BIOLOGICAL RESOURCE ASSESSMENT

GALINDO CREEK FIELD STATION
CALIFORNIA STATE UNIVERSITY EAST BAY
CONCORD, CONTRA COSTA COUNTY, CALIFORNIA

JULY 2019

Prepared for

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Section 1. INTRODUCTION

Nomad Ecology, LLC (Nomad) prepared this Biological Resource Assessment for California State University (CSU) East Bay's 54.45-acre Galindo Creek Field Station located in Concord, Contra Costa County, California.

This biological resource assessment documents the biological resources found on the field station during a single reconnaissance visit conducted in 2019. The report discusses (1) methodologies used for background literature search and the biological reconnaissance survey; (2) results of the background literature search and field reconnaissance survey; (3) existing biological conditions including vegetation communities and invasive weeds present on site; (4) the location, extent, and habitat requirements of any sensitive biological resources, or wetlands that occur, or will likely occur, in the study area; (5) recommendations for further focused species surveys; (6) a map of vegetation communities (including invasive weed species) within the study area; (7) a list of plant species observed; and (8) a list of animal species observed.

Section 2. STUDY METHODS

2.1. DATA RESOURCES

Background information for listed and special-status plant and wildlife species, and sensitive natural communities was compiled through a review of the following resources:

U.S. Fish and Wildlife Service (USFWS):

- Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in Contra Costa County (USFWS 2019a)
- National Wetland Inventory for the Clayton Quadrangle (USFWS 2019b)

California Department of Fish and Wildlife (CDFW):

- List of California Vegetation Alliances and Associations. The Vegetation Classification and Mapping Program (CDFW 2018a)
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2019c)
- State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFW 2019d)
- Special Vascular Plants, Bryophytes, Lichens List (CDFW 2019b)
- Special Animals List (CDFW 2018c)
- California Natural Diversity Database (CNDDB) Query for the Clayton USGS 7 ½ Minute Quadrangle (CDFW 2019a)

Other Sources:

- The Jepson Manual, 2nd Edition (Baldwin et al. 2012)
- The California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS 2019)
- A Manual of California Vegetation (Sawyer et al. 2009)
- Contra Costa County Breeding Bird Atlas (CCCBBA 2002)
- Contra Costa County Watershed Atlas (CCCCDD 2003)
- Consortium of California Herbaria (CCH 2019)
- Annotated Checklist of the East Bay Flora (CNPS 2013)

Definitions

Botanical taxonomy and nomenclature conforms to *The Jepson Manual* (Baldwin et al. 2012) with the exception of recent updates posted on the Jepson eFlora (Jepson Flora Project 2019) website. Common names of plant species are derived from the *Calflora Database* (Calflora 2019). Vegetation described conforms to the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) and *A Manual of California Vegetation* (Sawyer et al. 2009); wetland and deepwater habitat classifications conform to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979), where appropriate.

Nomenclature for common and special-status wildlife conforms to the nomenclature used in the *Complete List of Amphibian, Reptile, Bird and Mammal Species in California* (CDFW 2016), and in the CNDDB (CDFW 2019a).

2.2. REGULATORY FRAMEWORK

2.2.1 SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities are characterized as plant assemblages that are unique in constituent components, restricted in distribution, supported by distinctive edaphic conditions, considered locally rare, potentially support special-status plant or wildlife species and/or receive regulatory protection from municipal, county, state and/or federal entities. The regulatory framework that protects sensitive natural communities is derived from local, state and federal laws and regulations including Section 10 of the federal Rivers and Harbors Act, Sections 401 and 404 of the federal Clean Water Act, Section 1600 *et seq.* of the California Fish and Game Code, Section 15065 of the CEQA guidelines, and various other city or county codes. Implementation and enforcement of these regulations are conducted by their respective regulatory entities such as the U.S. Army Corps of Engineers, California Regional Water Quality Control Board, CDFW, lead agency and/or various cities or counties. The CNDDB treats a number of natural communities as rare, which are given the highest inventory priority (Holland 1986; CDFW 2018a).

2.2.2 SPECIAL-STATUS SPECIES

Special-status plant and wildlife species are defined as those species listed as threatened or endangered, proposed for listing as threatened or endangered, or are designated as candidate or fully protected species under the following regulatory statues: Federal Endangered Species Act of 1973, as amended (Code of Federal Regulations, Title 50, Section 17), California Endangered Species Act (California Code of Regulations Title 14, Section 670.5), California Fish and Game Code (Sections 1901, 2062, 2067, 3511, 4700, 5050 and 5515) and Native Plant Protection Act of 1977. Special-status species also include locally rare species defined by CEQA guidelines 15125(c) and 15380, which may include species that are designated as sensitive, declining, rare, locally endemic or as having limited or restricted distribution by various federal, state and local agencies, organizations and watchlists. Their status is based on their rarity and endangerment throughout all or portions of their range.

The California Native Plant Society (CNPS) has developed and maintains an inventory of Rare, Threatened and Endangered plants of California. This information is published in the *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2019). The rarity ranking contained in the CNPS inventory is endorsed by the CDFG and effectively serves as its list of "candidate" plant species. The following identifies the definitions of the CNPS California Rare Plant Ranks:

- Rank 1A: Plants presumed to be extinct in California;
- Rank 1B: Plants that are rare, Threatened, or Endangered in California and elsewhere;
- Rank 2A: Plants presumed extirpated in California, but more common elsewhere;
- Rank 2B: Plants that are rare, Threatened, or Endangered in California, but are more common elsewhere;
- Rank 3: Plants about which more information is needed (a review list): and
- Rank 4: Plants of limited distribution (a watch list).

California Rare Plant Rank 1B and 2 species are considered eligible for state listing as Endangered or Threatened pursuant to the California Fish and Game Code. As part of the CEQA process, such species should be fully considered, as they meet the definition of Threatened or Endangered under the NPPA and Sections 2062 and 2067 of the California Fish and Game Code. California Rare Plant Rank 3 and 4 species are considered to be either plants about which more information is needed or are uncommon enough that their status should be regularly monitored. Such plants may be eligible or may become eligible for state listing, and CNPS and CDFG recommend that these species be evaluated for

consideration during the preparation of CEQA documents (CNPS 2019), as some of these species may meet NPPA and CESA criteria as Threatened or Endangered.

2.3. PERSONNEL AND FIELD INVESTIGATION

Nomad Ecology senior vegetation ecologist Erin McDermott and botanist Jaclyn Inkster conducted a brief site visit on March 13, 2018 with CSUEB staff Kathy Cutting. Ms. McDermott, Ms. Inkster, and senior wildlife biologist Dana Terry surveyed the entire 54.45-acre Galindo Creek Field Station (study area) on April 19, 2019. The entire study area was surveyed on foot while searching for plant and wildlife species, recording notes on habitat quality and significant features, and mapping vegetation communities and invasive weed locations. Photographs were taken during the course of the survey to document select observations. Invasive plant species encountered were recorded as GPS data points and/or recorded on field maps.

During these surveys an inventory of plant species observed was recorded. In addition, all wildlife species observed or recognized by diagnostic sign (e.g., audible call, tracks, scat, carcasses, burrows) were recorded and identified to species, where feasible.

2.4. LIMITATIONS

Only one site visit was conducted in April 2019. Protocol-level surveys for special-status wildlife and plants were not conducted as part of this assessment. However, all plant species in bloom or otherwise recognizable were identified to a level necessary to determine their regulatory status. Furthermore, based on the timing of the assessment, and the sampling intensity, it was not possible to rule out the presence of any potentially occurring special-status plant, fish, or wildlife species. However, inferences on presence or absence were possible for specific special-status plant species with blooming periods corresponding to the April 2019 site visit. Negative findings during site assessments or focused surveys may not indicate absence unless field surveys conform to agency approved protocols. Moreover, for many species it is virtually impossible to prove absence even if surveys conform to approved protocols.

Plants

Because only one site visit was conducted in April, all plant species growing within the study area may not have been observed due to varying flowering phenologies and life forms, such as bulbs, biennials, and annuals. Other potentially dominant species within vegetation communities on site may be present during other times of the year. Therefore, the present study is not floristic in nature. A floristic study not only requires every plant observed to be identified to a level necessary to determine their regulatory status, it also necessitates a sufficient number of site visits spaced throughout the growing season within the blooming periods of all plant species, including common taxa, to ensure a complete inventory is obtained (CNPS 2001, CDFW 2018b, USFWS 2000). Some of the plant species identified in this report are tentative due to the absence of morphological characters, resulting from immature reproductive structures or seasonal desiccation, which is required to make species-level determinations. In these cases, cf (compares to) is used to indicate provisional species identification based on gestalt, vegetative morphology and/or a species' known range.

Species dominance, particularly with regard to annuals, may change depending on the sampling season. Certain plant species, especially annuals, may be absent in some years due to annual variations in temperature and rainfall, which influence germination and plant phenology. Finally, colonization of new populations within an area may occur from year to year. Our descriptions of the vegetation communities and species are based on the April 2019 site visit. Those descriptions may be subject to change in the event multiple seasons or years of data are collected.

Wildlife

All wildlife species observed, detected by call, or detected by sign in the course of conducting the site reconnaissance for this report were recorded. Several factors constrained our ability to identify wildlife species that occur in the study area. Songbirds are most easily detected in the early morning or late evening, rather than during other times of the day (Grue et al. 1981, Skirvin 1981). We did not survey all habitat types during the optimal time for bird detection. Because the survey was conducted during the daytime only, nocturnal species would not be readily detectable. Furthermore, the site visit was conducted in the spring during the avian breeding season. This limited Nomad's ability to detect bird species that may occur in the study area only during migration or the winter. During a single-day site assessment, it is also unlikely that cryptic species, such as fossorial animals and those that take cover in dense vegetation, or species that are highly transient and may occur only sporadically on site, would be detected.

Section 3. STUDY AREA DESCRIPTION

3.1. REGIONAL SETTING

The study area is shown on the Clayton 7.5-minute USGS topographic quadrangle. The southeast portion of the study area is located in Township 1 North, Range 1 West within the Mount Diablo Baseline and Meridian. The northwest portion of the study area lies within the Monte del Diablo land grant. The study area is within the San Francisco Bay Subregion of the California Floristic Province (Baldwin et al. 2012) and within the Galindo Creek/Pine Creek Watershed (CCCCDD 2003).

As described in the *Ecological Subregions of California* (USDA 1997), the study area is located in the East Bay Hills- Mt. Diablo subsection of the Central California Coast Section. The *Ecological Subregions of California* are the basis for describing regional variation in California alliance descriptions in *A Manual of California Vegetation* (Sawyer et al. 2009).

3.1.1 EAST BAY HILLS – MOUNT DIABLO

The East Bay Hills consist of steep hills west of Mt. Diablo, between the Diablo Range and San Francisco Bay which are characterized by a hot, sub-humid climate with a moderate marine influence that diminishes moving eastward (USDA 1997). This is a subsection of northwest trending hills with subequal summits, rounded ridges, steep sides, and narrow canyons and ranges from sea-level to about 2,000 feet in elevation in the East Bay Hills. Mass wasting and fluvial erosion are the main geomorphic processes. The East Bay Hills are mainly comprised of Cretaceous, Eocene, and Miocene marine and Pliocene nonmarine sedimentary rocks (USDA 1997). Most of the soils are leached free of carbonates, but calcium carbonates have accumulated in some soils in the Mt. Diablo and Diablo Valley areas (USDA 1997).

For this region the mean annual precipitation ranges from 15 to 25 inches and most of the precipitation is rainfall. The mean annual temperature is generally between 54° and 60°F and the mean freeze-free period is from 225 days at higher elevations to 275 days at lower elevations. Hydrologically, runoff is rapid from the hills, but slow from the alluvial plains. All but the larger streams are dry throughout the summer (USDA 1997).

3.2. LOCAL SETTING

The study area is located in the north central portion of Contra Costa County within the southeast portion of the City of Concord, California (Figure 1). The central point of the study area is approximately 5.1 air-miles northwest of the summit of Mount Diablo. It is adjacent to the California State University East Bay campus in Concord (Figure 1). The main access is from Campus Drive off of Ygnacio Valley Road. The majority of the study area is oriented in a north south orientation. From north to south, the study area is approximately 0.4 mile long and from east to west 0.25 mile wide.

Galindo Creek, a tributary to Walnut Creek, flows northward through the eastern section of the study area (Figure 2). Galindo Creek is continuously bordered by a riparian canopy. The west side of the study area is grassland pasture that is grazed by cattle, and contains a large freshwater marsh/seep wetland. The east side of the study area is characterized by annual grassland and ruderal vegetation. Scattered shrubs are present adjacent to the riparian canopy.

The study area is bordered on the south and east by residential neighborhoods, on the north by the Boatwright Sports Complex (which contains a paved parking lot and several sports fields), and to the west by rolling grassy hills. The grassy hills to the west are contiguous with the City of Walnut Creek's Lime Ridge Open Space and eventually Mt. Diablo State Park to the southeast of the study area.

3.2.1 LAND USE

The study area is bisected by a public pathway connecting residential neighborhoods to the south with the Boatwright Sports Complex to the north (Figure 3). Within the study area, the northern half of this pathway is also a paved road. Aside from this pathway, there is no public access allowed. A shared electrical and natural gas transmission utility right-of-way runs in a northeast-southwest direction along the northwestern border of the study area. On site, this right-of-way contains a single steel lattice tower supporting above-ground electrical transmission lines, and below ground a gas transmission pipeline. There are also above-ground electrical and telecommunications lines running on shared wooden utility poles along the public pathway in the center of the study area.

The pasture to the west of the walking path is grazed by cattle. It is surrounded by barbed wire fence and contains grazing infrastructure such as gates, troughs, and paddocks.

