COVERED PLANT SPECIES INVENTORY OF PRESERVE SYSTEM ACQUISITIONS, EAST CONTRA COSTA COUNTY HABITAT CONSERVANCY, CONTRA COSTA COUNTY, CALIFORNIA



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Section 1. INTRODUCTION

The purpose of this report is to present the results of surveys conducted by Nomad Ecology (Nomad) in 2014 for select covered¹ and no-take² plant species on East Contra Costa County Habitat Conservancy (Conservancy) preserve system acquisition properties (Figure 1). This report includes a description of the methods used; an assessment of population health based on HCP/NCCP reporting requirements for all populations observed; photographs; and recommendations for management.

During the course of these surveys, populations of four covered plant species were observed within acquisition properties: big tarplant (*Blepharizonia plumosa*), round-leaved filaree (*California macrophylla*), Diablo helianthella (*Helianthella castanea*), Brewer's dwarf flax (*Hesperolinon breweri*), and shining navarretia (*Navarrettia nigelliformis* subsp. *radians*³). In addition, non-covered but special status plant species including Contra Costa manzanita (*Arctostaphylos manzanita* subsp. *laevigata;* CRPR 1B.2), serpentine bedstraw (*Galium andrewsii* subsp. *gatense;* CRPR 4.2), hogwallow starfish (*Hesperevax caulescens;* CRPR 4.2), sylvan microseris (*Microseris sylvatica;* 4.2); Lime Ridge navarretia (*Navarretia gowenii;* CRPR 1B.1), and Michael's rein orchid (*Piperia michaelii;* CRPR 4.2) were also observed within acquisition properties.

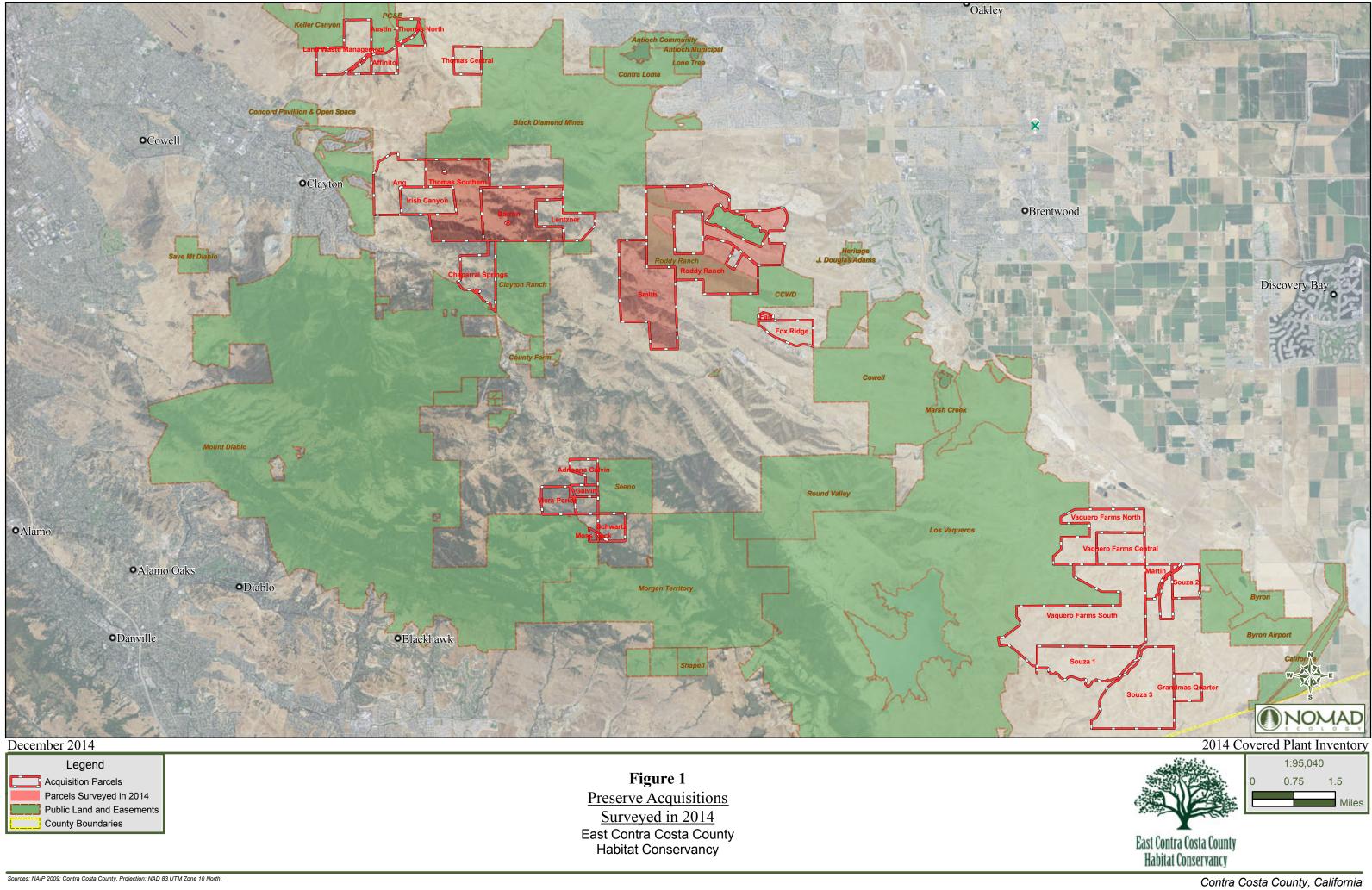
1.1. HCP/NCCP BACKGROUND

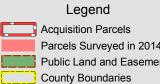
The Conservancy is the implementing entity of the East Contra Costa Habitat Conservation Plan/Natural Community Conservation Plan, referred to herein as the "HCP/NCCP" or "Plan" (Jones & Stokes 2006). The purpose of this Plan is to protect and enhance ecological diversity and function within the rapidly urbanizing region of eastern Contra Costa County (County). To that end, the Plan describes how to avoid, minimize, and mitigate, to the maximum extent practicable, impacts on covered species and their habitats, wetlands, and other sensitive communities while allowing for the growth of selected regions of the County. The Plan also describes the responsibilities associated with operating and maintaining the new preserves created to mitigate for the anticipated impacts. The Plan includes conservation measures to protect 11 covered and 6 no-take plant species (Table 1).

¹ Covered species are plants proposed for coverage for which the plan provides for their conservation and management, and for which take authorization may be required during the term of the HCP/NCCP.

² No-take species are plants for which take is not authorized under the Natural Community Conservation Plan Act.

³ The species *Navarretia nigelliformis* subsp. *nigelliformis* is no longer considered to occur within Contra Costa County based on specimen annotations at the UC and Jepson Herbaria at the University of California Berkeley as well as the opinions of experts in the genus. This taxon is now recognized as *Navarretia nigelliformis* subsp. *radians*. This change is discussed in more detail in Section 5 of this report.





SPECIES NAME	COMMON NAME
COVERED SPECIES	
Arctostaphylos auriculata	Mount Diablo manzanita
Atriplex depressa	brittlescale
Blepharizonia plumosa	big tarplant
California macrophylla	round-leaved filaree
Calochortus pulchellus	Mount Diablo fairy lantern
Delphinium recurvatum	recurved larkspur
Extriplex joaquinana	San Joaquin spearscale
Helianthella castanea	Diablo helianthella
Hesperolinon breweri	Brewer's dwarf flax
Madia radiata	showy madia
Navarretia nigelliformis subsp. nigelliformis ⁴	adobe/shining navarretia
No-Take Species	
Amsinckia grandiflora	large-flowered fiddleneck
Astragalus tener var. tener	alkali milk-vetch
Eriogonum truncatum	Mount Diablo buckwheat
Eschscholzia rhombipetala	diamond-petaled poppy
Lasthenia conjugens	Contra Costa goldfields
Tropidocarpum capparideum	caper-fruited tropidocarpum

Table 1. Covered and No-Take Plant Species of the HCP/NCCP

Conservation Strategy

As a component of the HCP/NCCP a conservation strategy, designed to achieve biological goals and objectives, was developed for each natural community and the covered species that each natural community supports. The conservation strategy was implemented to protect and recover listed covered species in the inventory area, and to help avoid the listing of non-listed covered species by protecting and, where appropriate, enhancing their populations. The conservation strategy is a program of conservation measures that, when implemented in concert, will achieve the biological goals and objectives of the Plan. Goals are broad, guiding principles based on the conservation needs of the resources. Biological objectives are expressed as conservation targets or actions. Objectives are measurable and achievable within a given time frame; they clearly state a desired result and will collectively achieve the biological goals (Jones & Stokes 2006).

The goals and objectives related to plan species of the HCP/NCCP are listed below. Based on these goals and objectives the Conservancy must ensure that an adequate number of populations of covered plants are included in the Preserve System. In order to meet these goals and objectives conducting baseline inventories of acquired properties is a crucial step of Plan implementation. After acquisitions are secured, baseline data will be used as a reference point from which to begin to measure Plan success by measuring the number of covered and no-take plant populations preserved.

⁴ See footnote 3 above.

Goals and Objectives

Goals and objectives related to covered plant species of the HCP/NCCP include the following:

- Goal 9: Protect populations of adobe navarretia within wetlands
 - Objective 9.1: Identify, protect, and maintain populations of **adobe navarretia** in the inventory area
- Goal 17: Protect in the Preserve System at least 11 unprotected occurrences of grasslanddependent covered plants
 - Objective 17.1: Protect populations of covered plants that are at least as large and healthy⁵ as populations lost to covered activities.
 - Objective 17.2: Protect at least **two** occurrences⁶ of **brittlescale** outside currently protected public lands
 - Objective 17.3: Protect at least **three** occurrences of **big tarplant** outside currently protected public lands
 - Objective 17.4: Protect at least **two** occurrences of **recurved larkspur** outside currently protected public lands
 - Objective 17.5: Protect at least **two** occurrences of **round-leaved filaree** outside currently protected public lands
- Goal 18: Enhance populations of grassland-dependent covered plants
 - Objective 18.1: Increase population size and distribution of grassland-dependent covered plants, where feasible and biologically desirable.
- Goal 23: Protect populations of showy madia within oak woodland and grassland.
 - Objective 23.1: Identify and maintain or increase populations of **showy madia** in the inventory area
- Goal 27: Protect in the Preserve System at least eight occurrences of chaparral-dependent covered plants
 - Objective 27.1: Protect populations of covered plant that are at least as large and as healthy as populations lost to covered activities
 - Objective 27.2: Protect at least **two** occurrences of **Mt. Diablo manzanita** outside currently protected public lands
 - Objective 27.3: Protect at least **two** occurrences of **Diablo helianthella** outside currently protected public lands
 - Objective 27.4: Protect at least **three** occurrences of **Brewer's dwarf flax** outside currently protected public lands

 ⁵ A healthy population of covered plants is defined as one that has a stable or increasing population growth rate or has a high potential to increase in size with improved management.
 ⁶ A plant occurrence is defined in the same way as an element occurrence is defined by the California Department of Fish and

⁶ A plant occurrence is defined in the same way as an element occurrence is defined by the California Department of Fish and Wildlife CDFW: a location record of a plant in the CNDDB that is a population or group of populations within 0.25 mile and not separated by significant habitat discontinuities.

• Objective 27.5: Protect at least **one** occurrence of **Mount Diablo fairy lantern** outside currently protected public lands

Section 2. Study Methods

2.1. DATA RESOURCES

Background information on potentially occurring endangered, threatened and rare plant, and sensitive natural communities was compiled through a review of the following resources:

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

- Endangered and Threatened Wildlife and Plants (USFWS 1999, 2008)
- Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in Contra Costa County (USFWS 2014)

California Department of Fish and Wildlife (CDFW):

- State and Federally Listed Endangered, Threatened and Rare Plants of California (CDFW 2014a)
- Special Vascular Plants, Bryophytes, Lichens List (CDFW 2014b)
- California Natural Diversity Database (CNDDB) (CDFW 2014c)
- List of California Vegetation Alliances. The Vegetation Classification and Mapping Program (CDFG 2010)

Other Sources:

- The Jepson Manual: Vascular Plants of California (Baldwin et al. 2012)
- The California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS 2001, 2014)
- Consortium of California Herbaria (CCH 2014)
- East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (Jones & Stokes 2006)
- Annotated Checklist of the East Bay Flora, Second Edition (CNPS 2013)
- Unusual and Significant Plants of Alameda and Contra Costa Counties. Eighth Edition (Lake 2010)
- Flowering Plants and Ferns of Mount Diablo, California (Ertter and Bowerman 2002)

Botanical taxonomy and nomenclature conform to *The Jepson Manual* (Baldwin et al. 2012) and recent circumscriptions in the *Jepson eFlora* (JFP 2014). Common names of plant species are derived from *The Calflora Database* (Calflora 2014). Nomenclature for special-status plant species conform to the *Inventory of Rare and Endangered Plants of California* (CNPS 2001, 2014) and *Special Vascular Plants, Bryophytes and Lichens List* (CDFW 2014b).

2.2. SURVEY METHODOLOGY

2.2.1 PERSONNEL AND FIELD INVESTIGATIONS

The following personnel directed and conducted botanical surveys and/or report preparation:

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Erin McDermott Botanist Nomad Ecology

Brian Peterson

Botanist Nomad Ecology

Covered and no-take plant species surveys were conducted by Nomad senior botanist Heath Bartosh (HB) and botanists Erin McDermott (EM), Brian Peterson (BP), and Gregg Weber (GW) during the months of March, April, May, June, and September 2014 (Table 2).

Survey Timing		Laguman	T i p gran	Democratic	
Month	DAY(S)	LOCATION	TARGETS	Personnel	
March	31	Roddy	large flowered fiddleneck round-leaved filaree diamond petaled poppy showy madia	HB, EM	
April	1, 7-8	Roddy	large flowered fiddleneck round-leaved filaree diamond petaled poppy showy madia	HB, EM	
April	9-10	Roddy Smith	large flowered fiddleneck round-leaved filaree diamond petaled poppy showy madia	HB	
April	14-15	Smith	large flowered fiddleneck round-leaved filaree diamond petaled poppy showy madia adobe/shining navarretia	HB, BP	
May	14	Roddy	Mount Diablo fairy lantern Diablo helianthella Brewer's dwarf flax adobe/shining navarretia	HB, EM	

Table 2. 2014 Survey Effort Details for Covered Plant Species

SURVEY TIMING		Location	Targets	Personnel	
Month	DAY(S)	LOCATION	TARGETS	I ERSUNNEL	
May	15	Roddy	Mount Diablo fairy lantern Diablo helianthella Brewer's dwarf flax adobe/shining navarretia	HB, GW	
May	20, 22	Barron Thomas South Roddy	Mount Diablo fairy lantern Diablo helianthella Brewer's dwarf flax adobe/shining navarretia	HB, BP	
May	21	Thomas South	Mount Diablo fairy lantern Diablo helianthella Brewer's dwarf flax adobe/shining navarretia	BP	
June	6	Thomas South	Brewer's dwarf flax	HB	
September	24	Smith	big tarplant	HB, BP	
September	25	Smith	big tarplant	BP	

Covered and/or no-take species that were targeted during the course of these surveys were determined by recent preserve acquisitions, habitat present within the preserves, and the direction of Conservancy personnel with input from Nomad. Once the species or preserve was determined, the survey timing was identified by Nomad. Based on discussions with Conservancy staff, John Kopchick and Abigail Fateman, Roddy Ranch and the Smith Property were identified as high priority for inventorying (Table 3). Table 3 shows which preserves contain habitat for each target covered/no-take plant species. If habitat is present, either the entire or partial area of suitable habitat was surveyed in 2014. Table 3 only contains covered/no-take plant species for which there is suitable habitat present on the acquisitions, and does not include all 17 covered/no-take plant species. A narrative discussion of the survey timing and habitat targeted for each preserve is presented in Section 3.

The 2014 survey effort was primarily focused on the Smith property since it was the newest of the acquisitions, and had not been previously surveyed for rare plants. Properties acquired during past years including Barron, Roddy Ranch, and Thomas South, were also targeted as they had not been surveyed entirely, and therefore had a high probability of supporting populations of covered plant species still needed to meet the conservation objectives, i.e. round leaved filaree and Brewer's dwarf flax. Although precipitation totals were low during the 2013/2014 rainy season, reference populations indicated favorable conditions to survey for covered species, as discussed below. Although alkaline habitat had been identified on Smith during previous surveys, it was determined unsuitable for halophytic covered species, such as *Atriplex/Extriplex* and *Delphinium recurvatum*, due to the abundance of salt grass cover (*Distichlis spicata*), and distance outside of local distributions.

Since access of the Roddy Ranch property was not possible until July 2013, early and late spring covered plant species surveys for round-leaved filaree, Brewer's dwarf flax, shining navarretia, and diablo helianthella were not possible. Therefore, surveys for these species, at the appropriate time, were conducted on Roddy Ranch during April and May 2014. Additionally, reference populations indicated

that 2014 was a suboptimal year for conducting big tarplant surveys. Therefore, minimal effort was spent on the Smith property attempting to locate populations of big tarplant.

Surveys for target species were conducted within suitable habitat (Table 4) by walking transects up to 10 meters apart depending on the topography or subject plant community. Visual surveys are considered adequate for determining the presence or absence of covered plant species that have a potential to occur within preserve acquisitions. Census information for all populations encountered were enumerated by direct count. All surveys generally began at 8:00 and concluded at approximately 16:00 each day (with short breaks for meals). Protocol-level surveys for special-status plants and animals 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. During these surveys an inventory of plant species observed was recorded. If encountered, other special-status species including State and federally-listed species or species included in the California Native Plant Society rare plant inventory were also recorded.

TARGET SPECIES	Barron	Roddy Ranch	Thomas South	Smith
Amsinckia grandiflora large-flowered fiddleneck		Е		Р
<i>Blepharizonia plumosa</i> big tarplant				Р
California macrophylla round-leaved filaree		Е		Е
Calochortus pulchellus Mount Diablo fairy lantern	Р	Р		Р
Eschscholzia rhombipetala diamond petaled poppy		Р		Р
<i>Helianthella castanea</i> Diablo helianthella	Р	Е		Р
<i>Hesperolinon breweri</i> Brewer's dwarf flax	Р	Е	Р	Р
Madia radiata showy madia		Р		Р
Navarretia nigelliformis subsp. radians ⁷ shining navarretia	Р	Е	Р	E

Table 3. High Priority Acquisition Properties Surveyed in 2014

--- = suitable habitat either not present on property or area not surveyed

E = Entire area of suitable habitat surveyed within property in 2014.

P = Partial survey of suitable habitat within property in 2014.

⁷ See footnote 3 above.

Species	Land Cover Types	ADDITIONAL Habitat Notes
Amsinckia grandiflora large-flowered fiddleneck (N)	Annual grassland	None
Blepharizonia plumosa big tarplant (C)	Annual grassland	Elevation below 1,500 feet; almost always found on soils of the Altamont Series or Altamont-Fontana complex.
<i>California macrophylla</i> round-leaved filaree (C)	Annual grassland	Heavy clay soils
<i>Calochortus pulchellus</i> Mount Diablo fairy lantern	Annual grassland Chaparral and scrub Oak woodland Oak savanna	Elevation between 650 and 2,600 feet.
Eschscholzia rhombipetala diamond petaled poppy	Annual grassland	Not enough known about local habitat parameters to add specificity.
<i>Helianthella castanea</i> Diablo helianthella (C)	Chaparral and scrub Oak savanna Oak woodland	Elevation above 650 feet; typically found on the ecotone of these habitats.
<i>Hesperolinon breweri</i> Brewer's western flax (C)	Annual grassland Chaparral and scrub Oak woodland	Restricted to grassland areas within a 500+ foot buffer from oak woodland and chaparral scrub. Typically associated with foothill pine (<i>Pinus</i> <i>sabiniana</i>).
Madia radiata showy madia	Annual Grassland	Primarily occupies open grassland or grassland on edge of oak woodland.
Navarretia nigelliformis subsp. radians shining navaretia	Annual Grassland	Generally found on clay barrens in Annual Grassland.

Table 4. Habitat Requirements of Survey Targets

2.2.2 REFERENCE SITES AND HERBARIUM SPECIMENS

To ensure the timing of surveys coincided with the flowering phenology of targeted HCP/NCCP covered and no-take species, reference populations and collection dates of herbaria specimens were examined.

Reference Sites

Known populations of round-leaved filaree (*California macrophylla*), Diablo helianthella (*Helianthella castanea*), Brewer's dwarf flax (*Hesperolinon breweri*), Mount Diablo fairy lantern (*Calochortus pulchellus*), and big tarplant (*Blepharizonia plumosa*) were visited at reference sites with similar characteristics to the acquisition properties such as habitat, topography, and climate.

