from the neighboring property line. An existing trail traverses the upper meadows area of Waddell Ranch. These meadows are considered sensitive and also remain wet in the winter and early spring; two sections of raised wooden boardwalk are planned for these sections. The Plan also presents the opportunity to bring forward two new trails in the existing Irish Hills Natural Reserve. One is an extension of the Bog Thistle Trail that is designated for hiking only, and would allow for hikers to gain a prominent lookout and the middle ridgeline before joining the existing Durata Vista Trail. The other links the top of the Mine Trail with the Morro View Trail creating a new loop in the upper, westerly portion of the Irish Hills Natural Reserve. A brief linkage at the easterly edge of the Froom Ranch portion of the Irish Hills Natural Reserve to the Mountainbrook property is also shown; this segment is a previously approved trail, but has yet to be constructed. All new trails have been carefully considered and mapped to avoid sensitive resources and special status plants and wildlife areas, as well as encourage use away from a few existing trail areas that are proximate to sensitive areas.

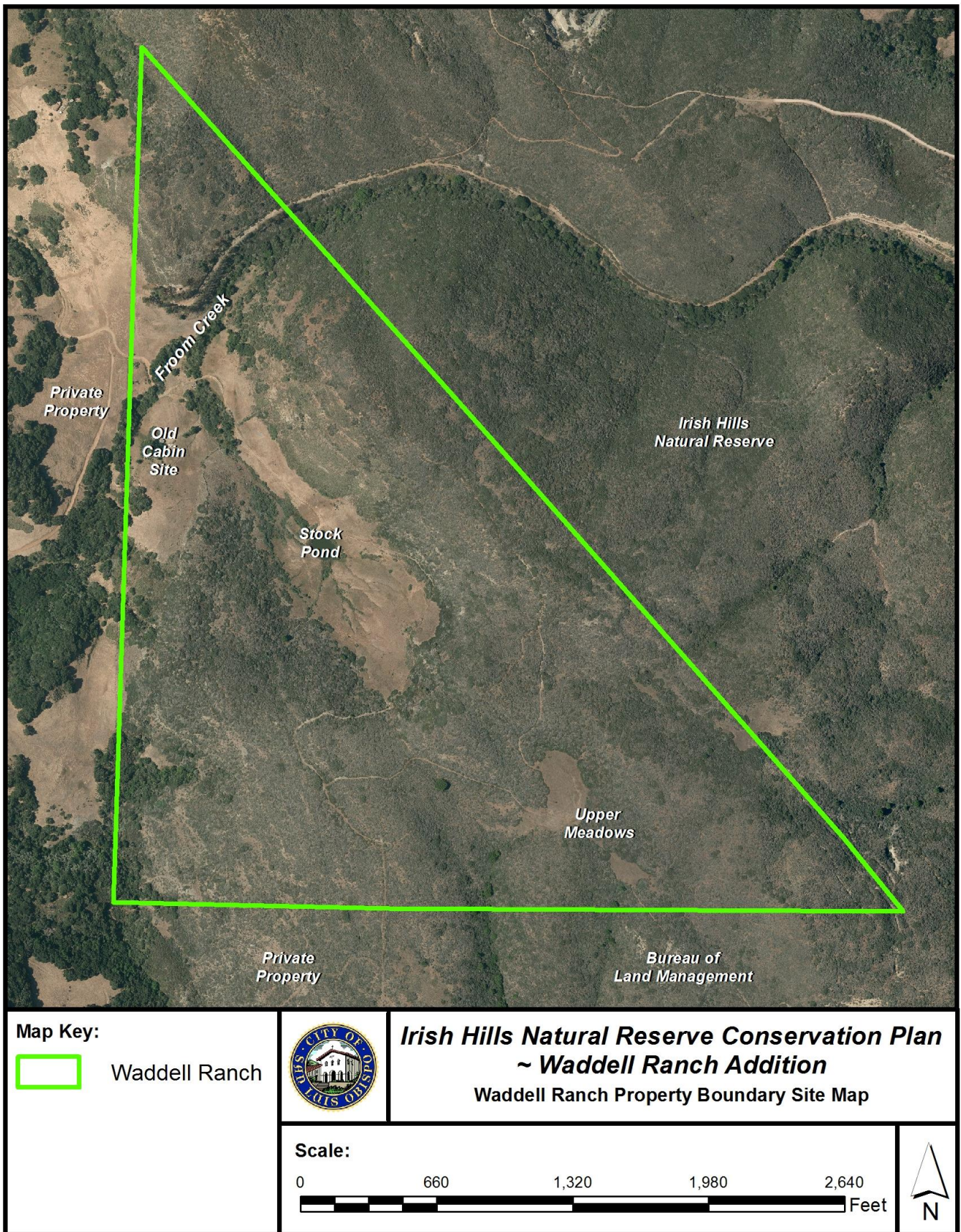


Figure 2: Waddell Ranch Property Boundary Site Map (2014 Aerial Photo)

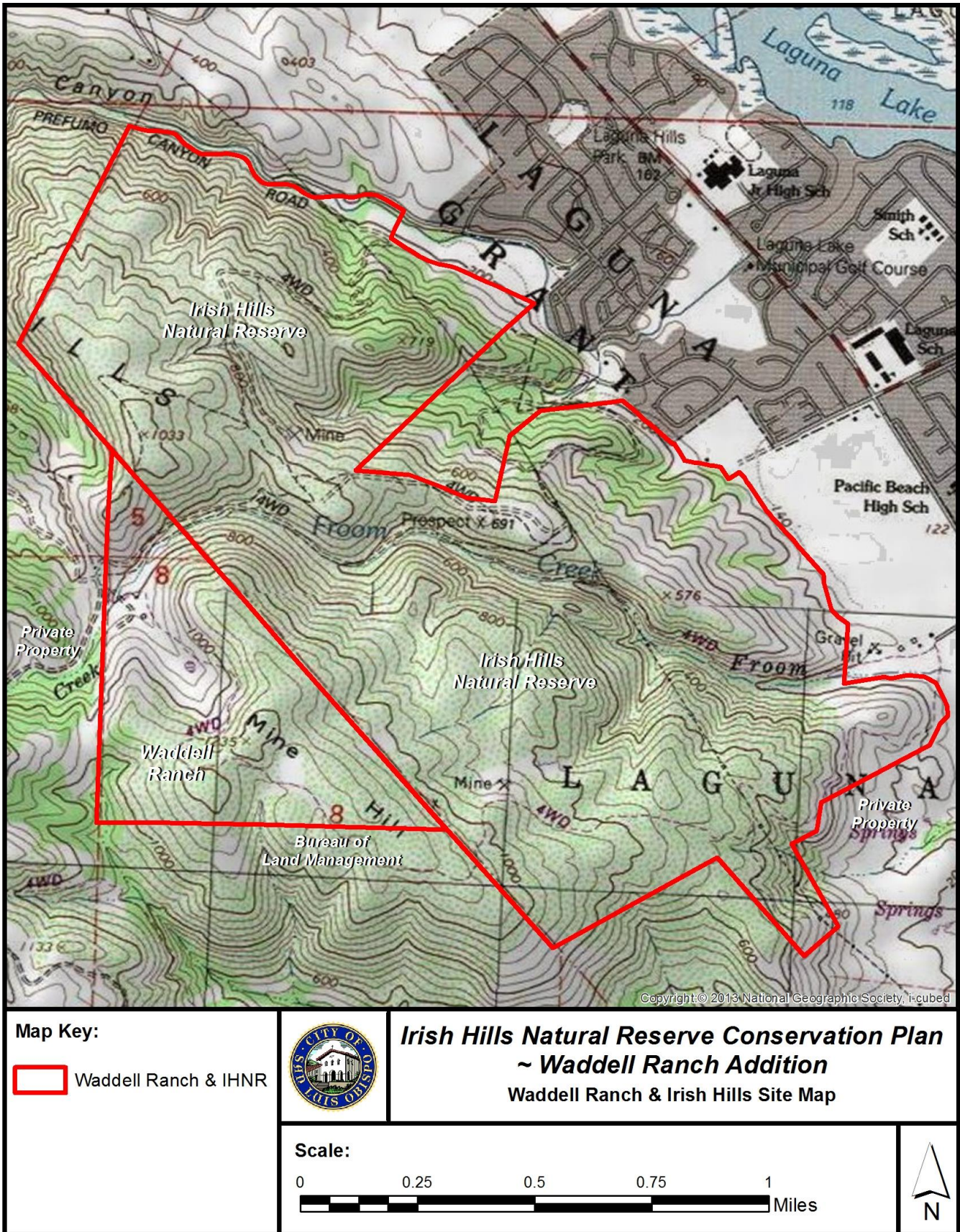


Figure 3: Waddell Ranch & Irish Hills Natural Reserve Property Boundary Site Map (USGS Topographic Basemap)

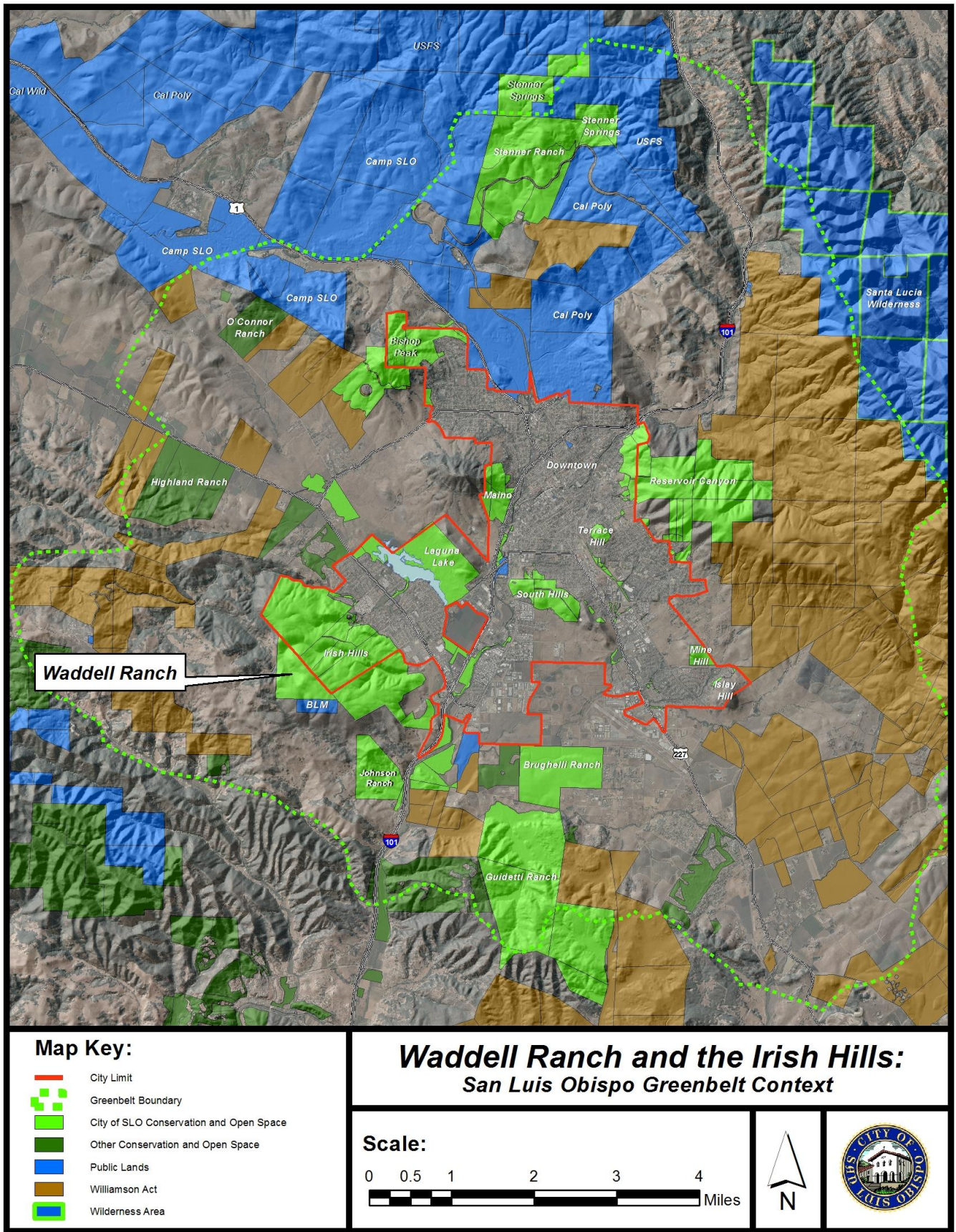


Figure 4: Waddell Ranch and the Irish Hills Natural Reserve in the context of the San Luis Obispo Greenbelt

1. History

Archaeological evidence suggests that Native American use of this region of the Central Coast began during the late Pleistocene, as early as 9000 B.C., and deep shell middens dating from 7000–8500 B.C. have been discovered in the San Luis Obispo area. The Waddell Ranch lies within the ethnographic territory of the Chumash, in an area historically occupied by the Northern (Obispeño) Chumash (Applied EarthWorks, 2015). Although proximate to several of the Mexican land grants distributed in the early and mid-1840s, the immediate area later became part of the township and range system of United States Government land patents following California's statehood. By the 1870's, the San Luis Obispo County economy was dominated by dairies, primarily owned by Swiss and Swiss-Italian farmers (Applied EarthWorks, 2015), but aside from limited cattle grazing these activities had limited impact on brush-covered upland areas of the property.

The Irish Hills area also has a history of chromite exploration and mining. The 1895 U.S. Geological Survey (USGS) map and subsequent USGS maps refer to the ridgeline extending to the east of Waddell Ranch as Mine Hill. Chromite was mined in San Luis Obispo County intermittently from the 1870s until the 1940s, although the Mine Hill area deposits do not appear to have been significant (Applied EarthWorks, 2015). A small abandoned mine shaft located at one end of the westerly ridgeline was discovered during early site visits by City staff.

In addition to livestock grazing and mining, other past known land uses on the Waddell property and adjacent areas included dry farming and private recreational use. Aerial photographs from 1939, 1949, and 1963 clearly depict dry farming cultivation of lowland areas (Rincon Consultants, 2016). Historical aerial photographs also depict a series of jeep trails that, over the years, have narrowed to foot trails along the top of the ridges at the upper extents of the property (Rincon Consultants, 2016). Mr. Duane Waddell acquired the property in 1979 and reports past use of the property as a weekend family retreat, while he had also leased the property to a tenant who grazed two horses on the property up until the time of his sale to the City of San Luis Obispo in January 2017.

2. Inventory

2.1 Physical Inventory and Improvements

Waddell Ranch is held as a single assessor parcel, APN 076-051-011, and is comprised of three underlying legal lots of record. It is 154 acres in size with an elevation ranging between 800 and 1,235 feet above mean sea level (msl). The primary entry and public access to the site is via existing trails within the Irish Hills Natural Reserve, either the Oceanview Trail or the Froom Canyon Trail. City staff also enjoys private access through a neighboring ranch property located off of Prefumo Canyon Road, for emergency and maintenance purposes only, that leads to a locked gate on the westerly boundary of the property. Bisecting the lower area of the property and the upper extent of the property are two rock walls constructed for pasture separation. The project site contains an existing constructed stock pond that contains cattail marsh and wetland habitat. There is one existing location on the project site where there is an old "Arizona"-style crossing of Froom Creek that will be maintained; however, to avoid impacts, the Plan allows for the possibility in the future of the installation of a pre-manufactured lightweight fiberglass "kit" bridge to provide year-around access when Froom Creek is flowing so that it can be avoided.

Other existing improvements include perimeter fencing, a gate at the Froom Canyon border with the existing Irish Hills Natural Reserve, a windmill and water tank, and a developed spring and spring box. Lastly, at the time of acquisition the Waddell Ranch included several structures at an old cabin site (identified on Figure 2); these included a travel-trailer with an attached "lean-to" shed roof, a bunk house, an outhouse, and a metal storage shed. These structures were all in very poor condition, and were considered to be an imminent structural hazard and health hazard due to presence of asbestos containing materials in two of the structures. These structures were demolished upon acquisition of the property, although the rock-sided foundations and ancillary rock retaining walls remain. A small deck and seating area has been installed over a remaining concrete slab in the location of the demolished travel-trailer.

2.2 Legal Agreements

There are no prior legal agreements (easements, rights of way, long-term leases, etc.) that staff is aware of that affect the management and use of Waddell Ranch. The City has secured an ALTA Owner's Policy of Title Insurance from First American Title Insurance Company, policy no. 721068.

2.3 Soils

A Custom Soil Resource Report was prepared for Waddell Ranch using the United States Department of Agriculture's Natural Resources Conservation Service (NRCS) website application. The report reveals that Waddell Ranch is comprised almost entirely (88%) of serpentine-derived soils known as the Obispo-Rock Outcrop Complex and identified as soil map unit no. 183. This soil is excessively well drained and characterized as having severe erosion potential, especially given the 15-75% slopes. The remaining soil types proximate to Froom Creek are Gazos-Lodo clay loam and Los Osos loam. A soils map and complete listing of soils found within Waddell Ranch is included as Appendix B.

2.4 Species Inventory

A Botanical Inventory and Wildlife Survey prepared by Terra Verde Environmental (2017) found four different sensitive wildlife species to be present, including California led-legged frog (*Rana draytonii*), Monarch butterfly (*Danaus plexippus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and Western pond turtle (*Actinemys marmorata*). Fifteen special status plants were identified, including a novel species, Irish Hills spineflower (*Chorizanthe aphanantha*), that is not previously known to science; additional focus surveys for this species were conducted by Terra Verde Environmental in 2018. See Appendix C and D for Terra Verde Environmental's complete memoranda, species lists, and mapping.

The special status plant species are primarily serpentine-endemic, and include: Bishop manzanita (*Arctostaphylos obispoensis*), club-haired mariposa lily (*Calochortus clavatus*), San Luis mariposa lily (*Calochortus obispoensis*), Cambria morning glory (*Calystegia subacaulis* subsp. *episcopalis*), San Luis Obispo sedge (*Carex obispoensis*), San Luis Obispo owl's clover (*Castilleja densiflora* subsp. *obispoensis*), Brewer's spineflower (*Chorizanthe breweri*), Palmer's spineflower (*Chorizanthe palmeri*), mouse-grey dudleya (*Dudleya abramsii* subsp. *murina*), Blochman's dudleya (*Dudleya blochmaniae* subsp. *blochmaniae*), small-leaved lomatium (*Lomatium parvifolium*), Palmer's monardella (*Monardella palmeri*), Adobe yampah (*Perideridia pringlei*), and Hoffman's sanicle (*Sanicula hoffmannii*).

Survey techniques included visual observation, remote-sensing wildlife cameras, and an acoustic bat detector. Locations for these special status wildlife and botanical species were mapped using Global Positioning Units (GPS) and Geographic Information Systems (GIS) software. There are no prior wildlife or botanical surveys known to exist; as such, these observations were documented and submitted to the California Natural Diversity Database maintained by the California Department of Fish and Wildlife. In addition, there is the possibility that sensitive or special status species may exist that were not found and documented in the survey work.

Irish Hills spineflower

Serpentine habitats are well known to support a unique flora, including numerous rare, endangered, and endemic species. Most of the special-status plants listed above occur within scrub and/or chaparral communities on serpentine outcrops. Of particular note, a species of spineflower (*Chorizanthe aphanantha*), not previously known to science, was observed on a serpentine outcrop and extending into adjacent chaparral habitat in the northern corner of the property during the survey on June 02, 2017 by Terra Verde Environmental botanist Kristen Nelson. Identification of the novel species was confirmed by Dr. David J. Keil and a follow-up site visit was made to document the size and extent of the population, specific habitat characteristics, and to make voucher collections for submittal to the Hoover Herbarium at California Polytechnic State University, San Luis Obispo (Cal Poly) on June 17, 2017. Cal Poly botany professors Drs. Matt Ritter and Jenn Yost, recent Cal Poly graduate Kyle Nessen (photographer), Terra Verde Environmental founder Brooke Langle, and City of San Luis Obispo Natural Resources Manager Robert Hill, also participated in the site visit on June 17, 2017.

As only 150-200 individuals were observed at the time of discovery in 2017, subsequent focus surveys were completed throughout the month of May and in early June 2018. Approximately 24,000 individuals of Irish Hills spineflower were documented throughout the Waddell Ranch and Irish Hills Natural Reserve during these follow up surveys in 2018. Dense populations were documented along the northern end of the Mariposa Trail, in two meadow openings in the chaparral along the Ocean View Trail, and in the vicinity of two abandoned chromite mines off the Mine and Wednesday Trails. More scattered occurrences were documented along the Froom Creek, Poppy, Canyon View, and Morro View Trails. Additional areas of suitable habitat exist in portions of the Reserve that were not included in the 2018 focused surveys. In particular, the ridgeline that borders the eastern edge of the Waddell Ranch parcel and the hill that covers the southwestern corner of the Waddell Ranch parcel support a mosaic of dense to open chaparral with occasional grassy and rocky openings that appear suitable for supporting Irish Hills spineflower. Although the known range and population size of this species was greatly expanded during the 2018 surveys, the specific habitat requirements and overall limited range of the species warrants careful management to avoid adverse impacts to the population on City-owned property. It appears that Irish Hills spineflower is tolerant of limited disturbance associated with the creation, recreational use, and maintenance of trails through chaparral, although much is still to be learned about Irish Hills spineflower. The new species has been submitted for publication in *Madroño*, the peer-reviewed journal of the California Botanical Society, and will be recommended for listing on the California Rare Plant Rank (CRPR) 1B.2 list.