3.2.2 TOPOGRAPHY

Topography on site ranges in elevation from 475 to 360 feet above mean sea level (Figure 2). The site is fairly level and slopes gently downhill from south to north.

3.2.3 CLIMATE

Locally the climate of the study area is characterized as Mediterranean with cool wet, winters and warm to hot, dry summers. It is presumed that the study area is near the edge of the coastal fog incursion zone and therefore occasionally receives moisture other than direct precipitation. Annual average rainfall is approximately 19 inches (PRISM 2018).

3.2.4 GEOLOGY AND SOILS

The underlying geology of the study area consists almost entirely of Early Cretaceous shale with minor sandstone, and a very small section in the northeast of the site mapped as Pleistocene/Holocene surficial deposits (Graymer et al. 1994). Five soil mapping units are located within the Galindo Creek Field Station (USDA 1977) (Figure 4). None of them are considered hydric, however hydric soil inclusions are presumably present in the wetlands on site.

Table 1. Soil Mapping Unit Characteristics in the Study Area

SOIL MAPPING UNIT (SYMBOL)	DRAINAGE CLASS	PERMEABILITY	RUNOFF	HYDRIC
Altamont clay, 9 to 15 percent slopes (AbD)	Well-drained	Slow	High	No
Altamont clay, 15 to 30 percent slopes 15 (AbE)	Well-drained	Slow	High	No
Capay clay, 1 to 15 percent slopes (CaC)	Moderately well-drained	Slow	High	No
Los Robles clay loam (Lm)	Well-drained	Moderately slow	Low	No
Positas loam, 0 to 2 percent slopes (PkA)	Moderately well-drained	Very slow	Medium	No

3.1. HYDROLOGY CHARACTERISTICS

Hydrology on site is influenced by many factors such as precipitation, run-off, geologic stratigraphy, topography, soil permeability, and plant cover.

A 2,025-foot section of Galindo Creek is present within the study area. Galindo Creek is characterized as an intermittent stream on the Clayton USGS 7.5-minute quadrangle. Galindo Creek originates at the base of Mt. Diablo State Park on the west side of the Park. It flows north through the study area, then continues north through urbanized Concord approximately 5 miles until it flows into Pine Creek. Pine Creek flows into Walnut Creek less than a mile downstream. Walnut Creek becomes Pacheco Creek at its confluence with Grayson Creek, which flows directly into Suisun Bay (CCCCDD 2003). Riparian vegetation borders the channel along its length. The creek was flowing during the April site visit and contained numerous pools of standing water. Depth of water ranged from 6 inches to 3-4 feet along the channel. Patches of emergent vegetation were present in the creek channel.

A large wetland (approximately 6.7 acre) is present on the west side of the study area. It is surrounded by pasture and the entire area is currently grazed by cattle. The wetland is fed by two tributaries and likely freshwater seeps. One tributary originates in the residential neighborhood to the south of the study area, and water was observed flowing in a channel from the neighborhood into the study area in an approximately 6 foot wide channel. This channel was flowing at the time of the April 2019 site visit. A second tributary flows into the wetland from hills to the west of the study area. It was dry at the time of the site visit. It is shown as an intermittent stream on the Clayton USGS 7.5-minute quadrangle.

3.2. VEGETATION COMMUNITIES

Based on Holland (1986) descriptions, there were five vegetation communities mapped on site: ruderal, non-native grassland, freshwater marsh/seep, northern coyote brush scrub, and Great Valley valley oak riparian forest (Table 2). A road/trail was also present.

Table 2. Vegetation Communities in the Study Area

VEGETATION COMMUNITY	AREA (ACRES)
Ruderal	4.03
Non-Native Grassland	37.55
Freshwater Marsh/Seep (wetland)	6.66
Northern Coyote Brush Scrub	1.05
Great Valley Valley Oak Riparian Forest	4.54
Total Vegetation:	**53.83**
Road/Trail	0.62
Total Study Area:	**54.45**

This section describes vegetation on-site utilizing three vegetation classification systems: *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), *California Vegetation* (Holland and Keil 1995) and *Manual of California Vegetation, Second edition* (MCV; Sawyer et al. 2009). Holland (1986) and Holland and Keil (1995) provide generalized natural community-level descriptions for natural communities present within the study area (Table 3). If applicable, each natural community-level is given more detail by providing a description of the vegetation using Sawyer et al. (2009) system based on field observations. MCV vegetation types are listed in the *List of California Vegetation Alliances and Associations* (CDFW 2018a).

Table 3 relates the Holland or Holland and Keil and MCV vegetation types identified within the study area to the *CNPS Inventory of Rare and Endangered Plants of California* (CNPS 2019), and *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). The codes used in Table 4 reflect those associated with Holland (1986) types and the *List of California Vegetation Alliances and Associations* (CDFW 2018a). The spatial distribution of vegetation types within the study area are depicted in Figure 4 (Appendix B).

Table 3. Vegetation Community Classification Systems Comparisons

TERRESTRIAL COMMUNITIES[1]	CALIFORNIA VEGETATION[2]	CNPS INVENTORY[3]	WETLANDS & DEEPWATER HABITATS[4]
Ruderal (Holland and Keil 1995)	Not Described	Not Described	Upland
Non-Native Grassland (42200)	*Avena fatua* Semi-Natural Herbaceous Stand (Wild Oats Grassland) (44.150.00), in part *Bromus* (*diandrus, hordeaceus*) Semi-Natural Herbaceous Stand, in part (Annual Brome Grassland) (42.026.00)	Valley and Foothill Grassland	Upland
Freshwater Marsh/Seep (52410, 45400)	*Juncus arcticus* (var. *balticus, mexicanus*) Herbaceous Alliance (Baltic and Mexican Rush Marshes) (45.562.00)	Meadows and Seeps	Palustrine persistent emergent wetland
Northern Coyote Brush Scrub (32100)	*Baccharis pilularis* Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	Coastal Scrub	Upland
Great Valley Valley Oak Riparian Forest (61430)	*Quercus lobata* Woodland Alliance (Valley Oak Woodland) (71.040.00)	Riparian Woodland Riparian Forest Cismontane Woodland	Palustrine Forested Wetland

[1] Terrestrial Natural Communities of California (Holland 1986)
[2] A Manual of California Vegetation (Sawyer *et al*. 2009) and List of California Vegetation Alliances and Associations (CDFW 2018)
[3]CNPS Inventory of Rare and Endangered Plants of California Habitat Types (CNPS 2001)
[4] Classification of Wetlands & Deepwater Habitats of the U.S. (Cowardin *et al*. 1979)

3.2.1 RUDERAL

Based on the description by Holland and Keil (1995), ruderal vegetation is an assemblage of plants, often a mixture of both native and nonnative weed species that thrive in waste areas, heavily grazed pastures, cultivated and fallow fields, roadsides, parking lots, footpaths, around residences and similar disturbed sites in towns and cities and along rural roadways. Ruderal communities are difficult to characterize and are often temporary assemblages. In areas of frequent human disturbance, the majority of wild plants are often introduced weeds rather than natives. Some urban weeds are ornamentals that have escaped from cultivation. Ruderal species may at times be integrated into various other communities (Holland and Keil 1995).

Within the study area ruderal vegetation is located along both sides of Galindo Creek adjacent to the riparian canopy. However, the majority of this type is located on the east side of the creek in areas where the vegetation has been disturbed through disking and mowing. Non-native plant species typical of

ruderal vegetation within the study area include field mustard (*Brassica rapa**), black mustard (*Brassica nigra**), charlock (*Sinapis arvensis**), hoary mustard (*Hirschfeldia incana**), bristly ox-tongue (*Helminthotheca echioides**), Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus**), perennial pepperweed (*Lepidium latifolium**), milk thistle (*Silybum marianum**), mayweed (*Anthemis cotula**), ripgut brome (*Bromus diandrus**), wild oats (*Avena fatua**), Italian ryegrass (*Festuca perennis**), brome fescue (*Festuca bromoides**), stinkwort (*Dittrichia graveolens**), cutleaved geranium (*Geranium cicutarium**), and horseweed (*Erigeron canadensis*), among others. In some areas, ruderal vegetation consisted of few plant species forming a dense monoculture. Dense stands of Italian thistle*, black mustard*, field mustard*, perennial pepperweed*, and charlock* were observed in the study area.

3.2.2 NON-NATIVE GRASSLAND

Based on the description by Holland (1986), non-native grassland is dominated by a sparse to dense cover of non-native annual grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, that have replaced native perennial grasslands as a result of human disturbance. However, where not completely out-competed by weedy non-native plant species, scattered native wildflower species and native perennial grass species considered remnants of the original vegetation, may also be common. This community occurs on fine-textured, usually clay soils, which are moist or waterlogged during the winter rainy season and very dry during the summer and fall. Germination occurs with the onset of the late fall rains while growth, flowering, and seed-set occur from winter through spring. With a few exceptions, the plants are dead through the summer and fall dry season, persisting as seeds. This community usually occurs below 3,000 feet (914 meters), but reaches 4,000 feet (1,219 meters) in the Tehachapi Mountains and interior San Diego County, and intergrades with coastal prairie along the Central Coast.

Non-native grassland is present throughout the study area and covers more area than any other vegetation type. It is present on the west side of the study area in the grazed pasture and on the east side of the study area adjacent to riparian woodland. Grass species observed throughout the study area include wild oats (*Avena fatua**), soft chess (*Bromus hordeaceus**), Italian ryegrass*, brome fescue*, ripgut brome*, foxtail fescue *(Festuca myuros**), Mediterranean barley (*Hordeum marinum* subsp. *gussoneanum**), saltgrass (*Distichlis spicata*), and hare barley (*Hordeum murinum subsp. leporinum**). Native and non-native forbs were observed in this community include red-stemmed filaree (*Erodium cicutarium**), tall annual willow-herb (*Epilobium brachycarpum*), purple owl's clover (*Castilleja exserta* subsp. *exserta*), little owl's clover (*Triphysaria pusilla*), silver puffs (*Microseris douglasii* subsp. *douglasii*), pygmyweed (*Crassula connata*), field madder (*Sherardia arvensis**), Ithuriel's spear (*Triteleia laxa),* burclover (*Medicago polymorpha**), rose clover (*Trifolium hirtum**), subterranean clover (*Trifolium subterraneum**), shamrock clover (*Trifolium dubium**), spring vetch (*Vicia sativa* subsp. sativa*), cut-leaf geranium*, scarlet pimpernel (*Lysimachia arvensis**), mouse-ear chickweed (*Cerastium glomeratum**), and smooth cat's ear (*Hypochaeris glabra**). Scattered invasive weeds were present scattered in the grassland including yellow star thistle (*Centaurea solstitialis**), bull thistle (*Cirsium vulgare**), milk-thistle*, cardoon (*Cynara cardunculus* subsp. *flavescens**), and stinkwort*. Scattered individuals of valley oak (*Quercus lobata*) were present in the grassland.

Non-native grasslands within the study area are characterized as at least two MCV alliances including *Avena fatua* Semi-Natural Stand and *Bromus diandrus, Bromus hordeaceus* Semi-Natural Stand.

Avena fatua Semi-Natural Stand (Wild Oats Grassland)

As described, wild oats* is dominant or co-dominant in the herbaceous layer (Sawyer et al. 2009). Emergent trees and shrubs may be present at low cover. Herbs are generally less than 4 feet (1.2 meters) in height and cover is open to continuous. According to the membership rules, for grassland to be

* Denotes a nonnative species that has an origin other than that of California

classified as wild oats grassland, wild oats must have greater than 50% relative cover and native herbs relatively low cover in the herbaceous layer (Sawyer et al. 2009). Habitat for this vegetation community throughout California includes waste places, rangelands, and openings in woodlands between 32 to 3,937 feet (10-1,200 meters) in elevation. Wild oats grassland occurs throughout the study area as a component of non-native grasslands.

Bromus (*diandrus*, *hordeaceus*) Semi-Natural Stands (Annual Brome Grassland)

As described, ripgut brome* or soft chess* are dominant or co-dominant with non-natives in the herbaceous layer (Sawyer et al. 2009). Emergent trees and shrubs may be present at low cover. Herbs are generally less than 2.5 feet (75 centimeters) in height and cover is intermittent to continuous. The membership rules for this semi-natural stand ripgut brome* or soft chess* greater than 50% relative cover in the herbaceous layer. Habitat for this vegetation type throughout California includes all topographic settings in foothills, waste places, rangelands, and openings in woodlands between 0 to 7,218 feet (0-2,200 meters) in elevation. Annual brome grassland occurs throughout the study area as a component of non-native grasslands.

3.2.3 FRESHWATER MARSH/SEEP

None of the freshwater wetland communities described by Holland fit the vegetation observed on site exactly, but the best fits are freshwater seep and coastal and valley freshwater marsh. As described in Holland (1986), freshwater seeps are characterized by mostly perennial herbs, especially sedges and grasses, usually forming complete cover, often low growing but sometime taller, growing throughout the year in areas with mild winters. They occur in permanently moist or wet soil around freshwater seeps, often associated with grasslands or meadows. As described by Holland (1986), coastal and valley freshwater marsh are dominated by perennial, emergent monocots often forming completely closed canopy.