On March 23, 2014, a previously unknown round-leaved filaree population was found on the north side of Black Diamond Mines Regional Park, east of Somersville Road. This occurrence is not recorded in the CNDDB though it lies between EONDX# 45807 and #67134, which are mapped as small isolated populations. Approximately 250 individuals were observed at the location with 50 percent in fruit, and 50 percent in flower. With the plants at this stage of flowering phenology it was determined that surveying within two to three weeks was appropriate survey timing for this species.

On April 12, 2014, a known population of shining navarretia was visited. This population is located within Black Diamond Mines Regional Preserve northwest of the intersection of Fredrickson Lane and

Contra Loma Boulevard at approximately 300 feet in elevation. It is recorded in the CNDDB (EONDX # 87633). A total of 150 plants were observed. Based on the condition of the individuals at, it was determined that surveys for this species should be conducted within the next three weeks on similar habitat and soil types.

On May 12, 2014, a known population of Diablo helianthella was evaluated at Lime Ridge Open Space in the City of Walnut Creek. This population is approximately 1,000 feet in elevation. This occurrence is not yet recorded in the CNDDB. Approximately 88 individuals were observed. A majority of these individuals were in flower. Based on this observation it was determined that surveys for this species should be conducted within one to two weeks of this observation.

On May 13, 2014, an extant population of Brewer's dwarf flax was visited in the Mitchell Canyon portion of Diablo State Park at approximately 800 feet in elevation. This is an existing CNDDB occurrence (EONDX #18647). Approximately 230 individuals were observed at this location in flower. Based on this observation it was determined that surveys for this species should be conducted within one to two weeks of this observation.

Also on May 13, 2014, a known population of Mt. Diablo fairy lantern was visited. The population is located within Mt. Diablo State Park near the mouth of Perkins Creek on the east side of the park. This occurrence is recorded in the CNDDB (EONDX #29947). Hundreds of individuals in peak flower were observed; therefore, it was determined that conducting surveys for this species within 1 week of this observation was suitable timing.

On September 19, 2014, an extant population of big tarplant was visited on the north side of Cowell Ranch State Park, which faces Briones Valley Road. This is an existing CNDDB occurrence (EONDX #25662). Approximately 10 individuals were observed, and 10 percent were in flower. Based on this information, it was determined that surveys for this species should be conducted within one to two weeks of this observation.

Observations made during big tarplant reference population visits indicated that surveys for this species would likely result in false negative survey results due to the absence or low abundance of individuals at the big tarplant reference population. As an annual species, these taxa may not germinate, grow, and set seed every year due to unfavorable precipitation and temperatures during winter and early spring. Based on these factors, Mr. Bartosh determined that a full September survey effort would not be undertaken in 2014, and instead recommended that surveys for these taxa be conducted in following years when conditions favor high abundance of the species at reference populations.

Herbaria Specimens

An examination of herbaria specimens was performed for the remaining potentially occurring taxa that did not have available reference populations to examine, using the Consortium of California Herbaria Database (CCH 2014). An estimation of blooming periods was attained by averaging the collection dates of herbarium specimens by month. Duplicate collections and specimens with label information lacking a collection month were not included in the averages. The purpose of this analysis to ensure survey timing corresponds with flowering and reproductive maturation since plant species are typically collected at peak flowering phenology. Specimen collection dates and corresponding survey timing are presented in Table 5 for HCP/NCCP covered and no-take species considered targets during the 2014 studies. All of the species appearing in Table 4 have peak blooming periods during the months of April which match the months during which botanical surveys were conducted.

	HERBARIA SPECIMEN COLLECTIONS AVERAGED BY MONTH											
TARGET SPECIES	JAN	Feb	MAR	APR	MAY	JUN	Jul	AUG	Sep	Ост	Nov	DEC
Amsinckia grandiflora large-flowered fiddleneck (N)	0%	0%	25%	60%	15%	0%	0%	0%	0%	0%	0%	0%
<i>Eschscholzia rhombipetala</i> diamond-petaled poppy (N)	0%	9%	27%	46%	18%	0%	0%	0%	0%	0%	0%	0%
Madia radiata showy madia (C)	0%	0%	30%	51%	17%	1%	0%	1%	0%	0%	0%	0%

Table 5. Herbaria Specimen Collection Dates and Correspondence of Survey Timing

Note: Shaded areas indicate months when botanical surveys were conducted. Bolded numbers denote peak period(s) for survey. Species flowering phenology represented as a percent (%) by month, percentages are rounded; months where collection dates have not been reported are designated as 0%. Species followed by (C) are "Covered Species" and (N) are "No-Take Species" in the HCP/NCCP.

2.2.3 DATA COLLECTION

Data collected in the field conforms to reporting requirements appearing in Chapter 5 of the Plan, "Incorporating Covered Plant Populations in the Preserve System" (Jones and Stokes 2006). To ensure long-term survival of these populations, maintaining healthy populations is a goal of the Plan. Healthy populations are those that have a stable or increasing population growth rate, or have a high potential to increase in size with improved management. The Plan states that the determination of a healthy population cannot be determined in the field based on a single survey. The health of a plant population will be inferred in the field on the basis of five relevant characteristics. Several surveys per season or surveys over multiple years may be necessary to assess all relevant site and population characteristics to ensure that populations within preserves are healthier than populations lost to covered activities. The five relevant characteristics include:

- <u>Physical Condition</u>: Individuals in good or excellent physical condition for the species (e.g., little or no signs of disease, viruses, severe herbivory, nutrient deficiencies) are more likely to survive, achieve an average or above-average lifespan, and reproduce more successfully than individuals in poor physical condition.
- <u>Age Structure</u>: For perennial plants, having an age structure with many seedlings or juvenile plants relative to adults suggests a stable or positive rate of population growth. Seeds in the soil (*i.e.*, the seed bank) are also part of a plant population's age structure, but this component is generally very difficult to measure. Similarly, for the geophyte Mount Diablo fairy lantern, dormant bulbs in the soil are a stage of the population age structure.
- <u>Reproductive Success</u>: Populations with evidence of average or above average reproductive success for the species (*e.g.*, production of flowers per plant, seed production per flower or per plant, proportion of seeds that appear to be viable based on visual observations) are more likely to be increasing than populations with below-average reproductive success because this is often a key component of population growth rate. If reproductive success cannot be measured, plant size or other physical features may be an appropriate surrogate in some covered species.
- <u>Availability of Suitable Habitat</u>: In order for a plant population to remain stable or grow, enough suitable habitat must be present. Populations near unoccupied suitable habitat or without evidence of shrinking suitable habitat areas (e.g., exotic plants that may be expanding, native shrubs that may be advancing) will be considered more healthy than populations without these indicators.

• <u>Diversity of Suitable Habitat</u>: Populations that occupy a wide range of microhabitats for the species may exhibit relatively high genetic diversity and therefore population health. Populations that occupy unusual microhabitats for the species may indicate unusual genetic composition or adaptations that should be preserved.

Detailed notes and measurement of these five relevant characteristics were recorded for each population of covered plant species observed.

2.2.4 MAPPING

Geographic Information System shapefiles (ESRI ArcGIS 9.2) of covered plant species populations were created by incorporating global positioning system (GPS) point data collected in the field or by digitizing locations hand drawn on field maps in areas where accuracy was assured. These field maps depicted 2009 NAIP 1-meter resolution for Contra Costa County at 1:2,400 scale.

2.2.5 SPECIAL-STATUS SPECIES OCCURRENCES

Special-status plants and animals encountered within the study area were recorded using California Natural Diversity Database Field Survey Forms (Appendix G). A GPS data point was recorded for each occurrence and digital photographs were taken. Voucher specimens of the special-status plant species encountered within the study area were also collected and will be donated to the Jepson Herbarium at the University of California Berkeley.

2.2.6 HERBARIUM VOUCHERS

In addition to the collection of special-status species voucher specimens, other plant species with regional significance were collected during the course of our study. Plant species considered as having regional significance include those not previously known as occurring in Contra Costa County. A GPS data point was recorded for each of these locations.

2.2.7 LIMITATIONS

Survey efforts were carefully designed to maximize the likelihood that the timing and effort of the surveys coincided with the optimum timing of phenology and were conducted in appropriate locations for each of the target species. This subsection discusses the unavoidable limitations inherent in rare plant surveys, with respect to the specifics of this inventory.

Based on the timing of this assessment, a determination of presence/absence within the study area was possible for special-status plant species with blooming periods corresponding to the March, April, May, June, and September 2014 surveys. Based on the timing of the surveys, 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. Annuals may be absent in some years due to annual variations in temperature and rainfall, which influence germination and plant phenology. Colonization of new populations within an area may also occur from year to year.

Some specific plant species identifications 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. However, all plant species in bloom or otherwise recognizable were identified to a level necessary to determine their regulatory status.

Section 3. Environmental Setting

3.1. Setting

The four preserve acquisitions surveyed in 2014, represent a single Acquisition Zone, Zone 2:Watersheds of Northern Tributaries of Marsh Creek. Table 6 summarizes preserve acquisitions surveyed by Acquisition Zone.

Acquisition	ZONE 1: Pittsburg Hills	Zone 2: Watersheds of Northern Tributaries of Marsh Creek	Zone 3: Clayton Area, Mount Diablo Foothills	ZONE 4: SLOPES OF MT. DIABLO AND MAIN STEM MARSH CREEK WATERSHED	ZONE 5: BYRON HILLS
Barron		•			
Roddy Ranch		•			
Smith		•			
Thomas South		•			

3.1.1 ZONE 2

Surveys conducted in Zone 2 included four properties: Roddy Ranch which is located west of Deer Valley Road, north of Briones Valley Road, and south of Empire Mine Road and shares its northwestern corner with Black Diamond Mines Regional Preserve; Barron, and Thomas South which are located north of Mount Diablo and Marsh Creek Road and connect East Bay Regional Park District's (EBRPD) Clayton Ranch Land Bank with Black Diamond Mines Regional Preserve; and the Smith Property which lies at the western end of Briones Valley Road and abuts Roddy Ranch on its southern boundary. Prominent geographic features on these properties include Horse, Deer, and Briones valleys; Kreigor Peak, headwaters of Irish Canyon, Keller Ridge, and Oil Canyon. The properties include land cover types such as grassland, alkali grassland, alkali wetland, chaparral, grassland, oak savanna, oak woodland, pond, and seasonal wetland. All of the properties are located near the boundary between the San Francisco Bay Area and San Joaquin Valley subregions of the California Floristic Province.

Surveys on the four properties focused on grassland habitat, in clay barrens of Altamont series/complex soils, during April and May for large-flowered fiddleneck, round-leaf filaree, showy madia, and shining navarretia. During the months of July and June scrubchaparral, woodland, and grassland habitats (and their ecotones) were targeted for Mount Diablo fairy lantern, Diablo helianthella, Brewer's dwarf flax, and shining navarretia, on various soil types. In the late summer, September, grasslands supported by Altamont Series and Altamont-Fontana Complex soils were surveyed for big tarplant.

Section 4. SURVEY FINDINGS

During plant surveys conducted in April, May, June, and September 2014, five covered species were observed by Nomad botanists. Covered species observed include big tarplant (*Blepharizonia plumosa*), round-leaved filaree (*California macrophylla*), Diablo helianthella (*Helianthella castanea*), Brewer's dwarf flax, and shining navarretia (*Navarretia nigelliformis* subsp. *radians*)⁸. Overall, a total of 13 populations of covered plant species were recorded with an estimated number of 3,284 individuals represented. Table 7 shows the number of covered species populations recorded on each acquisition property. No-take species were not observed during these surveys. It should be noted that the physical condition and population size and abundance may have been affected by poor rainfall patterns during the 2013/2014 rainy seasons.

Other special-status plant species including: Contra Costa manzanita (*Arctostaphylos manzanita* subsp. *laevigata*; CRPR⁹ 1B.2), small-flowered morning glory (*Convolvulus simulans* CRPR 4.2), serpentine bedstraw (*Galium andrewsii* subsp. *gatense* CRPR 4.2), Lime Ridge navarretia (*Navarretia gowenii*; CRPR 1B.1), hogwallow starfish (*Hesperevax caulescens;* CRPR 4.2); sylvan microseris (*Microseris sylvatica;* CRPR 4.2); and Michael's rein orchid (*Piperia michaelii;* CRPR 4.2) were also observed within acquisition properties. Although not covered or no-take species they are considered rare by the California Native Plant Society and are therefore included in this inventory.

TARGET SPECIES	BARREN	RODDY RANCH	SMITH RANCH	THOMAS SOUTH	TOTAL # OF POPULATION S
<i>Blepharizonia plumosa</i> big tarplant	0	0	1	0	1
California macrophylla round leaved filaree	0	1	0	0	1
<i>Helianthella castanea</i> Diablo helianthella	1	2	0	0	3
<i>Hesperolinon breweri</i> Brewer's dwarf flax	0	2	0	1	3
<i>Navarretia nigelliformis</i> subsp. <i>radians</i> shining navarretia	0	3	1	1	5
Total	1	8	2	2	13

Table 7. Number of Covered Species Populations Recorded by Acquisition (2014)

Details of each of these populations are discussed below. Voucher specimens of all covered plant species populations encountered were collected. Vouchers will be deposited at the UC/Jepson Herbaria at the University of California Berkeley. California Natural Diversity Database field forms were also filled out and are included in Attachment A.

⁸ See footnote 3 above.

⁹ CRPR = California Rare Plant Rank

4.1. COVERED PLANT POPULATION ASSESSMENTS

4.1.1 ZONE 2 – WATERSHEDS OF NORTHERN TRIBUTARIES OF MARSH CREEK

Barron

A single covered plant population was observed within the Barron Property (Table 8, Figure 2). No extant populations of rare plant species were known from this property prior to these studies based on CNDDB (2015) data. During 2014 surveys, a population comprising three separate colonies of the covered plant species Diablo helianthella was recorded along the southern boundary of the eastern portion of the property.

Table 8. Covered Plant Species Populations Recorded on the Barron Property

POPULATION NUMBER	SPECIES NAME	COMMON NAME	Status	NUMBER OF Individuals
Heca10	Helianthella castanea	Mt. Diablo helianthella	Covered CRPR 1B.2	148

Diablo Helianthella (Heca10)

On May 22, 2014, a single population (Heca10) of Diablo helianthella was observed in the understory of blue oak woodland (*Quercus douglasii*) in the southeast corner of the Barron Property (Figure 2). Occurring as three distinct colonies, the population totaled an estimated 148 individuals and occupied approximately 500 square feet (0.01 acre). The population was observed in the shade of blue oak woodland on a steep north-facing slope, in filtered sunlight, between 1,100 to 1,150 feet (335 to 457 meters) in elevation. The three colonies were located near small ridges on convex positions on the slope. The overstory canopy cover wass intermittent. The underlying soils are of the Los Gatos series (USDA 1977). Other plant species associated with this population included narrowleaf goldenbush (*Ericameria linearifolia*), poison oak (*Toxicodendron diversilobum*), pacific pea (*Lathyrus vestitus* var. *vestitus*), California brome (*Broums carinatus* var. *carinatus*), and Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus**).

^{*} Denotes a species with an origin other than California.

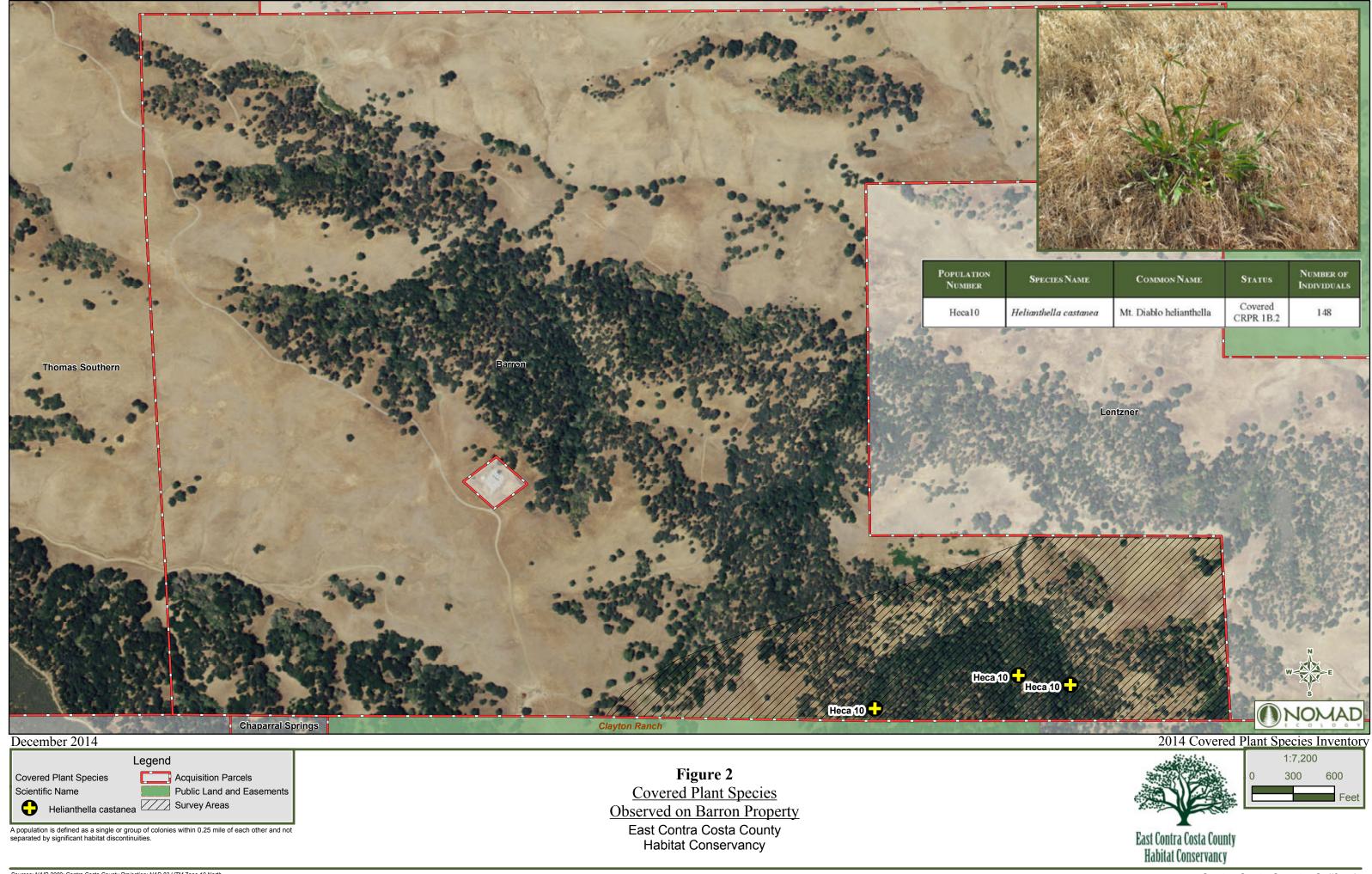




Photo 1. Heca10 in blue oak woodland understory with all individuals in fruit.