Table 1: Representative Special Status Species Observations at Waddell Ranch

California red-legged frog (*Rana draytonii*)



Western pond turtle snout in the stock pond (*Actinemys marmorata*)



San Luis mariposa lily

Calochortus obispoensis



Palmer's monardella

Monardella palmeri



Irish Hills spineflower (*Chorizanthe aphanantha*) and Brewer's spineflower (*Chorizanthe breweri*)



Irish Hills spineflower (*Chorizanthe aphanantha*)



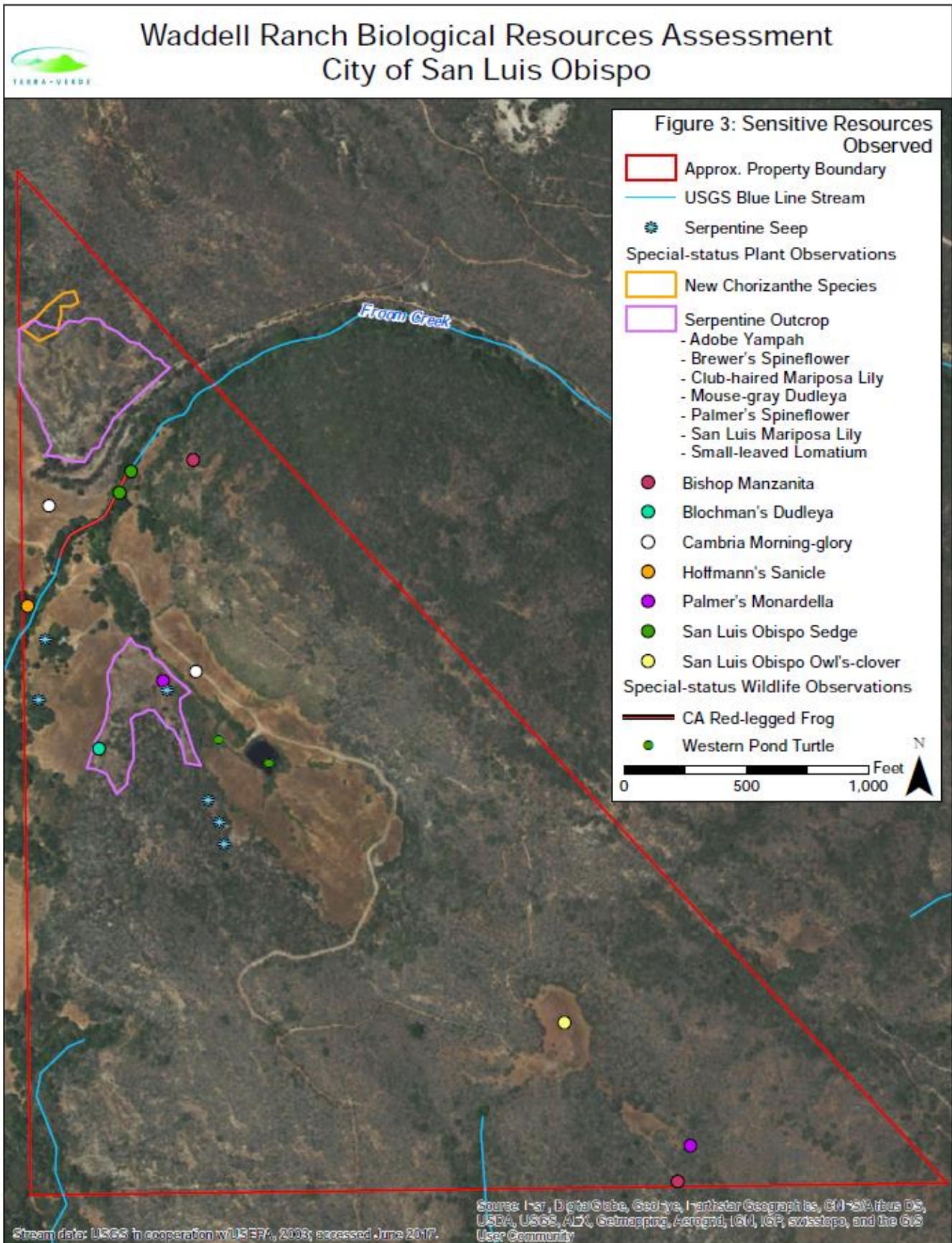


Figure 5: Map of Sensitive Resources

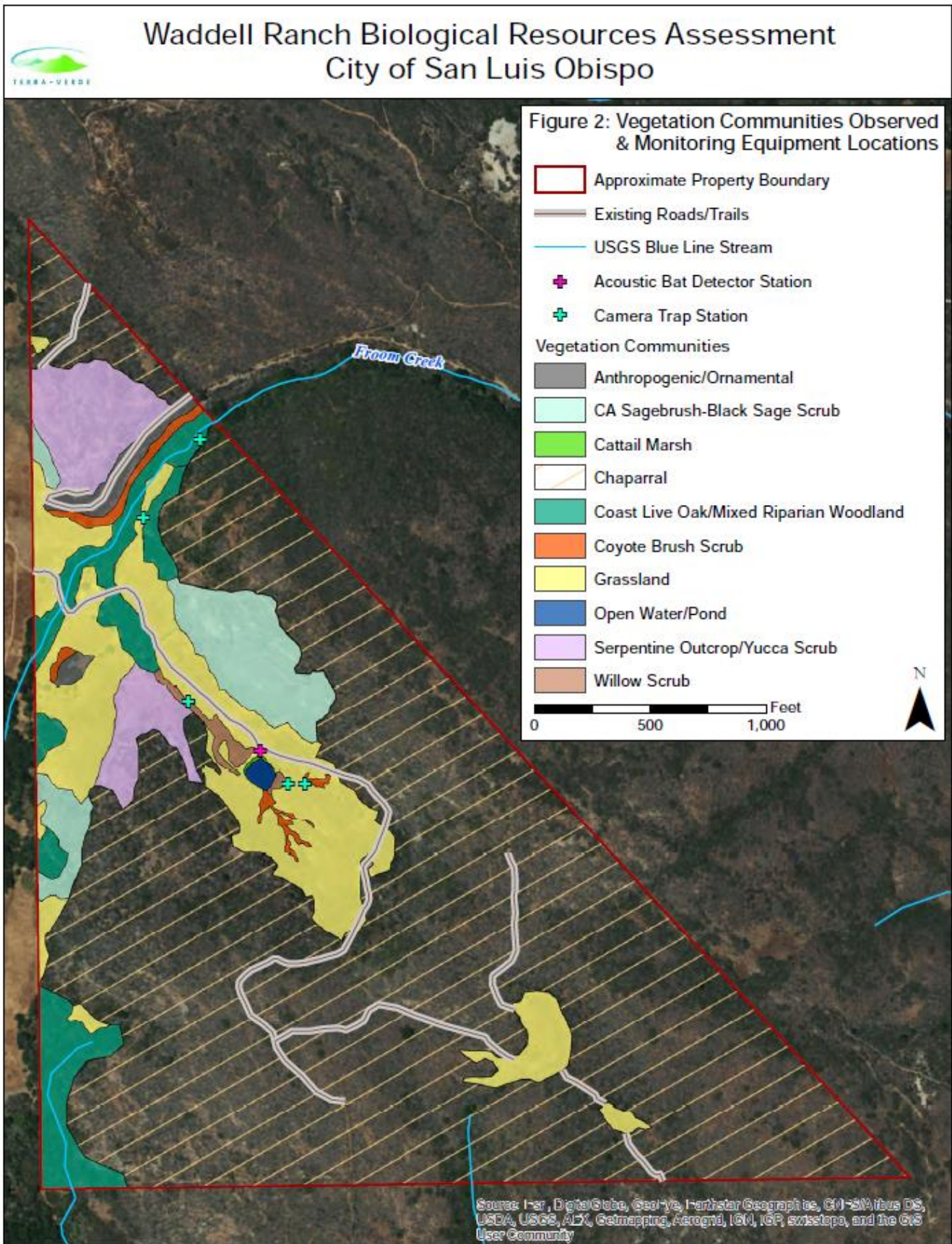


Figure 6: Map of Vegetation Communities

2.4 Vegetation Communities

A suite of nine vegetation communities are found on the Waddell Ranch, as described by Terra Verde Environmental consistent with the classification system set forth in *A Manual of California Vegetation* (Sawyer et al., 2009):

Buck Brush/Leather Oak Chaparral

Chaparral is the dominant habitat type on the Waddell Ranch property, dominating the higher elevation areas of the site. This community generally forms a closed-canopy of dense shrub cover ranging from four to seven feet high. Dominants in this community include buck brush (*Ceanothus cuneatus* var. *ramulosus*), leather oak (*Quercus durata* var. *durata*), and chamise (*Adenostoma fasciculatum* var. *fasciculatum*), with toyon (*Heteromeles arbutifolia*), black sage (*Salvia mellifera*), and chaparral yucca (*Hesperoyucca whipplei*) occurring at variable density. Five individuals of Bishop manzanita (*Arctostaphylos obispoensis*) were found in association with this community.

California Sagebrush-Black Sage Scrub

This community occurs in several areas on southwest-facing slopes, generally at mid-level elevations between chaparral habitats and low-lying grassland or woodland communities. California sagebrush (*Artemisia californica*) and black sage are co-dominant, with coyote brush (*Baccharis pilularis* subsp. *consanguinea*), California coffee berry (*Frangula californica*), chamise, and other species from the adjacent chaparral occurring at low cover.

Yucca Scrub/Serpentine Outcrop

This community generally occurs as a marginal or transitional area in openings and at the edges of chaparral and California sagebrush-black sage scrub. Chaparral yucca is the dominant species in these areas, with golden-yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*) often occurring as a co-dominant, and various other chaparral and scrub species occurring at low cover. This habitat tends to be very open, with large areas of exposed, rocky outcrops and moderate cover of herbaceous and/or annual species. This habitat is particularly suitable for most of the special-status taxa documented on site, including the newly discovered species of spineflower.

Serpentine Seeps

Several perennial or nearly-perennial seeps were identified within the serpentine outcrops on site. These areas are generally surrounded by areas of chaparral and scrub habitat, but support a unique assemblage of plants due to the presence of perennial water. California coffee berry forms variable shrub cover, with California lomatium (*California lomatium*) and several species of rushes (*Juncus* spp.) and sedges (*Carex* spp.) dominating the herbaceous cover. This unique habitat occurs in limited areas.

Annual Grasslands and Meadows

The grassland habitat documented on site is highly variable, but is generally dominated by non-native annual grass species, with variable cover of forbs and perennial grasses. Bromes (*Bromus* spp.) are the dominant grasses in most areas, with oats (*Avena* spp.) and false brome (*Brachypodium distachyon*) occurring as co-dominants. Non-native and invasive forbs are generally concentrated in the low-lying areas adjacent to Froom Creek and the remnant structures. In particular, fennel (*Foeniculum vulgare*), red brome (*Bromus madritensis* subsp. *rubens*), and Himalayan blackberry (*Rubus armeniacus*), California Invasive Plant Council rated 'High' species, were documented in these areas. Occasional openings in the chaparral support grassland/meadow habitat that generally support a higher percent cover of native grasses and forbs.

Coast Live Oak / Mixed Riparian Woodland

Coast live oak (*Quercus agrifolia*) forms the dominant tree cover along Froom Creek and adjacent, non-riparian woodland habitats. Arroyo willow (*Salix lasiolepis*) and California bay (*Umbellularia californica*) occur as co-dominants in the tree canopy, with poison oak (*Toxicodendron diversilobum*), pink honeysuckle (*Lonicera hispidula*), and blackberry (*Rubus* spp.) forming a dense understory.

Arroyo Willow Scrub

In addition to occurring as a characteristic component of the coast live oak woodland habitat, arroyo willow is the dominant overstory species in the seasonal stream between Froom Creek and the stock pond, and around the uphill (southern) margin of the pond. Brewer's willow (*Salix breweri*) occurs as a co-dominant in the dense overstory of this stream, with a sparse understory occurring in limited areas where the tree canopy is less dense.

Cattail Marshes

Southern cattail (*Typha domingensis*) occurs as emergent vegetation in a dense band along the northeastern and northwestern margins of the stock pond. Common spikerush (*Eleocharis macrostachya*) and several species of rushes (*Juncus* spp.) occur as characteristic components of this community. Although this community occurs in a very limited portion of the site, it provides important foraging, cover, and nesting habitat for semi-aquatic reptiles, amphibians, and birds that rely on the perennial water source of the stock pond.

Coyote Brush Scrub

Coyote brush occurs as the dominant shrub cover in several marginal habitat areas, including along the northern edge of the stock pond and lining the ephemeral drainages that flow into the stock pond from the south. Arroyo willow, California blackberry (*Rubus ursinus*), and California coffee berry occur at low cover in association with this community.

2.6 Natural Resources Protection

In consideration of the exceptional biological diversity found at the Waddell Ranch, the Plan calls for avoidance of all special status species, as well as ongoing site surveys and monitoring, in order to ensure that impacts are avoided. Protective management recommendations set forth by Terra Verde Environmental (2017 and 2018) are also incorporated by reference into the Plan. These are:

1. Improvements to stream crossings for pedestrian and/or vehicle use should be implemented in the late summer to early fall when nesting bird activity, California red-legged frog and western pond turtle dispersal, and water flow are minimal, to reduce the potential for impacts to these species and their habitats. Similarly, demolition of existing structures and installation of new structures should be timed to avoid seasonal impacts to riparian/aquatic habitats and sensitive species.
2. The establishment or maintenance of trails at stream crossings should be planned to avoid any downstream sedimentation or discharges of soil or other materials.
3. Vehicles, hand tools, and other equipment brought on site should be cleaned of all soil/mud and other debris to avoid the spread of non-native or invasive plants to the site.
4. Remove saplings/volunteer sprouts of Aleppo pine, blue gum, and red gum, whenever possible. Aleppo pine has already become naturalized within the ornamental stand of trees near the northern corner of the property.
5. Establishment of new trails through dense shrub and/or tree habitat should avoid known, occupied habitat for special-status plants, especially the newly described species of spineflower, or such work should occur after the flowering and fruiting period for annual special-status species populations that may be impacted.
6. Where feasible, the establishment/improvement of trails should occur where remnant trails/roads previously existed.
7. Install interpretive trail signs to inform the public of the sensitivity of resources present, and important ways in which those resources can be protected (e.g., stay on trail, pack-in/pack-out trash, don't pick wildflowers, etc.).
8. Establishment and maintenance of trails through chaparral habitat should occur outside the flowering and fruiting period for Irish Hills spineflower to the extent feasible, which may span from mid-March through late June.
9. Surrounding the old homestead and near the Froom Creek Trail access to the Waddell Ranch parcel, remove saplings/volunteer sprouts of Aleppo pine (*Pinus halepensis*), blue

gum (*Eucalyptus globulus*), and red gum (*Eucalyptus camaldulensis*), whenever possible, to avoid spread into adjacent habitat. Aleppo pine has already become naturalized within the ornamental stand of trees along the Froom Creek Trail.

Trail and fire hazard reduction activities will avoid mapped sensitive areas and will be undertaken only with prior site-specific survey work. Short-term grazing will create favorable disturbance and recovery periods for botanical species located in grassland areas. It should also be noted that the City's Open Space Regulations prohibit off-trail travel where it will negatively impact natural resources and public use of the property will be regularly patrolled by the City's Ranger Service.

3. Goals and Policies

In addition to the specific natural resources protection management recommendations described, above, the applicable policies of Conservation and Open Space Element of the City's General Plan and the *Conservation Guidelines for Open Space Lands of the City of San Luis Obispo* (2002) and Open Space Regulations (1998) are also incorporated by reference.

The *Irish Hills Natural Reserve Conservation Plan – Waddell Ranch Addition* has as its overarching goal to achieve sustainable conservation of habitat, while also allowing for passive recreational elements. The Plan will accomplish this goal, and address the management issues described, above, through the following goals and policies.

Goals and Policies

The City will manage Waddell Ranch with the following goals and policies:

- 3.1** Conserve, enhance, and restore natural plant and wildlife communities by protecting their habitats in order to maintain viable wildlife populations within balanced ecosystems.
- 3.2** Provide the public with an opportunity for greater understanding and appreciation for the cultural and historic resources values associated with the Waddell Ranch. Allow for ceremonial uses by the Northern Chumash and other traditionally and culturally affiliated California Native American tribes.
- 3.3** Provide the public with a safe, accessible, and pleasing natural environment in which to pursue passive recreational activities, including hiking and biking, while maintaining the integrity of natural resources and minimizing the impacts on the wildlife and habitats that are present.
- 3.4** Actively address sedimentation sources and erosion.
- 3.5** Avoid and minimize the impacts of activities, such as off-trail hiking and biking use by providing signage and interpretive features to enhance user safety, for educational purposes, and to help prevent unauthorized uses of the property.
- 3.7** Maintain, protect, and improve aesthetic views as seen from various locations throughout the City of San Luis Obispo.
- 3.8** Protect and honor the important historic and cultural values associated with the property.
- 3.9** Regularly monitor and patrol the Open Space, establish Levels of Acceptable Change (LAC), and take action to correct areas or problems that exceed LAC.

3.10 Vegetation Management

3.10.1 The City will monitor and manage vegetation to meet prescribed goals for the land. Management strategies such as the following will be implemented where necessary: physical

pruning/removal of unwanted or problematic vegetation – especially dead, dying, diseased, or non-native species; controlled, seasonal grazing; erosion and sediment control or removal strategies; and, application of Integrated Pest Management practices where needed and as appropriate.

3.10.2 Restoration and/or re-vegetation techniques will be utilized when necessary to restore a degraded vegetative community to a fully functioning ecosystem. All restoration activities will utilize site or region-specific native grasses, herbs, shrubs, and trees. Planting of invasive, non-native species will be prohibited. Adjacent landowners are encouraged to undertake efforts to control target non-native vegetation on their land.

3.10.3 All existing native trees will be protected wherever possible, and new native trees planted to enhance wildlife habitat. Where possible, vegetation will be left to follow its natural course of succession; however hazardous trees and fire protection will necessitate active management in some areas and instances. The ultimate goal will be to re-establish, or preserve, a self-sustaining ecosystem.

3.11 Passive Recreation

Passive recreational activities such as quiet and scenic enjoyment, hiking, and biking are accommodated by the Plan. All recreational uses will be monitored and patrolled in accordance with the City of San Luis Obispo's Open Space Regulations, Municipal Code, Chapter 12.22.

Active recreational uses are considered more intrusive to the natural environment and include activities such as special events, use of motorized vehicles and drones, discharge of weapons, paintball, and hunting, all of which are prohibited.

3.12 Scientific Research

Non-destructive scientific study and research will be permitted with prior, written approval from the City's Natural Resources Manager. A condition of approval will be that the applicant provides the City with a written report of the findings of the study. This will assist the City in continuing to compile a detailed inventory and deeper understanding of the natural and biological resources located within Waddell Ranch.

4. Conservation Plan

4.1 Naming

The purpose of this Plan is to incorporate *Waddell Ranch Open Space* into the *Irish Hills Natural Reserve*. More than one property comprised of a multiple parcels acquired from different parties is considered a "Natural Reserve" under the City's Open Space Regulations (Municipal Code, 12.22.030).

4.2 Land Use Designations

The property is zoned Rural Lands and will remain within the County of San Luis Obispo. Internal land uses of Waddell Ranch are explained below.

4.2.1 Habitat Area – Land areas where the primary objective will be to protect natural resources by maintaining intact native plant communities and habitat for both resident and migratory wildlife. Other than active management areas and restoration areas, all other land with Waddell Ranch is designated as a habitat area.

4.2.2 Management Areas - While the vast majority of the Waddell Ranch and Irish Hills Natural Reserve are to be protected as habitat areas, there are certain improved areas where active management and maintenance will be required. These are described below and located in Figure 7 on page 22.

a. Maintained Trails – Active management of land in these areas will be required to facilitate approved activities while protecting valuable natural resources. These trails are generally kept clear and receive maintenance as needed to prevent erosion, pooling of water, and instability. Slopes range

generally from less than 10% to as much as 20% in a few brief areas. Biking is allowable on maintained trails.

b. Dirt Road – A vehicular access road provides access to Waddell Ranch from the westerly gate. This road will be managed primarily as a trail corridor, and will receive periodic maintenance. Vehicular use shall be restricted to authorized City personnel for management and maintenance purposes only, as well as emergency services.

c. “Arizona” crossing – An existing “Arizona” crossing through Froom Creek is comprised of a concrete apron with dirt approach on both sides. The apron is underlain with a non-functional and deteriorating culvert that will require repair or removal in the future. Periodic maintenance will be necessary for this facility to remain functional.

d. Viewing and Shade Benches – A viewing bench at the top of the ridge will provide an attractive amenity with ocean views. An additional seating area at the location of the old cabin site will provide one of the few shady rest spots on the property.

e. Grazing – The grassland portions of Waddell Ranch were historically grazed by cattle and horses. “High intensity, short duration” controlled seasonal grazing with cattle appears to be a viable management strategy for reducing hazardous fuel loads, while the recruitment of native bunchgrasses and annual forbs that are adapted to a disturbance regime is also a desired management goal. Successful implementation will require close supervision. The existing rock pasture walls will be maintained *in situ*.

f. Gates, Signs, Fencing and Water Systems – The entry gates shall be maintained in functional condition to ensure readily available access for emergency response, maintenance purposes, and periodic closure when necessary. Signs within Waddell Ranch shall also be constructed and maintained in legible and functional condition for educational, directional, and safety purposes. As fencing is repaired or replaced, five-strand fencing should be installed that is barbless on the top and bottom strand, with the bottom strand being located 18” off the ground in order to allow for safe wildlife passage both over and under the fence. The existing spring box will be maintained, and it is possible that the existing windmill on site could also be refurbished. The old water tank located near the top of Froom Canyon should be removed as it represents an attractive nuisance.

4.3 Photo Monitoring Points

Photo-monitoring points throughout Waddell Ranch were established to document baseline conditions and periodically observe changes. Photo points include overlooks, areas anticipated to receive public use, and habitats with sensitive plant and wildlife species.