A large freshwater marsh/seep wetland was present in the study area to the west of Galindo Creek in the grazed pasture. A smaller freshwater marsh/seep wetland was present immediately east of the creek and was fed by overflow from the creek. Characteristic species of these wetlands on site include Mexican rush (*Juncus mexicanus*), toad rush (*Juncus bufonius* var. *bufonius*), iris-leaved rush (*Juncus xiphioides*), creeping spikerush (*Eleocharis macrostachya*), hyssop loostrife (*Lythrum hyssopifolia**), curly dock (*Rumex crispus**), chairmaker's bulrush (*Schoenoplectus americanus),* narrow-leaved cattail (*Typha angustifolia),* roughfruit popcornflower (*Plagiobothrys trachycarpus*), creeping wildrye (*Elymus triticoides),* birdfoot trefoil (*Lotus corniculatus**), rabbitsfoot grass (*Polypogon monspeliensis**), tall fescue (*Festuca arundinacea**), spiny buttercup *(Ranunculus muricatus**), and cocklebur (*Xanthium strumarium**). Scattered Mexican fan palms (*Washingtonia robusta*) and a Gooding's willow (*Salix gooddingii*) were present on the margin of the wetland.

Within the study area, freshwater marsh/seep is characterized by at least one MCV alliance including *Juncus arcticus* (var. *balticus, mexicanus*) Herbaceous Alliance, described below.

Juncus arcticus (var. balticus, mexicanus) Herbaceous Alliance (Baltic and Mexican Rush Marshes)

This alliance is described with Baltic rush or Mexican rush being dominant or co-dominant in the herbaceous layer. Emergent trees or shrubs may be present at low cover. Herbs are less than 3 feet (1 meter) tall, and the canopy is intermittent to continuous. The membership rules for this alliance require Baltic rush or Mexican rush be greater than 25-50% relative cover in the herbaceous layer. Habitat for this alliance is wet and mesic meadows; along stream banks, rivers lakes ponds, fens and sloughs; and freshwater, brackish and alkaline marshes between 0 to 7,217 feet (0 to 2,200 meters) in elevation. Soils are poorly drained often with a thick, organic layer (Sawyer et al. 2009).

3.2.4 NORTHERN COYOTE BRUSH SCRUB

As described by Holland (1986), northern coyote brush scrub is a cover type of Northern Coastal Scrub based on the dominance of coyote brush. This community comprises low shrubs, usually less than 6.5 feet (2 meters) tall, typically dense but with scattered grassy openings. It occurs on windy, exposed sites with shallow, rocky soils and is patchily distributed from southern Oregon to Point Sur in Monterey County.

Northern coyote brush scrub occurs in the study area adjacent to the riparian canopy of Galindo Creek. It was more widespread on site previously but stands of coyote brush on the east side of the creek were cut down and brush was piled on site sometime in 2018, based on field observations and aerial photo analysis. Species associated with coyote brush (*Baccharis pilularis* subsp. *consanguinea*) scrub on site include bitter cress (*Cardamine oligosperma*) and Italian thistle*, in part.

Within the study area, northern coyote brush scrub is represented by a single MCV alliance, *Baccharis pilularis* Shrubland Alliance, described below.

Baccharis pilularis Shrubland Alliance (Coyote Brush Scrub)

This alliance is described with coyote brush being dominant or co-dominant in the shrub canopy with other native shrubs. The shrub canopy is less than 10 feet (3 meters) tall and of variable cover. The membership rules for this alliance require coyote brush be greater than 50% relative cover in the shrub layer or greater than 15% absolute cover over grassy understory. Habitat for this alliance is river mouths, stream sides, terraces, stabilized dunes of coastal bars, spits along the coastline, coastal bluffs, open slopes, and ridges between 0 to 4,921 feet (0 to 1,500 meters) in elevation. Soils include a broad range of types from sandy to relatively clayey (Sawyer et al. 2009).

3.2.5 GREAT VALLEY VALLEY OAK RIPARIAN FOREST

As described by Holland (1986), Great Valley valley oak riparian forest is a medium to tall broadleafed, winter deciduous, closed canopy forest dominated by valley oak. The understory includes scattered riparian trees including ash, black walnut, and vines. It is found on the highest parts of floodplains, most distant from active river channels and therefore less subject to physical disturbance from flooding but still receiving annual inputs of silty alluvium and subsurface irrigation. It was formerly extensive on low gradient, depositional reaches of the major streams of the Sacramento and northern San Joaquin valleys.

Within the study area, valley oak riparian forest is present bordering Galindo Creek. The overstry is dominated by valley oak. Other overstory and understory tree species include California buckeye (*Aesculus californica*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), Fremont cottonwood (*Populus fremontii* subsp. *fremontii*), waif black walnut (*Juglans hindsii*), and sandbar willow (*Salix exigua*). Other species present include olive (*Olea europaea**), common fig (*Ficus carica**), white mulberry (*Morus alba**), blue elderberry (*Sambucus nigra* subsp. *caerulea*), toyon (*Heteromeles arbutifolia*), coyote brush, valley sedge (*Carex barbarae*), creeping wildrye, bedstraw (*Galium aparine*), periwinkle (*Vinca major**), smilo grass (*Stipa miliacea var. miliacea**), and poison hemlock (*Conium maculatum**), Species growing in the creek channel include water cress (*Nasturtium officinale*), tall flatsedge (*Cyperus eragrostis*), and narrow-leaved cattail.

Riparian forest within the study area is represented by one MCV alliance: *Quercus lobata* Woodland Alliance.

Quercus lobata Woodland Alliance (Valley Oak Woodland)

This alliance is described as valley oak being dominant or co-dominant in the tree canopy and occurring with other native broadleaved trees including oaks, willows, waif Northern California black walnut, white alder (*Alnus rhombifolia*), and Fremont cottonwood. Trees are less than 98 feet (30 meters) tall, the canopy is open to continuous, and shrubs are common to occasional with vines also present. The

membership rules for this alliance require valley oak be greater than 50% relative cover in the tree canopy or greater than 30% relative cover when other tree species are present. Habitat for this alliance is found on valley bottoms and seasonally saturated soils that may intermittently flood lower slopes and summit valleys between 0 and 2,542 feet (0 and 775 meters) in elevation (Sawyer et al. 2009).

3.3. INVASIVE WEEDS

During the course of the site visit, several non-native plant species were encountered within the study area. A non-native plant species is defined as a species that is occurring outside of its native distributional range, and the species has arrived there by human activity. Of the 100 plant species observed on site, 63 species (63%) are non-native.

Several of the non-native plant species encountered on-site are included on the Noxious Weed List maintained by the California Department of Food and Agriculture (CDFA 2019) or are tracked by the California Invasive Plant Council (Cal-IPC 2019) due to their noxious or invasive behavior. Species tracked by Cal-IPC are given a certain rating based on criteria such as ecological impacts, treatment or eradication priority, and threats they pose to agriculture. Invasive weed species (23 species) observed on site are listed in Table 4.

A large portion of the study area east of Galindo Creek was characterized by dense stands of invasive weeds. The area where coyote brush was removed in 2018 is colonized by dense stands of invasive weeds. The area east of the creek between the creek and the residences is regularly mowed and/or disced by the City for fuels management (Kathy Cutting, personal communication).

The pasture and wetland on the west side of the study area, west of Galindo Creek had fewer invasive weeds. Invasive weed control efforts should focus on keeping invasive weeds from spreading throughout the pasture and wetland. Control efforts should also focus on species that are not widespread throughout the study area and only occur in isolated locations including purple starthistle (*Centaurea calcitrapa**) and artichoke thistle (*Cynara cardunculus**). Stinkwort (*Dittrichia graveolens*) should be monitored and controlled on site to ensure it does not become widespread in the wetland, as this species can colonize wetlands, particularly as the wetlands dry down in late spring and summer when stinkwort* germinates.

Table 4. Invasive Weeds Observed in the Study Area

Common Name Scientific Name	California Invasive Plant Council Rank (Cal-IPC 2019)[1]	California Department of Food and Agriculture Noxious Weed List (CDFA 2019)[2]	Distribution in the Study Area
black mustard *Brassica nigra*	Moderate	--	Two isolated patches west of Galindo Creek. A part of the dense "mustard weeds" infestations east of Alberta Way trail, co-occurring with other mustards including field mustard, charlock, and London rocket.
field mustard *Brassica rapa*	Limited	--	A part of the dense "mustard weeds" infestations east of Alberta Way trail, co-occurring with other mustards including black mustard, charlock, and London rocket.
Italian thistle *Carduus pycnocephalus* subsp. *pycnocephalus*	Moderate	On List	Distributed throughout the site in all vegetation types. This species was not distinguished from slender flower thistle during mapping as the infestations often included both Italian thistle and slender flower thistle.
slender flower thistle *Carduus tenuiflorus*	Limited	On List	Distributed throughout the site in all vegetation types. This species was not distinguished from Italian thistle during mapping as the infestations often included both slender flower thistle and Italian thistle.
purple star thistle *Centaurea calcitrapa*	Moderate	On List	Two small patches near the wetland on the western half of the site.
yellow star thistle *Centaurea solstitialis*	High	On List	Several patches distributed east and west of Galindo Creek.
bull thistle *Cirsium vulgare*	Moderate	On List	Most infestations occurred in non-native annual grassland or ruderal areas west of Galindo Creek.
poison hemlock *Conium maculatum*	Moderate	--	One patch in ruderal vegetation east of Galindo Creek.
artichoke thistle *Cynara cardunculus* subsp. *flavescens*	Moderate	On List	Isolated patches throughout the study area—all but one patch (east of Galindo Creek) had just one individual.
stinkwort *Dittrichia graveolens*	Moderate	On List	Several large patches throughout the site. This species was mapped using skeletons from 2018—the survey timing was too early to map this year's infestation. This species is likely more widespread on site than mapped.

Common Name Scientific Name	California Invasive Plant Council Rank (Cal-IPC 2019)[1]	California Department of Food and Agriculture Noxious Weed List (CDFA 2019)[2]	Distribution in the Study Area
common fig *Ficus carica*	Moderate	--	Several trees in the riparian canopy of Galindo Creek.
whitetop *Lepidium draba*	Moderate	On List	One patch near the Alberta Way trail, and riparian canopy of Galindo Creek.
perennial pepperweed *Lepidium latifolium*	High	On List	Four patches east of Alberta Way trail. The largest patch is in ruderal vegetation that was previously coyote brush scrub, east of Galindo Creel.
white mulberry *Morus alba*	--	--	One tree in the riparian canopy of Galindo Creek.
olive *Olea europaea*	Limited	--	Most trees were found along Alberta Way trail, but several more individuals were found near or in the Galindo Creek riparian zone.
Harding grass *Phalaris aquatica*	Moderate	--	One small patch just west of Galindo Creek.
Chinese pistachio *Pistacia chinensis*	--	--	Two trees along Alberta Way trail.
Peruvian peppertree *Schinus molle*	Limited	--	Two trees near Alberta Way trail, and two trees in riparian woodland along Galindo Creek.
milk thistle *Silybum marinum*	Limited	--	Several patches distributed throughout the study area. The largest patch is in ruderal vegetation that was previously Coyote Brush Scrub, east of Galindo Creel.
charlock *Sinapis arvensis*	Limited	--	A part of the dense “mustard weeds” infestations east of Alberta Way trail, co-occuring with other mustards including black mustard, field mustard, and London rocket.
London rocket *Sisymbrium irio*	Limited	--	A part of the dense “mustard weeds” infestations east of Alberta Way trail, co-occuring with other mustards including black mustard, field mustard, and charlock.
periwinkle *Vinca major*	Moderate	--	Three patches on Galindo Creek stream banks.
Mexican fan palm *Washingtonia robusta*	Moderate	--	Several trees near the large wetland, and two trees near Alberta Way trail.

[1] Cal-IPC Weed Ranking Definitions:

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent - but generally not severe - ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic (Cal-IPC 2019).

[2] Species considered a noxious weed by CDFA are listed on the California Noxious Weed List (CDFA 2019).

3.4. MOVEMENT CORRIDORS AND HABITAT FRAGMENTATION

Habitat loss, fragmentation, and degradation resulting from land use changes or habitat conversion can alter the use and viability of wildlife movement corridors (*i.e*. linear habitats that naturally connect and provide passage between two or more otherwise disjunct larger habitats or habitat fragments). In general, studies suggest that habitat corridors provide connectivity for and are used by wildlife, and as such, are an important conservation tool (Beier and Noss 1998). According to Beier and Loe (1992), wildlife habitat corridors should fulfill several functions. They should maintain connectivity for daily movement, travel, mate-seeking, and migration; plant propagation; genetic interchange; population movement in response to environmental change or natural disaster; and recolonization of habitats subject to local extirpation.

The suitability of a habitat as a wildlife movement corridor is related to, among other factors, the habitat corridor's dimensions (length and width), topography, vegetation, exposure to human influence, and the species in question (Beier and Loe 1992). Species utilize movement corridors in several ways. "Passage species" are those species that use corridors as thru-ways between outlying habitats. The habitat requirements for passage species are generally less than those for corridor dwellers. Passage species use corridors for brief durations, such as for seasonal migrations or movement within a home range. As such, movement corridors do not necessarily have to meet any of the habitat requirements necessary for a passage species' everyday survival. Large herbivores, such as deer and elk, and medium-to-large carnivores, such as coyotes, bobcats and mountain lions, are typically passage species. "Corridor dwellers" are those species that have limited dispersal capabilities – a category that includes most plants, insects, reptiles, amphibians, small mammals, and birds – and that use corridors for a greater length of time. As such, wildlife movement corridors must fulfill key habitat components specific to a species' life history requirements in order for them to survive (Beier and Loe 1992). In general, however, the suitability and/or utility of the landscape – specifically, of the landscape as corridor habitat – is best evaluated on a species-level (Beier and Noss 1998).

The Galindo Creek riparian area is a highly suitable movement corridor and may allow for migratory movement, daily travel and/or dispersal for a variety of wildlife species. It provides a water source and continuous cover for terrestrial species travelling in a north-south direction. Riparian areas like that found on site also provide suitable stopover and resting points for migrating birds, which is critical for their life history (Skagen et al 2005, Pennington et al 2008).