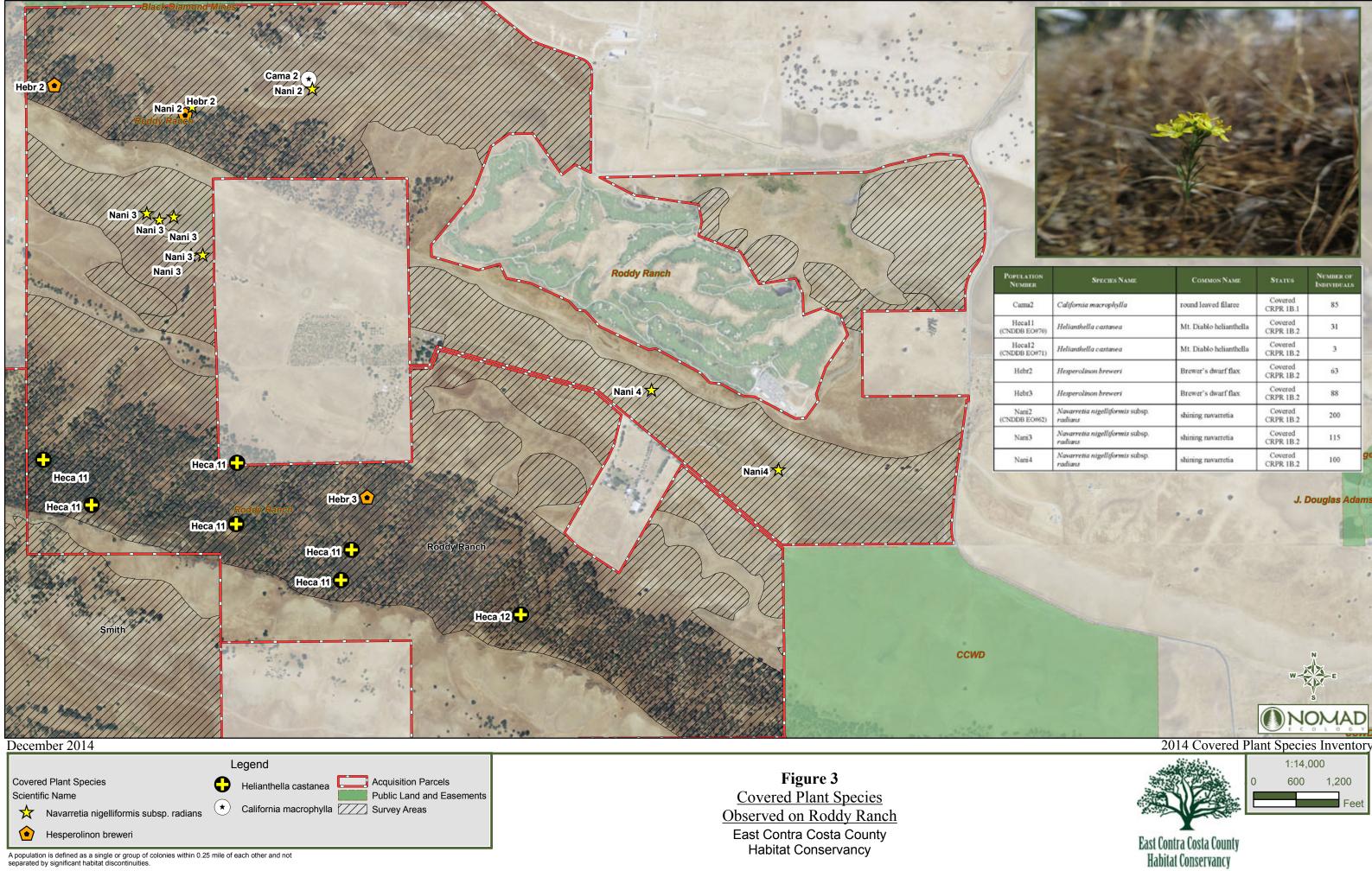
- Physical Condition: All plants appeared in excellent physical condition and all observed were mature individuals that had produced seed during the 2014 season. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Size of individuals ranged from approximately 12 inches to 28 inches tall, expressed as clustered plants.
- Age Structure: With 100 percent of the population considered mature, the age structure of the population suggests offspring are not being produced or not surviving to maturity. No assessment of the seed bank was attempted.
- Reproductive Success: 100 percent of the individuals that had produced an inflorescence, which was approximately 70, were fruiting at the time of observation. Some of the individuals had not flowered this year presumably due to drought conditions. If all of the fruiting heads observed set seed, the total number of seed potentially produced by this population would be 7,770 (number of fertile disk flowers in each inflorescence is estimated at 111). Based on the number of mature versus immature individuals, it is presumed this population is healthy. However, it may not be self-sustaining do to the lack of seedling and intermediate sized individuals.
- Availability of Suitable Habitat: Population Heca10 is small in relation to the unoccupied suitable habitat that is on the adjacent north facing slopes to the east and west (approximately 250 acres). There is also an abundance of loam soils with the appropriate vegetation associations throughout the 250 acres, particularly on the north-facing aspects in the woodland understory. Therefore, there is potential for expanding this population. No directly competing weed or native plant species were observed within or adjacent to the population.
- Diversity of Suitable Habitat: The population occupies habitat that is typical for this taxon in Contra Costa County.

Roddy Ranch

A total of eight populations of covered plant species were observed within the Roddy Ranch Property (Table 9, Figure 3). This total does not include big tarplant populations presented in the 2013 survey results. In addition to big tarplant populations several other extant populations of previously recorded rare plant populations were known from this property prior to these surveys. These include one round-leaved filaree population (Element occurrence (EO) #49), two populations of Diablo helianthella (EO #s 70 and 71), and one shining navarretia population ((EO #62). During 2014 surveys, the populations of Diablo helianthella and shining navarretia were confirmed however, the round-leaved filaree population (EO #49) was not relocated. A new, previously undocumented, location of round-leaved filaree was observed during the 2014 survey effort. Also during the 2014 survey effort previously undocumented populations of round-leaved filaree, Brewer's dwarf flax and shining navarretia were observed and recorded.

POPULATION NUMBER	Species Name	COMMON NAME	Status	NUMBER OF Individuals
Cama2	California macrophylla	round leaved filaree	Covered CRPR 1B.1	85
Heca11 (CNDDB EO#70)	Helianthella castanea	Mt. Diablo helianthella	Covered CRPR 1B.2	31
Heca12 (CNDDB EO#71)	Helianthella castanea	Mt. Diablo helianthella	Covered CRPR 1B.2	3
Hebr2	Hesperolinon breweri	Brewer's dwarf flax	Covered CRPR 1B.2	63
Hebr3	Hesperolinon breweri	Brewer's dwarf flax	Covered CRPR 1B.2	88
Nani2 (CNDDB EO#62)	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	200
Nani3	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	115
Nani4	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	100

Table 9. Covered Plan	t Species Populations Reco	orded on the Roddy Ran	ch Property
	i opulations need	si aca on the houdy hun	ch i roperty



Sources: NAIP 2009; Contra Costa County Projection: NAD 83 UTM Zone 10 North.

OPULATION NUMBER	Species Name	COMMON NAME	STATUS	NUMBER OF INDIVIDUALS
Cama2	California macrophylla	round leaved filaree	Covered CRPR 1B.1	85
Hecal 1 IDDB EO#70)	Helianthella castanea	Mt. Diablo helianthella	Covered CRPR 1B.2	31
Hecal2 IDDB EO#71)	Helianthella castanea	Mt. Diablo helianthella	Covered CRPR 1B.2	3
Hebr2	Hesperolinon breweri	Brewer's dwarf flax	Covered CRPR 1B.2	63
Hebr3	Hesperolinon breweri	Brewer's dwarf flax	Covered CRPR 1B.2	88
Nani2 IDDB E0#62)	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	200
Narii3	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	115
Nani4	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	100

lant	Species	Inventor
	1:14,00	0
0	600	1,200
		Feet

Contra Costa County, California

Round-leaved filaree (Cama2)

On April 7, 2014, a previously undocumented population of round-leaved filaree was observed in the northwestern portion of the ranch near the head of Horse Valley (Figure 3). This population was comprised of one colony totaling 85 individuals by direct count, occupying approximately 17,700 square feet (0.41 acre) of grassland habitat. This population occupies grassland habitat on a west facing clay barren comprised by 30-50 percent total vegetative cover. It lies between 300 to 320 feet in elevation. The soils that support this population are of the Altamont-Fontana Complex (USDA 1977). Associate plant species observed include abundant long beaked filaree (*Erodium botrys*), dwarf cudweed (*Hesperevax sparsiflora* var. *sparsiflora*), bur clover (*Medicago polymorpha**), Chilean trefoil (*Acmispon wrangelianus*), and Douglas' silverpuffs (*Microseris douglasii* subsp. *douglasii*). Shining navarretia was also observed co-occurring with this population of round-leaved filaree and is discussed below.



Photo 2. Cama2 Looking east at the clay barren where this population occurs.



Photo 3. Round-leaved filaree individual in fruit.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were setting seed at the time of the observation. Size of individuals ranged from approximately 2 to 6 inches; however most were 4 inches tall on average.
- Age Structure: This characteristic is not applicable as round-leaved filaree is an annual species.
- Reproductive Success: At the time of the observation, approximately 50 percent of the individuals were flowering and 50 percent were fruiting. All of the fruits/seeds inspected were either mature or maturing. An average of 4 inflorescences was estimated per individual. The total number of seed potentially produced in each inflorescence is 1 (one seed per mericarp). Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds produced is presumed to be 340 seeds (4 seeds per plant) could have been produced by this population in 2014. Even if all these plants successfully produce the maximum number of seed this seeding rate is low with only one mericarp/seed per flower. This could indicate why this once widespread California species is considered rare. It is unknown at this time whether this population, represented by 85 individuals is self-sustaining over the long term. However, given this is an annual plant population prone to fluctuations in population numbers based on climatic conditions and it was only observed at one time (not over multiple years) it is possible the seed bank is abundant enough to maintain this population over the long term.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers western to northern aspects on Altamont series, Altamont-Fontana complex, or Rincon series soils in annual grassland habitat (Bartosh pers. observation). The habitat typical of this soil type where round-leaved filaree occurs on clay barrens which are and anecdotally known ecological phenomenon

which little to no literature has been published on the subject. Locally, clay barrens (which can also be referred to as adobe clay lenses) are areas that have low overall vegetative cover (30-50 percent) dominated by native annual forb species with very low cover of non-native grasses and forbs. Population Cama2 appeared to be underutilizing available and unoccupied clay barren habitat within this portion of Horse Valley. However, there is an abundance of the highly invasive and competitive non-native species medusahead grass (*Elymus caput-medusae**) on the east facing slope of the hill this population occurs on, and a small amount of cover occupies the same area as Cama2. Population expansion is not recommended until an effort to control medusahead grass* has been attempted and this threat has been controlled. Management considerations should be directed at developing control strategies for medusahead grass to protect this population, which is currently one of two known populations under the Conservancy's stewardship, and the only one outside of the Byron area.

• Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types are fairly strict. This population occupies habitat that is typical for this taxon in Contra Costa County. Diversity of habitat that this taxon can occupy is limited to grasslands on west and north-facing aspects, on gentle slopes, and on Altamont series, Altamont-Fontana complex, or Rincon series. Surveys, acquisition, and any introduction activities related to this taxon should be directed by habitat limiting criteria.

Diablo helianthella (Heca11)

On May 20, 2014, CNDDB EO #70 was confirmed as extant within Roddy Ranch acquisition and is heretofore referenced as Heca11. This population comprises six colonies scattered over 0.9 mile along the southern boundary of Roddy Ranch south of Deer Valley (Figure 3). Based on CNDDB data, 10 colonies make up this population, which totaled 136 plants in 1998. During 2014, a total of six colonies were recorded totaling 31 individuals, enumerated by direct count. Each of these polygons contained few plants and based on the size of these small clusters this population occupied approximately 60 square feet of blue oak woodland and interior live oak understory with an intermittent canopy that is intermixed with occasional foothill pine (Pinus sabiniana). Some colonies are also on the chamise (Adenostoma fasciculatum var. fasciculatum) chaparral and grassland ecotone. Not all of the CNDDB polygons mapped in 1998 were relocated therefore the area occupied and number of individuals is less than a quarter of the individuals observed 16 years before. The six colonies observed in 2014 are located between 600 feet to 825 feet in elevation on a northeast facing slope that is moderately steep. The soils that support this population are of the Los Gatos Series (USDA 1977). Associate plant species observed include California buckeye (Aesculus californica), narrowleaf goldenbush, wild oats (Avena fatua*), ripgut brome (Bromus diandrus*), slender cottonweed (Micropus californicus var. californicus), and leafy fleabane (Erigeron foliosus var. foliosus).



Photo 4. A small colony indicative of Heca11

- Physical Condition: Although this population comprised small colonies with few individuals, all plants appeared in excellent physical condition and both mature and seedling stage individuals were observed. Of the mature individuals, all appeared to be producing seeds during the 2014 season. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Size of individuals ranged from approximately 8 inches to 22 inches tall, expressed mostly as individual plants.
- Age Structure: The age structure of this population comprised 61 percent mature (fruiting) and 39 percent seedling (immature) individuals. These numbers suggest a stable and positive rate of population growth. No assessment of the seed bank was attempted.
- Reproductive Success: Approximately 61 percent of the individuals of this population were fruiting. Had all of the potential fruiting flowers of each inflorescence (assuming one per plant) set seed the total number of seed potentially produced by this population is 13,653 (number of fertile disk flowers in each inflorescence is estimated at 111). Based on the number of mature versus immature individuals it is presumed this population is healthy and self-sustaining.
- Availability of Suitable Habitat: Population Heca11 is extremely small in relation to the unoccupied suitable habitat that is on the adjacent north facing slopes to the east and west (approximately 150 acres). There is also an abundance of loam soils with the appropriate vegetation associations throughout these 250 acres, particularly on the north-facing aspects in the woodland understory and chamise chaparral-grassland ecotones. Therefore there is potential for expanding this population. No directly competing weed or native plant species were observed within or adjacent to this population.
- Diversity of Suitable Habitat: This population occupies habitat that is typical for this taxon in Contra Costa County.

Diablo helianthella (Heca12)

On May 15, 2014, CNDDB EO #71 was confirmed as extant within Roddy Ranch acquisition and is heretofore referenced as Heca12. This is an isolated population of very few individuals along the slope south of Deer Valley and south of the inholding containing Roddy's house (Figure 3). Based on CNDDB data, this population totaled 36 plants in 1998. During 2014, the total number of individuals observed was 3 individuals. This small population totaled 30 square feet of occupied blue oak woodland habitat with an intermittent. The population observed in 2014 was located between 560 feet in elevation on a northwest facing slope that is moderately steep. The soils that support this population are of the Los Gatos Series (USDA 1977). Associate plant species observed included ripgut brome*, wild oats*, narrowleaved goldenbush, and California sagebrush (*Artemisia californica*).



Photo 4. A small colony indicative of Heca11

- Physical Condition: Although this population comprised small colonies with few individuals all plants appeared in excellent physical condition and both mature and seedling stage individuals were observed. All individuals, which were mature (fruiting), appeared to be producing seeds during the 2014 season. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Size of individuals averaged 10 inches tall.
- With 100 percent of the population considered mature the age structure of the population suggests offspring are not being produced or not surviving to maturity. No assessment of the seed bank was attempted.
- Reproductive Success: Each of the three individuals that comprised this population had produced 3 flowering heads that were fruiting at the time of the observation. Had all of the potential fruiting flowers of each inflorescence (set seed the total number of seed potentially produced by this population is 999 (number of fertile disk flowers in each inflorescence is estimated at 111). Based on the number of mature versus immature individuals it is presumed this population is

healthy; however it may not be self-sustaining do to the lack of seedling and intermediate sized individuals.

- Availability of Suitable Habitat: Population Heca12 is extremely small in relation to the unoccupied suitable habitat that is on the adjacent north facing slopes to the east and west (approximately 180 acres). There was also an abundance of loam soils with the appropriate vegetation associations throughout these 150 acres, particularly on the north-facing aspects in the woodland understory and chamise chaparral-grassland ecotones. Therefore there is potential for expanding this population. No directly competing weed or native plant species were observed within or adjacent to this population.
- Diversity of Suitable Habitat: This population occupies habitat that is typical for this taxon in Contra Costa County.

Brewer's dwarf flax (Hebr2)

On May 14, 2014, a previously undocumented population of Brewer's dwarf flax was observed in the northwestern portion of the ranch near the head of Horse Valley (Figure 3). This population was two colonies comprised of 63 individuals by direct count, occupying approximately 40 square feet. Each colony occupied grassland and blue oak woodland ecotone habitat. These colonies occupied northerly facing aspects on moderate slopes between 450 to 650 feet in elevation. The soils that support this population are of the Los Gatos series (USDA 1977). There are micro habitat differences between the two colonies. The eastern colony is on a slope of very erosive soils above a drainage on the margin of blue oak woodland. The colony on erosive soils is accompanied by species representing high native cover of grasses and forbs such as purple needlegrass (*Stipa pulchra*), one-sided bluegrass (*Poa secunda* subsp. *secunda*), small tarweed (*Madia exigua*), and purple navarretia (*Navarretia pubescens*). The western colony, located in blue oak woodland understory, was accompanied by species such as hollyleaf redberry (*Rhamnus ilicifolia*), yarrow (*Achillea millefolium*), wild oats*, false brome (*Brachypodium distachyon*), and red brome (*Hordeum madritensis* subsp. *rubens*).



Photo 5. Habitat of Hebr2 near the head of Horse Valley.



Photo 6. Individual of Hebr2 in flower and bud.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were setting seed at the time of the observation. Size of individuals ranged from 3 to 5 inches.
- Age Structure: This characteristic is not applicable as Brewer's dwarf flax is an annual species.
- Reproductive Success: At the time of the observation, approximately 80 percent of the individuals were flowering and 20 percent were fruiting. All of the fruits/seeds inspected were either mature or maturing. An average of 3 inflorescences was estimated per individual. The total number of seed potentially produced in each inflorescence is 6. Based on the number of individuals and average number of inflorescences at this population it is presumed that 1,134 seeds (18 seeds per plant) could have been produced by this population in 2014. It is unknown at this time whether this population, represented by 63 individuals, is self-sustaining over the long term. However, given this is an annual plant population prone to fluctuations in population numbers based on climatic conditions and that it was only observed at one time (not over multiple years), it is possible the seed bank is abundant enough to maintain this population over the long term.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers western to northern aspects on loamy soils in the ecotone of blue oak-grassland, chaparral-grassland, or occasionally in open grassland (Bartosh pers. observation). Population Hebr2 appeared to be

underutilizing available and unoccupied ecotone habitat on loam soils within this portion of Horse Valley. Approximately 61 acres of unoccupied habitat is available for expansion in the immediate area. No directly competing weed or native plant species were observed within or adjacent to this population.

• Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types are not very strict, however the abundance of populations relative to unoccupied suitable habitat is high. Therefore, there are likely specific unknown micro habitat requirements this species needs in order to successfully occupy specific locations. This population occupies habitat that is typical for this taxon in Contra Costa County. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these micro habitat criteria.

Brewer's dwarf flax (Hebr3)

On May 20, 2014, a previously undocumented population of Brewer's dwarf flax was observed in the southern portion of the ranch near below (sough) of the inholding in Deer Valley (Figure 3). This a discrete population of 88 individuals enumerated by direct count occupying approximately 100 square feet. It is located on a steep northwest facing aspect at approximately 575 feet in elevation. The soils that support this population are of the Los Gatos series (USDA 1977). This population occupied an island of grassland surrounded by blue oak and chamise. Other associate species included red brome*, wild oats*, purple navarretia, California sagebrush, and leafy fleabane.



Photo 6. Habitat of Hebr3 on the south side of Deer Valley.



Photo 7. Individual of Hebr3 in flower.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were setting seed at the time of the observation. Size of individuals ranged from 4 to 8 inches.
- Age Structure: This characteristic is not applicable as Brewer's dwarf flax is an annual species.
- Reproductive Success: At the time of the observation, approximately 25 percent of the individuals were flowering and 25 percent were fruiting. All of the fruits/seeds inspected were either mature or maturing. An average of 5 inflorescences was estimated per individual. The total number of seed potentially produced in each inflorescence is 6. Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds produced is presumed to be 1,584 seeds (18 seeds per plant) could have been produced by this population in 2014. It is unknown at this time whether this population, represented by 88 individuals is self-sustaining over the long term. However, given this is an annual plant population prone to fluctuations in population numbers based on climatic conditions and it was only observed at one time (not over multiple years) it is possible the seed bank is abundant enough to maintain this population over the long term.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers western to northern aspects on loamy soils in the ecotone of blue oak-grassland, chaparral-grassland, or occasionally in open grassland (Bartosh pers. observation). Population Hebr3 appeared to be underutilizing available and unoccupied ecotone habitat on loam soils within this portion of Horse Valley. Approximately 170 acres of unoccupied habitat is available for expansion in the immediate area. No directly competing weed or native plant species were observed within or adjacent to this population.

• Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types which are not very strict however the abundance of populations relative to unoccupied suitable habitat is high. Therefore there are likely specific unknown micro habitat requirements this species needs in order to successfully occupy specific locations. This population occupies habitat that is typical for this taxon in Contra Costa County. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these habitat criteria.

Shining navarretia (Nani2)

On April 17, 2014, CNDDB EO # 62 was confirmed as extant within Roddy Ranch acquisition and is heretofore referenced as Nani2. This population comprises three colonies located in the western end of Horse Valley at Roddy Ranch (Figure 3). Two of these colonies were associated with the CNDDB occurrence, the western and middle colonies. The third colony (eastern) was previously unknown and not a part of the CNDDB dataset. The western colony was not relocated. Based on 2008 CNDDB data the western and middle colonies totaled "hundreds" of plants. During 2014 a total of 200 individuals were recorded from the middle and eastern colonies, enumerated by direct count. Each of these colonies nearly 100 plants and together occupied approximately 0.20 acre of grassland habitat that could also be characterized as clay barren. These colonies are located between 320 feet to 360 feet in elevation. The middle and eastern colonies were observed on a combination of west to south facing aspects of gentle to moderately steep slopes. The soil that support this population are of the Los Gatos Series and Altamont Fontana complex (USDA 1977). Associate plant species observed include longbeak storksbill*, few flowered evax (*Hesperevax sparsiflora* var. *sparsiflora*), Douglas' microseris, bur clover*, and Chilean trefoil. The eastern colony was also the location of roud-leaved filaree (Cama2).



Photo 8. Nani2 prior to flowering.