The photo points are used to establish baseline conditions in order to track conditions and Levels of Acceptable Change (LAC) over time. Additional points may be added as necessary if conditions change or new issues arise. Photos points and an associated map of point locations are included as Appendix A.



Figure 7: Waddell Ranch Management Areas & Combined Trail Map

5. Wildfire Preparedness Plan

Waddell Ranch is designated as a Very High Fire Hazard Severity Zone by Cal Fire. Waddell Ranch is entirely surrounded by other open land uses comprised of private ranches and other conservation lands. Significant wildland fire hazard risk exists due to prevailing westerly winds; presence of annual grassland, chaparral, oak woodland, and mixed ornamental trees and vegetation; and due to the fact that there is no significant recorded fire history in the larger Irish Hills system. Accordingly, City Open Space Regulations prohibit fires, smoking, discharge of weapons, and fireworks or any kind, and also allow for closure if hazardous conditions warrant such action (12.22.050). Important pre-fire activity includes the use of controlled and seasonal grazing (as described in 4.2.2 (e), above). Exclusion of fire as a management strategy and as part of the natural fire ecology is anticipated, so this plan also calls for the removal of dead and downed trees and shrubs and phased removal of eucalyptus and Aleppo pine, all of which can be highly flammable during the dry season.

Waddell Ranch is closest to City Fire Station 4, which is typically equipped with wildland fire fighting apparatus (Type III or similar), however primary responsibility is with Cal Fire due to the property being located in County of San Luis Obispo jurisdiction. The only driving access into Waddell Ranch is through the private access road located off of Prefumo Canyon Road, which can be opened with a Parks Master key (marked PM on the lock itself). There are several other access points that provide emergency ingress and egress to open space users. The City does not maintain any critical, at-risk infrastructure within the property itself.

6. Implementation

General maintenance activities in accordance with the adopted policies described in *Conservation Guidelines for Open Space Lands of the City of San Luis Obispo* (2002), the *Conservation and Open Space Element* (2006) and the *Open Space Maintenance Plan* (2015) shall be implemented on a regular or as-needed basis.

Specific Tasks are anticipated as follows, subject to available funding:

Years 1-3

- Install new, updated signage at trailheads and along trails
- Install new trail sections
- Install new kit fiberglass bridge
- Install seating areas
- Continue special status species monitoring, especially Irish Hill spineflower

Ongoing Specific Tasks

- Maintain roads, trails and active areas
- Monitor non-native, dead, or dying vegetation and remove as appropriate
- Regularly patrol the property and interact with users
- Implement and monitor grazing strategy for hazardous fuel reduction
- Site stewardship and “pride of ownership” tasks
- Work with local universities to continue resource inventories

7. Fiscal Statement

Day-to-day management of Waddell Ranch will continue to be supported through the operating budgets within the Natural Resources Program and Ranger Service. City staff will also pursue grants and volunteers to augment funding for this plan’s identified projects. Overall, the fiscal impact of the Plan and its implementation is considered relatively minor given opportunities to phase projects and leverage modest investments of City funds.

8. Updates and Amendment



This Conservation Plan is intended to guide management actions over the course of the next ten years, after which time staff should consider the need for an update. Any portion of the plan may be considered for amendment upon request. Any citizen or other interested party may initiate such a request, and shall be directed to the City Manager or designee. Such a request will include the nature of the requested amendment and rationale for the request. If appropriate, the amendment will be processed in the same manner as the original Conservation Plan.






Serpentine columbine (*Aquilegia eximia*)

Appendix A: Photo Monitoring Points & Map

Photo monitoring points for Waddell Ranch. These locations may be modified, or new locations may be added, as conditions warrant.

Table 2: Photo Monitoring Points:	
(All photos established by Terra Verde Environmental, May 5 and June 2, 2017)	
1. View north across the central valley of the Waddell Ranch property	
2. View east toward grassy meadows near southern property boundary	

<p>3. View north along historical rock wall toward western property boundary</p>		
<p>4. Grassy meadow habitat with seasonal seep, in opening of chaparral near southern property boundary</p>		
<p>5. View south across the property from the ridgeline north of From Creek</p>		

Appendix B:

Soil Report for Terrace Hill Open Space

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	12
Map Unit Descriptions.....	12
San Luis Obispo County, California, Coastal Part.....	14
144—Gazos-Lodo clay loams, 30 to 50 percent slopes.....	14
161—Los Osos loam, 30 to 50 percent slopes.....	15
183—Obispo-Rock outcrop complex, 15 to 75 percent slopes.....	17
Soil Information for All Uses	19
Soil Reports.....	19
Soil Erosion.....	19
Conservation Planning (Waddell Ranch Soil Report).....	19
References	21

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

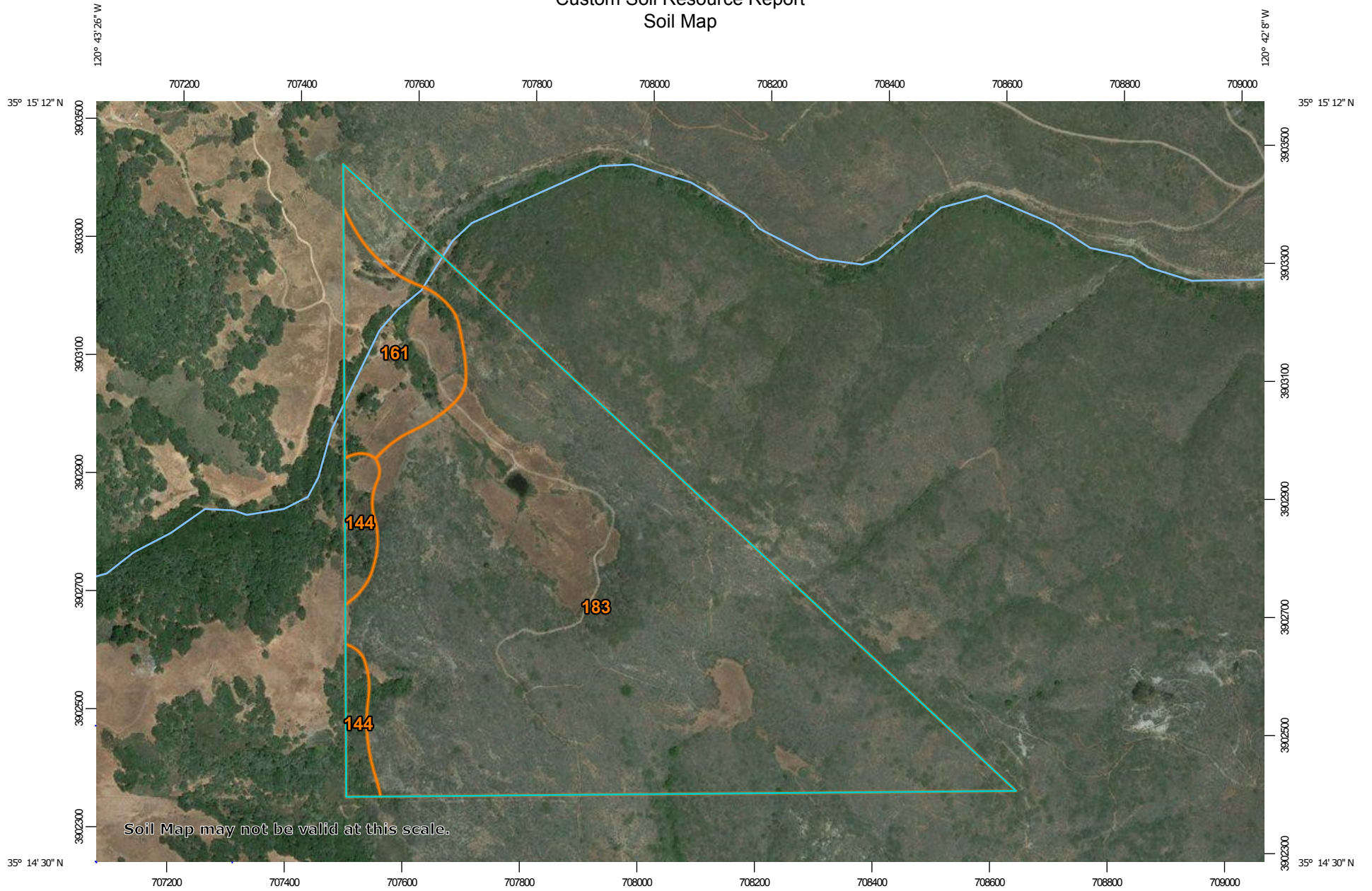
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

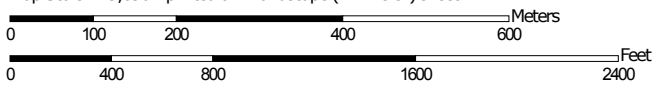
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map




Map Scale: 1:9,090 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Luis Obispo County, California, Coastal Part
 Survey Area Data: Version 10, Sep 13, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Feb 23, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
144	Gazos-Lodo clay loams, 30 to 50 percent slopes	5.5	3.6%
161	Los Osos loam, 30 to 50 percent slopes	13.7	9.0%
183	Obispo-Rock outcrop complex, 15 to 75 percent slopes	132.3	87.4%
Totals for Area of Interest		151.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

Custom Soil Resource Report

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Luis Obispo County, California, Coastal Part

144—Gazos-Lodo clay loams, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hbnp
Elevation: 300 to 2,000 feet
Mean annual precipitation: 15 to 28 inches
Mean annual air temperature: 57 to 59 degrees F
Frost-free period: 250 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Gazos and similar soils: 45 percent
Lodo and similar soils: 40 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gazos

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Mountainflank, crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 30 inches: clay loam
H2 - 30 to 40 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 22 to 38 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: FINE LOAMY (R015XD024CA)
Hydric soil rating: No

Description of Lodo

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Mountainflank, crest, side slope

Custom Soil Resource Report

Down-slope shape: Convex, linear

Across-slope shape: Convex

Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 12 inches: clay loam

H2 - 12 to 22 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 50 percent

Depth to restrictive feature: 4 to 20 inches to lithic bedrock

Natural drainage class: Somewhat excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: SHALLOW FINE LOAMY (R015XD070CA)

Hydric soil rating: No

Minor Components

Diablo, clay

Percent of map unit: 4 percent

Hydric soil rating: No

Cibo, clay

Percent of map unit: 4 percent

Hydric soil rating: No

Los osos, loam

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 3 percent

Hydric soil rating: No

161—Los Osos loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hbp7

Elevation: 100 to 3,000 feet

Mean annual precipitation: 15 to 35 inches

Mean annual air temperature: 55 to 59 degrees F

Custom Soil Resource Report

Frost-free period: 275 to 350 days

Farmland classification: Not prime farmland

Map Unit Composition

Los osos and similar soils: 85 percent

Minor components: 14 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Los Osos

Setting

Landform: Hills, ridges

Landform position (two-dimensional): Backslope, summit

Landform position (three-dimensional): Mountaintop, crest, side slope

Down-slope shape: Convex

Across-slope shape: Convex, linear

Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 14 inches: loam

H2 - 14 to 32 inches: clay

H3 - 32 to 39 inches: sandy loam

H4 - 39 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 7e

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: LOAMY CLAYPAN (R015XD049CA)

Hydric soil rating: No

Minor Components

Cibo, clay

Percent of map unit: 2 percent

Hydric soil rating: No

Diablo, clay

Percent of map unit: 2 percent

Hydric soil rating: No

Gazos, clay loam

Percent of map unit: 2 percent

Hydric soil rating: No

Lodo, clay loam

Percent of map unit: 2 percent

Custom Soil Resource Report

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent

Hydric soil rating: No

Lompico

Percent of map unit: 2 percent

Hydric soil rating: No

Mcmullin

Percent of map unit: 2 percent

Hydric soil rating: No

183—Obispo-Rock outcrop complex, 15 to 75 percent slopes

Map Unit Setting

National map unit symbol: hbpy

Elevation: 200 to 4,000 feet

Mean annual precipitation: 8 to 35 inches

Mean annual air temperature: 45 to 57 degrees F

Frost-free period: 110 to 350 days

Farmland classification: Not prime farmland

Map Unit Composition

Obispo and similar soils: 50 percent

Rock outcrop: 30 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Obispo

Setting

Landform: Mountain slopes, ridges

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainflank, mountaintop

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Residuum weathered from serpentinite

Typical profile

H1 - 0 to 11 inches: clay

H2 - 11 to 18 inches: weathered bedrock

H3 - 18 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 75 percent

Depth to restrictive feature: 8 to 20 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Depth to water table: More than 80 inches

Custom Soil Resource Report

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW CLAYEY SERPENTINE (R015XD146CA)
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 75 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Diablo, clay

Percent of map unit: 7 percent
Hydric soil rating: No

Henneke, clay loam

Percent of map unit: 7 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 6 percent
Hydric soil rating: No

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

Conservation Planning (Waddell Ranch Soil Report)

This report provides those soil attributes for the conservation plan for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. It provides the soil description along with the slope, runoff, T Factor, WEI, WEG, Erosion class, Drainage class, Land Capability Classification, and the engineering Hydrologic Group and the erosion factors Kf, the representative percentage of fragments, sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic surface layer. Further information on these factors can be found in the National Soil Survey Handbook section 618 found at the url http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054223#00 .

Custom Soil Resource Report

Soil properties and interpretations for conservation planning. The surface mineral horizon properties are displayed. Organic surface horizons are not displayed.

Conservation Planning—San Luis Obispo County, California, Coastal Part																	
Map symbol and soil name	Pct. of map unit	Slope RV	USLE Slope Length ft.	Runoff	T Factor	WEI	WEG	Erosion	Drainage	NIRR LCC	Hydro logic Group	Surface					
												Depths in.	Kf Factor	Frag-ments RV	Sand RV	Silt RV	Clay RV
144—Gazos-Lodo clay loams, 30 to 50 percent slopes																	
Gazos	45	40.0	—	Very high	2	48	6	—	Well drained	7e	C	0 - 29	.28	10	34	37	28
Lodo	40	40.0	—	Very high	1	48	6	—	Somewhat excessively drained	6e	D	0 - 11	.32	10	35	38	26
161—Los Osos loam, 30 to 50 percent slopes																	
Los Osos	85	40.0	—	Very high	3	48	6	—	Well drained	7e	D	0 - 14	.32	5	39	37	23
183—Obispo-Rock outcrop complex, 15 to 75 percent slopes																	
Obispo	50	45.0	—	Very high	1	86	4	—	Well drained	7e	D	0 - 11	.17	12	22	27	50
Rock outcrop	30	45.0	—	Very high	—	—	—	—	—	—	—	0 - 59	—	—	—	—	—

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix C:

Results of Botanical Inventory and Wildlife Surveys Completed on the Waddell Ranch Property, Irish Hills Natural Reserve, City of San Luis Obispo, California, Terra Verde Environmental, June 30, 2017



June 30, 2017

Mr. Bob Hill
Natural Resources Manager
City of San Luis Obispo
990 Palm Street
San Luis Obispo, CA 93401

RE: Results of Botanical Inventory and Wildlife Surveys Completed on the Waddell Ranch Property, Irish Hills Natural Reserve, City of San Luis Obispo, California

Dear Mr. Hill,

This memorandum is being provided to summarize the results of botanical and wildlife surveys completed by Terra Verde Environmental Consulting, LLC (Terra Verde) at the City of San Luis Obispo's (City) newly-acquired Waddell Ranch property. Waddell Ranch is an approximately 154-acre parcel that abuts the western edge of the existing Irish Hills Natural Reserve (Reserve), in San Luis Obispo, California. The Waddell Ranch property will be added to the total area of the Reserve for conservation and recreation purposes. As such, the City is planning to amend and update the existing *Irish Hills Natural Reserve Conservation Plan Update* (City of SLO, 2011 [see Attachment A]) to include the resources and conditions present on the new parcel. To support the proposed plan updates, Terra Verde completed an inventory and assessment of biological resources present on the Waddell Ranch parcel, which included a single-season botanical inventory, wildlife surveys, vegetation community classification and mapping, and an evaluation of management considerations. The results of this assessment are provided below.

Survey Methodology

Terra Verde conducted a series of surveys in April, May, and June, 2017 to capture a range of seasonal conditions through the mid- to late spring. Prior to conducting field surveys, the current *Irish Hills Natural Reserve Conservation Plan Update* (City of SLO, 2011) was reviewed, which documents the biological resources known to occur in the existing Reserve area, as well as current management strategies. The following additional resources were consulted prior to completing field surveys:

- Aerial photographs of the site and adjacent areas;
- Consortium of California Herbaria (CCH) online database of plant collections for the area surrounding Waddell Ranch (CCH, 2017);



- A California Natural Diversity Database (CNDDDB) map and list of rare, threatened, and endangered species known to occur within two miles of the Waddell Ranch property (see Attachment B, Figure 1) (California Department of Fish and Wildlife [CDFW] 2017);
- The California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants for the San Luis Obispo 7.5-minute quadrangle (CNPS 2017);

Table 1 below summarizes the details of all surveys completed at the site.

Table 1. Summary of Surveys Completed at Waddell Ranch in Spring 2017

Date	Personnel	Survey Focus	Hours ²	Conditions
April 28	Kristen Nelson Bob Hill	<ul style="list-style-type: none"> • Preliminary site visit • Preliminary/incidental botanical and wildlife species observations and habitat assessment 	2	Clear skies, calm, 80°F
May 05	Kristen Nelson Amy Golub	<ul style="list-style-type: none"> • Botanical inventory • Vegetation community mapping • Habitat assessment • Incidental wildlife observations 	10	100% overcast, clearing to sunny, calm, 73°F
June 02	Kristen Nelson Rhett Blanton	<ul style="list-style-type: none"> • Botanical inventory • Vegetation community mapping • Habitat assessment • General wildlife survey 	10	Clear skies, calm, 90°F
June 09	Halden Petersen	<ul style="list-style-type: none"> • General wildlife survey • Habitat assessment • Deploy camera traps (3) 	7	100% overcast, calm wind, drizzle, 63°F
June 13	Kristen Nelson Halden Petersen	<ul style="list-style-type: none"> • General wildlife survey • Focused botanical survey and habitat assessment • Re-locate camera traps (3) 	2.5	Clear skies, calm wind, 75°F
June 14	Halden Petersen	<ul style="list-style-type: none"> • General wildlife survey • Habitat assessment • Deploy acoustic bat detector 	1.5	Clear skies, calm wind, 65°F
June 17 ¹	Kristen Nelson Bob Hill Brooke Langle	<ul style="list-style-type: none"> • Botanical inventory and habitat assessment – focused in northern corner of property 	3	Clear skies, calm, 98°F
June 19	Halden Petersen Rhett Blanton	<ul style="list-style-type: none"> • General wildlife survey • Habitat assessment • Collect game cameras/bat detector 	7	Clear skies, calm wind, 85°F
June 20	Brian Dugas Amy Golub	<ul style="list-style-type: none"> • Final late spring botanical and wildlife surveys 	2.5	Clear skies, calm wind, 90°F

¹Additional, non-project-related experts were on site on June 17, for the specific purpose of documenting a newly-discovered species of spineflower (*Chorizanthe* sp.) present on the property; see discussion below for details.

²Indicates number of hours spent on site, per person.



General wildlife surveys were completed by Terra Verde biologists Brian Dugas, Halden Petersen, and Rhett Blanton over the course of six site visits on June 02, 09, 13, 14, 19, and 20. All species observed directly and indirectly (e.g., sign such as tracks, scat, remains, etc.) were documented. In addition, three game cameras and acoustic monitoring equipment for detection of bats (Pettersson D500x) were deployed at the site. Game cameras were left to collect data for a total of nine days and ten nights at five different locations (see Attachment B, Figure 2). Acoustic bat monitoring equipment was used to collect data for a period of five nights near the stock pond on site and data was analyzed using SonoBat US West (Szewczak).

Botanical surveys were completed by Terra Verde botanists Kristen Nelson and Amy Golub over the course of five site visits between April 28 and June 20. An initial site visit was conducted on April 28, during which incidental botanical, wildlife, and habitat observations were documented. To the extent feasible, the entire Waddell Ranch property was accessed on foot during the May 05 and June 02 surveys, to complete a botanical species inventory and vegetation community mapping for the entire property. These surveys were timed to coincide with the peak blooming and/or fruiting period for mid- and late spring blooming species. Surveys completed on June 13 and 17 were focused entirely on the northern corner of the property. To maximize the detectability of plants and wildlife that may inhabit areas of largely impenetrable chaparral habitat, transects were made through the middle of the chaparral communities on site, as well as along the edges, where there is greatest potential for unique species to occur.

Botanical species identifications and taxonomic nomenclature followed *The Jepson Manual: Vascular Plants of California*, 2nd edition (Baldwin et al., 2012) as well as taxonomic updates provided in the Jepson eFlora (Jepson Flora Project, 2017). Vegetation community classifications provided follow the second edition of *A Manual of California Vegetation* (MCV) classification system (Sawyer et al., 2009) where applicable. Species profiles provided online through the Consortium of North American Lichen Herbaria (CNALH, 2017) were referenced for the identification of lichen species documented at the site.

Some plant species could not be identified to the species level due to the absence of diagnostic morphological characters, resulting from absent/immature reproductive structures or seasonal desiccation, which is required to make species-level determinations. In these cases 'cf' (=conforms to) is used in the species list to indicate provisional species identification based on gestalt, vegetative morphology, and/or known range. When possible, all plant species in bloom or otherwise recognizable were identified to the species or infraspecific level (i.e., subspecies, variety). It is not expected that any of the provisional species identifications would be revised to recognize a sensitive taxon. A complete list of botanical and wildlife species observed on site is included as Attachment C.