Section 4. SENSITIVE NATURAL COMMUNITIES AND SPECIAL-STATUS SPECIES

4.1. SENSITIVE NATURAL COMMUNITIES

Great Valley valley oak riparian woodland (*Quercus lobata* Woodland Alliance) is considered of high inventory priority as it has a Subnational Conservation Status Rank of S3 (CDFW 2018a). A rank of S3 indicates a vegetation alliance or association as "Vulnerable" meaning it is at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors (NatureServe 2013).

Although not considered a sensitive natural community by CDFW (2018a) freshwater marsh/seep wetlands are treated as sensitive natural communities as they are likely potentially jurisdictional wetland features regulated by the Army Corps of Engineers and the California State Water Resources Control Board. Additionally, all creeks and drainages on site exhibit ordinary high water marks and evidence of scour. They are considered sensitive natural communities and are regulated by the Army Corps of Engineers, CDFW, and the California State Water Resources Control Board.

4.2. SPECIAL-STATUS PLANTS

Based on a review of available databases and literature (USFWS 2019a; CDFW 2019a,b,d; CNPS 2019; Baldwin et al. 2012), a total of 34 special-status plant species are known from the immediate vicinity of the study area[1] and were considered as part of this assessment. Based on habitats within the study area, familiarity with local flora, and on-site habitat suitability, a total of 4 special-status plant species are considered to have potential to occur at the Galindo Creek Field Station.

4.2.1 FEDERAL AND/OR STATE LISTED AND CALIFORNIA RARE PLANT SPECIES

Of the 34 special-status plant species known from the immediate vicinity of the study area, one is federal and/or state listed. Based on the field survey and on-site habitat suitability, this one species does not have the potential to occur within the study area. No federal and/or state listed species were observed during the site visits.

4.2.2 CALIFORNIA NATIVE PLANT SOCIETY LISTED PLANT SPECIES

All of the 34 special-status plant species known from the immediate vicinity of the study area are included in the California Native Plant Society Rare Plant Inventory (2001b; 2019) and are therefore given a California Rare Plant Rank. All but 4 special-status plant species were ruled out as occurring on site based on lack of suitable habitat such as vernal pools, playas, coastal dunes, coastal bluff scrub, chaparral, coniferous forest, pinyon juniper woodland, serpentine soils, alkaline soils, or sandy soils. Species were also ruled out due to the lack of appropriate bedrock substrates, elevation ranges, and distributional limits. Plant species were also ruled out as occurring on site because they would have been detectable during the April 2019 site visit.

Based on habitats within the study area, familiarity with local flora, and on-site habitat suitability, 4 species have the potential to occur within the study area based on the presence of suitable habitat (Table 5). These species bloom in May and September and would not have been detectable during the April survey.

[1] Vicinity is defined as the area included within the Clayton U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.

Table 5. Potentially Occurring Special Status Plant Species in the Study Area

SPECIES NAME	COMMON NAME	LISTING STATUS*	POTENTIAL FOR OCCURRENCE
FEDERAL/STATE LISTED SPECIES			
None			
CALIFORNIA NATIVE PLANT SOCIETY LISTED SPECIES			
Blepharizonia plumosa	big tarplant	CEQA, 1B.2	Possible
Calochortus pulchellus	Mount Diablo fairy lantern	CEQA, 1B.2	Possible
Navarretia gowenii	Lime Ridge navarretia	CEQA, 1B.1	Possible
Navarretia nigelliformis subsp. *radians*	shining navarretia	CEQA, 1B.2	Possible

***Explanation of Listing Codes**

California Rare Plant Ranks:

1A Presumed extinct in California
1B Rare or Endangered in California and elsewhere
2 Rare or Endangered in California, more common elsewhere
3 Plants for which we need more information - Review list
4 Plants of limited distribution - Watch list

California Native Plant Society Threat Codes:

.1 Seriously Endangered in California (over 80% of occurrences Threatened / high degree and immediacy of threat)
.2 Fairly Endangered in California (20-80% occurrences Threatened)
.3 Not very Endangered in California (<20% of occurrences Threatened or no current threats known)
Collection dates of herbarium specimens
Notes: CNPS List 1A and some List 3 plant species lacking any threat information receive no threat code extension.
CNPS R-E-D Codes have been discontinued.

4.3. SPECIAL-STATUS WILDLIFE

Based on a review of available databases and literature (USFWS 2019a; CDFW 2019a,c), a total of 20 special-status wildlife species are known from the immediate vicinity of the study area[2] and were considered as part of this assessment. Based on habitats within the study area, familiarity with local fauna, and on-site habitat suitability, the following special-status wildlife species are considered to have potential to occur at the Galindo Creek Field Station: California red-legged frog (*Rana draytonii*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), western burrowing owl (*Athene cunicularia hypugaea*), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), and bat species.

4.3.1 AMPHIBIANS

California Red-Legged Frog (*Rana draytonii*)

The California red-legged frog is a federally listed threatened species and a California Species of Special Concern. California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and man-made ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet (1,500 meters) in elevation (Jennings and Hayes 1994, Bulger et al. 2003). Adults breed in a variety of aquatic habitats, while larvae and metamorphs use streams, deep pools, backwaters of streams and creeks, ponds, marshes, sag ponds, dune ponds, and lagoons. In a study of upland movements, California red-legged frogs moved from 1 to 71 meters from aquatic habitats, averaging 24 meters.

[2] Vicinity is defined as the area included within the Clayton U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.

Individuals were found within a variety of refugia including ground squirrel burrows at the bases of trees or rocks, logs, grass thatch, crevices, cow hoof prints, and a downed barn door, while others were associated with upland sites lacking refugia. Uplands closer to aquatic sites were more often used and were more commonly associated with areas having abundant sources of cover (e.g., small woody debris, rocks, and vegetation) (Tatarian 2008).

California red-legged frogs may use Galindo Creek either as breeding habitat or as a non-breeding aquatic refuge. There are no previously documented observations of California red-legged frogs in the section of Galindo Creek that passes through the study area. The nearest occurrences are recorded in Mount Diablo State Park, roughly 2 miles to the southeast. The neighborhoods situated south and east of the study area, along with Crystyl Ranch Road to the west, all represent substantial barriers to movement of California red-legged frogs. California red-legged frogs generally do not persist in urbanized habitats, and existing development largely isolates the station from undeveloped habitats on and in the vicinity of Mount Diablo. However, individuals could follow the Galindo Creek corridor from further upstream and traverse under roadways through culverts and occupy the site. Surveys conducted according to established USFWS protocols could be used to investigate the California red-legged frog's current status on site.

4.3.2 REPTILES

Alameda Whipsnake (*Masticophis lateralis euryxanthus*)

The Alameda whipsnake (also known as the Alameda striped racer) is federally and State listed as threatened. It is endemic to California and occurs only in a small region on the east side of the San Francisco Bay in Contra Costa and Alameda Counties, and parts of San Joaquin and Santa Clara Counties (Nafis 2019). The historical range of the Alameda whipsnake has been fragmented into five disjunct populations: Tilden-Briones, Oakland-Las Trampas, Hayward-Pleasanton Ridge, Mount Diablo-Black Hills, and Sunol-Cedar Mountain (USFWS 1997). Potential habitat for this species includes mixed chaparral, coastal scrub, and annual grassland and oak woodlands adjacent to scrub habitats (USFWS 2000b). The Alameda whipsnake requires open and partially open, low-growing shrub communities for many of its biological needs. Shrub communities provide cover for snakes during dispersal, cover from predators, and a variety of microhabitats where whipsnakes can move to regulate their body temperature (Swaim 1994). Other important habitat features include small mammal burrows, rock outcrops, talus (a sloping mass of rock debris at the base of a cliff), and other forms of shelter (USFWS 2000b). These features provide whipsnakes with alternative habitats for temperature regulation, predator protection, egg laying, and periods of winter dormancy (Alameda whipsnakes generally spend November through March in winter hibernacula) (USFWS 2000b).

The study area has limited suitable habitat for Alameda whipsnake, as it contains very little scrub vegetation and is isolated from larger contiguous areas of scrub by annual grasslands, roads, and developed areas. The nearest scrub habitat known to have a population of Alameda whipsnakes is located approximately 0.5 mile to the west, in the Lime Ridge Open Space (CDFW 2019). However, all of the western section of the study area, from the paved access road to the western boundary, is within federally designated Critical Habitat Unit 4 for Alameda whipsnake. Critical Habitat is a formal designation by the U.S. Fish and Wildlife Service under the federal Endangered Species Act delineating land that contains "Primary Constituent Elements" (PCEs) of habitat that are essential for the primary biological needs of a federally-listed species, including foraging, sheltering, breeding, maturation, and dispersal. The PCEs for the Alameda whipsnake are: (1) scrub/shrub communities with a mosaic of open and closed canopy; (2) woodland or annual grassland plant communities contiguous to lands containing PCE 1; and (3) lands containing rock outcrops, talus, and small mammal burrows (USFWS 2006). The portion of the study area within designated Critical Habitat is entirely covered by annual grassland, and would therefore be considered to contain PCE 2. This habitat supports the dispersal of Alameda whipsnakes between core scrub habitat areas, like that found at Lime Ridge. Alameda whipsnakes may be present in the study area,

though would likely be low in number and only present only during occasional dispersal movements. For this reason, it would be very difficult to detect their presence on site.

4.3.3 BIRDS

Western Burrowing Owl (*Athene cunicularia hypugaea*)

The burrowing owl is a California Species of Special Concern. They are resident year-round throughout much of California, including the Central Valley, San Francisco Bay region, Carrizo Plain, and Imperial Valley. Burrowing owls that nest at higher elevations (e.g., Modoc Plateau) migrate to lower elevations in winter. In addition, migrants from other parts of western North America may augment resident lowland populations in winter (Shuford and Gardali 2008).

Throughout their range, burrowing owls require habitats with three basic attributes: (1) open, well-drained terrain; (2) short, sparse vegetation generally lacking trees; and (3) underground burrows or burrow-like structures (e.g., culverts) (Klute et al. 2003, Shuford and Gardali 2008). Burrowing owls are well adapted to open, relatively flat expanses. Grassland, shrub steppe, and desert are naturally occurring habitat types used by the species (CDFW 2012).

The flats and slopes in the western portion of the study area are suitable habitat for burrowing owls. Several California ground squirrels (*Spermophilus beechyi*) and their burrows were observed through the grasslands, and these burrows could be used by burrowing owls. This species breeds regularly east of Mount Diablo, but is generally only observed during the winter and early spring migratory period in central Contra Costa County (eBird 2019). For this reason, any owls occurring at the station are more likely to be either overwintering or using the site as a migratory stopover point.

4.3.4 MAMMALS

Bats

Bats are widespread within California and may be found in any habitat. They are nocturnal, aerial predators of insects and other arthropods, and often forage over open water, marshes, and other moist, open areas where flying insects tend to congregate. Different bat species have different roosting requirements and roosts can be found in a variety of habitats and locations. Day roosts, used from sunrise to sunset, provide a protected and sheltered location for bats to rest and sleep within a short flight to foraging areas and a site to raise their young (Erickson et al. 2002). During the day, bats may use three types of roosts: crevices, cavities, and foliage. Crevice and cavity roosts may be found in natural and human-made features such as caves, cliffs, rock outcrops, trees, mines, buildings, bridges, and tunnels. During the breeding season (April through September), crevice and cavity roosting species typically gather in groups of mothers and young (maternity colonies) that may number in the thousands or even tens of thousands of individuals. In contrast, foliage-roosting bats may be solitary or occur in small groups while breeding. Roosts used during the day and as maternity roosts tend to be well-hidden and require precise temperature and humidity conditions.

Night roosts, which are used from approximately sunset to sunrise, are primarily sites where animals congregate to rest and digest their food between foraging bouts (Erickson et al. 2002). Night roosts are often located in more open but protected areas such as overhangs on buildings and recessed areas on the undersides of bridges. Several bat species have the potential to occur at the station based on range, habitat, and recorded occurrences in the region.

The riparian corridor along Galindo Creek is suitable breeding habitat for several bat species. Foliage-roosting lasiurine bats, including the western red bat (*Lasiurus blossevillii*) and hoary bat (*Lasiurus cinereus*) may roost in the tree canopy, particularly in large, mature trees. Both of these species roost in foliage under overhanging leaves, particularly in riparian areas. Females raise pups solitarily or in very small groups, and may move their young among multiple roost locations. Crevice and cavity-roosting bats

such as pallid bat (*Antrozous pallidus*), big brown bat (*Eptesicus fuscus*), and several species of myotis bats (Myotis spp.) may use any available cracks or holes in trees as roosting habitat. Dead trees are especially good habitat for these species, and should be retained upright whenever feasible.

In addition to roosting habitat, bats may forage for insects almost anywhere in the study area. Different bat species employ different foraging strategies, with some preferring closed areas such as the interior of the riparian corridor, while others may utilize open areas and habitat edges along the grassland portions of the station.

Acoustical detectors could be used to monitor the use of the study area by bats. However, bat habitat use can vary widely on a yearly, seasonal, and even nightly basis, based on numerous factors such as temperature, precipitation, moon phase, migration, the presence of ephemeral aggregations of insect prey, and many other factors that are not well understood. For these reasons, any monitoring of bats should be conducted as part of a long-term data gathering process in order to determine how and to what degree various bat species are using the site.