Photo 9. Shining navarretia (Nani2) habitat.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were in flower and setting seed at the time of the observation. Size of individuals ranged from approximately 1 to 3 inches tall.
- Age Structure: This characteristic is not applicable as shining navarretia is an annual species.
- Reproductive Success: At the time of the observation, approximately 60 percent of the individuals were flowering and 20 percent were fruiting. All of the fruits/seeds inspected were either mature or maturing. An average of 6 flowers was estimated per individual. The total number of seed potentially produced in each capsule is 5. Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds produced is presumed to be 6,000 seeds (30 seeds per plant) could have been produced by this population in 2014. It is unknown at this time whether this population, represented by 200 individuals is self-sustaining over the long term. However, given this is an annual plant population prone to fluctuations in population numbers based on climatic conditions and it was only observed at one time (not over multiple years) it is possible the seed bank is abundant to maintain this population over the long term.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers gentle slopes that are slightly elevated valley bottoms, aspects are less of a factor although a majority of populations in the region are southerly. The soil types that support this species in Contra Costa county include Altamont-Fontana complex and Los Gatos or Rincon series soils in annual grassland habitat (Bartosh pers. observation). The habitat typical of this soil type where shining navarretia is found is similar to where round-leaved filaree occurs, clay barrens in annual grassland habitat. Population Nani2 appeared to be underutilizing available and unoccupied clay barren habitat within this portion of Horse Valley. However, there is an abundance of the highly

invasive and competitive non-native species medusahead grass* in other clay barrens that may be an impediment to population expansion. There is also an infestation of medusahead grass* immediately adjacent (west) to the eastern colony of this population that while not currently cooccurring with shining navarretia has the potential to become established within this colony. Population expansion is not recommended until an effort to control these has been attempted and this threats have been controlled. Management considerations should be directed at developing control strategies for medusahead grass *. This effort should be focused on protecting this population which is the only known population in Horse Valley.

• Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types which are fairly strict. This population occupies habitat that is typical for this taxon in Contra Costa County. Therefore diversity of habitat that this taxon can occupy is limited to grasslands, on gentle slopes above valley bottoms, and on Altamont-Fontana complex and Los Gatos or Rincon series soils. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these criteria.

Shining navarretia (Nani3)

On April 17, 2014, a previously undocumented population of shining navarretia was observed in the western portion of the ranch near the head of and the north side of Deer Valley (Figure 3). This population is comprised of five colonies clustered together flanking the northwest and southeast sides of a stockpond in clay barren habitat of annual grassland. A total of 115 individuals were enumerated, by direct count, occupying approximately 100 square feet of habitat. The low cover (30 to 40%) clay barren/grassland habitat this population occupies is on south facing aspects of gentle slopes immediately above the valley bottom between 290 to 320 feet in elevation. The soils that support this population are of the Altamont-Fontana Complex and Rincon Series (USDA 1977). Associate plant species observed include abundant soft chess (*Bromus hordeaceus**), few flowered evax, adobe popcornflower (*Plagiobothrys acathocarpa*), red stemmed filaree (*Erodium cicutarium**), shining pepperweed (*Lepidium nitidum*), Italian ryegrass (*Festuca perennis**), and sand pygmyweed (*Crassula connata*). The CRPR 4.2 species hogwallow starfish (*Hesperevax caulescens*) was also observed co-occurring with this population.



Photo 10. Nani3 occupied clay barren/annual grassland habitat.



Photo 11. Flowering individuals of Nani3.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were in flower and setting seed at the time of the observation. Size of individuals ranged from approximately 1 to 2 inches;
- Age Structure: This characteristic is not applicable as shining navarretia is an annual species.

- Reproductive Success: At the time of the observation, approximately 30 percent of the individuals were flowering and 70 percent were in bud. At the time of the observation no fruit had been forming yet. All of the fruits/seeds inspected were either mature or maturing. An average of 3 flowers was estimated per individual. The total number of seed potentially produced in each capsule is 5. Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds produced is presumed to be 1,725 seeds (15 seeds per plant) could have been produced by this population in 2014. It is unknown at this time whether this population, represented by 115 individuals is self-sustaining over the long term. However, given this is an annual plant population prone to fluctuations in population numbers based on climatic conditions and it was only observed at one time (not over multiple years) it is possible the seed bank is abundant to maintain this population over the long term.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers gentle slopes that are slightly elevated valley bottoms, aspects are less of a factor although a majority of populations in the region are southerly. The soil types that support this species in Contra Costa county include Altamont-Fontana complex and Los Gatos or Rincon series soils in annual grassland habitat (Bartosh pers. observation). The habitat typical of this soil type where shining navarretia is found is similar to where round-leaved filaree occurs, clay barrens in annual grassland habitat. Population Nani3 appeared to be underutilizing available and unoccupied clay barren habitat within this portion of Deer Valley and no threats were observed within occupied habitat is available for expansion in the immediate area. No directly competing weed or native plant species were observed within or adjacent to this population.
- Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types which are fairly strict. This population occupies habitat that is typical for this taxon in Contra Costa County. Therefore diversity of habitat that this taxon can occupy is limited to grasslands, on gentle slopes above valley bottoms, and on Altamont-Fontana complex and Los Gatos or Rincon series soils. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these criteria.

Shining navarretia (Nani4)

On April 30, 2014, a previously undocumented population of shining navarretia was observed in the central portion of Deer Valley on south facing aspects north of the paved road and north of the inholding containing Roddy's house (Figure 3). This population is comprised of two separate colonies totaling 100 individuals in clay barren/annual grassland habitat occupying approximately 8,000 square feet (0.18 acre). The low cover (30 to 40%) clay barren/grassland habitat this population occupies is on a south facing aspects of moderate slope immediately above the valley bottom between 175 to 280 feet in elevation. These two colonies are referred to as the western and eastern colonies. The western colony is located immediately north of Roddy's house on a moderately steep slope with little vegetative cover. The eastern polygon is located northeast of Roddy's house immediate west of a cross-fence and trough both north and south of an unpaved ranch access road. The soils that support the western colony are of the Altamont-Fontana Complex while the eastern colony occurs on areas mapped as Pescadero Series, which is presumed to be a mapping error as the characteristics on the ground where this colony is located appeared to be of the Rincon Series, which is immediately adjacent (USDA 1977). Associate plant species observed included Italian ryegrass*, longstemmed filaree*, Douglas' microseris, few flowered evax, adobe popcornflower, and red maids (Calandrinia ciliata). Minor amounts of charlock (Sinapis arvensis*) were also observed co-occurring with this population.



Photo 12. Nani4 occupied clay barren/annual grassland habitat.



Photo 13. Flowering individuals of Nani4.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were in flower and setting seed at the time of the observation. Size of individuals ranged from approximately 1 to 2 inches tall with some individuals having multi-branched inflorescences.
- Age Structure: This characteristic is not applicable as shining navarretia is an annual species.

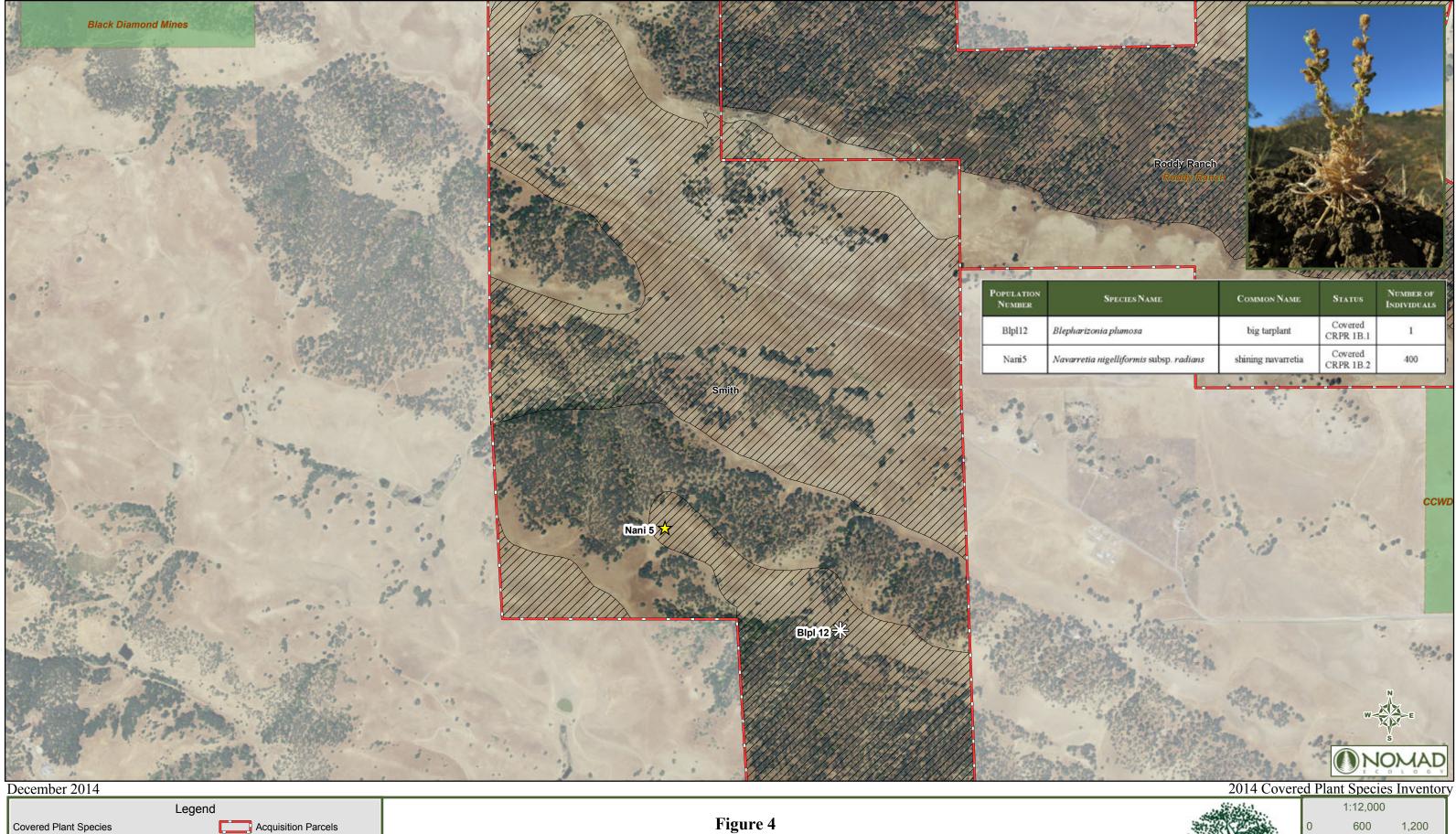
- Reproductive Success: At the time of the observation, approximately 50 percent of the individuals were flowering and 50 percent were in fruit. All of the fruits/seeds inspected were either mature or maturing. An average of 7 flowers was estimated per individual. The total number of seed potentially produced in each capsule is 5. Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds produced is presumed to be 3,500 seeds (35 seeds per plant) could have been produced by this population in 2014. It is unknown at this time whether this population, represented by 100 individuals is self-sustaining over the long term. However, given this is an annual plant population prone to fluctuations in population numbers based on climatic conditions and it was only observed at one time (not over multiple years), it is possible the seed bank is abundant enough to maintain this population over the long term.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers gentle slopes that are slightly elevated valley bottoms, aspects are less of a factor although a majority of populations in the region are southerly. The soil types that support this species in Contra Costa county include Altamont-Fontana complex and Los Gatos or Rincon series soils in annual grassland habitat (Bartosh pers. observation). The habitat typical of this soil type where shining navarretia is found is similar to where round-leaved filaree occurs, clay barrens in annual grassland habitat. Population Nani4 appeared to be underutilizing available and unoccupied clay barren habitat within this portion of Deer Valley. Although charlock* was identified as a co-occurring weed its abundance and stature did not appear to be threatening shining navarretia within these locations however it should be monitored to ensure that it does not become a competitor. Approximately 10 acres of unoccupied habitat is available for expansion in the immediate area to the east and west of this population on clay barren habitat.
- Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types which are fairly strict. This population occupies habitat that is typical for this taxon in Contra Costa County even though the eastern colony is mapped on Pescadero series soils that is considered an anomaly. Therefore diversity of habitat that this taxon can occupy is limited to grasslands, on gentle slopes above valley bottoms, and on Altamont-Fontana complex and Los Gatos or Rincon series soils. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these habitat criteria.

Smith

A total of two covered plant populations were observed within the Smith Property (Table 10, Figure 4). Although an occurrence of round-leaved filaree (EO #57) is mapped as occurring within the Smith property it is a non-specific location based on a 1929 herbarium collection. An effort was made to locate any round-leaf filaree populations, but none were observed on the Smith property. Other than this non-specific historic occurrence no extant populations of rare plant species were known from this property prior to these surveys. During 2014 surveys, populations of big tarplant and shining navarretia were observed in the southern half of the property outside of Briones Valley proper.

POPULATION NUMBER	Species Name	COMMON NAME	Status	NUMBER OF Individuals
Blpl12	Blepharizonia plumosa	big tarplant	Covered CRPR 1B.1	1
Nani5	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	400

Table 10. Covered Plant Species Populations Recorded on the Smith Property



Covered Plant Species

Observed on the Smith Property

East Contra Costa County Habitat Conservancy

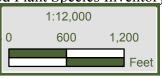
	Legend				
Covere	d Plant Species		Acquisition Parcels		
Scientific Name			Public Land and Easement		
☆	Navarretia nigelliformis subsp. radians		Survey Areas		
	Blepharizonia plumosa				

A population is defined as a single or group of colonies within 0.25 mile of each other and not separated by significant habitat discontinuities.

Sources: NAIP 2009; Contra Costa County Projection: NAD 83 UTM Zone 10 North.

Species Name	COMMON NAME	STATUS	NUMBER OF INDIVIDUALS
harizonia plumosa	big tarplant	Covered CRPR 1B.1	1
arretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	400





Big tarplant (Blpl12)

On September 24, 2014, a previously undocumented population of big tarplant was observed in the eastcentral portion of the Smith property in the valley to the south of Briones Valley. This population was observed on east side of the main northerly flowing drainage on a steep south facing aspect at approximately 650 feet in elevation. It occupied annual grassland habitat on a clay barren with 35 to 45 percent cover of annual grasses and forbs. The population was only represented by one individual, which is likely a result of poor germination due to precipitation and climatic conditions (Levine et al. 2008), as evidenced by reference populations in the region. This individual occupied a very small amount of habitat, however it is likely that a seed bank occupies more habitat than was represented by this single individual. The soils that support this population are of the Altamont Fontana Complex (USDA 1977). Associate plant species observed include black mustard (*Brassica nigra**), Italian ryegrass*, rose clover (*Trifolium hirtum**), wild oats*, and red brome*. There is also a low abundance of yellow starthistle (*Centaurea solsitialis**) occurring with big tarplant at this location.



Photo 14. Blpl12 occupied habitat in annual grassland looking east.



Photo 15. Blpl12 individual in fruit.

- Physical Condition: The plant at this location appeared in good condition although it appeared shorter statured than plants in average rain year. The lack of precipitation was a likely factor for the stunted appearance of this individual. Due to the presence of terpenoids produced by this plant species, they are unpalatable to cattle and are therefore not targeted for grazing by cattle. This individual is expected to survive and reproduce. This plant was eight inches tall.
- Age Structure: This characteristic is not applicable as big tarplant is an annual species.
- Reproductive Success: At the time of the observation, the single individual observed was 100 percent in fruit. All of the fruits/seeds inspected were either mature or maturing. Approximately 24 inflorescences were estimated on this individual. The total number of seed potentially produced in each inflorescence is 48, which includes the total number of disk and ray fruits (cypsela). Based on the number of individuals at this population and total possible number of seeds produced it is presumed that 1,152 seeds (1,152 seeds per plant) could have been produced by this population in 2014. However, it is unknown if a population represented by one individual is enough to maintain this population in the long term. Gathering additional census information during average precipitation years should be attempted to provide a better sense of the population size and its seed bank.
- Availability of Suitable Habitat: Throughout its range, especially within Contra Costa County, this taxon prefers northerly aspects on Altamont series or Altamont-Fontana complex soils in annual grassland habitat (Bartosh pers. observation). Population Blp112 may be underutilizing the available suitable habitat in the vicinity however it is difficult to say that definitively because of low germination of big tarplant in the region this year. The presence of yellow starthislte* is a concern management considerations should be directed at developing monitoring and control strategies for this invasive species.

• Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. Observation) habitat requirements for this taxon including slope, aspect, soil, and elevation (98 to 1,657 feet) are fairly strict. This population occupies habitat that is typical for this taxon in Contra Costa County. Therefore diversity of habitat that this taxon can occupy is limited to grasslands on north-facing aspects, slopes generally ranging between 30 to 50 percent, and on Altamont soils. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these criteria.

Shining navarretia (Nani5)

On April 15, 2014, a previously undocumented population of shining navarretia was observed in the western portion of the Smith property in the valley south of Briones Valley proper (Figure 4). This population was comprised of a single colony on a south west aspect on a clay barren in annual grassland with 30 to 40 percent cover of annual grasses and forbs. A total of 400 individuals, enumerated by direct count, occupied approximately 34,000 square feet (0.80 acre) of habitat. This population is on moderate slopes at approximately 800 feet in elevation. The soils that support this population are of the Altamont-Fontana Complex (USDA 1977). Associate plant species observed include few flowered evax, red stemmed filaree*, ripgut brome (*Bromus diandrus**), and wild oats*.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were in flower and setting seed at the time of the observation. Size of individuals ranged from approximately 1 to 3 inches tall.
- Age Structure: This characteristic is not applicable as shining navarretia is an annual species.
- Reproductive Success: At the time of the observation, approximately 2 percent of the individuals were flowering while the remaining 98 percent were in bud. The difference in flowering phenology compared to other shining navarretia populations observed during 2014 is likely to the elevation Nani5 occupies. An average of 5 flowers was estimated per individual. The total number of seed potentially produced in each capsule is 5. Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds produced is presumed to be 10,000 seeds (25 seeds per plant) could have been produced by this population in 2014. This is the largest population of shining navarretia documented during covered plant inventories to date. This population should be considered a core population in the region until more information on population dynamics is recorded. No directly competing weed or native plant species were observed within or adjacent to this population.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers gentle slopes that are slightly elevated valley bottoms, aspects are less of a factor although a majority of populations in the region are southerly. The soil types that support this species in Contra Costa County include Altamont-Fontana complex and Los Gatos or Rincon series soils in annual grassland habitat (Bartosh pers. observation). Population Nani5 appeared to be underutilizing available and unoccupied clay barren habitat within this portion of Deer Valley and no threats were observed within occupied habitat or unoccupied suitable habitat. Approximately 101,000 square feet (2.31 acres) of unoccupied habitat is available for expansion in the immediate area.
- Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types which are fairly strict. However, this population of shining navarretia

does occur at a higher elevation than is typical for this species and its conservation as a potential ecotype should be a priority. Therefore diversity of habitat that this taxon can occupy is limited to grasslands, on gentle slopes above valley bottoms (especially at lower elevations), and on Altamont-Fontana complex and Los Gatos or Rincon series soils. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these habitat criteria.

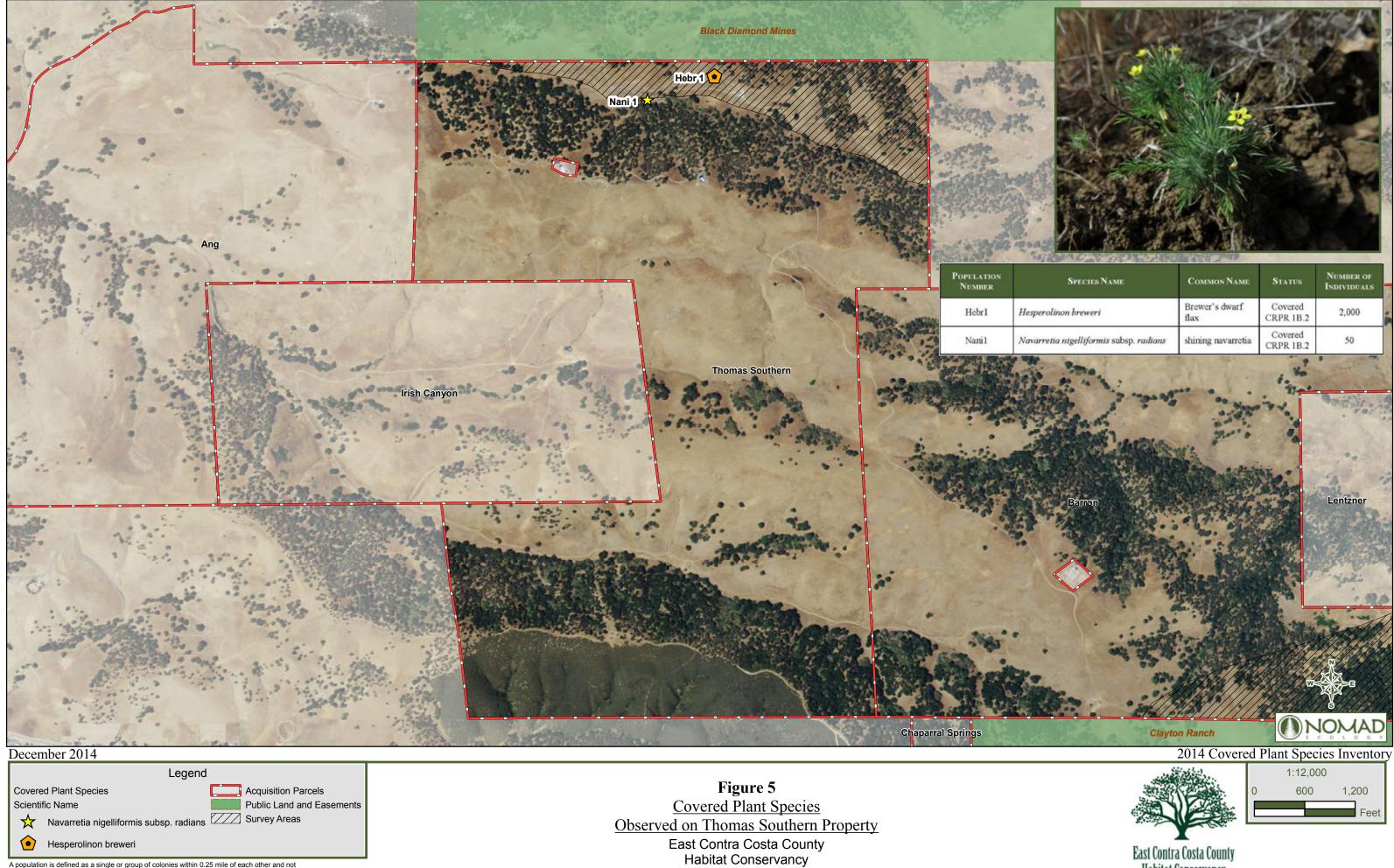
Thomas South

A total of two populations of covered plant species were observed within the Thomas South property (Table 11, Figure 5) during 2014 surveys. These populations include the species Brewer's dwarf flax and shining navarretia. This total does not include rare plant populations documented by Nomad in 2011 – 2013 such as big tarplant and Diablo helianthella. Aside from these populations no previously known CNDDB occurrences are known from this property. During Nomad's previous years' surveys this property was referred to as Thomas Kreigor.