Sufficiency of Biological Data

Weather conditions during each of the surveys were favorable for the detection of plants and wildlife. However, several botanical and wildlife species that were not observed during the surveys have potential to occur on site. Access constraints to certain portions of the property, seasonal timing of the surveys, and/or annual variability in the phenology and presence of annual-blooming species may have inhibited the detection of certain species.

In particular, a majority of the site is dominated by dense chaparral vegetation, which is often impenetrable, thus limiting access to some areas. Additionally, chaparral is a fire-adapted community, which often hosts numerous fire-following annual plant species. There is no recorded fire history for the site (California Department of Forestry and Fire Protection [FRAP], 2017), and the habitat present on site is mature, without any evidence of recent fire or other significant disturbance. If fire-following species are present at the site, they would likely not have been detectable at the time of the surveys.

Wildlife Survey Results

A total of 74 invertebrate and vertebrate species were documented on the property, including 44 species not previously documented on the Reserve. Of particular note, at least 6 individual California red-legged frogs (CRLF; *Rana draytonii*), a federally threatened species, were observed during daytime surveys in the riparian and aquatic habitat, indicating a healthy population of this species. All individuals observed were adults and sub-adults, likely also indicating the presence of a breeding population. No non-native predators of CRLF (e.g., American bullfrog, freshwater bass) were observed on site. Additionally, two western pond turtles (WPT; *Actinemys marmorata*), a California Species of Special Concern (CSC), were observed near and within the stock pond. One individual was a hatchling, indicating successful breeding of this species at the site as well. California Native Species Field Survey Forms were completed and submitted to CNDDDB for all special-status species observations, and are included as Attachment D.

Many of the avian species observed were identified either within the riparian areas of the northern portion of the property or near the stock pond, but the mosaic of open grasslands mixed with shrub- and tree-dominated habitats provides highly suitable foraging and nesting habitat for birds throughout the property.

Although there were no direct or indirect observations of large/predatory mammals (e.g., bobcat, mountain lion, black bear), there is potential for these species to occur in the area and move through the Waddell Ranch property; mountain lions have been documented by the City on an adjacent property.



Botanical Inventory and Vegetation Community Mapping Results

A total of 262 vascular plant taxa were documented on the property, of which 194 (74%) are native, 68 are naturalized (26%), and 34 (13%) are considered invasive/noxious. In addition, 15 special-status (i.e., rare and endangered) taxa and 4 native lichens were identified. Habitats on site are highly diverse, including a mosaic of open annual grasslands and meadows, serpentine outcrops, dense chaparral, freshwater marsh/wetland, serpentine seep, willow scrub, and mixed riparian woodlands (see Attachment B, Figure 2). Table 2 below provides a summary of special-status species observation details and Figure 3 in Attachment B is a map of special-status species observations.

Table 2. Occurrence details for special-status plant taxa observed

Species	Listing Status ¹	Estimated Population Size ²	Location(s) / Habitat ³
<i>Arctostaphylos obispoensis</i> Bishop manzanita	CRPR 4.3	5	Found in two locations – north-facing slope just south of Froom Creek and south of the open meadow at southern property boundary, in chaparral.
<i>Calochortus clavatus</i> var. <i>clavatus</i> Club-haired mariposa lily	CRPR 4.3	Several hundred	Abundant in open to dense scrub/chaparral habitat on serpentine outcrops.
<i>Calochortus obispoensis</i> San Luis mariposa lily	CRPR 1B.2	Several hundred	Abundant in open to dense scrub/chaparral habitat on serpentine outcrops.
<i>Calystegia subacaulis</i> subsp. <i>episcopalis</i> Cambria morning-glory	CRPR 4.2	Several hundred	Abundant in low-lying grassland habitat at the center of the valley and surrounding Froom Creek.
<i>Carex obispoensis</i> San Luis Obispo sedge	CRPR 1B.2	8-10	Along the banks of Froom Creek.
<i>Castilleja densiflora</i> subsp. <i>obispoensis</i> San Luis Obispo owl's clover	CRPR 1B.2	100-200	Grassland / meadow opening within chaparral, near southern property boundary.
<i>Chorizanthe breweri</i> Brewer's spineflower	CRPR 1B.3	Several thousand	Abundant in open scrub habitat on serpentine outcrops.
<i>Chorizanthe palmeri</i> Palmer's spineflower	CRPR 4.2	Several hundred	Abundant in open scrub habitat on serpentine outcrops.
<i>Chorizanthe</i> sp. ⁴	Not yet listed ⁵	150-200	Concentrated near ridge of serpentine outcrop in northern property corner, in openings of scrub/chaparral.
<i>Dudleya abramsii</i> subsp. <i>murina</i> Mouse-gray dudleya	CRPR 1B.3	Several thousand	Abundant in open scrub habitat on serpentine outcrops and adjacent areas (including chaparral, grasslands, seeps, oak woodland understory).



Species	Listing Status ¹	Estimated Population Size ²	Location(s) / Habitat ³
<i>Dudleya blochmaniae</i> subsp. <i>blochmaniae</i> Blochman's dudleya	CRPR 1B.1	<20	Concentrated on north-facing serpentine outcrop just south of old structures.
<i>Lomatium parvifolium</i> Small-leaved lomatium	CRPR 4.2	<50	Common in open scrub habitat on serpentine outcrops and along the edge of chaparral.
<i>Monardella palmeri</i> Palmer's monardella	CRPR 1B.2	<50	Near seeps on the east-facing slope west of the stock pond; chaparral opening near the southern property boundary.
<i>Perideridia pringlei</i> Adobe yampah	CRPR 4.3	Several hundred	Abundant in open to dense scrub/ chaparral habitat on serpentine outcrops.
<i>Sanicula hoffmannii</i> Hoffmann's sanicle	CRPR 4.3	15-20	Understory of oak woodland/ riparian habitat along Froom Creek at the western property boundary.

¹**Listing Status:** Indicates listing status for rare and endangered (i.e., special-status) taxa. No state or federal-listed special-status species were documented; taxa included on the California Rare Plant Rank (CRPR) are assigned listing status based on the degree of rarity (Lists 1A through 4) and threat level (0.1, 0.2, and 0.3) (CNPS, 2017). Plants included on List 1B are considered rare, threatened, or endangered in California and elsewhere; List 4 is a watch list of plants with limited distribution. Threat ranks are defined as follows: **0.1-** seriously threatened in California; **0.2-** moderately threatened in California; **0.3-** not very threatened in California. See complete species list in Attachment C for more details on CRPR rankings.

^{2,3}Population estimates and documentation of locations/habitats where special-status plants were observed are based on direct observations of individuals and populations.

^{4,5}Newly discovered species of *Chorizanthe* not yet published, and new species name not yet determined; expected to be recommended for listing on the California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1B.2 list.

Invasive and Noxious Species

In addition to documenting special-status taxa, occurrences of taxa included on the California Invasive Plant Council (Cal-IPC) Invasive Plant Inventory (Inventory) (Cal-IPC, 2017); the U.S. Department of Agriculture (USDA) state list of Introduced, Invasive, and Noxious Plants for California (USDA, 2017); and/or the list of Invasive Weeds of San Luis Obispo County (SLO County, 2017) were documented. The USDA uses a priority ranking system for noxious weeds known to occur in California using an 'A list' (AW), 'B list' (BW), and a 'C list' (CW). The SLO County list tracks species that are considered particularly problematic within the county, but does not designate different ranking or priority levels. The Cal-IPC Inventory ranks species based on their degree of invasiveness and ecological impacts, as follows:

- **Limited:** invasive but with minor statewide ecological impacts, or insufficient information to justify a higher score.
- **Moderate:** substantial and apparent, but generally not severe ecological impacts on physical processes, plant and animal communities, and vegetation structure.



- High: severe ecological impacts on physical processes, plant and animal communities, and vegetation structure.

A total of 34 taxa considered noxious or invasive were documented on the site. Invasive rankings are indicated on the Botanical Species List, included in Attachment C.

Identification of a Novel Species

Serpentine habitats are well known to support a unique flora, including numerous rare, endangered, and endemic species. Most of the special-status taxa listed in Table 2 above occur within scrub and/or chaparral communities on serpentine outcrops. Of particular note, a species of spineflower (*Chorizanthe* sp.), not previously known to science, was observed on the serpentine outcrop and extending into adjacent chaparral habitat in the northern corner of the property during the survey on June 02. Identification of the novel species was confirmed by Dr. David J. Keil on June 15 (pers. comm., June 15, 2017), and a follow-up site visit was made on June 17 to document the size and extent of the population, specific habitat characteristics, and to make voucher collections for submittal to the Hoover Herbarium at California Polytechnic State University, San Luis Obispo (Cal Poly). In addition to the project personnel listed in Table 1, Cal Poly botany professors Drs. Matt Ritter and Jenn Yost, as well as recent Cal Poly graduate Kyle Nessen (photographer) participated in the site visit on June 17. The name for the new species is currently under discussion by the authors. Once the name is decided, the new species will be published in *Madroño*, the peer-reviewed journal of the California Botanical Society, and likely recommended for listing on the California Rare Plant Rank (CRPR) 1B.2 list.

Vegetation Communities

The condition of habitats on site is relatively pristine, with ruderal, invasive, and noxious species occurring at fairly low abundance, concentrated in the low-lying grassland habitats and surrounding the remnant anthropogenic structures (i.e., dilapidated structures, historical rock wall, ornamental tree stand). Nine unique vegetation communities were mapped on the Waddell Ranch property, in addition to limited anthropogenic and/or ornamental areas. In general, slope, aspect, elevation, and substrate dictate the distribution of communities observed, but broad ecotones occur, where one community transitions widely into adjacent communities. As such, the communities mapped in Figure 2 of Attachment B should not be considered sharp transition lines between communities. Additionally, the community descriptions provided below represent typical conditions, but a great deal of variability was observed in each of these habitat types throughout the site. Representative site photos are included as Attachment E.



Buck Brush/Leather Oak Chaparral

Chaparral is the dominant habitat type on the Waddell Ranch property, dominating the higher elevation areas of the site. This community generally forms a closed-canopy of dense shrub cover ranging from four to seven feet high. Dominants in this community include buck brush (*Ceanothus cuneatus* var. *ramulosus*), leather oak (*Quercus durata* var. *durata*), and chamise (*Adenostoma fasciculatum* var. *fasciculatum*), with toyon (*Heteromeles arbutifolia*), black sage (*Salvia mellifera*), and chaparral yucca (*Hesperoyucca whipplei*) occurring at variable density. Five individuals of Bishop manzanita (*Arctostaphylos obispoensis*), a CRPR 4.3 species, were found in association with this community.

This community assemblage closely corresponds to two communities described in MCV: *Ceanothus cuneatus* Shrubland Alliance (buck brush chaparral) and *Quercus durata* Shrubland Alliance (leather oak chaparral).

California Sagebrush-Black Sage Scrub

This community occurs in several areas on southwest-facing slopes, generally at mid-level elevations between chaparral habitats and low-lying grassland or woodland communities. California sagebrush (*Artemisia californica*) and black sage are co-dominant, with coyote brush (*Baccharis pilularis* subsp. *consanguinea*), California coffee berry (*Frangula californica*), chamise, and other species from the adjacent chaparral occurring at low cover. This community composition most closely corresponds to the *Artemisia californica*-*Salvia mellifera* Shrubland Alliance (California sagebrush-black sage scrub) in the MCV classification system.

Yucca Scrub/Serpentine Outcrop

This community generally occurs as a marginal or transitional area in openings and at the edges of chaparral and California sagebrush-black sage scrub. Chaparral yucca is the dominant species in these areas, with golden-yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*) often occurring as a co-dominant, and various other chaparral and scrub species occurring at low cover. This habitat tends to be very open, with large areas of exposed, rocky outcrops and moderate cover of herbaceous and/or annual species. This habitat is particularly suitable for most of the special-status taxa documented on site, including the newly discovered species of spineflower. This habitat composition does not correspond to any of the community assemblages identified in MCV.

Serpentine Seeps

Several perennial or nearly-perennial seeps were identified within the serpentine outcrops on site. These areas are generally surrounded by areas of chaparral and scrub habitat, but support a unique assemblage of plants due to the presence of perennial water. California



coffee berry forms variable shrub cover, with California lomatium (*California lomatium*) and several species of rushes (*Juncus* spp.) and sedges (*Carex* spp.) dominating the herbaceous cover. This unique habitat occurs in limited areas, and does not correspond to any of the community assemblages identified in MCV.

Annual Grasslands and Meadows

The grassland habitat documented on site is highly variable, but is generally dominated by non-native annual grass species, with variable cover of forbs and perennial grasses. Bromes (*Bromus* spp.) are the dominant grasses in most areas, with oats (*Avena* spp.) and false brome (*Brachypodium distachyon*) occurring as co-dominants. Non-native and invasive forbs are generally concentrated in the low-lying areas adjacent to Froom Creek and the remnant structures. In particular, fennel (*Foeniculum vulgare*), red brome (*Bromus madritensis* subsp. *rubens*), and Himalayan blackberry (*Rubus armeniacus*), Cal-IPC rated 'High' species, were documented in these areas. Occasional openings in the chaparral support grassland/meadow habitat that generally support a higher percent cover of native grasses and forbs. The community composition documented for all grassland habitats on site most closely corresponds to the *Bromus (diandrus, hordeaceus)–Brachypodium distachyon* Semi-Natural Herbaceous Alliance (annual brome grassland) in the MCV classification system.

Coast Live Oak / Mixed Riparian Woodland

Coast live oak (*Quercus agrifolia*) forms the dominant tree cover along Froom Creek and adjacent, non-riparian woodland habitats. Arroyo willow (*Salix lasiolepis*) and California bay (*Umbellularia californica*) occur as co-dominants in the tree canopy, with poison oak (*Toxicodendron diversilobum*), pink honeysuckle (*Lonicera hispidula*), and blackberry (*Rubus* spp.) forming a dense understory. This community assemblage most closely corresponds to the *Quercus agrifolia* Woodland Alliance (coast live oak woodland) in the MCV classification system.

Arroyo Willow Scrub

In addition to occurring as a characteristic component of the coast live oak woodland habitat, arroyo willow is the dominant overstory species in the seasonal stream between Froom Creek and the stock pond, and around the uphill (southern) margin of the pond. Brewer's willow (*Salix breweri*) occurs as a co-dominant in the dense overstory of this stream, with a sparse understory occurring in limited areas where the tree canopy is less dense. This community assemblage closely corresponds to the *Salix lasiolepis* Shrubland Alliance (arroyo willow scrub) in the MCV classification system.

Cattail Marshes



Southern cattail (*Typha domingensis*) occurs as emergent vegetation in a dense band along the northeastern and northwestern margins of the stock pond. Common spikerush (*Eleocharis macrostachya*) and several species of rushes (*Juncus* spp.) occur as characteristic components of this community. Although this community occurs in a very limited portion of the site, it provides important foraging, cover, and nesting habitat for semi-aquatic reptiles, amphibians, and birds that rely on the perennial water source of the stock pond. This community composition closely corresponds to the *Typha* (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance (cattail marshes) in the MCV classification system.

Coyote Brush Scrub

Coyote brush occurs as the dominant shrub cover in several marginal habitat areas, including along the northern edge of the stock pond and lining the ephemeral drainages that flow into the stock pond from the south. Arroyo willow, California blackberry (*Rubus ursinus*), and California coffee berry occur at low cover in association with this community. This community assemblage corresponds to the *Baccharis pilularis* Shrubland Alliance (coyote brush scrub) in the MCV classification system.

In addition to these natural community assemblages, limited anthropogenic areas were identified and mapped, including a cluster of several dilapidated structures, a historical rock wall, and a stand of ornamental trees. The line of mature, ornamental trees is located along the existing trail that runs roughly east-west near the northern corner of the property. Several species of pines (*Pinus* spp.) and eucalypts (*Eucalyptus* spp.) were documented in this stand. Aleppo pine (*Pinus halepensis*) has become naturalized in this area, with numerous saplings observed, which appear to be establishing from seed set by one mature individual, located near the western end of the line of trees. Red gum (*Eucalyptus camaldulensis*) and blue gum also have the potential to become naturalized at the site, particularly within riparian areas. One blue gum sapling was noted within the seasonal drainage that flows from the stock pond into Froom Creek.

Management Considerations

The 154-acre Waddell Ranch property supports a diverse assemblage of unique species and habitats. Purchase of this parcel by the City for permanent conservation within the Irish Hills Natural Reserve was a critical acquisition for the protection of the distinctive resources present on this property. To aid the City in amending the existing conservation plan for inclusion of the Waddell Ranch and, in particular, for public recreational use, the following management considerations are offered:

- As feasible, improvements to stream crossings for pedestrian and/or vehicle use should be implemented in the late summer to early fall when nesting bird activity, CRLF and



WPT dispersal, and water flow are minimal, to reduce the potential for impacts to these species and their habitats. Similarly, demolition of existing structures and installation of new structures should be timed to avoid seasonal impacts to riparian/aquatic habitats and sensitive species.

- The establishment or maintenance of trails at stream crossings should be planned to avoid any downstream sedimentation or discharges of soil or other materials.
- If feasible, conduct focused bat surveys to determine the presence/absence of roosts within the old structures prior to demolition.
- Vehicles, hand tools, and other equipment brought on site should be cleaned of all soil/mud and other debris to avoid the spread of non-native or invasive plants to the site.
- Remove saplings/volunteer sprouts of Aleppo pine, blue gum, and red gum, whenever possible. Aleppo pine has already become naturalized within the ornamental stand of trees near the northern corner of the property.
- Establishment of new trails through dense shrub and/or tree habitat should avoid known, occupied habitat for special-status plants, especially the newly described species of spineflower, or such work should occur after the flowering and fruiting period for annual special-status species populations that may be impacted.
- If feasible, the City should search the Reserve for additional occurrences of the newly described species of spineflower to further refine the known range for this species, focusing on habitat similar to where it is currently known.
- Where feasible, the establishment/improvement of trails should occur where remnant trails/roads previously existed.
- Install interpretive trail signs to inform the public of the sensitivity of resources present, and important ways in which those resources can be protected (e.g., stay on trail, pack-in/pack-out trash, don't pick wildflowers, etc.).

These recommendations should be considered in the management of the Waddell Ranch property to support public recreation and the persistence of pristine native habitats and diverse species assemblages, including robust populations of special-status plant and wildlife populations.



If you have any questions or require additional information, please contact me at knelson@terraverdeweb.com or at (702) 596-5038.

Sincerely,

A handwritten signature in black ink that reads "Kristen Nelson".

Kristen Nelson
Botanist

Attachments

A – References

B – Maps

Figure 1: 2-mile CNDDDB Occurrences Map

Figure 2: Vegetation Communities Observed and Monitoring Equipment Locations

Figure 3: Sensitive Resources Observed

C – Botanical and Wildlife Species Lists for Waddell Ranch

D – CNDDDB Forms for Special-status Species Observations

E – Representative Site Photographs



ATTACHMENT A - References

- Baldwin, Bruce G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken. *The Jepson Manual: Vascular Plants of California*, Second Edition. 2012. University of California Press. Berkeley, California.
- California Department of Fish and Wildlife (CDFW), 2017. California Natural Diversity Database: RareFind 5. Accessible online with subscription at: <http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>. Accessed April, June 2017.
- California Department of Forestry and Fire Protection (FRAP). 2017. FRAP Mapping. http://frap.fire.ca.gov/data/frapgisdata-sw-fireperimeters_download. Accessed June 2017).
- California Invasive Plant Council (Cal-IPC). 2017. California Invasive Plant Inventory. Available online at: <http://cal-ipc.org/>. Accessed April, June 2017.
- California Native Plant Society (CNPS), 2017. Online Inventory of Rare and Endangered Plants. Sacramento, California. Available Online at: <http://www.rareplants.cnps.org/>. Accessed April, June 2017.
- City of San Luis Obispo (City) Natural Resources Program. 2011. *Irish Hills Natural Reserve Conservation Plan Update*.
- Consortium of California Herbaria (CCH). 2017. Regents of the University of California. Available online at: <http://ucjeps.berkeley.edu/consortium/>. Accessed April, June 2017.
- Consortium of North American Lichen Herbaria (CNALH). 2017. Available online at: <http://lichenportal.org/portal/index.php>. Accessed on June 2017.
- Jepson eFlora. 2017. Regents of the University of California. Available online at: <http://ucjeps.berkeley.edu/eflora/>. Accessed April, June 2017.
- San Luis Obispo County. 2017. List of Invasive Weeds of SLO County. Available online at: http://www.slocounty.ca.gov/agcomm/Weed_Control/SLO_County_s_Weed_Management_Area/Invasive_Weeds_of_SLO_County.htm. Accessed June 2017.
- Sawyer, John O.; Keeler-Wolf, Todd; and Evens, Julie M. 2009. *A Manual of California Vegetation*, Second Edition. California Native Plant Society Press: Sacramento, California.
- United States Department of Agriculture (USDA) Natural Resources Conservation Service. 2017. List of California State-listed Noxious Weeds. Available online at: <https://plants.usda.gov/java/noxious?rptType=State&statefips=06>. Accessed June 2017.



This page intentionally left blank.



ATTACHMENT B - Figures

Figure 1: 2-mile CNDDB Occurrences Map

Figure 2: Vegetation Communities Observed and Monitoring Equipment Locations

Figure 3: Sensitive Resources Observed



This page intentionally left blank.