San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*)

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) is a California Species of Special Concern. One of eleven recognized subspecies, the San Francisco dusky-footed woodrat is found on the San Francisco Peninsula south to the southernmost edge of Santa Cruz County and inland to the East Bay hills (Hooper 1933, Matocq 2000). It is a medium-sized native rodent with large ears and a long, scantily haired tail. They inhabit oak and riparian woodlands with a well-developed understory as well as chaparral and scrub habitats, where their stick nests are often visible (Carraway and Verts 1991). The nests, often called 'houses', may be as much as 6 feet tall, and contain multiple chambers used for sleeping and food storage. Nests are typically occupied by single adults or females with young, and can be used by successive generations of woodrats. They exhibit high site fidelity, with some stick nests seeing continuous use for 20 years or more. They are also highly arboreal and sometimes construct nests in the tree canopy, utilizing evergreen or live oaks and other trees and shrubs with thick leaves (Kelly 1990, Williams et al. 1992). Woodrat nests provide cover for many other animal species, including small mammals, reptiles, amphibians, and arthropods, thereby increasing local biodiversity (Cranford 1982; Vestal 1938). Woodrats are generalist herbivores, consuming a variety of nuts, fruits, fungi, foliage and some forbs, though they are primarily found to forage on foliage of evergreen broadleaf plants, such as poison oak (*Toxicodendron diversilobum*), coffeeberry (*Rhamnus californica*), elderberry (*Sambucus* spp.), toyon (*Heteromeles* spp.), and oaks. Woodrats live in loosely-cooperative groups of multiple nests, but maintain and defend home ranges (Carraway and Verts 1991). Reproduction occurs from February through September.

Suitable habitat for San Francisco dusky-footed woodrats is present throughout the Galindo Creek riparian corridor in the study area. Five woodrat nests were observed in the understory during the site visit. Additional woodrats may be present, and further focused surveys would be useful in determining how extensively this species uses the site.

Section 5. CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSIONS

5.1.1 SENSITIVE NATURAL COMMUNITIES

Although not considered a sensitive natural community by CDFW (2018a), freshwater marsh/seep wetlands are treated as sensitive natural communities as they are likely potentially jurisdictional wetland features regulated by the Army Corps of Engineers and the California State Water Resources Control Board. Additionally, all creeks and drainages on site exhibit ordinary high water marks and evidence of scour. They are considered sensitive natural communities as they are regulated by the Army Corps of Engineers, CDFW, and the California State Water Resources Control Board. Any work on site that removes riparian trees, or alters the creek or wetlands will likely require permits from these regulatory agencies.

Any construction activities or projects on site should avoid and minimize impacts to sensitive natural communities and aquatic features to the maximum extent feasible. Prior to the start of construction, Environmentally Sensitive Areas (ESA) – determined by the biologist and defined as areas containing sensitive habitats adjacent to or within construction work areas where physical disturbance is not allowed – should be delineated using high-visibility flagging or fencing. The ESA delineation should remain in place while any construction or work activities are ongoing.

5.1.2 SPECIAL-STATUS PLANTS

Based on habitats within the study area, familiarity with local flora, and on-site habitat suitability, 4 special-status plant species have the potential to occur within the study area based on the presence of suitable habitat. These species bloom in May and September and would not have been detectable during the April surveys. A rare plant survey should be conducted in May for Mount Diablo fairy lantern (*Calochortus pulchellus)*, Lime Ridge navarretia (*Navarretia gowenii*), and shining navarretia (*Navarretia nigelliformis* subsp. *radians*), and in September for big tarplant (*Blepharizonia plumosa)*. Surveys should be done in accordance with the California Native Plant Society's *Botanical Survey Guidelines* (CNPS 2001a), California Department of Fish and Game's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2018b), and U.S. Fish and Wildlife's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 2000a). In addition, plant surveys conducted throughout the spring and summer will capture additional plant species, that wouldn't have been detectable during the April 2019 survey, to add to the plant list for the site.

5.1.3 NOXIOUS/INVASIVE WEEDS

Numerous invasive weed species (23 species) were observed in the study area. The majority of the study area east of Galindo Creek was characterized by dense stands of invasive weeds. The area where coyote brush was removed in 2018 is colonized by dense stands of invasive weeds. The area east of the creek between the creek and the residences is regularly mowed and/or disced by the City for fuels management.

Regularly disking and disturbance of this area will likely result in the continued dominance by invasive weeds as invasive weeds thrive on disturbance. This are could be restored a year or two of invasive weed control, followed by seeding of native perennial grasses, and continued weed control with selective broadleaf herbicide until the grasses become established. Native forbs species are often seeded in after broadleaf weeds are under control. Native perennial bunchgrasses can benefit from mowing and can be mowed to provide fuels management.

The pasture and wetland on the west side of the study area, west of Galindo Creek had fewer invasive weeds. Invasive weed control efforts should focus on keeping invasive weeds from spreading throughout the pasture and wetland. Control efforts should also focus on species that are not widespread throughout the study area and only occur in isolated locations including purple starthistle* and artichoke thistle*. Stinkwort* should be monitored and controlled on site to ensure it does not become widespread in the wetlands on site.

5.1.4 WILDLIFE

Birds

The majority of bird nests are protected by the federal Migratory Bird Treaty Act and California Fish and Game Code, and should be protected from disturbance or destruction during any studies conducted at the station.

California Red-Legged Frog

Surveys conducted according to established USFWS protocols could be used to investigate the California red-legged frog's current status on site.

Bats

Any large dead trees should be left upright and in place to the extent that safety allows, as the decaying wood creates crevices and cavities that are favored by bats as roosting habitat. If any roosts are identified on site, human disturbance in the vicinity should be minimized.

Acoustical detectors could be used to monitor the use of the station by bats. However, bat habitat use can vary widely on a yearly, seasonal, and even nightly basis, based on numerous factors such as temperature, precipitation, moon phase, migration, the presence of ephemeral aggregations of insect prey, and many other factors that are not well understood. For these reasons, any monitoring of bats should be conducted as part of a long-term data gathering process in order to determine how and to what degree various bat species are using the site.

San Francisco Dusky-Footed Woodrat

Woodrats are generally tolerant of disturbance, though excessive human activity in the immediate vicinity of their nests (up to and including damage to the nest structure) could lead to abandonment. For these reasons, existing woodrat nests should be avoided during the installation of any equipment or materials used for studies in the riparian corridor. Further focused surveys would be useful in determining how extensively this species uses the station.

Section 6. REFERENCES

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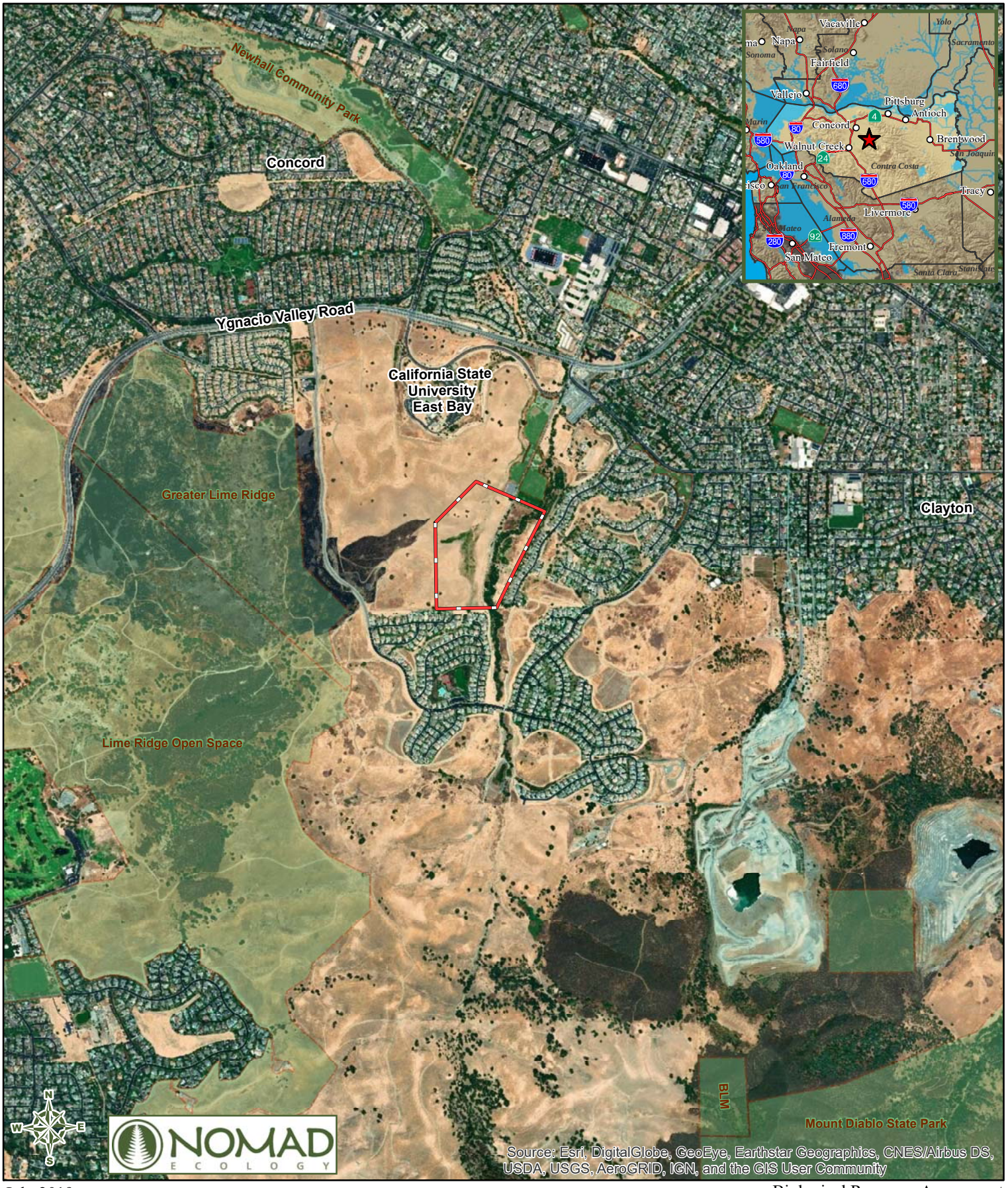
APPENDIX A FIGURES



July 2019

Biological Resource Assessment

Legend
Study Area

1:24,000
0 1,200 2,400
Feet

Figure 1

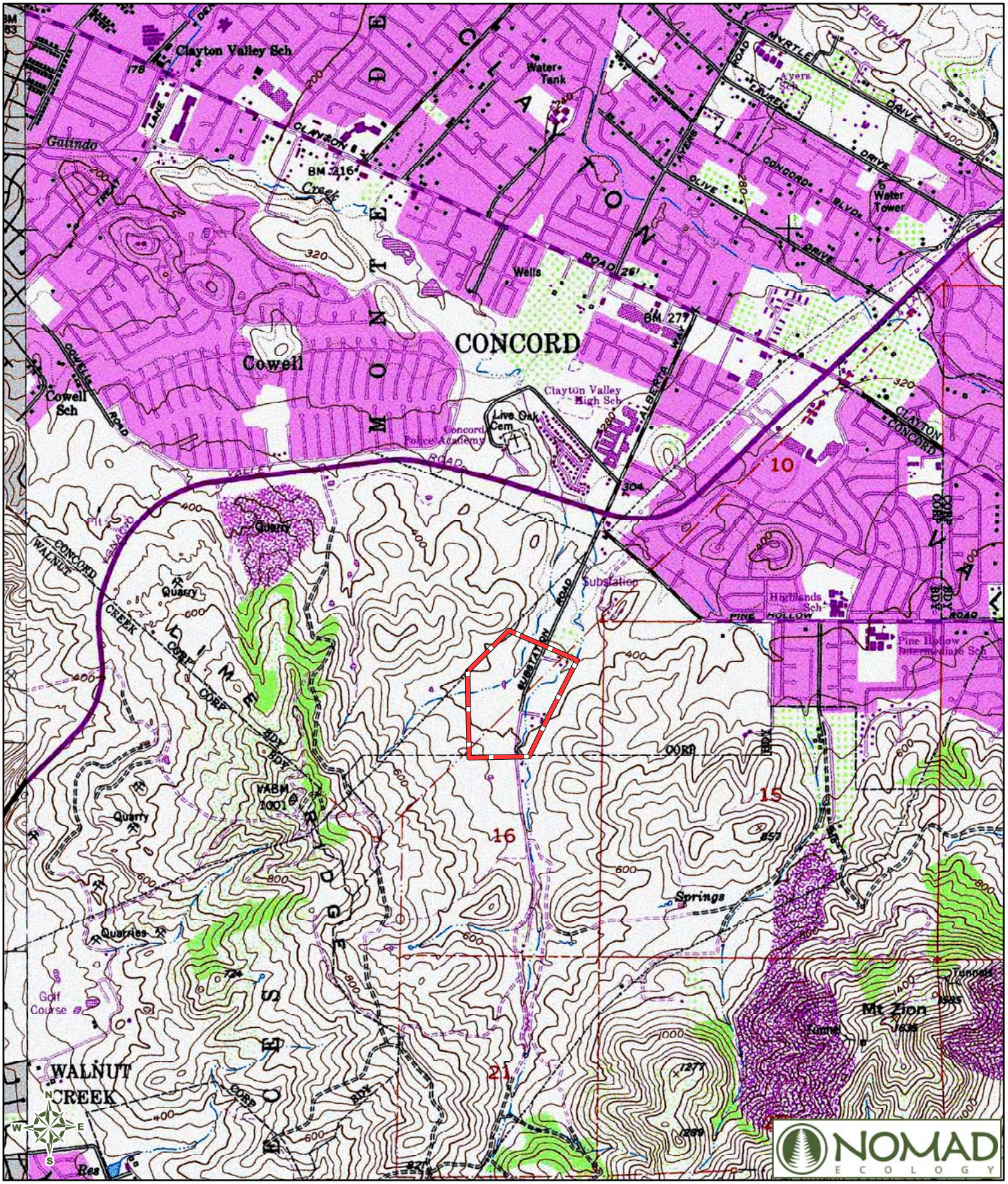
Study Area Vicinity Map

Galindo Creek Field Station

California State University East Bay

Source: ESRI Aerial Imagery 2019.