It should also be noted that a significant discovery of a non-covered, but special-status plant species population was made during 2014 surveys. This species is Lime Ridge navarretia (*Navarettia gowenii*) and is discussed in more detail in Section 4.2 below.

POPULATION NUMBER	Species Name	COMMON NAME	Status	Number of Individuals
Hebr1	Hesperolinon breweri	Brewer's dwarf flax	Covered CRPR 1B.2	2,000
Nani1	Navarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	50

Table 11. Covered Plant Species Populations Recorded on the Thomas South Property



A population is defined as a single or group of colonies within 0.25 mile of each other and not separated by significant habitat discontinuities.

Sources: NAIP 2009; Contra Costa County Projection: NAD 83 UTM Zone 10 North.

Species Name	COMMON NAME	Status	NUMBER OF INDIVIDUALS	
Iesperolinon breweri	Brewer's dwarf flax	Covered CRPR 1B.2	2,000	-
lavarretia nigelliformis subsp. radians	shining navarretia	Covered CRPR 1B.2	50	



Brewer's dwarf flax (Hebr2)

On June 6, 2014, a previously undocumented population of Brewer's dwarf flax was observed along the northern boundary of the property north of the barn and paved road and between two stock ponds (Figure 5). This population is comprises a single colony of approximately 2,000 individuals, enumerated by direct count, occupying approximately 9,000 feet (0.21 acre) of annual grassland habitat. This colony is positioned on a northern aspect on a gentle slope flanking Kreigor Peak. This population lies at approximately 1,368 feet in elevation and is supported by Altamont Fontana Complex soils (USDA 1977) that can be characterized as clay barren. Associate species include threeray tarweed (*Deinandra lobbii*), Italian ryegrass*, Great Valley gumweed (*Grindelia camporum*), Jepson's coyote thistle (*Eryngium jepsonii*), soap plant (*Chlorogalum pomeridianum* subps. *pomeridianum*), soft chess*, and cream sacs (*Castilleja rubicundula* subsp. *lithospermoides*). A moderate abundance of medusahead grasss* was also recorded as occurring with this population.



Photo 16. Clay barren habitat of Hebr1.



Photo 17. Individuals of Hebr1 in flower and bud.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were setting seed at the time of the observation. Size of individuals averaged 10 inches which represents the largest average size of individuals for any population of Brewer's dwarf flax observed in 2014.
- Age Structure: This characteristic is not applicable as Brewer's dwarf flax is an annual species.
- Reproductive Success: At the time of the observation, approximately 90 percent of the individuals were flowering and 5 percent were fruiting, the remaining 5 percent of individuals had yet to produce reproductive structures. All of the fruits/seeds inspected were either mature or maturing. An average of 6 inflorescences was estimated per individual. The total number of seed potentially produced in each inflorescence is 6. Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds produced by this population in 2014 is presumed to be 72,000seeds (36 seeds per plant). This is the most abundant population observed during 2014 surveys.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers western to northern aspects on loamy soils in the ecotone of blue oak-grassland, chaparral-grassland, or occasionally in open grassland (Bartosh pers. observation). Population Hebr1 appeared to be underutilizing available and unoccupied ecotone habitat on loam soils within the immediate northern slopes of Kriegor Peak. Approximately 10 acres of unoccupied habitat is available for expansion in the immediate area. However, any attempts at population expansion should be focused on abating the threat posed by medusahead grass* which was observed occurring with this population and in the surrounding vicinity.
- Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper

slope, aspect, and soil types which are not very strict however the abundance of populations relative to unoccupied suitable habitat is high. Therefore, there are likely specific unknown micro habitat requirements this species needs in order to successfully occupy specific locations. This population occupies habitat that is typical for this taxon in Contra Costa County. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these habitat criteria.

Shining navarretia (Nani1)

On May 23, 2014, a previously undocumented population of shining navarretia was observed in the in the same vicinity as Hebr1 near the northern boundary of the Thomas Smith property on the northern flank of Kriegor Peak but immediately south of the paved road and west of the western most stock pond in the area (Figure 5). This is population is comprised of a single colony totaling 50 individuals in clay barren/annual grassland habitat occupying approximately 300 square feet (0.01 acre). The habitat this population occupies is on a northeast facing aspect of moderate slope immediately above the paved road that heads east at approximately 1,497 feet in elevation. The soils that support the western colony are of the Altamont-Fontana Complex (USDA 1977). Associate plant species observed include Italian ryegrass*, soft chess*, red brome*, Great Valley gumweed*, Jepson's coyote thistle, and chaparral clarkia (*Clarkia affinis*). A low abundance of medusahead grass* was also observed co-occurring with this population and is a common component of the grasslands on the northern flank of Kriegor Peak.



Photo 18. Nani1 individuals in clay barren habitat.

- Physical Condition: All individuals of this population appeared in good condition. No signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. This population is expected to survive and reproduce. Individuals were in flower and setting seed at the time of the observation. Size of individuals ranged from approximately 1 to 2 inches tall with some individuals having multi-branched inflorescences.
- Age Structure: This characteristic is not applicable as shining navarretia is an annual species.

- Reproductive Success: At the time of the observation, approximately 80 percent of the individuals were flowering and 10 percent were in fruit, and the remainder had not yet produced reproductive structures. All of the fruits/seeds inspected were either mature or maturing. An average of 6 flowers was estimated per individual. The total number of seed potentially produced in each capsule is 5. Based on the number of individuals and average number of inflorescences at this population the total possible number of seeds that could have been produced by this population in 2014 is presumed to be 1,500 seeds (30 seeds per plant). It is unknown at this time whether this population, represented by 50 individuals is self-sustaining over the long term. However, given this is an annual plant population prone to fluctuations in population numbers based on climatic conditions and it was only observed at one time (not over multiple years) it is possible the seed bank is abundant enough to maintain this population over the long term.
- Availability of Suitable Habitat: Within Contra Costa County, this taxon prefers gentle slopes that are slightly elevated valley bottoms, aspects are less of a factor although a majority of populations in the region are southerly. The soil types that support this species in Contra Costa County include Altamont-Fontana complex and Los Gatos or Rincon series soils in annual grassland habitat (Bartosh pers. observation). Population Nani1 appeared to be underutilizing available and unoccupied clay barren habitat within this portion of the Thomas South property. However, efforts to control medusahead grass* in this vicinity should be made prior to any population expansion efforts. Approximately 10 acres of unoccupied habitat is available for expansion in the immediate area to the east and west of this population on clay barren habitat.
- Diversity of Suitable Habitat: Based on the information associated with specific California Natural Diversity Database (CNDDB) (CDFW) locations in Contra Costa County and personal observations (Bartosh pers. observation) habitat requirements for this taxon including the proper slope, aspect, and soil types which are fairly strict. This population occupies habitat that is atypical for the elevation ranges for this taxon in Contra Costa County. Therefore this population may represent an ecotype adapted to the climate of Kriegor Peak.

4.2. NON-COVERED RARE PLANT OCCURRENCES

In addition to covered plant species, seven rare plant species (Table 12) not covered by the HCP/NCCP were observed during 2014 surveys. These plant species are included in the California Native Plant Society's *Inventory of Rare and Endangered Plants* (CNPS 2001; 2014). These species include: Contra Costa manzanita (*Arctostaphylos manzanita* subp. *laevigata*; CRPR 1B.2), small-flowered morning glory (*Convolvulus simulans* CRPR 4.2), serpentine bedstraw (*Galium andrewsii* subsp. *gatense* CRPR 4.2), Lime Ridge navarretia (*Navarretia gowenii*; CRPR 1B.1), howgwallow starfish (*Hesperevax caulescens*; CRPR 4.2), sylvan microseris (*Microseris sylvatica*; CRPR 4.2), and Michael's rein orchid (*Piperia michaelii*, CRPR 4.2).

Non-Covered Rare Plants	BARRON	RODDY RANCH	HIIH	THOMAS SOUTH	TOTAL # OF Populations
Arctostaphylos manzanita subsp. laevigata Contra Costa manzanita	0	1	0	0	1
Convolvulus simulans small-flowered morning glory	0	4	1	0	5
Galium andrewsii subsp. gatense serpentine bedstraw	0	2	0	0	2
Navarretia gowenii Lime Ridge navarretia	0	0	0	1	1
Hesperevax caulescens hogwallow starfish	0	2	0	0	2
Microseris sylvatica sylvan microseris	0	1	0	0	1
<i>Piperia michaelii</i> Michael's rein orchid	0	1	0	0	1

Table 12. Number of Non-Covered Rare Plant Populations Recorded by Acquisition (2014)

4.2.1 CONTRA COSTA MANZANITA

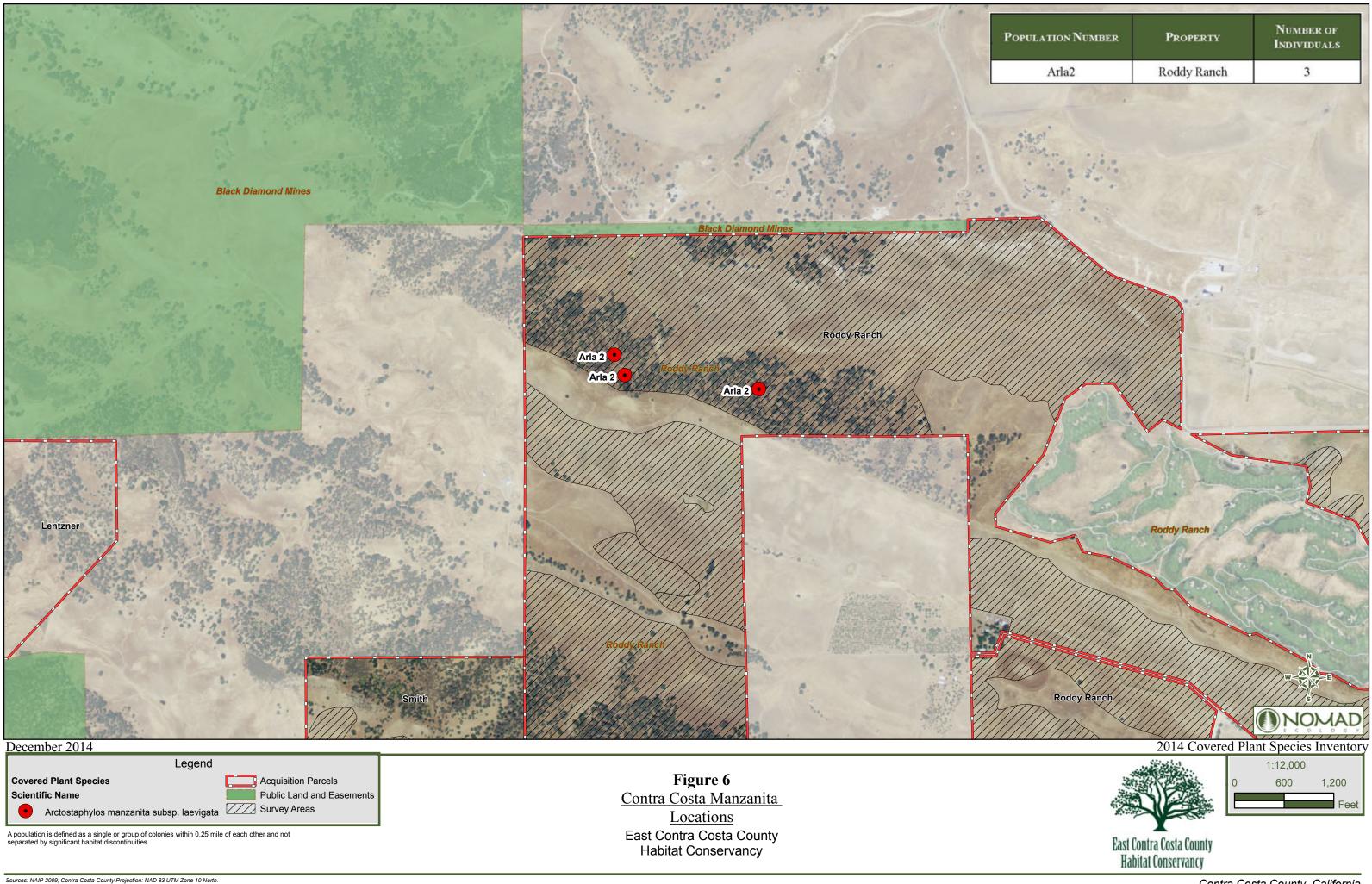
During surveys conducted on May 14, 2014 one population (Arla2) of Contra Costa manzanita was recorded on Roddy Ranch (Table 13; Figure 6). A total of three individuals were observed. It should be noted that Contra Costa manzanita in this part of the Mount Diablo region is pushing the boundary of its southern distribution and many of the individuals observed on Roddy Ranch appeared to be intermediates between Contra Costa manzanita and the common manzanita species (*Arctostaphylos manzanita* subsp. *manzanita*) which is more abundant in Black Diamond Mines Regional Preserve. The three individuals identified as Contra Costa manzanita determined based on an average of three to four inflorescence branches and bright green leaves.

Table 13. Location of C	Contra Costa manzanita	within Preserves
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POPULATION NUMBER	PROPERTY	Number of Individuals
Arla2	Roddy Ranch	3

⁺ Number of individuals determined by direct population count.

Population Arla2 was observed on Roddy Ranch property containing three individuals, supported by soils mapped as Los Gatos loam (USDA 1977). This population is located in the northwestern corner of Roddy Ranch on a steep north facing slope blue oak woodland ranging from 520 to 700 feet elevation.



4.2.2 SMALL-FLOWERED MORNING GLORY

During surveys conducted April 10, 2014 a single population of small-flowered morning glory was recorded on the Smith property. (Table 14, Figure 7). During surveys conducted April 7, 9, and 10, 2014, four populations of small flowered morning glory were recorded on Roddy Ranch. Although this plant is widely distributed from the interior East Bay south to Baja California (Baldwin et al. 2012) it is extremely rare in Contra Costa County. Due to the results of the 2014 surveys this species in now considered more abundant than previously known data (CCH 2014) indicates.

POPULATION NUMBER	Property	NUMBER OF Individuals
Cosi4	Roddy Ranch	182
Cosi5	Roddy Ranch	108
Cosi6	Roddy Ranch	750
Cosi8	Roddy Ranch	80
Cosi7	Smith Ranch	556

 Table 14. Locations of Small-Flowered Morning Glory within Preserves

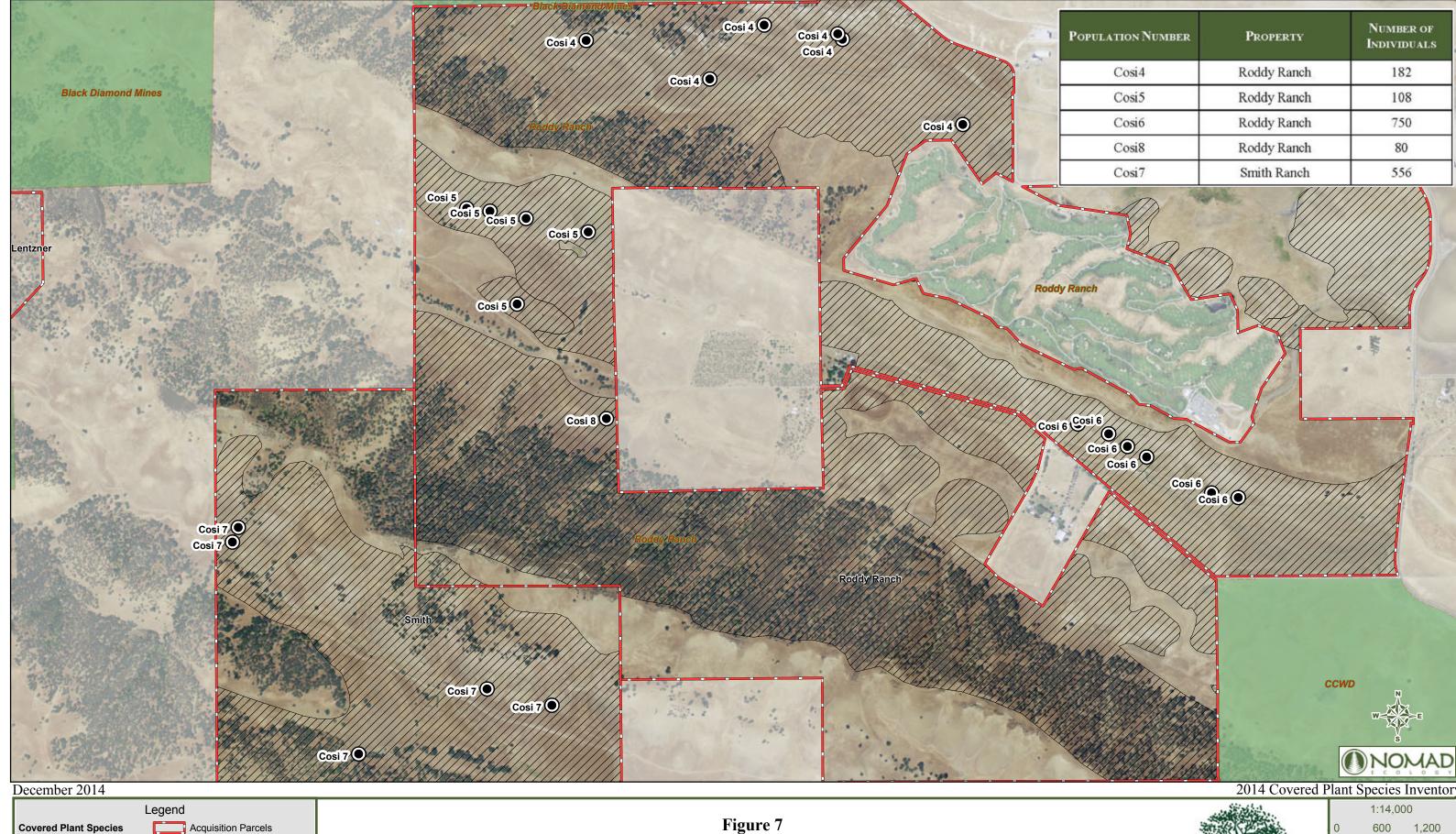
Population Cosi4 was observed on Roddy Ranch on April 7, 2014 totaling an estimated 182 individuals on clay barrens with sparse vegetation cover, supported by soils mapped as Altamont clay and Altamont-Fontana Complex (USDA 1977). This population is located on south and southeast facing aspects in and on the edges of Horse Valley ranging from 220 feet to 480 feet in elevation. A voucher specimen (Collection #912) was collected from this population.

Population Cosi5 was observed on Roddy Ranch on April 7, 2014 with an estimated 108 individuals on a silty-clay pocket with sparse vegetation cover, supported by soils mapped as Altamont clay and Altamont-Fontana Complex (USDA 1977). This population is located on south and southeast facing aspects of moderate slopes in the western end of Deer Valley ranging from 250 to 350 feet in elevation.

Population Cosi6 was observed on Roddy Ranch on April 9, 2014 with an estimated 750 individuals on clay barrens dominated by bur clover (*Medicago polymorpha**), supported by soils mapped as Pescadero clay loam and Altamont-Fontana Complex (USDA 1977). This population is located on south facing moderate slopes in Deer Valley ranging from 190 to 230 feet elevation. A voucher specimen (Collection #928) was collected from this population.