Waddell Ranch Biological Resources Assessment City of San Luis Obispo

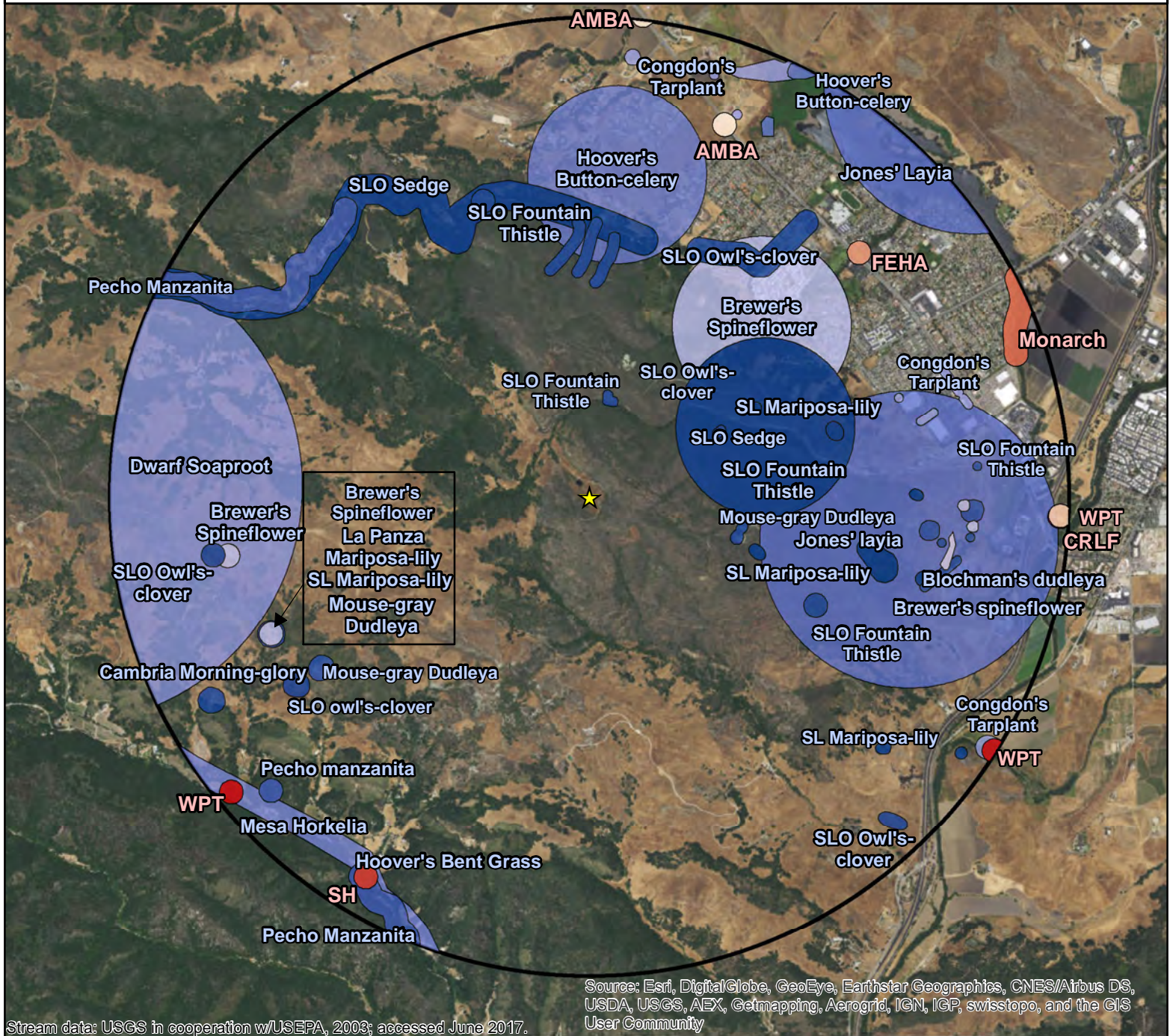
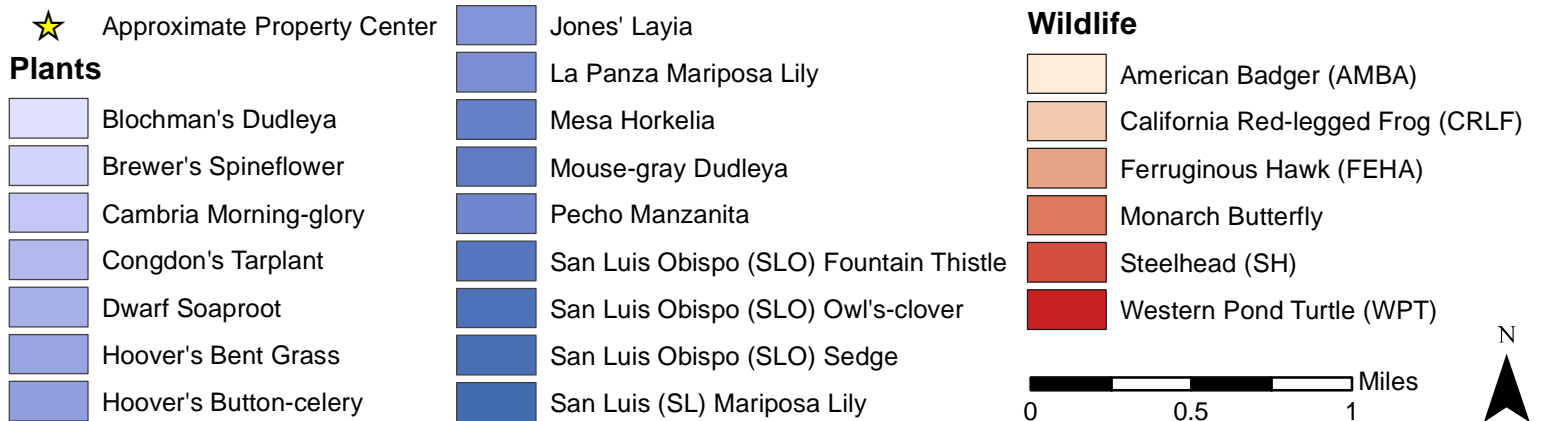


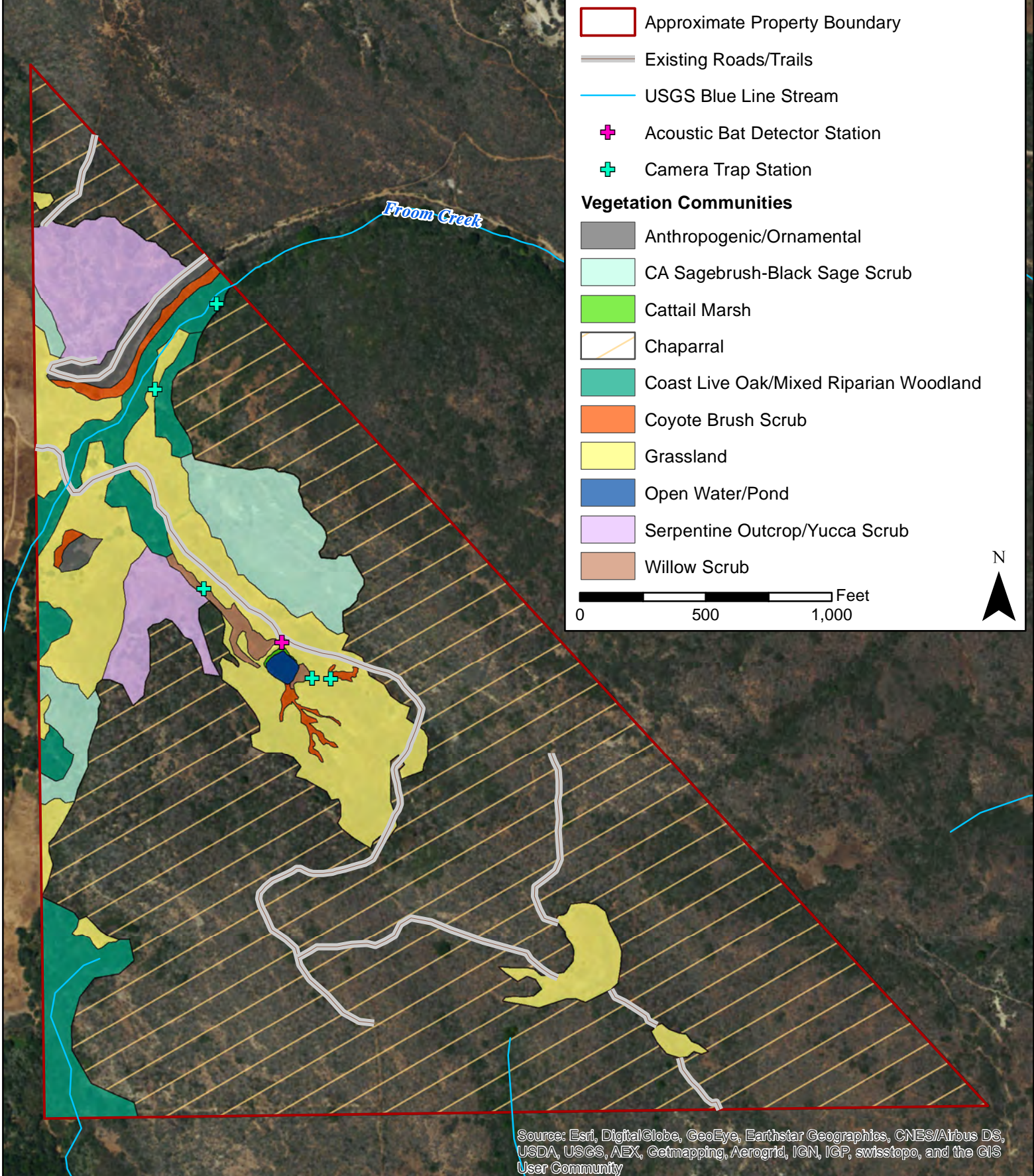
Figure 1: 2-mile CNDDDB Occurrences Map





Waddell Ranch Biological Resources Assessment City of San Luis Obispo

Figure 2: Vegetation Communities Observed & Monitoring Equipment Locations





Waddell Ranch Biological Resources Assessment City of San Luis Obispo

Figure 3: Sensitive Resources Observed

Approx. Property Boundary

USGS Blue Line Stream

Serpentine Seep

Special-status Plant Observations

New Chorizanthe Species

Serpentine Outcrop
 - Adobe Yampah
 - Brewer's Spineflower
 - Club-haired Mariposa Lily
 - Mouse-gray Dudleya
 - Palmer's Spineflower
 - San Luis Mariposa Lily
 - Small-leaved Lomatium

Bishop Manzanita

Blochman's Dudleya

Cambria Morning-glory

Hoffmann's Sanicle

Palmer's Monardella

San Luis Obispo Sedge

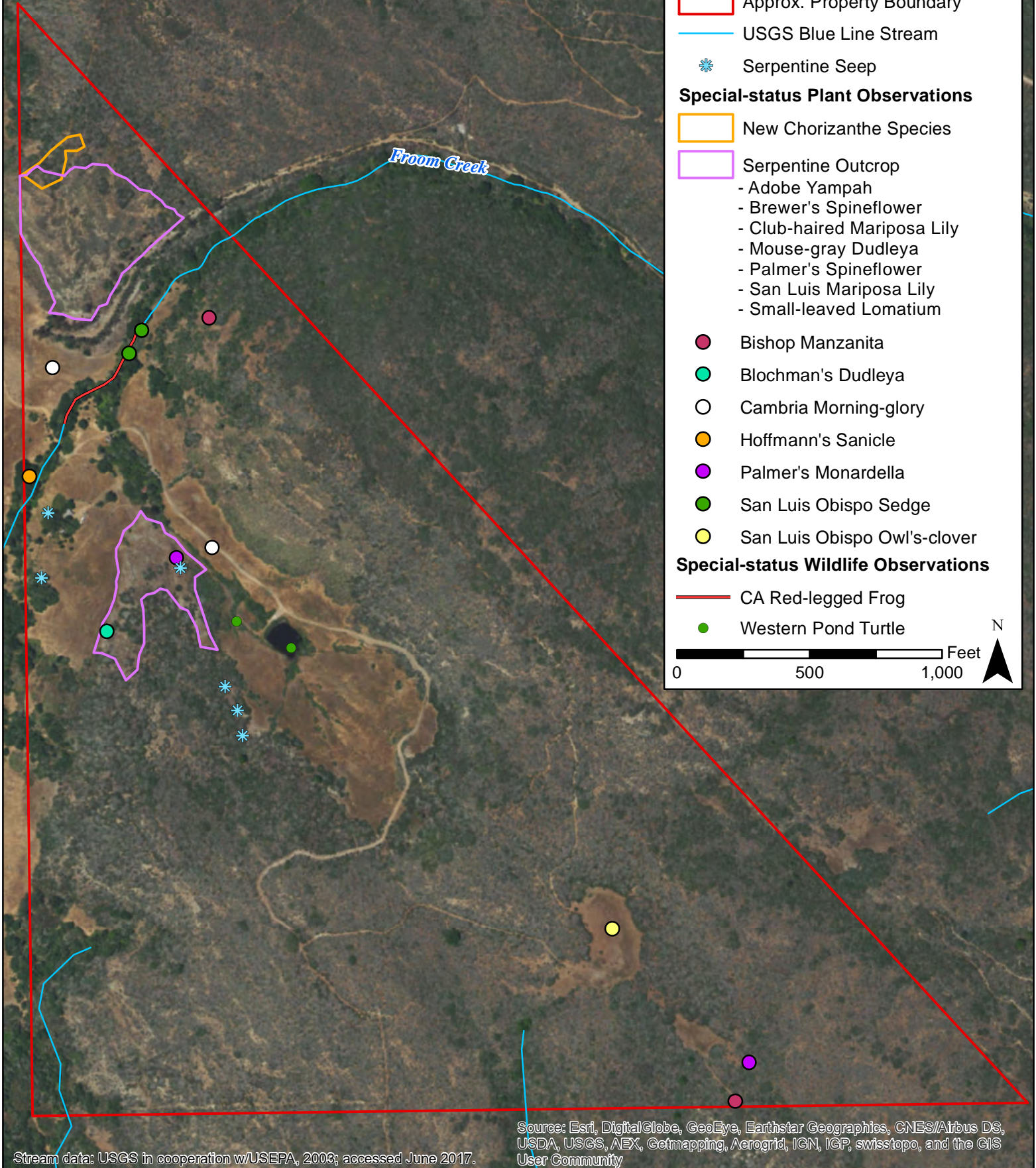
San Luis Obispo Owl's-clover

Special-status Wildlife Observations

CA Red-legged Frog

Western Pond Turtle

0 500 1,000 Feet





ATTACHMENT C - Botanical and Wildlife Species Lists for Waddell Ranch



This page intentionally left blank.



Botanical Species List for Waddell Ranch (Addition to Irish Hills Natural Reserve)

Observed by Terra Verde on April 28, May 05, and June 02, 13, 17, and 20, 2017

Family	Scientific Name	Common Name	Listing Status ¹	Origin
Vascular Plants				
Adoxaceae, Muskroot Family	<i>Sambucus nigra</i> subsp. <i>caerulea</i>	Blue elderberry	--	Native
Agavaceae, Century Plant Family	<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	Soap plant	--	Native
	<i>Hesperoyucca whipplei</i>	Chaparral yucca	--	Native
Alliaceae, Onion Family	<i>Allium haematochiton</i>	Redskin onion	--	Native
	<i>Allium lacunosum</i> var. <i>lacunosum</i>	Pitted onion	--	Native
	<i>Allium sativum</i>	Garlic	--	Naturalized (waif)
Anacardiaceae, Sumac Family	<i>Toxicodendron diversilobum</i>	Western poison oak	--	Native
Apiaceae, Carrot Family	<i>Apiastrum angustifolium</i>	Wild celery	--	Native
	<i>Conium maculatum</i>	Poison hemlock	Mod/-/SLO	Naturalized
	<i>Daucus pusillus</i>	American wild carrot	--	Native
	<i>Foeniculum vulgare</i>	Fennel	High/-/SLO	Naturalized
	<i>Lomatium californicum</i>	California lomatium	--	Native
	<i>Lomatium caruifolium</i>	Alkali parsley	--	Native
	<i>Lomatium dasycarpum</i> subsp. <i>dasycarpum</i>	Woolly fruited lomatium	--	Native
	<i>Lomatium parvifolium</i>	Small-leaved lomatium	CRPR 4.2	Native
	<i>Lomatium utriculatum</i>	Common lomatium	--	Native
	<i>Perideridia pringlei</i>	Adobe yampah	CRPR 4.3	Native
	<i>Sanicula arguta</i>	Sharp toothed sanicle	--	Native
	<i>Sanicula crassicaulis</i>	Gamble weed	--	Native
	<i>Sanicula hoffmannii</i>	Hoffmann's sanicle	CRPR 4.3	Native
	<i>Scandix pecten-veneris</i>	Venus' needle	--	Naturalized
<i>Torilis arvensis</i>	Tall sock-destroyer	Mod/-/-	Naturalized	
Apocynaceae, Dogbane Family	<i>Asclepias fascicularis</i>	Narrow-leaf milkweed	--	Native
Asteraceae, Sunflower Family	<i>Achillea millefolium</i>	Common yarrow	--	Native
	<i>Achyrachaena mollis</i>	Soft blow wives	--	Native
	<i>Agoseris grandiflora</i> var. <i>grandiflora</i>	Giant mountain dandelion	--	Native



Family	Scientific Name	Common Name	Listing Status ¹	Origin
Asteraceae, Sunflower Family (cont.)	<i>Agoseris heterophylla</i>	Annual mountain dandelion	--	Native
	<i>Anthemis cotula</i>	Mayweed	--	Naturalized
	<i>Artemisia californica</i>	California sagebrush	--	Native
	<i>Artemisia douglasiana</i>	Mugwort	--	Native
	<i>Baccharis pilularis</i> subsp. <i>consanguinea</i>	Coyote brush	--	Native
	<i>Carduus pycnocephalus</i>	Italian thistle	Mod/CW/ SLO	Naturalized
	<i>Centaurea melitensis</i>	Maltese star-thistle	Mod/-/SLO	Naturalized
	<i>Cirsium vulgare</i>	Bull thistle	Mod/-/SLO	Naturalized
	<i>Corethrogyne filaginifolia</i>	Common sandaster	--	Native
	<i>Erigeron philadelphicus</i> var. <i>philadelphicus</i>	Philadelphia fleabane	--	Native
	<i>Eriophyllum confertiflorum</i> var. <i>confertiflorum</i>	Golden-yarrow	--	Native
	<i>Eurybia radulina</i>	Roughleaf aster	--	Native
	<i>Gamochaeta ustulata</i>	Featherweed	--	Native
	<i>Grindelia hirsutula</i>	Hairy gumweed	--	Native
	<i>Hazardia squarrosa</i>	Saw-toothed goldenbush	--	Native
	<i>Hemizonia congesta</i> subsp. <i>luzulifolia</i>	Hayfield tarweed	--	Native
	<i>Hesperevax sparsiflora</i> var. <i>sparsiflora</i>	Erect dwarf cudweed	--	Native
	<i>Hypochaeris glabra</i>	Smooth cat's ear	Lim/-/-	Naturalized
	<i>Lactuca serriola</i>	Prickly lettuce	--	Naturalized
	<i>Lagophylla ramosissima</i>	Common hareleaf	--	Native
	<i>Lasthenia gracilis</i>	Common goldfields	--	Native
	<i>Logfia filaginoides</i>	California cottonrose	--	Native
	<i>Logfia gallica</i>	Daggerleaf cottonrose	--	Naturalized
	<i>Madia exigua</i>	Little tarweed	--	Native
	<i>Madia gracilis</i>	Gumweed	--	Native
	<i>Microseris douglasii</i> subsp. <i>douglasii</i>	Douglas' silverpuffs	--	Native
<i>Pseudognaphalium californicum</i>	Ladies' tobacco	--	Native	
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	--	Naturalized	



Family	Scientific Name	Common Name	Listing Status ¹	Origin
Asteraceae, Sunflower Family (cont.)	<i>Pseudognaphalium stramineum</i>	Cottonbatting plant	--	Native
	<i>Psilocarphus tenellus</i>	Slender woolly-marbles	--	Native
	<i>Soliva sessilis</i>	Field burrweed	--	Naturalized
	<i>Sonchus asper</i> subsp. <i>asper</i>	Prickly sow thistle	--	Naturalized
	<i>Sonchus oleraceus</i>	Common sow thistle	--	Naturalized
	<i>Stephanomeria cichoriacea</i>	Silver rock-lettuce	--	Native
	<i>Stephanomeria</i> cf ² <i>exigua</i>	Wire lettuce	--	Native
	<i>Symphotrichum chilense</i>	California aster	--	Native
	<i>Uropappus lindleyi</i>	Silver puffs	--	Native
Blechnaceae, Deer Fern Family	<i>Woodwardia fimbriata</i>	Giant chain fern	--	Native
Boraginaceae, Borage Family	<i>Cryptantha clevelandii</i> var. <i>florosa</i>	Coastal cryptantha	--	Native
	<i>Cryptantha microstachys</i>	Tejon cryptantha	--	Native
	<i>Phacelia imbricata</i> var. <i>imbricata</i>	Imbricate phacelia	--	Native
Brassicaceae, Mustard Family	<i>Streptanthus glandulosus</i> subsp. <i>glandulosus</i>	Bristly jewelflower	--	Native
Cactaceae, Cactus Family	<i>Opuntia ficus-indica</i>	Mission prickly-pear	--	Naturalized
Caprifoliaceae, Honeysuckle Family	<i>Lonicera hispidula</i>	Pink honeysuckle	--	Native
	<i>Symphoricarpos mollis</i>	Creeping snowberry	--	Native
Caryophyllaceae, Pink Family	<i>Cerastium glomeratum</i>	Sticky mouse-ear chickweed	--	Naturalized
	<i>Sagina apetala</i>	Dwarf pearlwort	--	Native
	<i>Silene antirrhina</i>	Sleepy catchfly	--	Native
	<i>Silene gallica</i>	Windmill pink	--	Naturalized
	<i>Silene laciniata</i> subsp. <i>laciniata</i>	Mexican pink	--	Native
	<i>Stellaria media</i>	Common chickweed	--	Naturalized
Convolvulaceae, Morning-glory Family	<i>Calystegia macrostegia</i> subsp. <i>cyclostegia</i>	Coast morning glory	--	Native
	<i>Calystegia subacaulis</i> subsp. <i>episcopalis</i>	Cambria morning-glory	CRPR 4.2	Native
	<i>Convolvulus arvensis</i>	Bindweed	-/CW/-	Naturalized
Cornaceae, Dogwood Family	<i>Cornus sericea</i> subsp. <i>occidentalis</i>	Western dogwood	--	Native