Concord, Contra Costa County, California



July 2019

Biological Resource Assessment

Figure 2

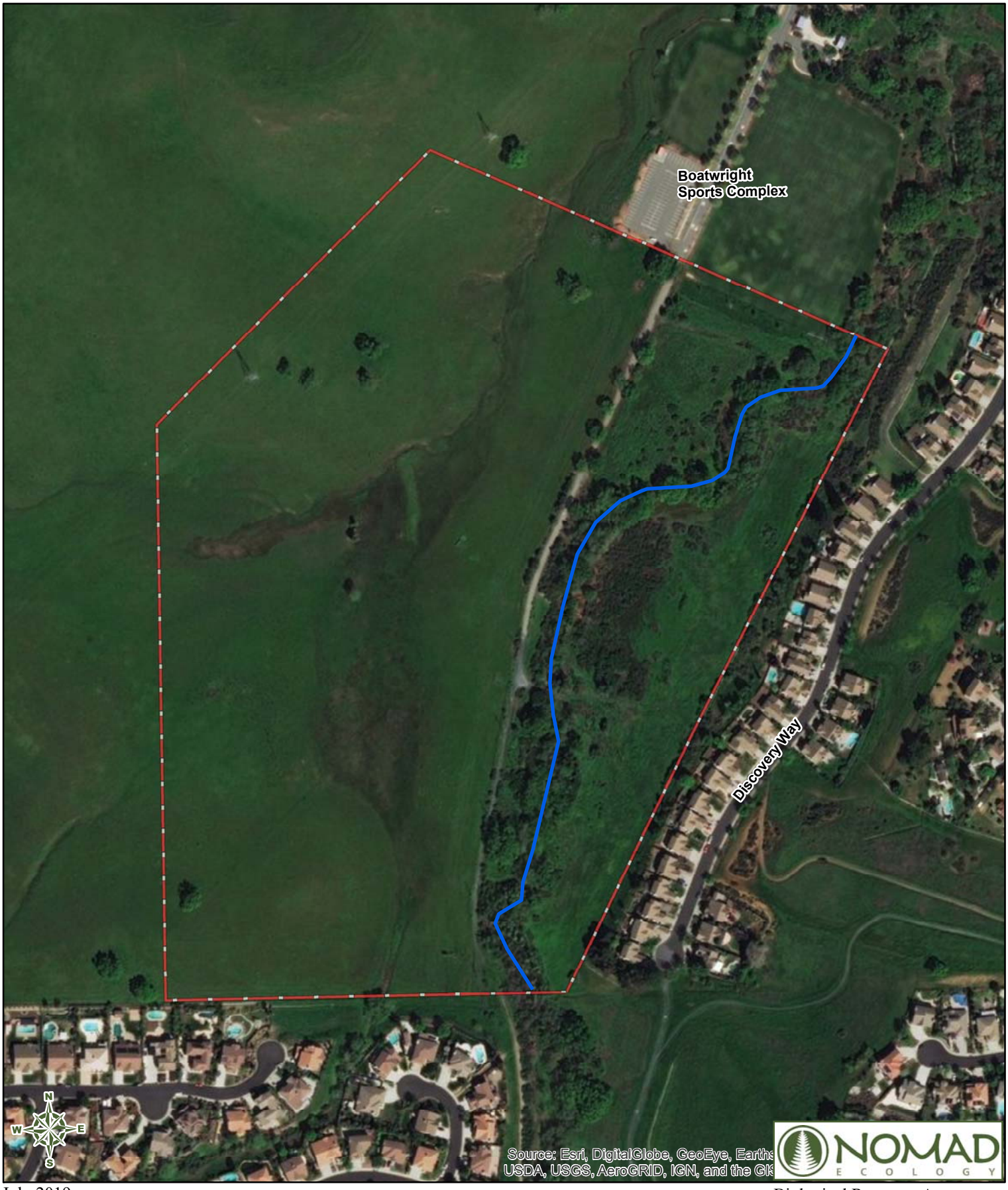
Study Area on USGS Topographic Map

Galindo Creek Field Station

California State University East Bay

Source: USGS

Concord, Contra Costa County, California



July 2019

Biological Resource Assessment

Legend
Study Area
Galindo Creek

1:3,600
0 150 300
Feet

Figure 3

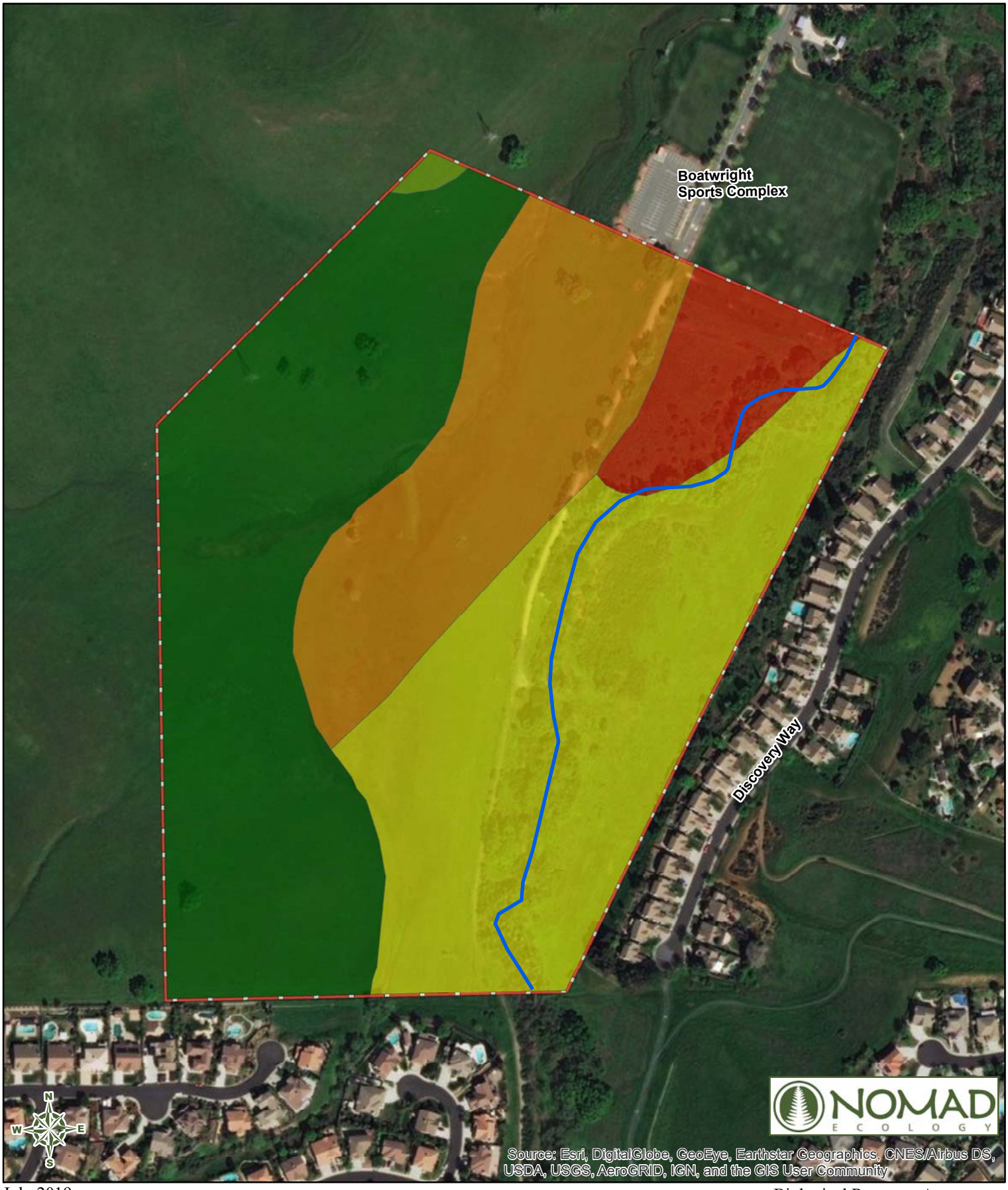
Study Area on Aerial Photo

Galindo Creek Field Station

California State University East Bay

Source: ESRI Aerial Imagery 2019.

Concord, Contra Costa County, California



July 2019

Biological Resource Assessment

Legend

- Study Area
- Galindo Creek

Soil Mapping Units

- Altamont clay, 9 to 15 percent slopes
- Altamont clay, 15 to 30 percent slopes
- Capay clay, 2 to 9 percent slopes
- Los Robles clay loam
- Positas loam, 0 to 2 percent slopes

Figure 4

Soils in the Study Area

Galindo Creek Field Station

California State University East Bay

1:3,600

0 150 300

Feet

Source: ESRI Aerial Imagery 2019, USGS.

Concord, Contra Costa County, California

July 2019

Biological Resource Assessment

Legend

Study Area

Galindo Creek

Vegetation Communities

- Ruderal
- Non-Native Grassland
- Freshwater Marsh/Seep Wetland
- Northern Coyote Brush Scrub
- Great Valley Valley Oak Riparian Forest
- Road

1:3,600

0 150 300

Feet

Figure 5

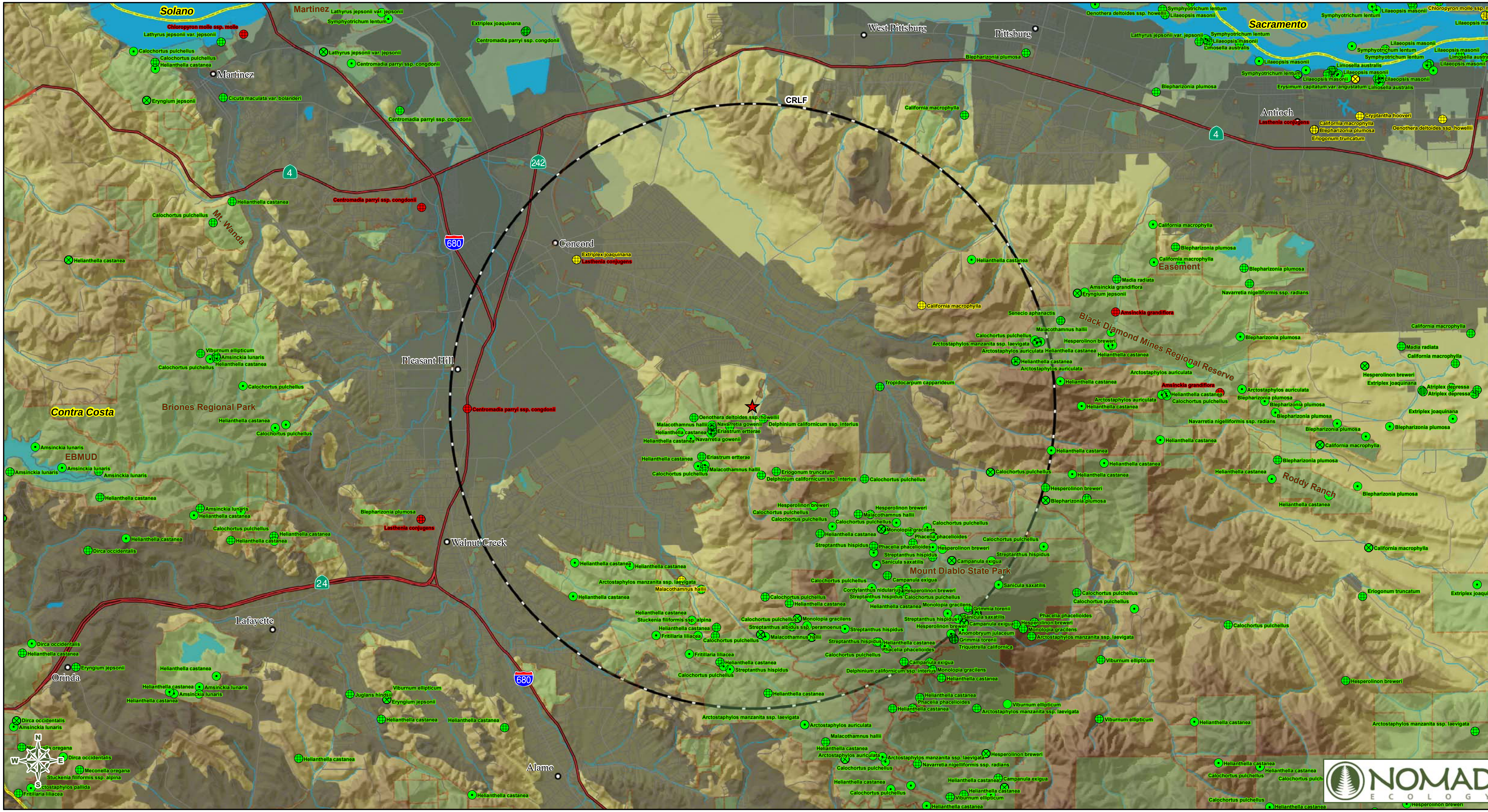
Vegetation Communities within the Study Area

Galindo Creek Field Station

California State University East Bay

Sources: ESRI Aerial Imagery 2019.