The population observed on Smith (Cosi7) was estimated at 556 individuals on clay barrens, with little grassland vegetative cover, supported by soils mapped as Altamont clay and Altamont-Fontana Complex (USDA 1977). This population is located on a south facing aspect in the west end of Briones Valley at approximately 500 feet elevation. This population is threatened by an infestation of charlock*. A voucher specimen (Collection #931) was collected within this population.

Population Cosi8 was observed on Roddy Ranch on April 10, 2014 with an estimated 80 individuals on clay barrens with low vegetation cover, supported by soils mapped as Altamont clay (USDA 1977). This population is located on a south facing moderate slope on the southern side of Deer Valley at approximately 460 feet elevation.



A population is defined as a single or group of colonies within 0.25 mile of each other and not separated by significant habitat discontinuities.

Public Land and Easements

Small Flowered Morning Glory Locations East Contra Costa County Habitat Conservancy

Convolvulus simulans

Scientific Name

PULATION NUMBER	PROPERTY	NUMBER OF INDIVIDUALS
Cosi4	Roddy Ranch	182
Cosi5	Roddy Ranch	108
Cosió	Roddy Ranch	750
Cosi8	Roddy Ranch	80
Cosi7	Smith Ranch	556



P.	lant	Species	Inventory
I		1:14,00	0
	0	600	1,200
			Feet

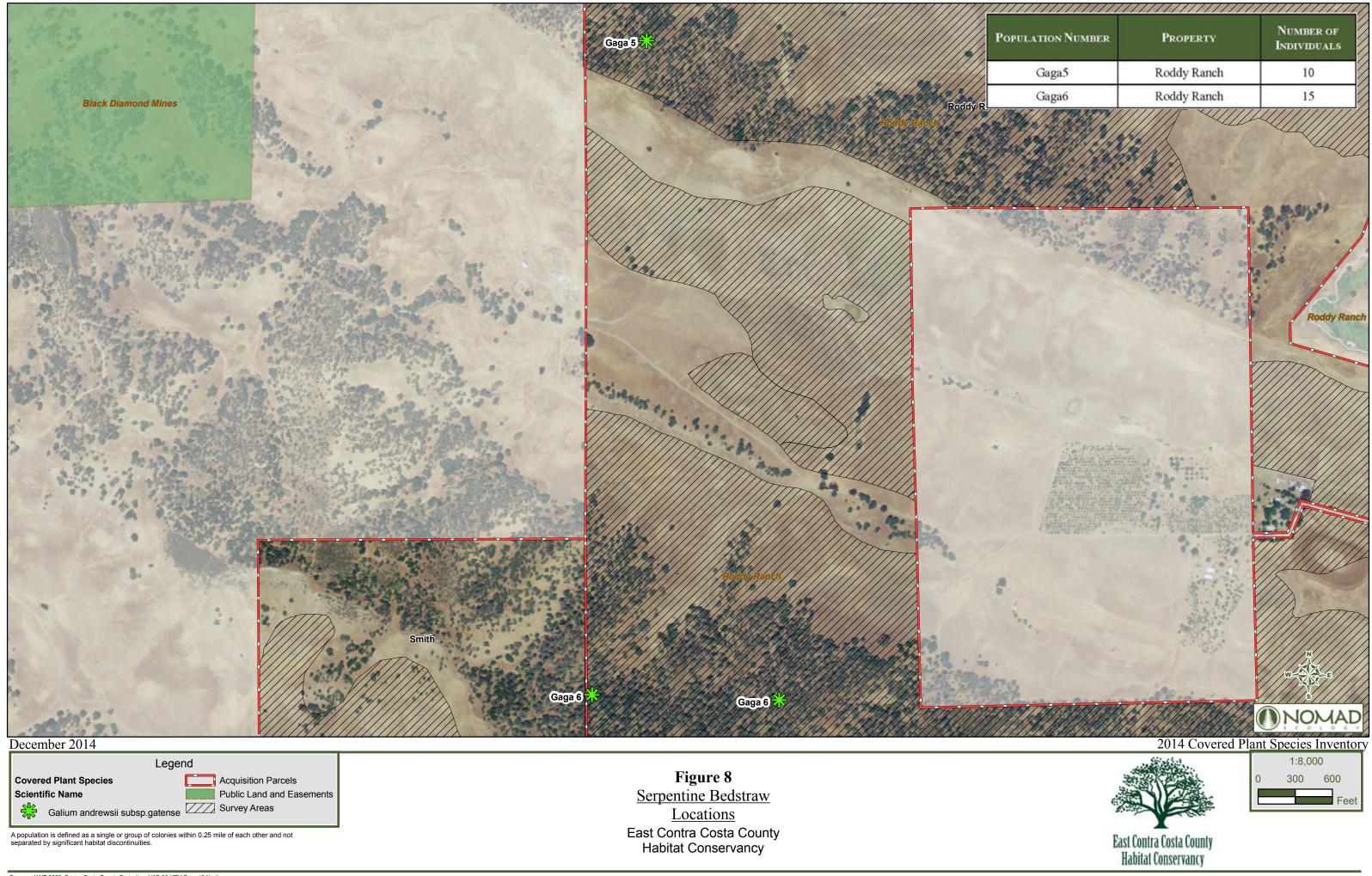
4.2.3 SERPENTINE BEDSTRAW

During 2014 surveys two populations (Gaga5 & Gaga6) of serpentine bedstraw were recorded on Roddy Ranch (Table 15; Figure 8). Together these populations total 25 individuals. It should be noted that although the common name may imply this species is restricted to serpentine habitat is can also grow off serpentinite. This species is primarily distributed in the Diablo Range however it is also found in the Santa Cruz Mountains. It is uncommon in the Mount Diablo Region.

POPULATION NUMBER	Property	NUMBER OF Individuals
Gaga5	Roddy Ranch	10
Gaga6	Roddy Ranch	15

Population Gaga5 was observed on Roddy Ranch property on May 5, 2014 with an estimated 10 individuals, supported by soils mapped as Los Gatos loam (USDA 1977). This population is located in the northwestern portion of Roddy Ranch on a steep north facing aspects in blue oak woodland at approximately 645 feet elevation.

Population Gaga6 was observed on Roddy Ranch on May 5, 2014 with an estimated 15 individuals, supported by soils mapped as Los Gatos loam (USDA 1977). This population is located along the western boundary of Roddy Ranch and the Smith Property on a steep north facing slope in grey pine (*Pinus sabiniana*) and interior live oak woodland (*Quercus wislizeni* var. *wislizeni*) at approximately 670 feet elevation.



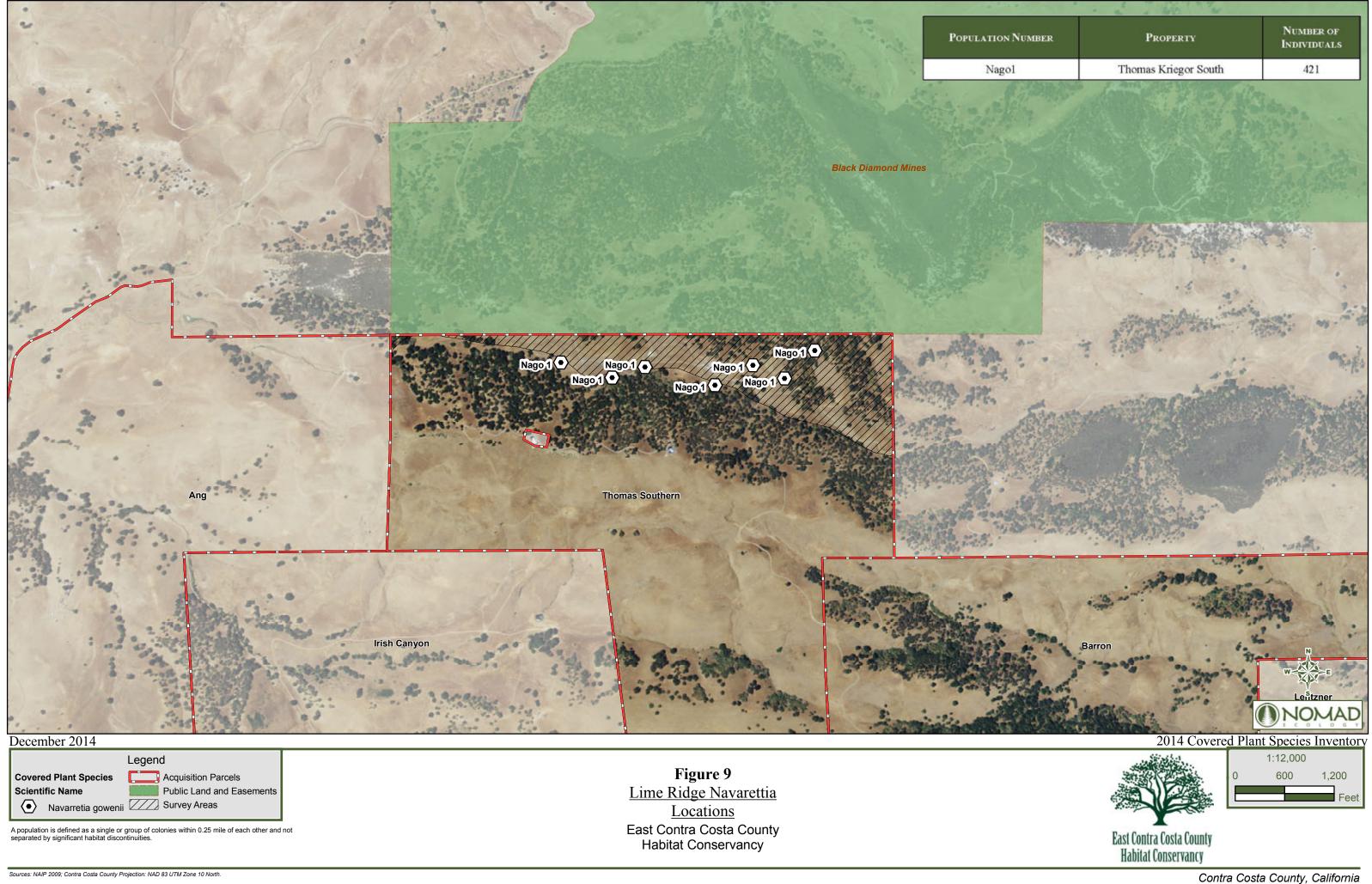
4.2.1 LIME RIDGE NAVARRETIA

During 2014 surveys one population (Nago1) of Lime Ridge navarretia was recorded on the Thomas South property (Table 16; Figure 9). This species is a recently described taxon new to science in 2007 and added to the CNPS Inventory in 2008 (CNPS 2014). Prior to this year's survey effort Lime Ridge had only been known from two locations Lime Ridge Open Space in Walnut Creek and Quito Canyon in Stanislaus County. Mr. Bartosh has been monitoring the Lime Ridge populations for the past three years and these populations have not produced more than 100 individuals in each of those years. Population counts are not available for the Quito Canyon population (CNDDB 2014). Based on the population count in this report the Lime Ridge navarretia population at the Thomas South property is the most abundant currently known in Contra Costa County. This discovery gives us the opportunity to learn more about a plant whose habitat requirements we are just beginning to understand.

Table 16. Location of Lime Ridge navarretia within Preserves.

Population Number	Property	NUMBER OF Individuals	
Nago1	Thomas Kriegor South	421	

The population on the Thomas Southern property (Nago1) was observed on May 23, 2014 with an estimated 421 individuals on a clay barren in grassland with low vegetation cover, supported by soil mapped as Altamont-Fontana complex and Los Gatos loam (USDA 1977). This population is located on moderate to steep north facing slope ranging from 1450 to 1520 feet in elevation. Medusahead* occupies much of the habitat associated with this population. This species of invasive grass has been known to invade other harsh soil types in California and poses a threat to this rare plant population.



4.2.2 HOGWALLOW STARFISH

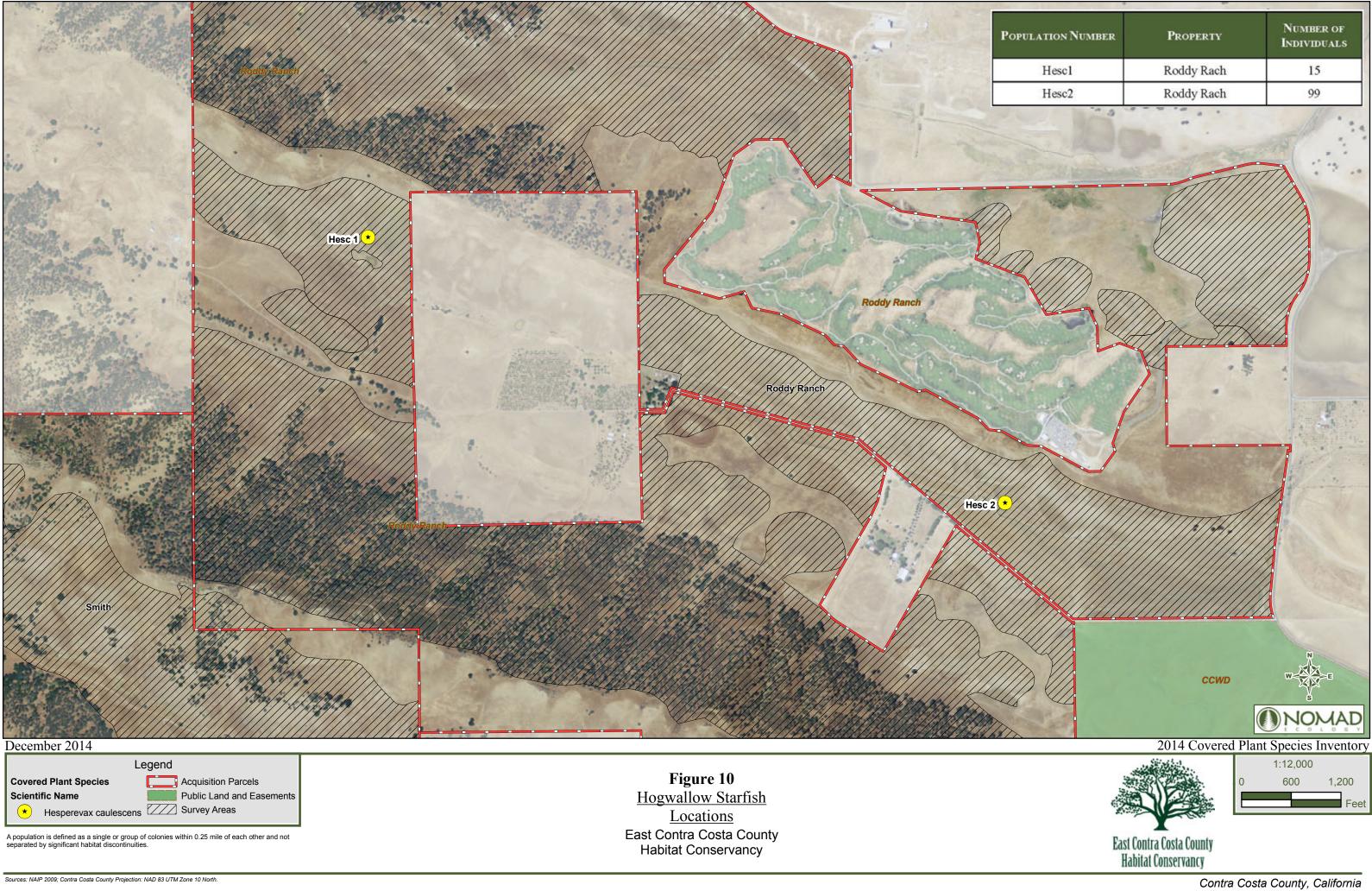
During survey conducted in 2014 two populations (Hesc1 & Hesc2) of hogwallow starfish were recorded on Roddy Ranch (Table 17; Figure 10). Together these populations total 114 individuals. These populations co-occurred with either shining navarretia or round-leaved filaree.

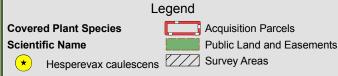
POPULATION NUMBER	Property	NUMBER OF Individuals	
Hesc1	Roddy Rach	15	
Hesc2	Roddy Rach	99	

 Table 17. Location of hogwallow starfish within Preserves

Population Hesc1 was observed on Roddy Ranch on April 17, 2014 with an estimated 15 individuals on a clay barren pocket with sparse vegetation cover, supported by soils mapped as Altamont-Fontana Complex (USDA 1977). This population is located on south facing moderate slopes in the north end of Deer Valley at approximately 325 feet elevation.

Population Hesc2 was observed on Roddy Ranch on April 9, 2014 with an estimated 99 individuals, growing on the border of soils mapped as Rincon clay loam and Altamont-Fontana complex (USDA 1977). This population is located on south facing moderate slopes just north of Deer Creek at approximately 200 feet in elevation.





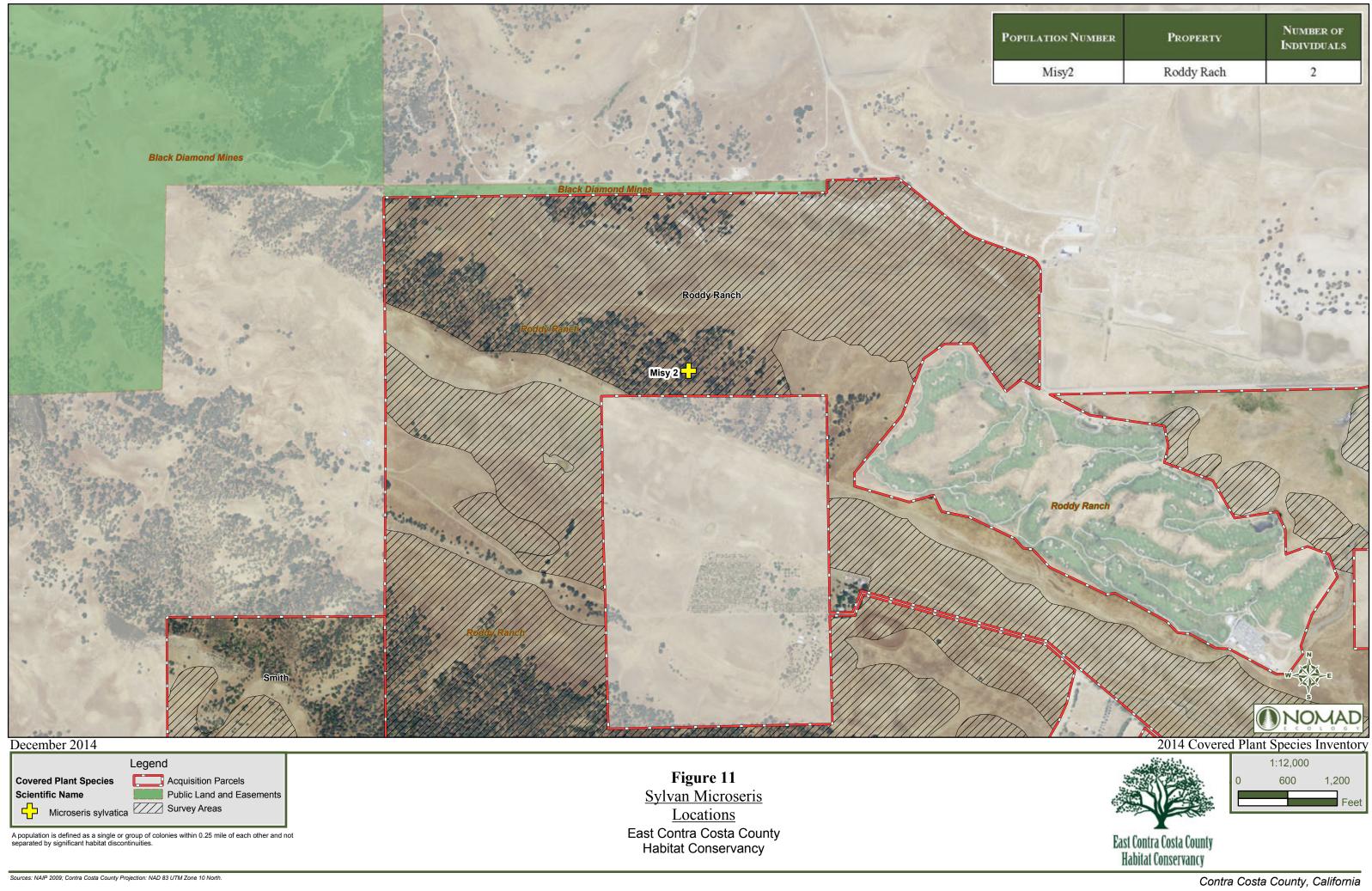
4.2.3 SYLVAN MICROSERIS

During 2014 surveys one population (Misy2) of sylvan microseris was recorded on Roddy Ranch (Table 18; Figure 11).