Family	Scientific Name	Common Name	Listing Status ¹	Origin
Crassulaceae, Stonecrop Family	<i>Crassula connata</i>	Pygmy-weed	--	Native
	<i>Crassula tillaea</i>	Mediterranean pygmy-weed	--	Naturalized
	<i>Dudleya abramsii</i> subsp. <i>murina</i>	Mouse-gray dudleya	CRPR 1B.3	Native
	<i>Dudleya blochmaniae</i> subsp. <i>blochmaniae</i>	Blochman's dudleya	CRPR 1B.1	Native
	<i>Dudleya lanceolata</i>	Lance-leaved dudleya	--	Native
Cyperaceae, Sedge Family	<i>Carex obispoensis</i>	San Luis Obispo sedge	CRPR 1B.2	Native
	<i>Carex serratodens</i>	Saw-toothed sedge	--	Native
	<i>Carex spissa</i>	San Diego sedge	--	Native
	<i>Carex tumulicola</i>	Foothill sedge	--	Native
	<i>Cyperus eragrostis</i>	Tall flatsedge	--	Native
	<i>Eleocharis macrostachya</i>	Common spikerush	--	Native
	<i>Scirpus microcarpus</i>	Panicled bulrush	--	Native
Dennstaedtiaceae, Bracken Family	<i>Pteridium aquilinum</i> var. <i>pubescens</i>	Western bracken fern	--	Native
Dryopteridaceae, Wood Fern Family	<i>Dryopteris arguta</i>	California wood fern	--	Native
Equisetaceae, Horsetail Family	<i>Equisetum arvense</i>	Common horsetail	--	Native
Ericaceae, Heath Family	<i>Arctostaphylos obispoensis</i>	Bishop manzanita	CRPR 4.3	Native
Euphorbiaceae, Spurge Family	<i>Euphorbia spathulata</i>	Warty spurge	--	Native
Fabaceae, Legume Family	<i>Acmispon americanus</i> var. <i>americanus</i>	Spanish lotus	--	Native
	<i>Acmispon brachycarpus</i>	Short podded lotus	--	Native
	<i>Acmispon glaber</i> var. <i>glaber</i>	Deerweed	--	Native
	<i>Acmispon junceus</i> var. <i>junceus</i>	Rush lotus	--	Native
	<i>Acmispon wrangelianus</i>	Chilean trefoil	--	Native
	<i>Lathyrus vestitus</i> var. <i>vestitus</i>	Common pacific pea	--	Native
	<i>Lotus corniculatus</i>	Bird's-foot trefoil	--	Naturalized
	<i>Lupinus bicolor</i>	Miniature lupine	--	Native
	<i>Lupinus succulentus</i>	Arroyo lupine	--	Native
	<i>Medicago polymorpha</i>	California burclover	Lim/-/-	Naturalized



Family	Scientific Name	Common Name	Listing Status ¹	Origin
Fabaceae, Legume Family (cont.)	<i>Melilotus indicus</i>	Sourclover	--	Naturalized
	<i>Pickeringia montana</i> var. <i>montana</i>	Chaparral pea	--	Native
	<i>Thermopsis macrophylla</i>	Santa Ynez false lupine	--	Native
	<i>Trifolium albopurpureum</i>	Rancheria clover	--	Native
	<i>Trifolium ciliolatum</i>	Foothill clover	--	Native
	<i>Trifolium depauperatum</i> var. <i>truncatum</i>	Truncate sack clover	--	Native
	<i>Trifolium dubium</i>	Little hop clover	--	Naturalized
	<i>Trifolium fucatum</i>	Bull clover	--	Native
	<i>Trifolium hirtum</i>	Rose clover	Lim/-/-	Naturalized
	<i>Trifolium microcephalum</i>	Small-head clover	--	Native
	<i>Vicia sativa</i>	Spring vetch	--	Naturalized
	<i>Vicia villosa</i>	Hairy vetch	--	Naturalized
Fagaceae, Oak Family	<i>Quercus agrifolia</i> var. <i>agrifolia</i>	Coast live oak	--	Native
	<i>Quercus durata</i> var. <i>durata</i>	Leather oak	--	Native
Gentianaceae, Gentian Family	<i>Zeltnera davyi</i>	Davy's centaury	--	Native
Geraniaceae, Geranium Family	<i>Erodium botrys</i>	Big heron bill	--	Naturalized
	<i>Erodium brachycarpum</i>	Foothill filaree	--	Naturalized
	<i>Erodium cicutarium</i>	Redstem filaree	Lim/-/-	Naturalized
	<i>Geranium dissectum</i>	Cut leaved geranium	Lim/-/-	Naturalized
	<i>Geranium molle</i>	Crane's bill geranium	--	Naturalized
Iridaceae, Iris Family	<i>Sisyrinchium bellum</i>	Western blue-eyed-grass	--	Native
Juncaceae, Rush Family	<i>Juncus bufonius</i>	Toad rush	--	Native
	<i>Juncus phaeocephalus</i> var. <i>phaeocephalus</i>	Brownheaded rush	--	Native
	<i>Juncus patens</i>	Spreading rush	--	Native
	<i>Juncus tenuis</i>	Slender rush	--	Native
	<i>Juncus xiphioides</i>	Iris-leaved rush	--	Native
Lamiaceae, Mint Family	<i>Clinopodium douglasii</i>	Yerba buena	--	Native
	<i>Mentha pulegium</i>	Pennyroyal	--	Naturalized
	<i>Monardella palmeri</i>	Palmer's monardella	CRPR 1B.2	Native
	<i>Salvia columbariae</i>	Chia	--	Native
Lamiaceae, Mint Family (cont.)	<i>Salvia mellifera</i>	Black sage	--	Native
	<i>Salvia spathacea</i>	Hummingbird sage	--	Native
	<i>Stachys bullata</i>	California hedge nettle	--	Native

Family	Scientific Name	Common Name	Listing Status ¹	Origin
Lauraceae, Laurel Family	<i>Umbellularia californica</i>	California bay	--	Native
Liliaceae, Lily Family	<i>Calochortus albus</i>	Fairy-lantern	--	Native
	<i>Calochortus argillosus</i>	Clay mariposa lily	--	Native
	<i>Calochortus clavatus</i> var. <i>clavatus</i>	Club-haired mariposa lily	CRPR 4.3	Native
	<i>Calochortus obispoensis</i>	San Luis mariposa lily	CRPR 1B.2	Native
	<i>Fritillaria biflora</i> var. <i>biflora</i>	Chocolate lily	--	Native
Linaceae, Flax Family	<i>Hesperolinon micranthum</i>	Common dwarf flax	--	Native
Lythraceae, Loosestrife Family	<i>Lythrum hyssopifolia</i>	Hyssop loosestrife	--	Naturalized
Malvaceae, Mallow Family	<i>Sidalcea malviflora</i>	Checkermallow	--	Native
Melanthiaceae, False-hellebore Family	<i>Toxicoscordion cf fremontii</i>	Death camas	--	Native
Montiaceae, Miner's Lettuce Family	<i>Calandrinia menziesii</i>	Red maids	--	Native
	<i>Claytonia exigua</i>	Serpentine springbeaty	--	Native
	<i>Claytonia parviflora</i>	Narrow leaved miner's lettuce	--	Native
	<i>Claytonia perfoliata</i>	Miner's lettuce	--	Native
Myrsinaceae, Myrsine Family	<i>Lysimachia arvensis</i>	Scarlet pimpernel	--	Naturalized
Myrtaceae, Myrtle Family	<i>Eucalyptus camaldulensis</i>	Red gum	Lim/-/-	Naturalized
	<i>Eucalyptus globulus</i>	Blue gum	Lim/-/-	Naturalized
Onagraceae, Evening-primrose Family	<i>Clarkia bottae</i>	Punchbowl godetia	--	Native
	<i>Epilobium brachycarpum</i>	Annual fireweed	--	Native
	<i>Epilobium ciliatum</i> subsp. <i>ciliatum</i>	Fringed willowherb	--	Native
Orobanchaceae, Broomrape Family	<i>Bellardia trixago</i>	Mediterranean linseed	Lim/-/-	Naturalized
	<i>Castilleja attenuata</i>	Valley tassels	--	Native
	<i>Castilleja densiflora</i> subsp. <i>gracilis</i>	Graceful owl's clover	--	Native
	<i>Castilleja densiflora</i> subsp. <i>obispoensis</i>	San Luis Obispo owl's clover	CRPR 1B.2	Native
	<i>Castilleja exserta</i> subsp. <i>exserta</i>	Purple owl's clover	--	Native

Family	Scientific Name	Common Name	Listing Status ¹	Origin
Orobanchaceae, Broomrape Family (cont.)	<i>Castilleja miniata</i> subsp. <i>miniata</i>	Scarlet Indian paintbrush	--	Native
	<i>Cordylanthus rigidus</i> subsp. <i>rigidus</i>	Rigid bird's beak	--	Native
	<i>Triphysaria eriantha</i>	Butter-and-eggs	--	Native
Papaveraceae, Poppy Family	<i>Dendromecon rigida</i>	Bush poppy	--	Native
	<i>Eschscholzia californica</i>	California poppy	--	Native
Phrymaceae, Lopseed Family	<i>Diplacus aurantiacus</i>	Bush monkeyflower	--	Native
	<i>Erythranthe guttata</i>	Common monkeyflower	--	Native
	<i>Erythranthe microphylla</i>	Small-leaved monkeyflower	--	Native
Pinaceae, Pine Family	<i>Pinus canariensis</i>	Canary Island pine	--	Naturalized
	<i>Pinus eldarica</i>	Mondell pine	--	Naturalized
	<i>Pinus halepensis</i>	Aleppo pine	--	Naturalized
	<i>Pinus muricata</i>	Bishop pine	--	Native (ornamental)
	<i>Pinus pinea</i>	Stone pine	--	Naturalized
	<i>Pinus radiata</i>	Monterey pine	--	Native (ornamental)
Plantaginaceae, Plantain Family	<i>Antirrhinum kelloggii</i>	Climbing snapdragon	--	Native
	<i>Collinsia heterophylla</i> var. <i>heterophylla</i>	Chinese-houses	--	Native
	<i>Plantago erecta</i>	California plantain	--	Native
	<i>Plantago lanceolata</i>	English plantain	Lim/-/-	Naturalized
Platanaceae	<i>Platanus racemosa</i>	Western sycamore	--	Native
Poaceae, Grass Family	<i>Agrostis exarata</i>	Spike bent grass	--	Native
	<i>Aira caryophyllea</i>	Silver hair grass	--	Native
	<i>Avena barbata</i>	Slender wild oat	Mod/-/-	Naturalized
	<i>Avena fatua</i>	Wild oat	Mod/-/-	Naturalized
	<i>Brachypodium distachyon</i>	False brome	Mod/-/-	Naturalized
	<i>Briza minor</i>	Annual quaking grass	--	Naturalized
	<i>Bromus diandrus</i>	Rippgut grass	Mod/-/-	Naturalized
	<i>Bromus hordeaceus</i>	Soft chess	Lim/-/-	Naturalized
	<i>Bromus madritensis</i> subsp. <i>rubens</i>	Red brome	High/-/-	Naturalized
	<i>Cynodon dactylon</i>	Bermuda grass	Mod/-/-	Naturalized
	<i>Dactylis glomerata</i>	Orchard grass	Lim/-/-	Naturalized
	<i>Danthonia californica</i>	California oat grass	--	Native



Family	Scientific Name	Common Name	Listing Status ¹	Origin
Poaceae, Grass Family (cont.)	<i>Deschampsia danthonioides</i>	Annual hair grass	--	Native
	<i>Elymus condensatus</i>	Giant wild-rye	--	Native
	<i>Elymus glaucus</i> subsp. <i>glaucus</i>	Blue wild-rye	--	Native
	<i>Elymus multisetus</i>	Big squirreltail	--	Native
	<i>Festuca microstachys</i>	Small fescue	--	Native
	<i>Festuca myuros</i>	Rattail sixweeks grass	Mod/-/-	Naturalized
	<i>Festuca perennis</i>	Rye grass	Mod/-/-	Naturalized
	<i>Gastridium phleoides</i>	Nit grass	--	Naturalized
	<i>Hordeum brachyantherum</i>	Meadow barley	--	Native
	<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	Mediterranean barley	Mod/-/-	Naturalized
	<i>Hordeum murinum</i>	Wall barley	Mod/-/-	Naturalized
	<i>Koeleria macrantha</i>	June grass	--	Native
	<i>Melica imperfecta</i>	Little California melica	--	Native
	<i>Poa secunda</i> subsp. <i>secunda</i>	One-sided blue grass	--	Native
	<i>Polypogon interruptus</i>	Ditch beard grass	--	Naturalized
	<i>Polypogon monspeliensis</i>	Rabbitfoot grass	Lim/-/-	Naturalized
	<i>Schismus arabicus</i>	Mediterranean grass	Lim/-/-	Naturalized
	<i>Stipa lepida</i>	Foothill needle grass	--	Native
<i>Stipa pulchra</i>	Purple needle grass	--	Native	
Polemoniaceae, Phlox Family	<i>Gilia achilleifolia</i> subsp. <i>achilleifolia</i>	California gilia	--	Native
	<i>Gilia achilleifolia</i> subsp. <i>multicaulis</i>	Many stemmed California gilia	--	Native
	<i>Leptosiphon parviflorus</i>	Variable linanthus	--	Native
	<i>Navarretia squarrosa</i>	Skunkweed	--	Native
Polygonaceae, Buckwheat Family	<i>Chorizanthe breweri</i>	Brewer's spineflower	CRPR 1B.3	Native
	<i>Chorizanthe obovata</i>	Spoon-sepal spineflower	--	Native
	<i>Chorizanthe palmeri</i>	Palmer's spineflower	CRPR 4.2	Native
	<i>Chorizanthe</i> sp. [NEW]	--	Pending ³	Native
	<i>Eriogonum elongatum</i> var. <i>elongatum</i>	Long-stem wild buckwheat	--	Native
	<i>Persicaria amphibia</i>	Water smartweed	--	Native
	<i>Pterostegia drymarioides</i>	Fairy mist	--	Native
	<i>Rumex acetosella</i>	Sheep sorrel	Mod/-/-	Naturalized
<i>Rumex conglomeratus</i>	Clustered dock	--	Naturalized	

Family	Scientific Name	Common Name	Listing Status ¹	Origin
Polygonaceae, Buckwheat Family (cont.)	<i>Rumex crispus</i>	Curly dock	Lim/-/-	Naturalized
	<i>Rumex pulcher</i>	Fiddle dock	--	Naturalized
Polypodiaceae, Polypody Family	<i>Polypodium californicum</i>	California polypody	--	Native
Potamogetonaceae, Pondweed Family	<i>Potamogeton</i> cf <i>diversifolius</i>	Diverse-leaved pondweed	--	Native
Primulaceae, Primrose Family	<i>Primula clevelandii</i>	Padre's shooting star	--	Native
Pteridaceae, Brake Family	<i>Pellaea andromedifolia</i>	Coffee fern	--	Native
	<i>Pentagramma triangularis</i>	Goldback fern	--	Native
Ranunculaceae, Buttercup Family	<i>Aquilegia eximia</i>	Serpentine columbine	--	Native
	<i>Delphinium hesperium</i> subsp. <i>hesperium</i>	Western larkspur	--	Native
	<i>Ranunculus californicus</i> var. <i>californicus</i>	California buttercup	--	Native
Rhamnaceae, Buckthorn Family	<i>Ceanothus cuneatus</i> var. <i>ramulosus</i>	Buck brush	--	Native
	<i>Ceanothus rigidus</i>	Monterey ceanothus	--	Native
	<i>Frangula californica</i>	California coffee berry	--	Native
Rosaceae, Rose Family	<i>Adenostoma fasciculatum</i> var. <i>fasciculatum</i>	Chamise	--	Native
	<i>Heteromeles arbutifolia</i>	Toyon	--	Native
	<i>Pyracantha koidzumii</i>	Taiwan firethorn	--	Naturalized
	<i>Rosa californica</i>	California rose	--	Native
	<i>Rubus armeniacus</i>	Himalayan blackberry	High/-/-	Naturalized
	<i>Rubus ursinus</i>	California blackberry	--	Native
Rubiaceae, Madder Family	<i>Galium aparine</i>	Goose grass	--	Native
	<i>Galium californicum</i>	California bedstraw	--	Native
	<i>Galium porrigens</i> var. <i>porrigens</i>	Climbing bedstraw	--	Native
Salicaceae, Willow Family	<i>Salix breweri</i>	Brewer's willow	--	Native
	<i>Salix lasiolepis</i>	Arroyo willow	--	Native
Scrophulariaceae, Figwort Family	<i>Scrophularia californica</i>	California figwort	--	Native
Solanaceae, Nightshade Family	<i>Solanum douglasii</i>	Douglas' nightshade	--	Native
	<i>Solanum umbelliferum</i>	Blue witch nightshade	--	Native



Family	Scientific Name	Common Name	Listing Status ¹	Origin
Themidaceae, Brodiaea Family	<i>Bloomeria crocea</i> var. <i>crocea</i>	Common goldenstar	--	Native
	<i>Dichelostemma capitatum</i> subsp. <i>capitatum</i>	Blue dicks	--	Native
Typhaceae, Cattail Family	<i>Typha domingensis</i>	Southern cattail	--	Native
Verbenaceae, Vervain Family	<i>Verbena lasiostachys</i>	Vervain	--	Native
Violaceae, Violet Family	<i>Viola pedunculata</i>	Johnny-jump-up	--	Native
Viscaceae, Mistletoe Family	<i>Phoradendron leucarpum</i> subsp. <i>macrophyllum</i>	Big leaf mistletoe	--	Native
Lichens				
Parmeliaceae	<i>Evernia prunastri</i>	Oakmoss lichen	--	Native
	<i>Flavopunctelia caperata</i>	Common greenshield lichen	--	Native
Ramalinaceae	<i>Ramalina menziesii</i>	Lace lichen	--	Native
Teloschistaceae	<i>Teloschistes exilis</i>	Slender orange-bush	--	Native

¹**Listing Status:** Indicates listing status for rare and endangered (i.e., special-status) taxa, as well as taxa considered noxious/invasive weeds in California and San Luis Obispo County. No state or federal-listed special-status species were documented; taxa included on the California Rare Plant Rank (CRPR) are assigned listing status based on the degree of rarity (Lists 1A through 4) and threat level (0.1, 0.2, and 0.3), as follows (CNPS, 2017):

Rarity Ranks:

- **List 1A:** presumed extirpated in California, and rare or extinct elsewhere
- **List 1B:** rare, threatened, or endangered in California and elsewhere
- **List 2A:** presumed extirpated in California, but more common elsewhere
- **List 2B:** rare, threatened, or endangered in California, but more common elsewhere
- **List 3:** review list of plants about which more information is needed
- **List 4:** watch list of plants with limited distribution

Threat Ranks:

- **0.1:** seriously threatened in California (> 80% threatened / high degree and immediacy of threat)
- **0.2:** moderately threatened in California (20-80% threatened / moderate degree and immediacy of threat)
- **0.3:** not very threatened in California (< 20% threatened / low degree and immediacy or no current threats known)

Taxa included on the California Invasive Plant Council (Cal-IPC) Invasive Plant Inventory (Cal-IPC, 2017); the U.S. Department of Agriculture (USDA) state list of Introduced, Invasive, and Noxious Plants for California (USDA, 2017); and/or the list of Invasive Weeds of San Luis Obispo County (SLO County, 2017) are indicated above in order of: Cal-IPC rank / USDA rank / SLO County list. The USDA ranking 'CW' refers to a 'C list' of noxious weeds known to occur in California. The SLO County list does not designate different ranking levels; any species included on the SLO County list is considered particularly problematic within the county, and is indicated above with --/--/SLO. Cal-IPC rankings included on this list are defined as:

Cal-IPC Inventory:

- **Limited (Lim):** invasive but with minor statewide ecological impacts, or insufficient information to justify a higher score.
- **Moderate (Mod):** substantial and apparent, but generally not severe ecological impacts on physical processes, plant and animal communities, and vegetation structure.
- **High:** severe ecological impacts on physical processes, plant and animal communities, and vegetation structure.

² **cP (=conforms to):** indicates provisional species determination based on the observed pheno-phase, but in the absence of diagnostic features.

³Final species name pending; will be recommended for inclusion on the CRPR 1B.2 list when published.