Concord, Contra Costa County, California



July 2019

Biological Resource Assessment

Legend

Study Area Location	CNDDB Occurrences PRESENCE	CNDDB Occurrences ACCURACY
★	Presumed Extant	specific area
Distance Radii	Possibly Extirpated	accuracy ranging from 80 meters to 5 miles
5 miles from Study Area	Extirpated	nonspecific area

Figure 6

California Natural Diversity Database Special Status Plant Species Occurrences within 5 Miles of the Study Area

Galindo Creek Field Station

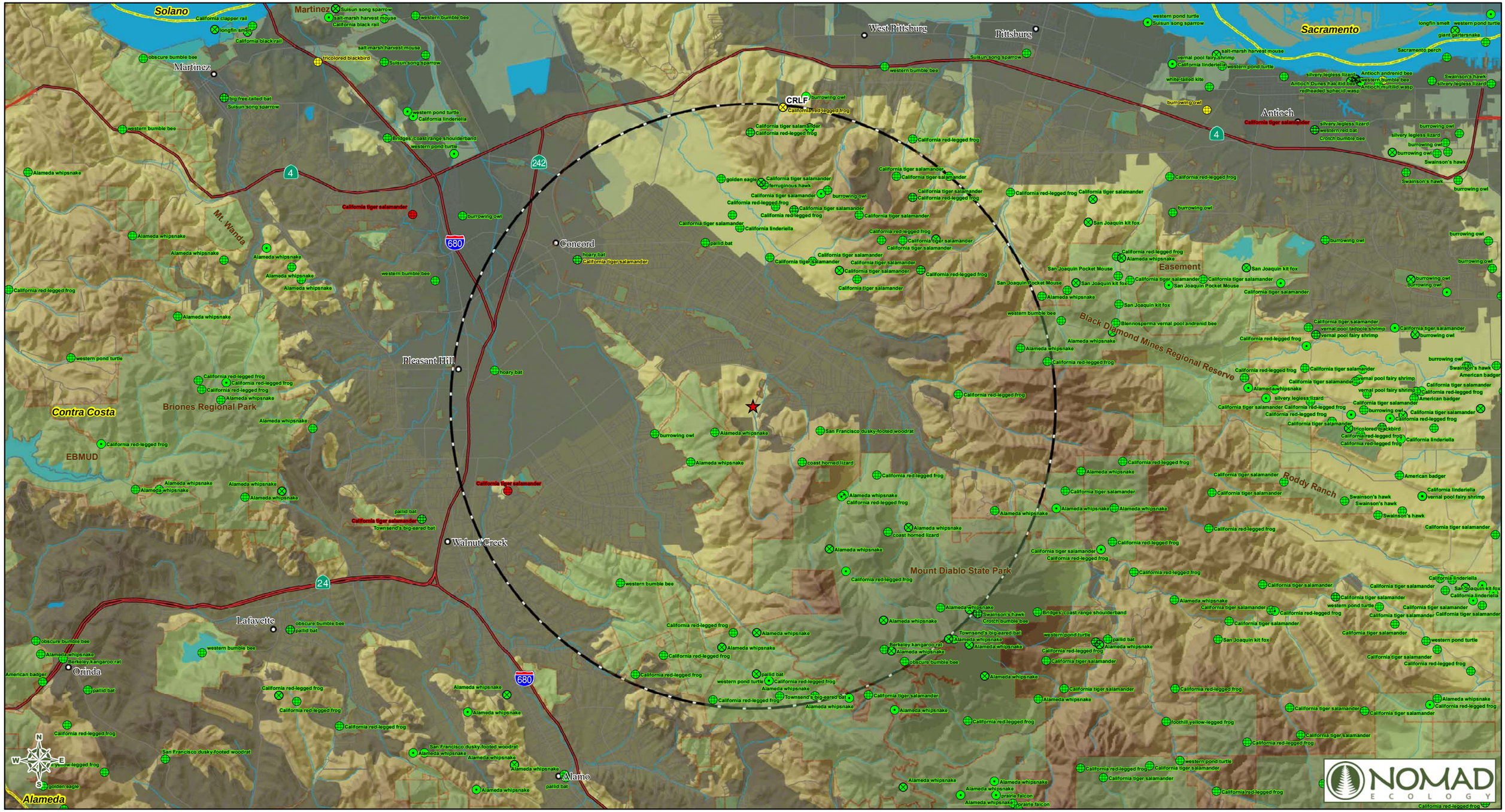
California State University East Bay

1:95,040

0 0.75 1.5 Miles

Sources: ESRI, California Spatial Information Library, Bay Area Open Space Council, California Department of Fish and Wildlife.

Concord, Contra Costa County, California



July 2019

Biological Resource Assessment

Legend

Study Area Location

Distance Radii

5 miles from Study Area

CNDDB Occurrences PRESENCE

- Presumed Extant
- Possibly Extirpated
- Extirpated

CNDDB Occurrences ACCURACY

- specific area
- accuracy ranging from 80 meters to 5 miles
- nonspecific area

1:95,040

0 0.75 1.5 Miles

Figure 7

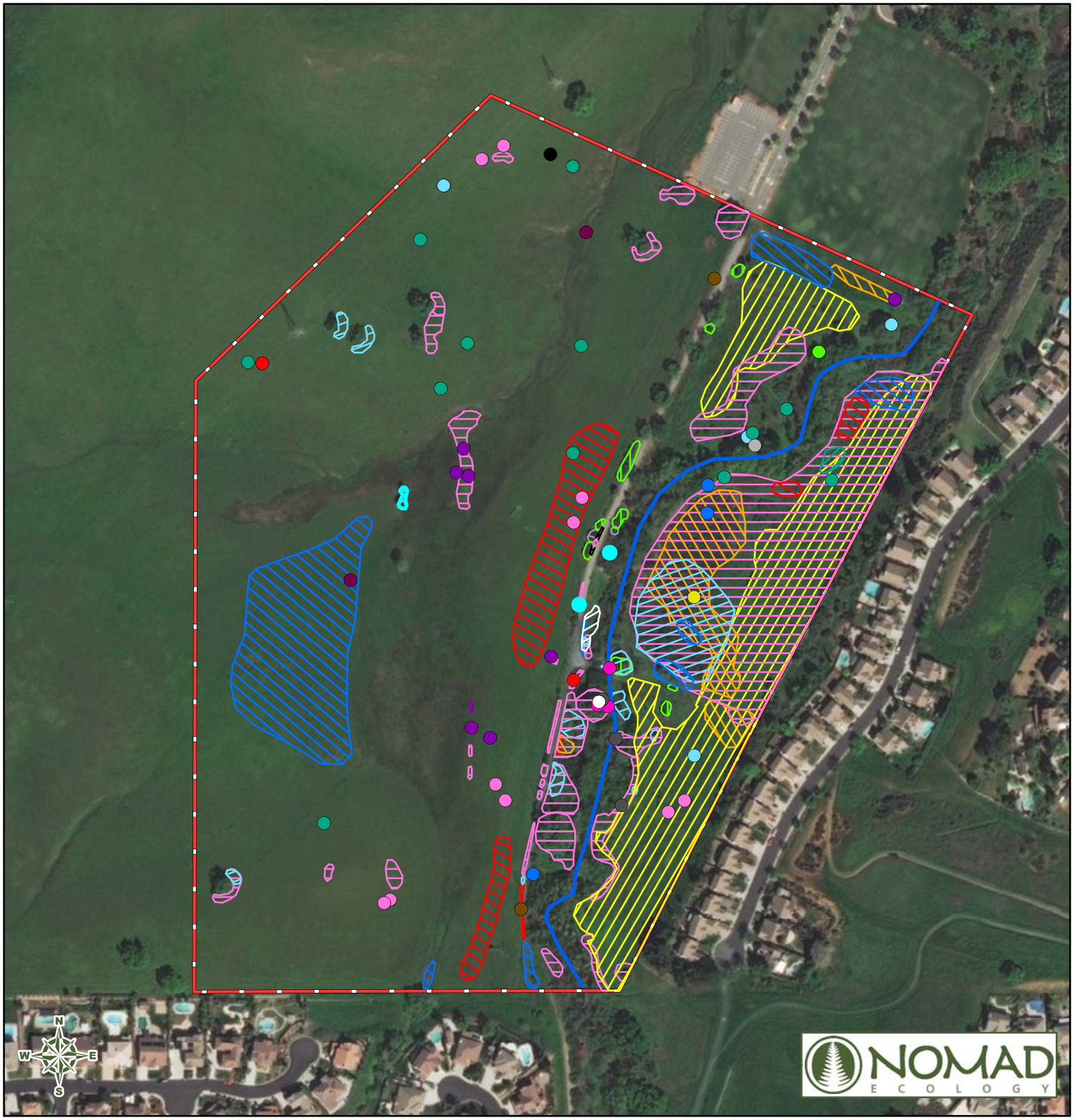
California Natural Diversity Database Special Status Wildlife Species Occurrences within 5 Miles of the Study Area

Galindo Creek Field Station

California State University East Bay

Sources: ESRI, California Spatial Information Library, Bay Area Open Space Council, California Department of Fish and Wildlife.

Concord, Contra Costa County, California



July 2019

Biological Resource Assessment

Legend

Study Area

Galindo Creek

Invasive Weeds (polygons)*

- Italian/slender flower thistle
- mustard weeds**
- perennial pepperweed
- Peruvian pepper tree
- Mexican fan palm
- artichoke thistle
- black mustard
- bull thistle
- milk thistle
- olive
- stinkwort
- whitetop
- yellow star thistle

Invasive Weeds (points)*

- Chinese pistachio
- Harding grass
- Italian/slender flower thistle
- Mexican fan palm
- artichoke thistle
- black mustard
- bull thistle
- common fig
- milk thistle
- olive
- periwinkle
- poison hemlock
- purple star thistle
- stinkwort
- white mullberry
- yellow star thistle

1:3,600

0 150 300

Feet

Figure 8

Invasive Weeds in the Study Area

Galindo Creek Field Station

California State University East Bay

*Infestations were mapped as polygons when the areas were greater than 0.01 acres (436 square feet) and mapped as points when the infestation was less than 0.01 acres.

**Includes field mustard, charlock, black mustard and london rocket

Sources: ESRI Aerial Imagery 2019.

Concord, Contra Costa County, California

APPENDIX B LIST OF PLANT SPECIES OBSERVED DURING APRIL 2019 SITE VISIT

SPECIES NAME	COMMON NAME	ORIGIN	COLLECTION	LOCALLY RARE	CAL-IPC RATING	CDFA RATING
EUDICOTS						
Adoxaceae – Muskroot Family						
Sambucus nigra subsp. *caerulea*	blue elderberry	Native	---	---	---	---
Anacardiaceae – Sumac or Cashew Family						
Pistacia chinensis	Chinese pistache	Non-Native	---	---	---	---
Schinus molle	Peruvian pepper tree	Non-Native	---	---	Limited	---
Apiaceae – Carrot Family						
Conium maculatum	poison hemlock	Non-Native	---	---	Moderate	---
Torilis nodosa	hedge parsley	Non-Native	---	---	---	---
Apocynaceae – Dogbane Family						
Vinca major	periwinkle	Non-Native	---	---	Moderate	---
Asteraceae – Sunflower Family						
Anthemis cotula	mayweed	Non-Native	---	---	---	---
Baccharis pilularis subsp. *consanguinea*	coyote brush	Native	---	---	---	---
Carduus pycnocephalus subsp. *pycnocephalus*	Italian thistle	Non-Native	---	---	Moderate	On List
Carduus tenuiflorus	slender flowered thistle	Non-Native	---	---	Limited	On List
Centaurea calcitrapa	purple star thistle	Non-Native	---	---	Moderate	On List
Centaurea solstitialis	yellow star thistle	Non-Native	---	---	High	On List
Cirsium vulgare	bull thistle	Non-Native	---	---	Moderate	On List
Cynara cardunculus subsp. *flavescens*	cardoon	Non-Native	---	---	Moderate	On List
Dittrichia graveolens	stinkwort	Non-Native	---	---	Moderate	---
Erigeron canadensis	horseweed	Native	---	---	---	---
Helminthotheca echioides	bristly ox-tongue	Non-Native	---	---	Limited	---
Hesperevax sparsiflora var. *sparsiflora*	few-flowered evax	Native	---	---	---	---
Hypochaeris glabra	smooth cat's ear	Non-Native	---	---	Moderate	---
Microseris douglasii subsp. *douglasii*	silver puffs	Native	---	---	---	---
Silybum marianum	milk thistle	Non-Native	---	---	Limited	---

Species Name	Common Name	Origin	Collection	Locally Rare	Cal-IPC Rating	CDFA Rating
Sonchus asper subsp. *asper*	prickly sowthistle	Non-Native	---	---	---	---
Sonchus oleraceus	common sowthistle	Non-Native	---	---	---	---
Xanthium strumarium	cocklebur	Non-Native	---	---	---	---
Boraginaceae – Borage or Waterleaf Family						
Plagiobothrys trachycarpus	roughfruit popcornflower	Native	---	B	---	---
Brassicaceae – Mustard Family						
Brassica nigra	black mustard	Non-Native	---	---	Moderate	---
Brassica rapa	field mustard	Non-Native	---	---	Limited	---
Cardamine oligosperma	bitter cress	Native	---	---	---	---
Hirschfeldia incana	hoary mustard	Non-Native	---	---	Moderate	---
Lepidium draba	whitetop	Non-Native	--	---	Moderate	On List
Lepidium latifolium	perennial pepperweed	Non-Native	---	---	High	On List
Nasturtium officinale	water cress	Native	---	---	---	---
Sinapis arvensis	charlock	Non-Native	---	---	Limited	---
Sisymbrium irio	London rocket	Non-Native	---	---	Moderate	---
Caryophyllaceae – Pink Family						
Cerastium glomeratum	mouse-ear chickweed	Non-Native	---	---	---	---
Chenopodiaceae – Goosefoot Family						
Atriplex prostrata	spearscale	Native	---	---	---	---
Crassulaceae – Stonecrop Family						
Crassula connata	pygmyweed	Native	---	---	---	---
Euphorbiaceae – Spurge Family						
Euphorbia peplus	petty spurge	Non-Native	---	---	---	---
Fabaceae – Pea Family						
Lotus corniculatus	birdfoot trefoil	Non-Native	---	---	---	---
Medicago polymorpha	burclover	Non-Native	---	---	Limited	---
Trifolium dubium	shamrock clover	Non-Native	---	---	---	---
Trifolium fragiferum	strawberry clover	Non-Native	---	---	---	---
Trifolium glomeratum	clustered clover	Non-Native	---	---	---	---
Trifolium hirtum	rose clover	Non-Native	---	---	Moderate	---
Trifolium subterraneum	subterraneum clover	Non-Native	---	---	---	---
Trifolium tomentosum	woolly clover	Non-Native	---	---	---	---