 Table 18. Locations of sylvan microseris within Preserves

POPULATION NUMBER	Property	NUMBER OF Individuals	
Misy2	Roddy Rach	2	

Population Misy2 was observed on Roddy Ranch property on May 14, 2014 with an estimated 2 individuals, supported by soils mapped as Los Gatos loam (USDA 1977). This population is located in the northern portion of Roddy Ranch on a steep north facing slope blue oak woodland at approximately 440 feet elevation.



4.2.4 MICHAEL'S REIN ORCHID

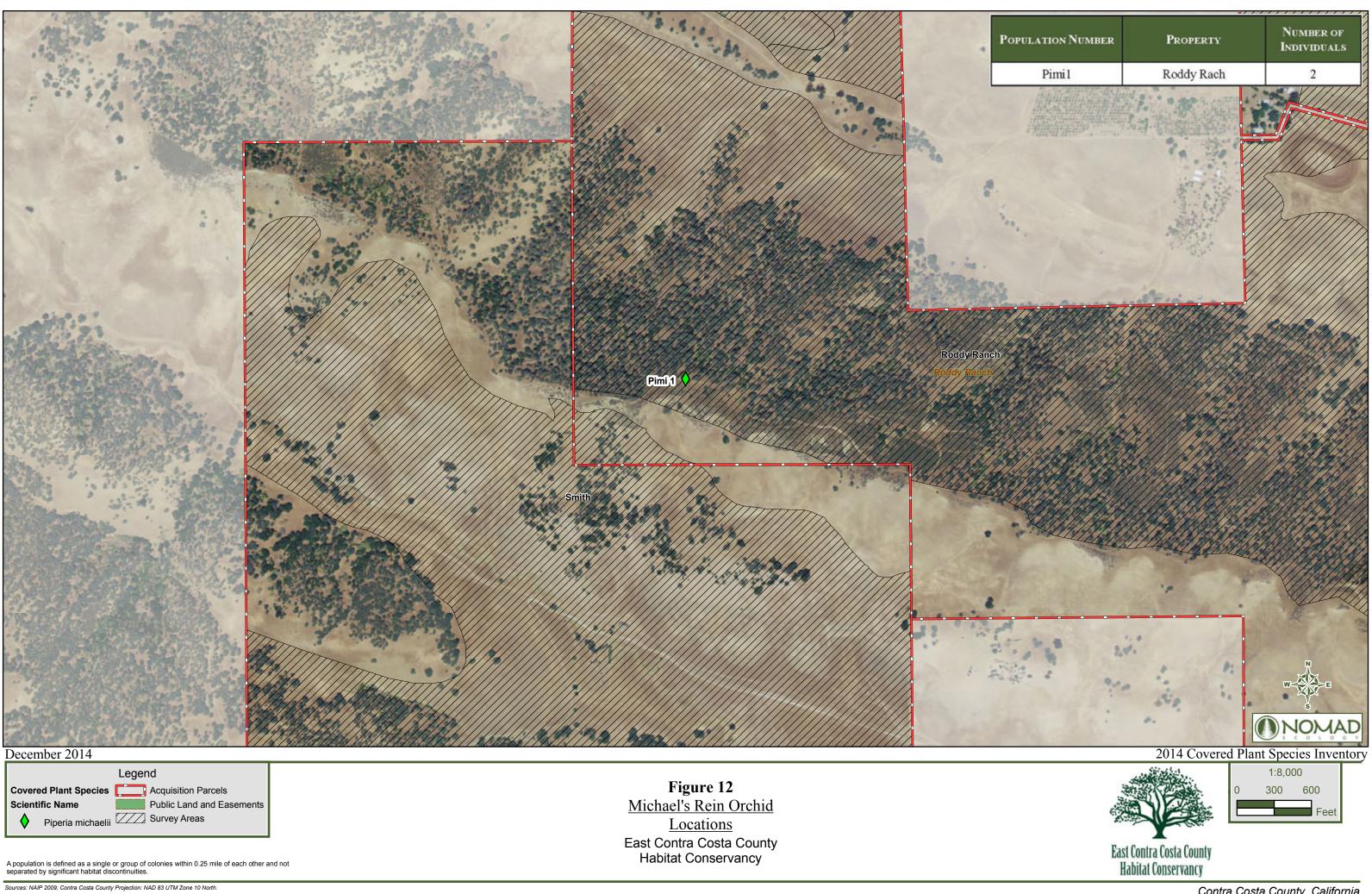
During 2014 surveys one population (Pimi1) of Michael's rein orchard was recorded on Roddy Ranch (Table 19; Figure 12).

Table 19. Locations of Michael's rein orchard within Preserves

POPULATION NUMBER	Property	NUMBER OF Individuals	
Pimi1	Roddy Rach	2	

⁺ Number of individuals determined by direct population count.

Population Pimi1 was observed on Roddy Ranch property on May14, 2014 containing 2 individuals, supported by soils mapped as Los Gatos loam (USDA 1977). This population is located in the southwestern portion of Roddy Ranch on a ridge top just off a dirt road in blue oak woodland at approximately 825 feet elevation.





Section 5. SUMMARY AND RECOMMENDATIONS

5.1. SUMMARY

Based on the results of the 2014 surveys conducted during the months of March, April, May, June, and September, a total of 13 populations of covered plant species were recorded. To date, 74 percent of the population specific goals for all covered species have been met (Table 20). No population specific goals were identified for San Joaquin spearscale or shining (adobe) navarretia other than landscape- and community-level measures aimed at maintaining or enhancing its preserve populations. Overall, populations of covered plant species are considered healthy based on positive observations of physical condition, reproductive success, and abundance and diversity of suitable habitat. A majority of the populations of covered species recorded did not appear to be threatened by non-native invasive weeds, with the exception of some shining navarretia and the round-leaved filaree populations. These are discussed below.

Species Recorded	BIOLOGICAL GOALS – # of Populations Targeted For Protection	2011 Populations Recorded (Nomad 2011)	2012 Populations Recorded (Nomad 2012)	2013 Populations Recorded (Nomad 2013)	2014 Population s Recorded	Populations Needed to Meet Biological Goals
Arctostaphylos auriculata Mount Diablo manzanita	2	0	0	0	0	2
<i>Atriplex depressa</i> brittlescale	2	1	0	0	0	1
<i>Extriplex joaquinana</i> San Joaquin spearscale	N/A	6*	1	1	0	N/A
Blepharizonia plumosa big tarplant	5^	2	1	8	1	0
<i>California macrophylla</i> round-leaved filaree	2	1**	0	0	1	0
<i>Calochortus pulchellus</i> Mt. Diablo fairy lantern	1	0	1	3	0	0
Delphinium recurvatum recurved larkspur	2	0	0	0	0	2
<i>Helianthella castanea</i> Diablo helianthella	2	1	5	3	3	0
Hesperolinon breweri Brewer's dwarf flax	3	0	0	0	3	0
<i>Navarretia nigelliformis</i> subsp. <i>radians</i> shining navarretia	N/A	0	0	0	5	N/A

Table 20. Summary of Biological Goals Met Based on 2011- 2014 Surveys.

There is a discrepancy between Biological Goals as presented in Table 5-1 (3 populations) and page 5-126 (5 populations) of the HCP/NCCP.

*One of these populations a result of translocation efforts.

** Observation is a result from surveys by Insignia Environmental (2011).

5.2. RECOMMENDATIONS

Recommendations are based on details of field observations with the purpose of meeting biological goals as outlined in the HCP/NCCP, weed control, additional habitat models, and gathering information on undocumented rare vegetation types.

5.2.1 COVERED PLANT INVENTORIES

Since population specific biological goals have not been fully met, covered plant inventories should be conducted during the appropriate blooming periods, based on suitable habitat, in 2015. These surveys should be directed at unsurveyed Conservancy parcels, or at the remaining portions of surveyed Conservancy parcels, for relevant covered and no-take plant species. Covered and/or no-take species and preserves targeted for next year should be determined based on the current needs of the HCP/NCCP and the direction of Conservancy personnel. However, efforts in 2015 should focus on covered plant species that have yet to be found on Conservancy acquisitions, particularly, recurved larkspur and brittlescale on the Vaquero Farms preserves; and Mount Diablo manzanita on the Viera-Perley aquisition.

5.2.2 POPULATION MONITORING

Of the covered plant species populations recorded in 2014, seven were recorded as having small population numbers (Table 21), which we define as 100 individuals or less. Based on 2014 observations, it is possible these populations may either be in decline or too small to be viable for the long term. The HCP/NCCP states that several surveys per season or surveys over multiple years may be necessary to assess all relevant site and population characteristics to ensure that populations within potential preserves are healthier than populations lost to covered activities (Jones and Stokes 2006). Population monitoring should be conducted on a regular basis. However, priorities for monitoring should be based on populations that are in danger of becoming extirpated because of low population numbers or showing signs of decline. For these populations a census should be conducted annually and should result in recommendations for enhancing and/or expanding the population to ensure survivability. Populations that have large numbers of individuals or are known to be sustaining themselves based on existing data could be monitored less frequently, every two or three years.

It should be noted that low numbers for Brewer's dwarf flax and big tarplant may be due to below average rainfall totals for the 2013/2014 rainy season or unfavorable germination cues such as temperatures after the first major rainfall event (Levine et al. 2008). As annual plant species they are more susceptible to fluctuations in annual weather patterns and precipitation. Nevertheless these populations should be priorities for monitoring efforts. Management considerations for these taxa should be focused on annual population monitoring paying particular attention to number of individuals. These efforts should be conducted in all types of rainfall years to understand how these populations are affected by varying rainfall patterns.

Population Number	Species Name/ Common Name	Property	Previous CNDDB Census Data (# of Individuals)	Number of Individuals (2014)
Blpl12	<i>Blepharizonia plumosa</i> big tarplant	Smith	No Data	1
Cama2	California macrophylla	Roddy Ranch	No Data	85
Hebr2	<i>Hesperolinon breweri</i> Brewer's dwarf flax	Roddy Ranch	No Data	63
Hebr3	<i>Hesperolinon breweri</i> Brewer's dwarf flax	Roddy Ranch	No Data	88
Heca11 (CNDDB EO#70)	<i>Helianthella castanea</i> Diablo helianthella	Roddy Ranch	136	64
Heca12 (CNDDB EO#71)	<i>Helianthella castanea</i> Diablo helianthella	Roddy Ranch	36	3
Nani 1	<i>Navarretia nigelliformis</i> subsp. <i>radians</i> shining navarretia	Thomas South	No Data	50

 Table 21. Covered Plant Species Populations with Low Population Numbers.

5.2.3 WEED CONTROL

During 2014 surveys several noxious weed species populations were recorded within preserve properties. The most abundant weed infestations were of medusahead grass (*Elymus caput-medusae**) on Roddy Ranch and Thomas South. This graminoid species has the ability covert native and non-native grasslands into monocultures of this invasive grass and can directly threaten covered plant species habitat. A low abundance of yellow starthistle* was observed threatening big tarplant on Smith. Management considerations for these weed species should concentrate on abatement and eventual eradication by first compiling known treatment strategies then determining which may be the most effective based on tools and budget available to the Conservancy. Fine scale information on local timing of germination of these weeds and the covered plant species they threatened should be collected to maximize weed abatement effectiveness while avoiding harm to rare plants. Additionally, charlock* may have a negative effect on shining navarretia habitat however little is known about how this species interacts with clay barrens therefore it should be monitored before taking action. Locations of these infestations are associated with the covered plant population numbers depicted below (Table 22).

WEED Species Name/ Common Name	Property	Population Number	Recommended Activity
<i>Centaurea solstitialis</i> yellow starthistle	Smith	Blpl12	Abatement
<i>Elymus caput-medusae</i> medusahead grass	Roddy Ranch Thomas South	Cama2, Hebr2 Nani1 Nani2	Abatement
Sinapis arvensis charlock	Roddy Ranch	Nani4	Monitor

Table 22. Noxious Weed Threats.

5.2.4 LIME RIDGE NAVARRETIA HABITAT MODEL

Lime Ridge navarretia is a relatively recently recognized species and based on its currently known distribution may be naturally rare. Although Lime Ridge navarretia is not a covered species under this HCP/NCCP its recent recognition and narrow distribution make it one of the rarest plants in the inventory area and we recommend it be considered as an addition to the no-take species list as a part of the HCP/NCCP. To support this effort a habitat model should be developed to quantify the availability of potentially suitable within the inventory area. Habitat for this species is just beginning to be understood on a local scale, especially with the discovery of the population on Thomas South. With this new insight into Lime Ridge navarretia habitat, a habitat model based on vegetation, soil, and geology criteria could be developed to aid in locating additional populations. The development of a habitat model would increase the possibility of the discovery of additional populations within the HCP Inventory area.

5.2.5 CLAY BARREN STUDY

Clay barren habitat, as observed in the annual grasslands of HCP acquisition properties, supports an abundance of covered and other rare plant species. However, little is known about this type of habitat locally, and it is not described in the literature. Describing the composition and vegetative cover of this habitat would elevate its' prominence in the literature, which would further support its' recognition as a sensitive natural community.

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Personal Observations

Bartosh, Heath. 2002-2014. Rare plant field observations of numerous populations in Contra Costa County.

APPENDIX A CNDDB FIELD FORMS

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Visible disturbances: <u>None</u>		0		
Threats: <u>Non-nature</u> wards Comments: <u>Site</u> rated as go of Brassian Myra				[
Illeas: Nor-hanve weeds				
Comments: Site rated as so	roel and not exe	lent becau	use of the abo	indiance
of Brassian marine	,		-	
moustly a particular	6 4 -			
· · · · · · · · · · · · · · · · · · ·				
Determination: (check one or more, and fill in bla	nks)		Photographs: (check one or me	ore)
Keyed (cite reference):				Slide Print Digital
Compared with specimen housed at:			Plant / animal	
Compared with photo / drawing in:			Habitat	
By another person (name):			Diagnostic feature	
Other:	······································	N	May we obtain duplicates at our ex	kpense? Oyes Ono

CDFW/BDB/1747 Rev. 8/10/2014

Mail to:			
California Natural Diversity Datab		For Office Use Only	
California Dept. of Fish & Wildlit 1807 13 th Street, Suite 202	e Sourc	e Code: Quad Code	e:
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wi	Idlife.ca.gov Elm C	ode: Occ No.:	
Date of Field Work (mm/dd/yyyy): 4	17/14 EO In	dex: Map Index:	·
Clear Form California	a Native Specie	s Field Survey Form	Print Form
Scientific Name: California	macrophylla		
Common Name: round-leafed	et / V		
Species Found? 🛞 🔘	If not found, why?	Reporter: Heath Bastash/	Nomed Ecology
A.C.	equent Visit? O Yes O No	Address: 832 Escobar St	reat Ur
Is this an existing NDDB occurrence?	🛛 🖂 No 🗌 Unk.	Martinez, Ca 94553	
Collection? If yes: 913	′es, Occ. #	E-mail Address: heartash Chan	maderology. com
Number	Museum / Herbarium	Phone: (925) 228 -1027	
Plant Information	Animal Information	an a	
Phenology:	# adults # iuv	eniles # larvae # egg masses	# unknown
wegetative 50 50	wintering breeding	nesting rookery burrow site	
			located based
Location Description (please attach Roddy Ranch. Near western e	nd of hourse walley	South of EBPd easement	
County: Contra Coda	Landowner / Mgr:	EBRPD/Contra Costa Conse	1 verely
Quad Name:	······································	Elevation:	
T R Sec,1/4 of 1/4,	Meridian: HO MO SO		
T R Sec,1/4 of 1/4,			
		GPS Make & Model:	
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DATUM: NAD27 O NAD83 Ø Coordinate System: UTM Zone 10 Ø	WGS84 O		
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CDFW/BDB/1747	Rev.	8/10/2014

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Mail to: California Natural Diversity Databa	ise		For Office Use Only	
California Dept. of Fish & Wildlife		ource Code:	Quad Code:	<u> </u>
1807 13 th Street, Suite 202 Sacramento, CA 95811				
Fax: (916) 324-0475 email: CNDDB@wild	dlife.ca.gov	Im Code:	Occ No.:	
Date of Field Work (mm/dd/yyyy):	10/14	:O Index:	Map Index:	
Clear Form California	Native Spec	ies Field S	Survey Form	Print Form
Scientific Name: Convolvulus	Simulari S			
Common Name: Small flowers	Morning alou	eri .		
Species Found? 📿 🔿	If not found, why?	Reporter: _	faith Bartash	
		No Address: 8	32 Escobar st	
		Martin	ez. (2 94553	
	No	Unk. E-mail Addre	ss: h bar tish Chance	Lecology com
Collection? If yes:		Phone: (9	25 228-1027	<i>C p</i>
Number	Museum / Herbarium			
Plant Information	Animal Information			
26 50 36	# adults	# juveniles #	larvae # egg masses	# unknown
% vegetative % flowering % fruiting	wintering breed	ing nesting	rookery burrow site	lek other
Location Description (please attach	map AND/OR fill ou	ıt your choice o	f coordinates, below)	
Sunth / Davidy Korrich be	yound The Ser	remembers of R	limes valley R.) at
the week and of here	in stillow			• · · · ·
County: Contra Costa	Landowner / M	lgr: <u>EBRPD/</u>	Conservery	
Quad Name:		<u> </u>		500 12
T R Sec,1/ ₄ of1/ ₄ ,		-		
T R Sec,1/4 of 1/4, DATUM: NAD27 O NAD83 O			odel:	
DATUM: NAD27 O NAD83 O Coordinate System: UTM Zone 10 O				meters/feet
Coordinates: 652620		Geographic (L	atitude & Longitude) 🔾	
4197517				
Habitat Description (plants & animals) plan Animal Behavior (Describe observed behavior,				
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Clay Barren on South f in 20=30% with Sincepis	any aris tacits	undasa s l	parri com cranges	knon lover
Saches about about.	un orientoj turente	1000000, (Vae	our electrony fes	ma permos
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			6 T	and a
Please fill out separate form for other rare taxa see Site Information Overall site/occurrent	n at this site.	·····	5 shapetiles	Cost +
Site Information Overall site/occurrence	ce quality/viability (site	+ population): C	Excellent O Good	🛛 Fair 🔿 Poor
Immediate AND surrounding land use:	pen space	gmang		·
Visible disturbances: <u>Cattle and a</u> Threats: <u>Sinapis</u> arreisis	n show	~ ~	· · · · · · · · · · · · · · · · · · ·	
	····			
Comments:				
Determination: (check one or more, and fill in blar	iks)		hotographs: (check one or mo	
Keyed (cite reference):				Slide Print Digital
Compared with specimen housed at:			Plant / animal Habitat	
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□ Other:		M	ay we obtain duplicates at our ex	pense? Oyes Ono
		-	C	DFW/BDB/1747 Rev. 8/10/2014

Mail to: California Natural Diversity Databa	A50	(For Offic	e Use Only		
California Dept. of Fish & Wildlife		Source	Code:		Quad Code	:	
1807 13 th Street, Suite 202							
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wil	Idlife ca gov	Elm Co	ode:	······	Occ No.:		
Г <u></u>	1/7/14	EO Ind	ex:		Map Index:		
	a Native Sp	ecies	Field	Survey	/ Form	Pri	nt Form
	Simulan:		· · · · · · · · · · · · · · · · · · ·				
Common Name: Small Share	1		V				
Species Found? \emptyset \bigcirc	If not found, why?	<u> </u>	1	Heath	Barbook		
100			Address:	832 E	scobar St	veet	
Is this an existing NDDB occurrence?		Unk.	Marti	mz, Ca	94553		
	No		E-mail Add	dress: h ba	itosh Puer	moleco	lon in . Con
Collection? If yes:			1	925) 22		-	00
Number	Museum / Herbarium		Fnone: <u></u>		E - I w Last		
Plant Information	Animal Informatio	on			•		
Phenology:	# adults	# juve	niles	# larvae	# egg masses	# unkn	own
% vegetative % flowering % fruiting		reeding	nesting		burrow site	lek	other
Location Description (please attach							
Horse valley just west of 2	-	-					
	`		NONN	1.1.1			
County: Contra Costa	Landowner	· / Mgr: _	<u>cick hor</u>	/ Contra L	Elevation:	near	
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Habitat Description (plants & animals) pla							
Animal Behavior (Describe observed behavior							
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Chay barren with spars medicargo polymorpha, Cre	i chi i	. 1	J.	1	,		
20 programmy che	ton set yeru	.5 176	en an		(3 bon	~~ >)	
South face of					C		
Please fill out separate form for other rare taxa see	en at this site			k a	. 11 .	C.S.U	
Please fill out separate form for other rare taxa see Site Information Overall site/occurren					aper 2 -	$\frac{cc \sqrt{q}}{c}$	<u> </u>
Site mormation Overall site/occurren	ce quality/viability (s	site + pop	oulation):		O Good) Fair	O Poor
Visible disturbeness:	open space	- CIST &	ziner ()				
Threater Trade to C	privers		V				
Immediate AND surrounding land use: Visible disturbances: <u>Cantus</u> South Threats: <u>Toriks span Canduus</u> Comments:	- Ny Lnoce phake	<u>v</u>					
Comments:							
Determination: (check one or more, and fill in blan	nks)			Photograp	hs: (check one or n	ore) Slide	Print Digital
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CDFW/BDB/1747 Rev. 8/10/2014