Wildlife Species List for Waddell Ranch (Addition to Irish Hills Natural Reserve)

Observed by Terra Verde on June 02, 09, 13, 14, 19 and 20, 2017

Order	Scientific Name	Common Name	Listing Status Federal/State
Amphibians	<i>Pseudacris regilla</i>	Pacific treefrog	-
	<i>Rana draytonii</i>	California red-legged frog	FT/CSC
Birds	<i>Agelaius phoeniceus</i>	Red-winged blackbird	-
	<i>Aphelocoma californica</i>	Western scrub-jay	-
	<i>Baeolophus inornatus</i>	Oak titmouse	-
	<i>Buteo jamaicensis</i>	Red-tailed hawk	-
	<i>Callipepla californica</i>	California quail	-
	<i>Calypte anna</i>	Anna's hummingbird	-
	<i>Carpodacus mexicanus</i>	House finch	-
	<i>Cathartes aura</i>	Turkey vulture	-
	<i>Chamaea fasciata</i>	Wrentit	-
	<i>Chondestes grammacus</i>	Lark sparrow	-
	<i>Colaptes auratus</i>	Northern flicker	-
	<i>Cyanocitta stelleri</i>	Steller's jay	-
	<i>Empidonax difficilis</i>	Pacific-slope flycatcher	-
	<i>Euphagus cyanocephalus</i>	Brewer's blackbird	-
	<i>Falco sparverius</i>	American kestrel	-
	<i>Junco hyemalis</i>	Dark-eyed junco	-
	<i>Melanerpes formicivorus</i>	Acorn woodpecker	-
	<i>Myiarchus cinerascens</i>	Ash-throated flycatcher	-
	<i>Phalaenoptilus nuttallii</i>	Common poorwill	-
	<i>Pheucticus melanocephalus</i>	Black-headed grosbeak	-
	<i>Picoides nuttallii</i>	Nuttall's woodpecker	-
	<i>Pipilo maculatus</i>	Spotted towhee	-
	<i>Poecile rufescens</i>	Chestnut-backed chickadee	-
	<i>Polioptila caerulea</i>	Blue-gray gnatcatcher	-
	<i>Psaltriparus minimus</i>	Bushtit	-
	<i>Sayornis nigricans</i>	Black phoebe	-
	<i>Selasphorus rufus</i>	Rufous hummingbird	-
	<i>Sialia mexicana</i>	Western bluebird	-
	<i>Tachycineta bicolor</i>	Tree swallow	-
	<i>Tachycineta thalassina</i>	Violet-green swallow	-
	<i>Thryomanes bewickii</i>	Bewick's wren	-
	<i>Toxostoma redivivum</i>	California thrasher	-
	<i>Troglodytes aedon</i>	House wren	-
<i>Tyrannus verticalis</i>	Western kingbird	-	
<i>Vireo gilvus</i>	Warbling vireo	-	

Birds (cont.)	<i>Vireo huttoni</i>	Hutton's vireo	-
	<i>Wilsonia pusilla</i>	Wilson's warbler	-
	<i>Zenaida macroura</i>	Mourning dove	-
Invertebrates	Acrididae	Locust	
	Araneidae (Order)	Orb weaver	
	<i>Argia lugens</i>	Sooty dancer	
	<i>Bombus</i> sp.	Bumble bee	
	Corixidae (Order)	Water boatman	
	<i>Danaus plexippus</i>	Monarch butterfly	-/Special Animal
	<i>Eleodes dentipes</i>	Dentate stink beetle	
	Gerridae (Order)	Water striders	
	<i>Libellula saturata</i>	Flame skimmer	
	Lithobiomorpha (Order)	Stone centipede	
	<i>Papilio rutulus</i>	Western tiger swallowtail	
	<i>Plathemis lydia</i>	Common whitetail	
	Simuliidae	Black fly	
Mammals	<i>Canis latrans</i>	Coyote	-
	* <i>Corynorhinus townsendii</i>	Townsend's big-eared bat	-/CSC & CT
	* <i>Eptesicus fuscus</i>	Big brown bat	-
	* <i>Lasionycteris noctivagans</i>	Silver-haired bat	-
	* <i>Lasiurus cinereus</i>	Hoary bat	-
	** <i>Neotoma</i> sp.	Woodrat	Potential CSC
	<i>Odocoileus hemionus columbianus</i>	Columbian black-tailed deer	-
	* <i>Myotis thysanodes</i>	Fringed myotis	-
	* <i>Myotis yumanensis</i>	Yuma myotis	-
	* <i>Parastrellus hesperus</i>	Canyon bat	-
	<i>Sylvilagus audubonii</i>	Desert cottontail	-
	<i>Sylvilagus bachmani</i>	Brush rabbit	-
	* <i>Tadarida brasiliensis</i>	Brazilian free-tailed bat	-
	<i>Thomomys bottae</i>	Botta's pocket gopher	-
Reptiles	<i>Actinemys marmorata</i>	Western pond turtle	-/CSC
	<i>Aspidoscelis tigris munda</i>	California whiptail	-
	<i>Coluber lateralis lateralis</i>	California striped racer	-
	<i>Elgaria multicarinata</i>	Southern alligator lizard	-
	<i>Pituophis catenifer</i>	Gopher snake	-
	<i>Sceloporus occidentalis</i>	Western fence lizard	-
	<i>Thamnophis elegans terrestris</i>	Coast gartersnake	-

* Bat species were identified with a high degree of certainty using SonoBat identification software.

**Potential for Monterey dusky-footed woodrat (*Neotoma macrotis luciana*) to occur, but presence not confirmed.



ATTACHMENT D – CNDDDB Field Survey Forms



This page intentionally left blank.

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Rana draytonii

Common Name: California red-legged frog

Species Found? Yes No _____ If not found, why?
Total No. Individuals: 6 Subsequent Visit? Yes No
Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____
Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Rhett Blanton
Address: 3765 South Higuera Street, Suite 102
San Luis Obispo, CA 93401
E-mail Address: rblanton@terraverdeweb.com
Phone: (805) 458-3451

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Habitat consisted of riparian corridor with nearly complete willow and coast live oak canopy cover. Understory herbaceous vegetation included horsetail, posoin oak, and bunchgrass. Substrate primarily bedrock with cobble. Stream structure includes pools and shallow riffle.
County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo
Quad Name: San Luis Obispo Elevation: 783
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____
DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)
Coordinates: 35 degrees 15' 1.71" N
-120 degrees 43' 5.52" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Adult and subadult frogs observed sunning on algal mat and drainage banks.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor
Immediate AND surrounding land use: Open space
Visible disturbances: None
Threats: None
Comments:

Determination: (check one or more, and fill in blanks)
 Keyed (cite reference): _____
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): Halden Petersen
 Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Actinemys marmorata

Common Name: Western pond turtle

Species Found? Yes No _____ If not found, why?
Total No. Individuals: 2 Subsequent Visit? Yes No
Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____
Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Rhett Blanton
Address: 3765 South Higuera Street, Suite 102
San Luis Obispo, CA 93401
E-mail Address: rblanton@terraverdeweb.com
Phone: (805) 458-3451

Plant Information
Phenology: _____
% vegetative _____ % flowering _____ % fruiting _____

Animal Information
adults 1 # juveniles 1 # larvae _____ # egg masses _____ # unknown _____
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Open pond habitat with cattails and willows around perimeter. Downslope drainage is narrow with infrequent bedrock pools. Cover for drainage is willow dominated with nearly complete canopy cover.

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo
Quad Name: Pismo Beach Elevation: 895
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth
T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____
DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)
Coordinates: 35 degrees 14' 51.07" N
-120 degrees 42' 58.09" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

One adult observed in pond and one hatchling observed basking on bank of drainage pool 120 feet downstream of pond.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor
Immediate AND surrounding land use: Open space
Visible disturbances: None
Threats: None
Comments: _____

Determination: (check one or more, and fill in blanks)
 Keyed (cite reference): _____
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): Halden Petersen
 Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Scientific Name: Chorizanthe palmeri

Common Name: Palmer's spineflower

Species Found? Yes No _____ If not found, why? _____

Total No. Individuals: 300-500 Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
2 98 0
% vegetative % flowering % fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters

T 31S R 12E Sec 5, ___ 1/4 of ___ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, ___ 1/4 of ___ 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)

Coordinates: Populations concentrated on serpentine outcrops/in serpentine chaparral at: 35.252455 / -120.719047;
35.247949 / -120.717996; 35.244924 / -120.716578

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Common among serpentine chaparral/scrub communities and on exposed outcrops in openings in the veg. Dominant associates include: Ceanothus cuneatus var. ramulosus, Artemisia californica, Hesperoyucca whipplei, Salvia mellifera, Quercus durata. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe breweri, Dudleya abramsii murina, D. blochmaniae blochmaniae, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Carex obispoensis, Lomatium parvifolium, Sanicula hoffmannii, Perideridia pringlei, Castilleja densiflora obispoensis

Please fill out separate form for other rare taxa seen at this site. ... Calystegia subacaulis episcopalis, C. alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: Potential for minor impacts from light recreation

Comments: _____

Determination: *(check one or more, and fill in blanks)*

Keyed (cite reference): TJM2, Baldwin et al.

Compared with specimen housed at: _____

Compared with photo / drawing in: _____

By another person (name): _____

Other: Sight ID

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Chorizanthe breweri

Common Name: Brewer's spineflower

Species Found? Yes No _____ If not found, why?
Total No. Individuals: 1000+ Subsequent Visit? Yes No
Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____
Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson
Address: 3765 South Higuera Street
San Luis Obispo, California 93401
E-mail Address: knelson@terraverdeweb.com
Phone: (702) 596-5038

Plant Information
Phenology:
0 90 10
% vegetative % flowering % fruiting

Animal Information
adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).
County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo
Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters
T 31S R 12E Sec 5, ___ 1/4 of ___ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth
T 31S R 12E Sec 8, ___ 1/4 of ___ 1/4, Meridian: H M S GPS Make & Model: _____
DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)
Coordinates: Populations concentrated on serpentine outcrops/in serpentine chaparral at: 35.252455 / -120.719047;
35.247949 / -120.717996; 35.244924 / -120.716578

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Common among serpentine chaparral/scrub communities and on exposed outcrops in openings in the veg. Dominant associates include: Ceanothus cuneatus var. ramulosus, Artemisia californica, Hesperoyucca whipplei, Salvia mellifera, Quercus durata. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe palmeri, Dudleya abramsii murina, D. blochmaniae blochmaniae, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Carex obispoensis, Lomatium parvifolium, Sanicula hoffmannii, Perideridia pringlei, Castilleja densiflora obispoensis
Please fill out separate form for other rare taxa seen at this site. ... Calystegia subacaulis episcopalis, C. alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor
Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches
Visible disturbances: None
Threats: Potential for minor impacts from light recreation
Comments:

Determination: *(check one or more, and fill in blanks)*
 Keyed (cite reference): TJM2, Baldwin et al.
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): _____
 Other: Sight ID

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/05/2017

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Castilleja densiflora subsp. obispoensis*

Common Name: San Luis Obispo owl's clover

Species Found? Yes No _____ If not found, why?

Total No. Individuals: 150+ Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk. Yes, Occ. # _____

Collection? If yes: _____ Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
0 85 15
% vegetative % flowering % fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.2 miles (as the crow flies) southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: Pismo Beach Elevation: 344-346 meters

T 31S R 12E Sec 8, 1/4 of 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T _____ R _____ Sec _____, 1/4 of 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)

Coordinates: 35.244528 / -120.712334

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Grassy meadow opening in otherwise chaparral-dominated ridgeline; growing on slightly raised area with reduced density of grasses/higher density of herbs. Dominant associates include: *Castilleja exserta*, *Lasthenia gracilis*, *Corethrogyne filaginifolia*, *Plantago erecta*, *Microseris douglasii*, *Festuca perennis*, *Eschscholzia californica*. Other rare taxa (observed in same and adjacent communities): *Monardella palmeri*, *Chorizanthe breweri*, *Chorizanthe palmeri*, *Dudleya abramsii murina*, *Calochortus clavatus clavatus*, *Arctostaphylos obispoensis*, *Monardella palmeri*, *Lomatium parvifolium*

Please fill out separate form for other rare taxa seen at this site. ...*Calystegia subacaulis episcopalis*, *Calochortus obispoensis*, *Perideridia pringlei*

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: Potential for minor impacts from recreation/public access

Comments:

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): TJM2, Baldwin et al.
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): _____
 Other: Sight ID

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Carex obispoensis

Common Name: San Luis Obispo sedge

Species Found? Yes No _____ If not found, why? _____

Total No. Individuals: < 10 Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
% vegetative 0 % flowering 100 % fruiting 0

Animal Information

adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____

wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.3 miles (as the crow flies) west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 237-240 meters

T 31S R 12E Sec 5, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)

Coordinates: 35.250665 / -120.718133

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Growing streamside in Froom Creek, overhanging the water. Dominant associates include: Quercus agrifolia, Umbellularia californica, Cornus sericea occidentalis, Toxicodendron diversilobum, Lonicera hispidula. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe breweri, Chorizanthe palmeri, Dudleya abramsii murina, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Monardella palmeri, Lomatium parvifolium, Sanicula hoffmannii, Perideridia pringlei, Castilleja densiflora obispoensis

Please fill out separate form for other rare taxa seen at this site. ...Calystegia subacaulis episcopalis, C.alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments: _____

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): TJM2, Baldwin et al.

Compared with specimen housed at: _____

Compared with photo / drawing in: _____

By another person (name): _____

Other: Sight ID

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/05/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Calystegia subacaulis subsp. episcopalis

Common Name: San Luis Obispo owl's clover

Species Found? Yes No _____ If not found, why? _____

Total No. Individuals: 200+ Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
5 60 35
% vegetative % flowering % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____

wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.32 miles (as the crow flies) west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 240 - 250 meters

T 31S R 12E Sec 5, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)

Coordinates: Annual grasslands, surrounding: 35.250432 / -120.718964; 35.249751 / -120.718098; 35.248778 / -120.719325

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Low-lying annual grasslands around Froom Creek and its tributaries. Dominant associates include: Castilleja exserta, Hemizonia congesta luzulifolia, Festuca perennis, Bromus spp., Avena spp., Brachypodium distachyon. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe breweri, Chorizanthe palmeri, Dudleya abramsii murina, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Monardella palmeri, Lomatium parvifolium, Calochortus obispoensis, Perideridia pringlei

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments: _____

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): TJM2, Baldwin et al.

Compared with specimen housed at: _____

Compared with photo / drawing in: _____

By another person (name): _____

Other: Sight ID

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Calochortus obispoensis

Common Name: San Luis mariposa lily

Species Found? Yes No _____ If not found, why? _____

Total No. Individuals: 150+ Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
% vegetative: 0 % flowering: 95 % fruiting: 5

Animal Information

adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____

wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters

T 31S R 12E Sec 5, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)

Coordinates: Populations concentrated on serpentine outcrops/in serpentine chaparral at: 35.252455 / -120.719047;
35.247949 / -120.717996; 35.244924 / -120.716578

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Common among serpentine chaparral/scrub communities and on exposed outcrops in openings in the veg. Dominant associates include: Ceanothus cuneatus var. ramulosus, Artemisia californica, Hesperoyucca whipplei, Salvia mellifera, Quercus durata. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe palmeri, C. breweri, Dudleya abramsii murina, D. blochmaniae blochmaniae, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Carex obispoensis, Lomatium parvifolium, Sanicula hoffmannii, Perideridia pringlei, Castilleja densiflora obispoensis

Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
...

Please fill out separate form for other rare taxa seen at this site. ...Calystegia subacaulis episcopalis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments: _____

Determination: *(check one or more, and fill in blanks)*

Keyed (cite reference): TJM2, Baldwin et al.

Compared with specimen housed at: _____

Compared with photo / drawing in: _____

By another person (name): _____

Other: Sight ID

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Calochortus clavatus* var. *clavatus*

Common Name: Club-haired mariposa lily

Species Found? Yes No _____ If not found, why?

Total No. Individuals: 100+ Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
% vegetative: 0 % flowering: 95 % fruiting: 5

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters

T 31S R 12E Sec 5, 1/4 of 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, 1/4 of 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)

Coordinates: Populations concentrated on serpentine outcrops/in serpentine chaparral at: 35.252455 / -120.719047;
35.247949 / -120.717996; 35.244924 / -120.716578

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Common among serpentine chaparral/scrub communities and on exposed outcrops in openings in the veg. Dominant associates include: *Ceanothus cuneatus* var. *ramulosus*, *Artemisia californica*, *Hesperoyucca whipplei*, *Salvia mellifera*, *Quercus durata*. Other rare taxa (observed in same and adjacent communities): *Monardella palmeri*, *Chorizanthe palmeri*, *C. breweri*, *Dudleya abramsii murina*, *D. blochmaniae blochmaniae*, *Calochortus obispoensis*, *Arctostaphylos obispoensis*, *Carex obispoensis*, *Lomatium parvifolium*, *Sanicula hoffmannii*, *Perideridia pringlei*, *Castilleja densiflora obispoensis*, *Calystegia...*

Please fill out separate form for other rare taxa seen at this site. ...*subacaulis episcopalis*

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): TJM2, Baldwin et al.
- Compared with specimen housed at: _____
- Compared with photo / drawing in: _____
- By another person (name): _____
- Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/05/2017

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Arctostaphylos obispoensis*

Common Name: Blshop manzanita

Species Found? Yes No _____ If not found, why?

Total No. Individuals: 5 Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
100 0 0
% vegetative % flowering % fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 miles (as the crow flies) due west of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters

T 31S R 12E Sec 5, 1/4 of 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, 1/4 of 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)

Coordinates: 4 individuals: 35.251029 / -120.717082
1 individual: 35.242862 / -120.710860

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

4 individuals found on northwest-facing slope above Froom Creek in open serpentine scrub/chaparral (transitional zone). 1 individual on flat ridgeline in dense chaparral, along a remnant trail. Dominant associates include with *Ceanothus cuneatus* var. *ramulosus*, *Adenostoma fasciculatum*, *Quercus durata*, *Quercus agrifolia*, *Salvia mellifera*. Other rare taxa (observed in same and adjacent communities): *Monardella palmeri*, *Chorizanthe palmeri*, *C. breweri*, *Dudleya abramsii murina*, *D. blochmaniae*, *Calochortus obispoensis*, *Calochortus clavatus clavatus*, *Carex obispoensis*, *Lomatium parvifolium*.

Please fill out separate form for other rare taxa seen at this site. ...*Sanicula hoffmannii*, *Perideridia pringlei*, *Castilleja densiflora obispoensis*

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments:

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): Field Guide to Manzanitas, Kauffman
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): _____
 Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/05/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Sanicula hoffmannii

Common Name: Hoffmann's sanicle

Species Found? Yes No _____ If not found, why? _____

Total No. Individuals: 10-12 Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
0 % vegetative 25 % flowering 75 % fruiting

Animal Information

adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____

wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.4 miles (as the crow flies) west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: Pismo Beach Elevation: 248 - 249 meters

T 31S R 12E Sec 8, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)

Coordinates: 35.249109 / -120.719625

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Growing on upper banks of Froom Creek under dense tree canopy/sparse herb/shrub layer, in thick leaf litter. Dominant associates include: Quercus agrifolia, Umbellularia californica, Toxicodendron diversilobum, Lonicera hispidula, Rubus ursinus, Salvia spathacea. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe breweri, Chorizanthe palmeri, Dudleya abramsii murina, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Monardella palmeri, Lomatium parvifolium, Carex obispoensis Perideridia pringlei, Castilleja densiflora obispoensis

Please fill out separate form for other rare taxa seen at this site. ...Calystegia subacaulis episcopalis, C.alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments: _____

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): TJM2, Baldwin et al.

Compared with specimen housed at: _____

Compared with photo / drawing in: _____

By another person (name): _____

Other: Sight ID

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/05/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Perideridia pringlei

Common Name: Adobe yampah

Species Found? Yes No _____ If not found, why? _____

Total No. Individuals: 300+ Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
% vegetative: 0 % flowering: 90 % fruiting: 10

Animal Information

adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____

wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters

T 31S R 12E Sec 5, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)

Coordinates: Populations concentrated on serpentine outcrop/in serpentine chaparral at: 35.247949 / -120.717996

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Common on north- & west-facing slopes on serpentine chaparral/scrub community & on exposed outcrops in veg openings. Dominant associates include: Ceanothus cuneatus var. ramulosus, Hesperoyucca whipplei, Salvia mellifera, Quercus durata. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe breweri, Chorizanthe palmeri, Dudleya abramsii murina, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Carex obispoensis, Sanicula hoffmannii, Lomatium parvifolium, Castilleja densiflora obispoensis, Dudleya blochmaniae blochmaniae

Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
...

Please fill out separate form for other rare taxa seen at this site. ... Calystegia subacaulis episcopalis, C. alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments: _____

Determination: *(check one or more, and fill in blanks)*

Keyed (cite reference): TJM2, Baldwin et al.

Compared with specimen housed at: _____

Compared with photo / drawing in: _____

By another person (name): _____

Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Monardella palmeri

Common Name: Palmer's monardella

Species Found? Yes No _____ If not found, why? _____

Total No. Individuals: <50 Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
85 15 0
% vegetative % flowering % fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown

wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: San Luis Obispo, Pismo Beach Elevation: 262-345 meters

T 31S R 12E Sec 5, ___ 1/4 of ___ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T 31S R 12E Sec 8, ___ 1/4 of ___ 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)

Coordinates: Observed in three separate locations: 35.253321 / -120.718892; 35.248418 / -120.717519; 35.243329 / -120.710623

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Uncommon in concentrated on north- & west-facing slopes on serpentine chaparral and grassland. Dominant associates include: Ceanothus cuneatus var. ramulosus, Quercus durata, Corethrogyne filaginifolia, Hemizonia congesta luzulifolia, Stachys bullata, annual grasses. Other rare taxa (observed in same and adjacent communities): Chorizanthe breweri, C. palmeri, Dudleya abramsii murina, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Carex obispoensis, Sanicula hoffmannii, Lomatium parvifolium, Castilleja densiflora obispoensis, Dudleya blochmaniae blochmaniae, Perideridia pringlei

Please fill out separate form for other rare taxa seen at this site. ...Calystegia subacaulis episcopalis, C. alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments: _____

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): TJM2, Baldwin et al.