Species Name	Common Name	Origin	Collection	Locally Rare	Cal-IPC Rating	CDFA Rating
Vicia sativa subsp. *sativa*	spring vetch	Non-Native	---	---	---	---
Fagaceae – Oak Family						
Quercus agrifolia var. *agrifolia*	coast live oak	Native	---	---	---	---
Quercus lobata	valley oak	Native	---	---	---	---
Geraniaceae – Geranium Family						
Erodium cicutarium	red-stemmed filaree	Non-Native	---	---	Limited	---
Geranium dissectum	cut-leaf geranium	Non-Native	---	---	Moderate	---
Juglandaceae – Walnut Family						
Juglans hindsii (waif)	Northern California black walnut	Native	---	---	---	---
Lamiaceae – Mint Family						
Marrubium vulgare	horehound	Non-Native	---	---	Limited	---
Lythraceae – Loosestrife Family						
Lythrum hyssopifolia	hyssop loostrife	Non-Native	---	---	Limited	---
Malvaceae – Mallow Family						
Malva parviflora	cheeseweed	Non-Native	---	---	---	---
Malvella leprosa	alkali mallow	Native	---	---	---	---
Moraceae – Mulberry Family						
Ficus carica	common fig	non-native	---	---	Moderate	---
Morus alba	white mulberry	Non-Native	---	---	---	---
Myrsinaceae – Myrsine Family						
Lysimachia arvensis	scarlet pimpernel	Non-Native	---	---	---	---
Oleaceae – Olive Family						
Olea europaea	olive	Non-Native	---	---	Limited	---
Onagraceae – Evening Primrose Family						
Epilobium brachycarpum	tall annual willow-herb	Native	---	---	---	---
Epilobium ciliatum	willowherb	Native	---	---	---	---
Orobanchaceae – Broomrape Family						
Castilleja attenuata	valley tassels	Native	---	---	---	---
Castilleja exserta subsp. *exserta*	purple owl's clover	Native	---	---	---	---
Triphysaria pusilla	little owl's clover	Native				
Polygonaceae – Buckwheat Family						
Rumex crispus	curly dock	Non-Native	---	---	Limited	---

Species Name	Common Name	Origin	Collection	Locally Rare	Cal-IPC Rating	CDFA Rating
Ranunculaceae – Buttercup Family						
Ranunculus muricatus	spiny buttercup	Non-Native	---	---	---	---
Rosaceae – Rose Family						
Heteromeles arbutifolia	toyon	Native	---	---	---	---
Rosa californica	California wild rose	Native	---	---	---	---
Rubiaceae – Madder Family						
Galium aparine	bedstraw	Native	---	---	---	---
Sherardia arvensis	field madder	Non-Native	---	---	---	---
Salicaceae – Willow Family						
Populus fremontii subsp. fremontii	Fremont cottonwood	Native	---	---	---	---
Salix babylonica	weeping willow	Non-Native	---	---	---	---
Salix exigua	sandbar willow	Native	---	---	---	---
Salix gooddingii	Gooding's black willow	Native	---	B	---	---
Salix laevigata	red willow	Native	---	---	---	---
Salix lasiolepis	arroyo willow	Native	---	---	---	---
Sapindaceae – Soapberry Family						
Aesculus californica	California buckeye	Native	---	---	---	---
MONOCOTS						
Alliaceae – Onion or Garlic Family						
Allium triquetrum	whiteflowered onion	Non-Native	---	---	---	---
Arecaceae (Palmae) – Palm Family						
Washingtonia robusta	Mexican fan palm	Non-Native	---	---	Moderate	---
Cyperaceae – Sedge Family						
Carex barbarae	valley sedge	Native	---	B	---	---
Cyperus eragrostis	tall flatsedge	Native	---	---	---	---
Eleocharis macrostachya	creeping spikerush	Native	---	---	---	---
Schoenoplectus americanus	chairmaker's bulrush	Native	---	---	---	---
Juncaceae – Rush Family						
Juncus bufonius var. *bufonius*	toad rush	Native	---	---	---	---
Juncus mexicanus	Mexican rush	Native	---	B	---	---
Juncus xiphioides	iris-leaved rush	Native	---	---	---	---
Poaceae – Grass Family						

Species Name	Common Name	Origin	Collection	Locally Rare	Cal-IPC Rating	CDFA Rating
Avena fatua	wild oats	Non-Native	---	---	Moderate	---
Bromus diandrus	ripgut brome	Non-Native	---	---	Moderate	---
Bromus hordeaceus	soft chess	Non-Native	---	---	Limited	---
Bromus laevipes	woodland brome	Native	---	---	---	---
Bromus madritensis subsp. rubens	foxtail chess	Non-Native	---	---	High	---
Distichlis spicata	saltgrass	Native	---	---	---	---
Elymus triticoides	creeping wildrye	Native	---	---	---	---
Festuca arundinacea	tall fescue	Non-Native	---	---	Moderate	---
Festuca bromoides	brome fescue	Non-Native	---	---	---	---
Festuca myuros	foxtail fescue	Non-Native	---	---	Moderate	---
Festuca perennis	Italian ryegrass	Non-Native	---	---	Moderate	---
Hordeum jubatum subsp. *jubatum*	fox tail barley	Native	---	A2	---	---
Hordeum marinum subsp. gussoneanum	Mediterranean barley	Non-Native	---	---	Moderate	---
Hordeum murinum subsp. leporinum	hare barley	Non-Native	---	---	Moderate	---
Phalaris aquatica	Harding grass	Non-Native	---	---	Moderate	---
Polypogon monspeliensis	rabbitsfoot grass	Non-Native	---	---	Limited	---
Stipa miliacea var. miliacea	smilo grass	Non-Native	---	---	Limited	---
Themidaceae – Brodiaea Family						
Triteleia laxa	Ithuriel's spear	Native	---	---	---	---
Typhaceae – Cattail Family						
Typha angustifolia	narrow-leaved cattail	Native	---	---	---	---

APPENDIX C LIST OF WILDLIFE SPECIES OBSERVED DURING APRIL 2019 SITE VISIT

SPECIES NAME	COMMON NAME	NATIVE	NOTES
Amphibians			
Anaxyrus boreas halophilus	California toad	Native	Larvae observed in wetland pools in western section of site. Adults observed under plywood adjacent to public trail.
Pseudacris sierra	Sierran tree frog	Native	Larvae observed in Galindo Creek and in wetland pools in western section of site. Adults observed in grassland adjacent to wetland pools.
Reptiles			
Crotalus oregonus	northern Pacific rattlesnake	Native	
Pituophis catenifer	gopher snake	Native	
Sceloporus occidentalis	western fence lizard	Native	
Birds			
Agelaius phoeniceus	red-winged blackbird	Native	
Aphelocoma californica	California scrub jay	Native	
Baeolophus inornatus	oak titmouse	Native	
Buteo jamaicensis	red-tailed hawk	Native	
Callipepla californica	California quail	Native	
Calypte anna	Anna's hummingbird	Native	
Carduelis psaltria	lesser goldfinch	Native	
Cathartes aura	turkey vulture	Native	
Charadrius vociferus	killdeer	Native	
Euphagus cyanocephalus	Brewer's blackbird	Native	
Falco sparverius	American kestrel	Native	Nesting in nest box attached to valley oak just north of site boundary. Observed food exchange between adult male and female in a different valley oak located on site near the nest tree.
Icterus bullockii	Bullock's oriole	Native	
Junco hyemalis	dark-eyed junco	Native	

Species Name	Common Name	Native	Notes
Melanerpes formicivorus	acorn woodpecker	Native	
Meleagris gallopavo	wild turkey	Native	
Melospiza melodia	song sparrow	Native	
Mimus polyglottos	northern mockingbird	Native	
Picoides nuttallii	Nuttall's woodpecker	Native	
Picoides villosus	hairy woodpecker	Native	
Pipilo maculatus	spotted towhee	Native	
Poecile rufescens	chestnut-backed chickadee	Native	
Psaltriparus minimus	bushtit	Native	
Sayornis nigricans	black phoebe	Native	
Sitta carolinensis	white-breasted nuthatch	Native	
Sturnella neglecta	western meadowlark	Native	
Sturnus vulgaris	European starling	Non-native	Nesting in snag at north end of site adjacent to sports complex parking lot
Turdus migratorius	American robin	Native	
Tyrannus verticalis	western kingbird	Native	
Wilsonia pusilla	Wilson's warbler	Native	
Zonotrichia atricapilla	golden-crowned sparrow	Native	
Mammals			
Canis latrans	coyote	Native	
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	Native	Five stick nests observed at various locations in the riparian corridor
Peromyscus maniculatus	deer mouse	Native	
Sciurus niger	fox squirrel	Non-native	
Spermophilus beecheyi	California ground squirrel	Native	Scattered burrows on hillsides and flats in western section of site.
Sylvilagus audubonii	Audubon's cottontail	Native	

APPENDIX D PHOTOS

Photo 1. View of the freshwater marsh/seep wetland with non-native grassland on the adjacent slopes. Facing southwest. April 2019.

Photo 2. View of the freshwater marsh/seep wetland with non-native grassland adjacent. Facing south. April 2019.

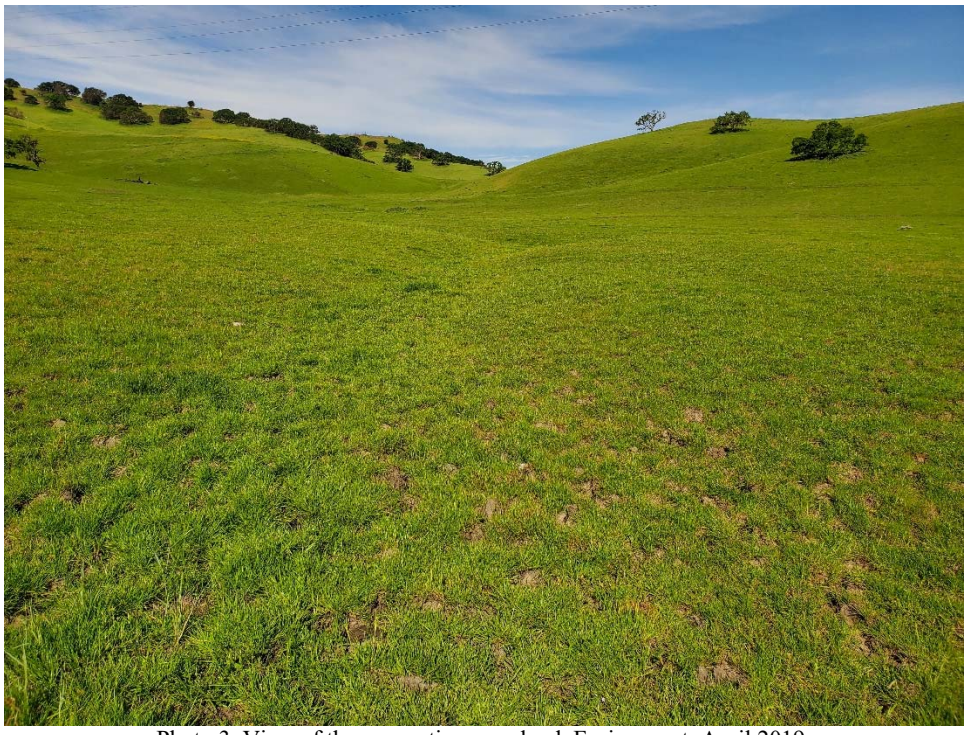


Photo 3. View of the non-native grassland. Facing west. April 2019.

Photo 4. View of ruderal vegetation (mustard stands) and riparian woodland along Galindo Creek. Facing northwest. April 2019.

Photo 5. View of ruderal vegetation (dense Italian thistle stand) and riparian woodland along Galindo Creek. Facing south. April 2019.

Photo 6. View of coyote brush scrub and riparian woodland along Galindo Creek. Facing northeast. April 2019.

Photo 7. View of Galindo Creek. Facing north. April 2019.

Photo 8. View of Galindo Creek. Facing north. April 2019.

Photo 9. Slow-moving pool in Galindo Creek where Sierran tree frog larvae were abundant. April 2019.

Photo 10. Shallow pool of water in freshwater marsh/seep in western portion of site, typical of those where Sierran tree frog and California toad larvae were observed. April 2019.

Photo 11. View of coyote observed during site visit in the non-native annual grassland. April 2019.

Photo 12. View of northern Pacific rattlesnake observed during site visit in the non-native annual grassland immediately adjacent to freshwater marsh/seep wetland. April 2019.

Photo 13. San Francisco dusky-footed woodrat nest in Galindo Creek riparian corridor. April 2019.

Photo 14. Dead tree (snag) on northern site boundary where European starlings were nesting. Facing north. April 2019.