Compared with specimen housed at: _____

Compared with photo / drawing in: _____

By another person (name): _____

Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/05/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Lomatium parvifolium

Common Name: Small-leaved lomatium

Species Found? Yes No _____ If not found, why? _____
Total No. Individuals: < 50 Subsequent Visit? Yes No
Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____
Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson
Address: 3765 South Higuera Street
San Luis Obispo, California 93401
E-mail Address: knelson@terraverdeweb.com
Phone: (702) 596-5038

Plant Information
Phenology:
50 50 0
% vegetative % flowering % fruiting

Animal Information
adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).
County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo
Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters
T 31S R 12E Sec 5, _____ 1/4 of _____ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth
T 31S R 12E Sec 8, _____ 1/4 of _____ 1/4, Meridian: H M S GPS Make & Model: _____
DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)
Coordinates: Populations concentrated on serpentine outcrops/in serpentine chaparral at: 35.252455 / -120.719047;
35.247949 / -120.717996; 35.244924 / -120.716578

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Common among serpentine chaparral/scrub communities and on exposed outcrops in openings in the veg. Dominant associates include: Ceanothus cuneatus var. ramulosus, Artemisia californica, Hesperoyucca whipplei, Salvia mellifera, Quercus durata. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe breweri, Chorizanthe palmeri, Dudleya abramsii murina, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Carex obispoensis, Sanicula hoffmannii, Perideridia pringlei, Castilleja densiflora obispoensis, Dudleya blochmaniae blochmaniae
Please fill out separate form for other rare taxa seen at this site. ...Calystegia subacaulis episcopalis, C. alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor
Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches
Visible disturbances: None
Threats: None
Comments:

Determination: (check one or more, and fill in blanks)
 Keyed (cite reference): TJM2, Baldwin et al.
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): _____
 Other: Sight ID

Photographs: (check one or more)
Slide Print Digital
Plant / animal
Habitat
Diagnostic feature
May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/05/2017

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Dudleya blochmaniae* subsp. *blochmaniae*

Common Name: Blochman's dudleya

Species Found? Yes No _____
If not found, why?

Total No. Individuals: < 20 Subsequent Visit? Yes No

Is this an existing NDDDB occurrence? _____
Yes, Occ. # No Unk.

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson

Address: 3765 South Higuera Street
San Luis Obispo, California 93401

E-mail Address: knelson@terraverdeweb.com

Phone: (702) 596-5038

Plant Information

Phenology:
% vegetative: 100 % flowering: 0 % fruiting: 0

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.35 miles (as the crow flies) west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).

County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo

Quad Name: Pismo Beach Elevation: 285-295 meters

T 31S R 12E Sec 8, 1/4 of 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth

T _____ R _____ Sec _____, 1/4 of 1/4, Meridian: H M S GPS Make & Model: _____

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)

Coordinates: 35.247853 / -120.718351

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Exposed, northwest-facing serpentine outcrop. Dominant associates include: *Ceanothus cuneatus* var. *ramulosus*, *Artemisia californica*, *Hesperoyucca whipplei*, *Eriophyllum confertiflorum*, *Hesperolinon micranthum*, *Plantago erecta*. Other rare taxa (observed in same and adjacent communities): *Monardella palmeri*, *Chorizanthe breweri*, *Chorizanthe palmeri*, *Dudleya abramsii* *murina*, *Calochortus clavatus clavatus*, *Arctostaphylos obispoensis*, *Carex obispoensis*, *Lomatium parvifolium*, *Sanicula hoffmannii*, *Perideridia pringlei*, *Castilleja densiflora obispoensis*

Please fill out separate form for other rare taxa seen at this site. ...*Calystegia subacaulis episcopalis*, *C.alochortus obispoensis*

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches

Visible disturbances: None

Threats: None

Comments:

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): TJM2, Baldwin et al.
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): _____
 Other: Sight ID

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDDB@wildlife.ca.gov

For Office Use Only

Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 06/02/2017

California Native Species Field Survey Form

Clear Form Print Form

Scientific Name: Dudleya abramsii subsp. murina

Common Name: Mouse-gray dudleya

Species Found? Yes No _____ If not found, why?
Total No. Individuals: 7500+ Subsequent Visit? Yes No
Is this an existing NDDDB occurrence? _____ No Unk.
Yes, Occ. # _____
Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Kristen Nelson
Address: 3765 South Higuera Street
San Luis Obispo, California 93401
E-mail Address: knelson@terraverdeweb.com
Phone: (702) 596-5038

Plant Information
Phenology:
25 75 0
% vegetative % flowering % fruiting

Animal Information
adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site lek other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Irish Hills Natural Reserve, west of City of San Luis Obispo; 1.25 - 1.5 miles (as the crow flies) due west and west-southwest of the Madonna Road trailhead into Irish Hills (where Madonna Road dead-ends at a round-about).
County: San Luis Obispo Landowner / Mgr: City of San Luis Obispo
Quad Name: San Luis Obispo, Pismo Beach Elevation: 255-345 meters
T 31S R 12E Sec 5, ___ 1/4 of ___ 1/4, Meridian: H M S Source of Coordinates (GPS, topo. map & type): Google Earth
T 31S R 12E Sec 8, ___ 1/4 of ___ 1/4, Meridian: H M S GPS Make & Model: _____
DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 UTM Zone 11 **OR** Geographic (Latitude & Longitude)
Coordinates: Populations concentrated on serpentine outcrops/in serpentine chaparral at: 35.252455 / -120.719047;
35.247949 / -120.717996; 35.244924 / -120.716578

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Abundant on exposed serpentine outcrops & occasional in adjacent communities. Dominant associates include: Ceanothus cuneatus var. ramulosus, Artemisia californica, Hesperoyucca whipplei, Salvia mellifera, Quercus durata. Other rare taxa (observed in same and adjacent communities): Monardella palmeri, Chorizanthe breweri, Chorizanthe palmeri, Dudleya blochmaniae blochmaniae, Calochortus clavatus clavatus, Arctostaphylos obispoensis, Carex obispoensis, Lomatium parvifolium, Sanicula hoffmannii, Perideridia pringlei, Castilleja densiflora obispoensis
Please fill out separate form for other rare taxa seen at this site. ... Calystegia subacaulis episcopalis, C. alochortus obispoensis

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor
Immediate AND surrounding land use: Protected open space - light recreation/public access; surrounded by private ranches
Visible disturbances: None
Threats: None
Comments:

Determination: (check one or more, and fill in blanks)
 Keyed (cite reference): TJM2, Baldwin et al.
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): _____
 Other: Sight ID

Photographs: (check one or more)
Slide Print Digital
Plant / animal
Habitat
Diagnostic feature
May we obtain duplicates at our expense? yes no



ATTACHMENT E – Representative Site Photographs



This page intentionally left blank.



Photo 1. View north across the central valley of the Waddell Ranch property (May 05, 2017).



Photo 2. View east toward grassy meadows near southern property boundary (May 05, 2017).



Photo 3. View north along historical rock wall toward western property boundary (May 05 2017).



Photo 4. Grassy meadow habitat with seasonal seep, in opening of chaparral near southern property boundary (May 05 2017).



Photo 5. View northeast of the City of San Luis Obispo from the ridgeline south of Froom Creek (May 05 2017).



Photo 6. View south across the property from the ridgeline north of Froom Creek (June 02, 2017).



Photo 7. Coast gartersnake foraging in the cattail marsh at the edge of the stock pond (June 02, 2017).



Photo 8. Common poorwill nestling on the serpentine outcrop north of Froom Creek (June 02, 2017).



Photo 9. Western pond turtle snout in the middle of the stock pond (June 19, 2017).



Photo 10. Two adult California red-legged frogs found on algae mats in Froom Creek (June 19, 2017).



Photo 11. Wilson's warbler singing in the oak woodland near Froom Creek (June 19, 2017).



Photo 12. Young male Columbian black-tailed deer near the northern corner of the property (June 13, 2017).



Photo 13. New species of *Chorizanthe* growing with *C. breweri* (June 13, 2017).



Photo 14. New species of *Chorizanthe*; photo by Kyle Nessen (June 17, 2017).



Photo 15. *Calochortus argillosus* on the grassy hill south of the stock pond (June 02, 2017).



Photo 16. *Calochortus obispoensis* growing in the yucca scrub north of Froom Creek (June 02, 2017).



Photo 17. *Monardella palmeri* growing near the serpentine seep northwest of the stock pond (June 02, 2017).



Photo 18. *Streptanthus glandulosus* growing with *Dudleya abramsii* subsp. *murina* on the serpentine outcrop north of Froom Creek (May 05, 2017).

Appendix D:

Results of Focused Botanical Surveys for Irish Hills Spineflower (*Chorizanthe aphanantha*) Completed in the Irish Hills Natural Reserve, City of San Luis Obispo, California, Terra Verde Environmental, June 17, 2018



June 19, 2018

Mr. Robert Hill, Natural Resources Manager
City of San Luis Obispo
990 Palm Street
San Luis Obispo, CA 93401

RE: Results of Focused Botanical Surveys for Irish Hills Spineflower (*Chorizanthe aphanantha*) Completed in the Irish Hills Natural Reserve, City of San Luis Obispo, California

Dear Mr. Hill,

This memorandum is being provided to summarize the results of a series of focused botanical surveys completed by Terra Verde Environmental Consulting, LLC (Terra Verde) throughout the City of San Luis Obispo's (City) Irish Hills Natural Reserve (Reserve). The purpose of the surveys was to document the geographical range of the newly-described Irish Hills spineflower (*Chorizanthe aphanantha* K.M. Nelson & D.J. Keil, in review), which was discovered during a spring 2017 botanical survey of the Waddell Ranch, a parcel on the western edge of the Reserve. In 2017, the City acquired the 154-acre Waddell Ranch property as an extension of the existing Reserve. Prior to formally adding the Waddell Ranch property to the Reserve and opening it to the public for conservation and recreation purposes, the City retained Terra Verde to conduct biological surveys on the new parcel, in order to inform necessary updates to the existing *Irish Hills Natural Reserve Conservation Plan Update* (Plan). The following includes a summary of the survey methods and results of the recent focused surveys, as well as management recommendations for the newly-described species.

Survey Methodology

Terra Verde conducted a series of surveys in May and early June, 2018, to capture the peak flowering and early fruiting period of Irish Hills spineflower, when it is most readily identifiable. Surveys focused on identifying and documenting the overall range of the new species along existing trails and natural openings within suitable chaparral habitat throughout the Reserve (see Attachment A – Survey Results Map). In addition, new information was documented about the phenology and population size. New collections were made and submitted to the Hoover Herbarium at California Polytechnic State University, San Luis Obispo (Kristen M. Nelson, collection #44, #47).

Terra Verde botanist Kristen Nelson led a series of seven surveys on May 11, 14, 19, 22, 23, 28, and June 02. Additional observations were also made earlier in the season (April 05 and May 05), the results of which are included here. Surveys were pedestrian in nature and lasted between 2 and 10 hours each day. Wherever found, individuals and populations of Irish Hills spineflower were



documented using a Trimble hand-held global positioning system (GPS) unit with sub-meter accuracy (see Attachment A).

Survey Results

During the 2018 surveys, approximately 24,000 individuals of Irish Hills spineflower were documented throughout the Reserve. Dense populations were documented along the northern end of the Mariposa Trail, in two meadow openings in the chaparral along the Ocean View Trail, and in the vicinity of two abandoned chromium mines off the Mine and Wednesday Trails. More scattered occurrences were documented along the Froom Creek, Poppy, Canyon View, and Morro View Trails. Additional areas of suitable habitat exist in portions of the Reserve that were not included in the 2018 focused surveys. In particular, the ridgeline that borders the eastern edge of the Waddell Ranch parcel and the hill that covers the southwestern corner of the Waddell Ranch parcel support a mosaic of dense to open chaparral with occasional grassy and rocky openings that appear suitable for supporting Irish Hills spineflower.

Irish Hills spineflower occupies a fairly consistent micro-habitat, in rocky openings of serpentine chaparral, and generally at the immediate edge of shrub canopy. Dominant overstory species consist of buckbrush (*Ceanothus cuneatus* var. *ramulosus*), leather oak (*Quercus durata*), and black sage (*Salvia mellifera*), with infrequent occurrences of Bishop manzanita (*Arctostaphylos obispoensis*), chaparral pea (*Pickeringia montana*), chaparral yucca (*Hesperoyucca whipplei*), chamise (*Adenostoma fasciculatum*), and California sagebrush (*Artemisia californica*). In several locations, where grassy meadows occupy large openings in the chaparral shrub cover, Irish Hills spineflower was observed at variable density (sparse to very dense) at the margins of meadows, occurring with a mix of native and non-native grasses dominated by foothill needle grass (*Stipa lepida*) and rye grass (*Festuca perennis*). Irish Hills spineflower often co-occurs with Brewer's spineflower (*Chorizanthe breweri*), occasionally growing under its sprawling canopy. It was also documented co-occurring with Palmer's spineflower (*Chorizanthe palmeri*) at a few localities.

GPS data depicting Irish Hills spineflower observations was collected and mapped in a way that illustrates the overall range and distribution of the species within the Reserve. Point data was collected when a small, discrete patch of individuals was observed. These patches often consisted of less than 30 individuals in a very localized patch, typically a small opening in the chaparral canopy at the edge of an existing trail. Line data was collected when individuals and small to large patches of Irish Hills spineflower were observed along a continuous section of trail. Polygon data was collected to document larger patches that were entirely or mostly occupied by Irish Hills spineflower (e.g., large openings around abandoned mines).

Management Considerations

When it was originally discovered and documented in 2017, Irish Hills spineflower was only known to occur on a single hill slope above Froom Creek, near the northern corner of the Waddell Ranch parcel. At the time, approximately 200 to 300 individual plants were documented at this locality. Formal publication and acceptance of the new species is pending, and expected in late 2018. Following publication of the new taxon, documentation will be submitted to the California Native Plant Society, with a request to consider assigning Irish Hills spineflower a California Rare Plant Rank. Although the known range and population size of this species was greatly expanded during



the 2018 surveys, the specific habitat requirements and overall limited range of the species warrants careful management to avoid adverse impacts to the population on City-owned property. It appears that Irish Hills spineflower is tolerant of limited disturbance associated with the creation, recreational use, and maintenance of trails through chaparral. However, to aid the City in amending the existing Plan, and particularly for management of the newly-described species, the following management considerations are offered:

- Establishment and maintenance of trails through chaparral habitat should occur outside the flowering and fruiting period for Irish Hills spineflower to the extent feasible, which may span from mid-March (early bolting) through late June (seed set).
- Prior to being brought to the Reserve, vehicles, hand tools, and other equipment used at the Reserve should be cleaned of all soil/mud and other debris to avoid the spread of non-native or invasive plants.
- If feasible, the City should search un-surveyed portions of the Reserve and suitable habitat on other City-owned properties (e.g., Reservoir Canyon/Bowden Ranch, South Hills, Johnson Ranch, etc.) for additional occurrences of Irish Hills spineflower to further refine the known range for this species.
- Interpretive trail signs should be installed to inform the public of the sensitivity of resources present, and important ways in which those resources can be protected (e.g., stay on trail, pack-in/pack-out trash, don't pick wildflowers, etc.).
- Surrounding the old homestead and near the Froom Creek Trail access to the Waddell Ranch parcel, remove saplings/volunteer sprouts of Aleppo pine (*Pinus halepensis*), blue gum (*Eucalyptus globulus*), and red gum (*Eucalyptus camaldulensis*), whenever possible, to avoid spread into adjacent habitat. Aleppo pine has already become naturalized within the ornamental stand of trees along the Froom Creek Trail.

These recommendations should be considered in the management of the Waddell Ranch property and the entire Reserve to support public recreation and the persistence of pristine native habitats and diverse species assemblages, including robust populations of special-status plant populations.

If you have any questions or require additional information, please contact me at knelson@terraverdeweb.com or at (702) 596-5038.

Sincerely,

A handwritten signature in black ink that reads "Kristen Nelson".

Kristen Nelson
Botanist

Attachments

- A – Survey Results Map
- B – Representative Habitat and Species Photographs



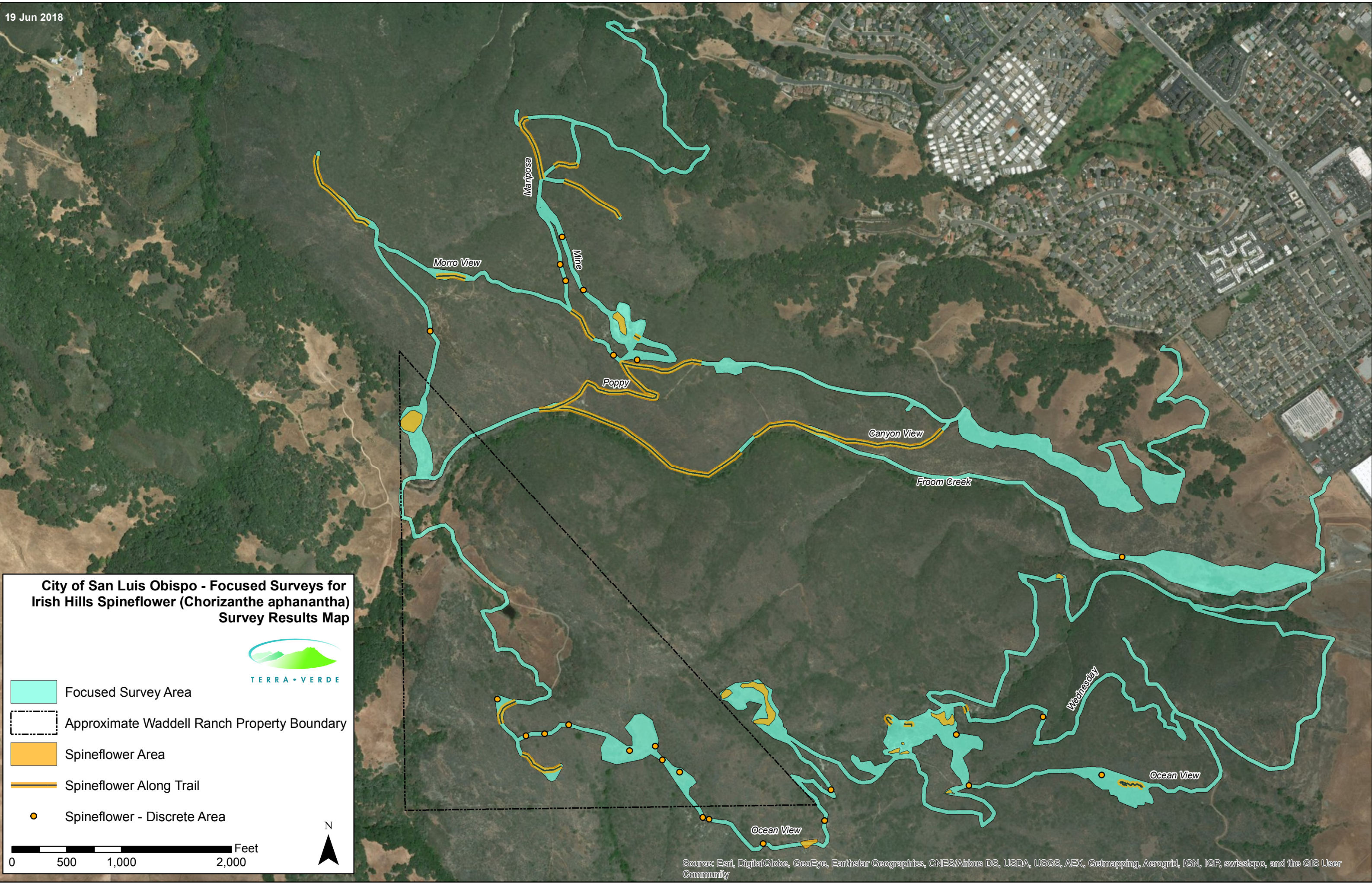
This page intentionally left blank.



ATTACHMENT A – Survey Results Map

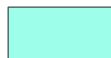






This page intentionally left blank.



**City of San Luis Obispo - Focused Surveys for
Irish Hills Spineflower (*Chorizanthe aphanantha*)
Survey Results Map**



-  Focused Survey Area
-  Approximate Waddell Ranch Property Boundary
-  Spineflower Area
-  Spineflower Along Trail
-  Spineflower - Discrete Area

0 500 1,000 2,000 Feet





ATTACHMENT B - Representative Habitat and Species Photographs



This page intentionally left blank.



Photo 1. Basal leaves and early inflorescence development on Irish Hills spineflower at the northern corner of the Waddell Ranch parcel (04/05/18).



Photo 2. Early flower development on several individuals of Irish Hills spineflower along the edge of the Wednesday Trail (05/05/18).



Photo 3. Occupied habitat along the edge of the Wednesday Trail; Irish Hills spineflower observed within and adjacent to pervious pavers (05/19/18).



Photo 4. Small patch of several very small individuals of Irish Hills spineflower near the abandoned mine at the end of the Wednesday Trail (05/19/18).



Photo 5. Irish Hills spineflower (right) growing under Brewer's spineflower (left) on the northern end of the Mariposa trail; top scale shows centimeters (cm)/millimeters (mm) (05/14/18).



Photo 6. Occupied habitat along the edges of the Mariposa Trail (05/14/18).



Photo 7. Larger, sprawling individual of Irish Hills spineflower along the Mariposa Trail; right scale shows cm/mm (05/14/18).



Photo 8. Dense patch of Irish Hills spineflower growing at the edge of a grassy meadow off the Ocean View Trail (05/23/18).



Photo 9. Smaller, more compact individuals of Irish Hills spineflower growing trail-side on the Ocean View Trail (05/23/18).



Photo 10. Open flowers of Irish Hills spineflower (left) and Brewer's spineflower (right) (06/02/18).



Photo 11. Occupied habitat surrounding the abandoned mine off the Wednesday and Ocean View Trails (06/02/18).



Photo 12. Grassy meadow off the Ocean View Trail; Irish Hills spineflower found concentrated along the northern edge (left) of the meadow (06/02/18).