Mail to: California Natural Diversity Database				
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Contenue Dank of Cick O Mildle	0		-	
California Dept. of Fish & Wildlife 1807 13 th Street, Suite 202	Source Co	ode:	Quad Code	
Sacramento, CA 95811			•	
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov	Elm Code		Occ No.:	
Date of Field Work (mm/dd/yyyy): 4 7/14	EO Index:		Map Index:	
Clear Form California Nativ	ve Species I	ield Surv	vev Form	Print Form
Scientific Name: Corro Vulus Simula				
Common Name: Small flowered more			· · ·	
Species Found? O O		norten ltant	h Bartosh	
Yes No If not found, wh	iy?		Escolear st	
Total No. Individuals: <u>(8)</u> Subsequent Visit?		hav timez,		
Is this an existing NDDB occurrence?	NO UNK.		1 1 -	loul
			ibartosh@nov	maderony
Collection? If yes:	P	ione: (925) 2	.28-1027	4
Number Museum / He	erbanum		······	
Plant Information Animal II	nformation			
Phenology:				
#	adults # juvenile	s #larvae	# egg masses	# unknown
% vegetative % flowering % fruiting wintering	ng 🚺 breeding	nesting 🗌 rooke	ery	iek other
Location Description, (please attach map ANE		abaica of aca	dinatas halau	
			unales, below)	
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County: <u>Contra Costa</u> L	andowner/Mar: 2	BRADLente	Costa Causer	and V
		OR D Conto		7200
Quad Name:	<u> </u>		Elevation:	<u></u>
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DATUM: NAD27 ○ NAD83 Ø WGS84 Coordinate System: UTM Zone 10 Ø UTM Zone Coordinates: 603 79.6 AIG 8335 Habitat Description (plants & animals) plant communitie Animal Behavior (Describe observed behavior, such as territ SILF3 Clay pocket with Sparse Hesperevax sparsitiona sparsitiona, Plagi lefticium mittelum, Festure perennis, Please fill out separate form for other rare taxa seen at this site. Site Information Overall site/occurrence quality/v Immediate AND surrounding land use: <u>Gran Spir</u> Visible disturbances: <u>NDNE</u> Threats: <u>None</u> Comments: No Servers threats - Determination: (check one or more, and fill in blanks) □ Keyed (cite reference): <u></u>	O Hori 11 O OR Geo es, dominants, associates, toriality, foraging, singing, vegetation Con 10 kothyrs acar (0 kothyrs acar Crassala Con riability (site + popul a-e <u>Graz</u>	zontal Accuracy: _ graphic (Latitude substrates/soils, as, calling, copulating, p -r = 30 - 402 othe carpus; 1 in ata ; ation): O Excel	e & Longitude) O pects/slope: erching, roosting, etc., Fraction courter Shopefic lent O Good raphs: (check one or n	especially for avifauna): Nouns hordeaceon Numy = Cost S O Fair O Poor
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California Dept. of Fish & Wildlif		Source Code:	Quad Code:	
1807 13 th Street, Suite 202				
Sacramento, CA 95811 Epy: (016) 224 0475	Idlife on state	Elm Code:	Occ No.:	
Fax: (916) 324-0475 email: CNDDB@wi	5// 9/11/	EO Index:	Map Index:	
	1/ 1/17			
Clear Form California	a Native Sp	ecies Field	Survey Form	Print Form
Scientific Name: Con yolvolus	simulars			
Common Name: Small flower	ed morning	alors		
Species Found? \varnothing \bigcirc	. V	/ Reporter:	Heath Bartoola	
- (0	If not found, why?		832 Escobar st	
Total No. Individuals: 750 Subse	equent Visit? O Yes			*
Is this an existing NDDB occurrence?	ΠNο	Unk. Marti	M2, La 94553	
	/es, Occ. #		dress: hbartosh@nom	ad ecologics
Collection? If yes: <u>728</u>			(925) 228-1027	
Number	Museum / Herbarium	Prione:	a the for the for the former of the former o	
Plant Information	Animal Informati	on		
Phenology:		<u> </u>	#1	
	# adults	# juveniles	# larvae # egg masses	# unknown
% vegetative % flowering % fruiting		preeding nesting	rookery burrow site	lek other
Location Description (please attach		l out your choice	e of coordinates, below)	
North side of deer vall	ey on Poolit			
و م الل	U		1	
County: Cantra Casha	Landowne	r / Mgr: <u> </u>	1/ Contra Costa Conse	he con chip
Quad Name:			Elevation:	33 1 k
T R Sec,1/4 of 1/4,	Meridian: HO MO	SO Source of Co	ordinates (GPS, topo, map & ty	vpe):
T R Sec,1/4 of 1/4,		-	Model:	
DATUM: NAD27 O NAD83 Ø	WGS84 O			meters/feet
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		On Geographic		
4197749				
777777				
Habitat Description (plants & animals) pla	nt communities, dominai	nts, associates, substrat	es/soils, aspects/slope:	
Animal Behavior (Describe observed behavior	r, such as territoriality, for	aging, singing, calling, c	opulating, perching, roosting, etc., e	specially for avifauna):
In clay Rances as 5. Ho	forma slage	the	LE I	1
	succeed super	, pu morin 2	ieve of deen val	ley
In clay Barnen on South dominated by undera	25 polymanpi	ha.		V
V	\vee \vee \vee $/$			
Please fill out separate form for other rare taxa see	en at this site.		Shane file	Cosch
Please fill out separate form for other rare taxa see Site Information Overall site/occurren	ce quality/viability /	site + population).	O Excellent O Good	
Immediate AND surrounding land use:	Down Space ?	Geo Sura		
Immediate AND surrounding land use: Visible disturbances: /ໄợચાટ	pro production ,	Trazing		
		·		
Threats: <u>Mene</u>				
Comments:			•	
-				
Determination: (check one or more, and fill in bla	nks)		Photographs: (check one or mo	ore)
Keyed (cite reference):				Slide Print Digital
Compared with specimen housed at:	· · · · · · · · · · · · · · · · · · ·		Plant / animal Habitat	
Compared with photo / drawing in:			Diagnostic feature	
By another person (name):			Diagnostis icature	
□ Other:			May we obtain duplicates at our ex	

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Mail to: California Natural Diversity Database	(For Office Use Only	
California Dept. of Fish & Wildlife	Source Code:	Quad Code) :
1807 13 th Street, Suite 202			· · · · · · · · · · · · · · · · · · ·
Sacramento, CA 95811 Eax: (016) 224 0475 - amail: CNDDB@wildlife as asu	Elm Code:	Occ No.:	
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov Date of Field Work (mm/dd/yyyy): L/////		Map Index:	
		•	
Clear Form California Native	Species Fiel	d Survey Form	Print Form
Scientific Name: Convolus Simulans		······································	
Common Name: Small flowered morning	abrox		
Species Found? Yes No If not found, why?	Reporte	r: Heath Bartash	
Total No. Individuals: 30 Subsequent Visit?) Yes () No Address	: <u>832 Escobar S</u>	£
	Mari	mez, La 94553	
Yes, Occ. #	E-mail A	Address: <u>hbartsh@no</u> s	madeeology for
Collection? If yes:	Bhone	(925) 228-1027	\$** \$ /
Plant Information Animal Info			and the second
Phenology:	maavn		
20 50 30 #adul	ts # juveniles	# larvae # egg masses	# unknown
% vegetative % flowering % fruiting wintering	breeding nestin	g 🗌 rookery 🔲 burrow site	🗌 lek 🔲 other
Location Description (please attach map AND/O	R fill out your choi	ce of coordinates, below)	
West side of Roddy Ronch in de	er vallen we	st of Suman South	of Tower
	9	1	
County: <u>Califa Costa</u> Land	lowner / Mgr: <u> </u>	D/Contra Casta Cans	ermany
Quad Name:		Elevation:	
T R Sec,1/ ₄ of 1/ ₄ , Meridian: H O	MOSO Source of	Coordinates (GPS, topo. map & t	vpe):
T R Sec,1/ ₄ of 1/ ₄ , Meridian: H O		& Model:	
DATUM: NAD27 O NAD83 O WGS84 O			meters/feet
Coordinate System: UTM Zone 10 O UTM Zone 11	~	ic (Latitude & Longitude) O	
Coordinates: 604127	en coograpi		
4198030			
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Habitat Description (plants & animals) plant communities, de			
Animal Behavior (Describe observed behavior, such as territoria.	iity, toraging, singing, calling	, copulating, perching, roosting, etc.,	especially for avifauna):
Ling and Samen with	30-40% 60	sured byrachium constant	(ma)
South facing Clay Barren with Torilis nadesa, Hersperium charsillora spa	115. florn, medic	ago polymorphan Fes.	fund stevens.
Evalue baty S, Goranim untle	/	U I U T '	p
Please fill out separate form for other rare taxa seen at this site.		1 shapa file	Casi 8
Please fill out separate form for other rare taxa seen at this site. Site Information Overall site/occurrence quality/viab	ility (site + population)	O Excellent Ø Good	O Fair O Poor
Immediate AND ourrounding land upor one 50 mil			
Visible disturbances: <u>Nore</u> Threats: <u>Advencent</u> North slope has Comments:	V I	i i i i i i i i i i i i i i i i i i i	
Threats: Advercent North class have	Eluna can	+-meducer & Point	
Comments:	V vorus carl	Sale	aurca
		نه (^د اردم مد	CITLES S
Determination: (1)		Dhada ang la	
Determination: (check one or more, and fill in blanks) Keyed (cite reference):		Photographs: (check one or n	nore) Slide Print Digital
Compared with specimen housed at:		Plant / animal	
Compared with photo / drawing in:		Habitat	
By another person (name):		Diagnostic feature	
Other:		May we obtain duplicates at our e	expense? Oyes Ono

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California Natural Diversity Databa			•	
California Dept. of Fish & Wildlife	Sourc	e Code:	Quad Code	:
1807 13 th Street, Suite 202				
Sacramento, CA 95811	Elm C	ode:	Occ No.:	
Fax: (916) 324-0475 email: CNDDB@wild	llife.ca.gov			
Date of Field Work (mm/dd/yyyy): 5	EO In	dex:	Map Index:	
Clear Form California				Print Form
California	Native Species	s Fleid Sui	rvey Form	
Scientific Name: Galium andrew	usil subsp. gaten	50		
Common Name: Screentine b	, , , , , , , , , , , , , , , , , , , 			
Species Found? Ø O		Reporter: Hea	th Bartosh	
	f not found, why?	02	~ < /	1
Total No. Individuals: LO Subsec	quent Visit? () Yes () No	Address: $\underline{\sigma}$	2 Escobar St	inco الف
	· · · ·	Martinez	La 94553	
Is this an existing NDDB occurrence?	🗹 No 🗌 Unk.	7		
Ye	»s, Occ. #	E-mail Address:	hbartosh Cnomad	lecolog. Com
Collection? If yes:		()		V
Number	Museum / Herbarium	Phone: (125)	228-1027	
Plant Information	Animal Information			
Phenology:				
	# adults # ju	veniles # larva	e # egg masses	# unknown
% vegetative % flowering % fruiting	wintering breeding	nesting ro	okery Durrow site	lek other
Location Description (please attach			ordinates, below)	
Western edge of horse	Valley on Roddy	Ranch		
	- B m 0			
County: <u>Contra</u> Costa Quad Name:		SROON/r.1	I. I. C.	
County: Contrac	Landowner / Mgr: _	CIDRED/CONN	ta costa conser.	<u>re a chijan</u>
Quad Name:		/	Elevation:	6544
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Coordinate System: UTM Zone 10 🔗		•	-	
		Geographic (Latitu	de & Longitude) O	
Coordinates: 60349				
4199368				
Habitat Description (plants & animals) plan	nt communities, dominants, assoc	iates, substrates/soils, a	aspects/slope:	
Animal Behavior (Describe observed behavior,				especially for avifauna):
Quercus daughes: with Ad	lounstany Jacoulation	ma and Dh	and the fale	<i>۳</i> ۲
		KV4	annus muchan	M.
			Ν.	
Please fill out separate form for other rare taxa seer	n at this site.		Shalle Good	L L
Please fill out separate form for other rare taxa seer Site Information Overall site/occurrence		~	- Rappin Gar	
Site Information Overall site/occurrence	;e quality/viability (site + po	pulation): 🚫 Exc	cellent O Good (⊖ Fair ⊖ Poor
Immediate AND surrounding land use:	Dow Some and 21-10	• •-		
	101			
Threats: non				
Threats: <u>more</u> Comments: Hyply intact habitat				
Highly intrat habitat	68°			
U Ø TTT,				
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Determination: (check one or more, and fill in blan	ks)	Photo	ographs: (check one or m	ore)
Keyed (cite reference):			Diant / animal	Slide Print Digital
Compared with specimen housed at:	· · · ·		Plant / animal	님 님 닏ㅣ
Compared with photo / drawing in:			Habitat	님 브 !
By another person (name):			Diagnostic feature	
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	·····			

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California Natural Diversity Databa California Dept. of Fish & Wildlife		Source	e Code:	Quad Code	1
1807 13 th Street, Suite 202					
Sacramento, CA 95811		Elm C	ode:	Occ No.:	
Fax: (916) 324-0475 email: CNDDB@will Date of Field Work (mm/dd/yyyy): 5/		EO Inc		Map Index:	
	7/14				
Clear Form California	Native Sp	ecies	s Field S	Survey Form	Print Form
Scientific Name: Galum and	newsi: Sukep	gater	ise		
Common Name: Scrpentine		C			
Species Found? O	If not found, why?		Reporter:	teath Bartosh	
4	quent Visit? () Yes	∩ No	Address:	832 Escobar	
		<u> </u>		2. 6 94553	
Is this an existing NDDB occurrence?	es, Occ. #	Unk.	E-mail Addre	ess: hbartah@noma	decolorm.com
Collection? If yes:			Phone: 19	25) 228-1027	VO
Number	Museum / Herbarium		Filone. Cr	~/~~~	
Plant Information	Animal Informati	on			
Phenology:	# adults	# juv	eniles i	# larvae # egg masses	# unknown
% vegetative % flowering % fruiting	wintering t	preeding	nesting	rookery burrow site	☐ lek ☐ other
Location Description_(please attach					becaused Methodead
West side of Deer Valley		-		i coorumates, serowj	
l , U	Į.		(
County: Contra Costa	Landowne	r / Mgr:	EBRPD/	Contra Costa Conse	runney
Quad Name:		0 -	/	Elevation:	675 A
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DATUM: NAD27 O NAD83 Ø					meters/feet
Coordinate System: UTM Zone 10 O	UTM Zone 11 O	OR (Geographic (L	atitude & Longitude) O	
Coordinates: 603370					
419775G					
Habitat Description (plants & animals) pla. Animal Behavior (Describe observed behavior, Pinns Sabiniana and Qu	such as territoriality, for	aging, sing	ging, calling, cop	ulating, perching, roosting, etc.,	especially for avifauna):
Please fill out separate form for other rare taxa see	n at this site.			shapetile = 6	age 6
Site Information Overall site/occurren	ce quality/viability (site + po	pulation): C)Excellent 뉯 Good 👘	O'Fair O Poor
Immediate AND surrounding land use: <u>_</u>	pon land, 4	Jazin	ef.		
Visible disturbances: <u>None</u>			<u> </u>		
Threats: <u>None</u>	r.			· · · · · · · · · · · · · · · · · · ·	<u>.</u>
Comments: <u>home</u> Comments: Good habitat but	lots at Br	er et e e e S	diandru		-
Determination: (check one or more, and fill in bla	nks)		F	Photographs: (check one or n	nore)
Keyed (cite reference):				Plant / animal	Slide Print Digital
Compared with specimen housed at: Compared with photo / drawing in:				Habitat	
By another person (name):				Diagnostic feature	
Other:				lay we obtain duplicates at our e	expense? O yes O no
M.					CDFW/BDB/1747 Rev. 8/10/2014

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California Dept. of Fish & Wildlife	9	Source Code:	Code: Quad Code:			
1807 13 th Street, Suite 202						
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov	Elm Code:	Occ No.:			
Date of Field Work (mm/dd/yyyy): 5	1/15/14	EO Index:	Map Index:			
Clear Form California	a Native Spe	cies Field	Survey Form	Print Form		
Scientific Name: Helianthella	costarea					
Common Name: Diablo heliar	thelia					
Species Found? Ø O	If not found, why?	Reporter:	Heath Bartosh			
		Address:	832 Escalar st			
Is this an existing NDDB occurrence?			1×2, Ca 94553			
	es, Occ. #	E-mail Ad	dress: hbartach enon	red ecology		
Collection? If yes:	Museum / Herbarium		925) 228-1027	V (*		
Plant Information	Animal Information					
Phenology:						
	# adults	# juveniles		# unknown		
% vegetative % flowering % fruiting	wintering bree		rookery burrow site	lek other		
Location Description (please attach	map AND/OR fill o	ut your choice	e of coordinates, below)			
Deer Jally portion of	Noven Abren Ab		And F2 NONFE			
County: Cantra Casta	Landowner /	Mgr: ⋸ ଌ ⋈ ⊅)	Kontra Losta Conser.	Mater P		
Quad Name:		•	Elevation:	5591+		
T R Sec,1/4 of 1/4,	Meridian: HO MO S	O Source of Co	oordinates (GPS, topo. map & t	ype):		
T R Sec,1/ ₄ of 1/ ₄ ,	Meridian: HO MO S	O GPS Make 8	Model:			
DATUM: NAD27 O NAD83 O	wgs84 \bigcirc		ccuracy:	meters/feet		
Coordinate System: UTM Zone 10 O	UTM Zone 11 O 0	R Geographic	(Latitude & Longitude) O			
Coordinates: Cot 179						
Habitat Description (plants & animals) plan						
Animal Behavior (Describe observed behavior,	such as territoriality, foragi	ng, singing, calling, c	opulating, perching, roosting, etc.,	especially for avifauna):		
on north west facing slop	pe, steep on ma	rgin of Adeno	storma societation in	Querche dangest.		
with Avena barbata, Davens) Sheractia armsis	pasilles, Bronnas	diaidous, T	Fither Laxa, Galous	~ paristense		
Sperae a composition of	E.	*	.,	Ŷ		
Please fill out separate form for other rare taxa see	n at this site.		1 shape =	heca 12		
Site Information Overall site/occurrent	ce quality/viability (site	e + population):	O Excellent Ø Good	O Fair O Poor		
Immediate AND surrounding land use: _(Open Space and	1 grazina				
Visible disturbances: <u>None</u>	(;	<u> </u>	· · · · · · · · · · · · · · · · · · ·			
Threats: Mone		·				
Comments: Heult 10" 2 land	co deste A i	<i>,</i>	· / /			
Comments: Heyld 10", 3 heads p with non-raine of	assend Will	Experision fint.	entio. (
Determination: (check one or more, and fill in blai	าหร)		Photographs: (check one or m	nore) Slide Print Digital		
Compared with specimen housed at:			Plant / animal			
Compared with photo / drawing in:			Habitat Diagnostic feature			
By another person (name): Other:	······		May we obtain duplicates at our e	expense? Oves Ono		

Roddin

CDFW/BDB/1747 Rev. 8/10/2014

Mail to:	(For Office Use Only
California Natural Diversity Databa		•
California Dept. of Fish & Wildlift 1807 13 th Street, Suite 202	Source Code: _	Quad Code:
Sacramento, CA 95811		
Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov Elm Code:	Occ No.:
Date of Field Work (mm/dd/yyyy):		Map Index:
	2/20/17	
Clear Form California	a Native Species Field	d Survey Form Print Form
Scientific Name: Hellanthella co	astonea	······
Common Name: Diado helian		
Species Found? \emptyset O		: Heath Bartosh
	equent Visit? () Yes () No (Address:	: 832 Escober street
Is this an existing NDDB occurrence?	TA Mart	122, Ca 94553
Y Y	es, Occ. #	ddress: 1/carbs r Cnowed ecology for
Collection? If yes:	Bhone:	(925) 228-1027
Number	Museum / Herbarium	
Plant Information	Animal Information	
Phenology:		
390	# adults # juveniles	# larvae # egg masses # unknown
% vegetative % flowering % fruiting	wintering breeding nesting	rookery burrow site lek other
Location Description (please attach	map AND/OR fill out your choic	e of coordinates, below)
West side of Deer valley		
	ίν.	
County: Contra Costa County	Landowner / Mgr: <u>EBPD</u> /	Contra Costa Conservinary
T R Sec,1/4 of 1/4,	Meridian: HO MO SO Source of C	Coordinates (GPS, topo. map & type):
T R Sec,1/4 of 1/4,	Meridian: HOMOSO GPS Make	& Model:
DATUM: NAD27 O NAD83 O	_	Accuracy: meters/feet
		-
Coordinate System: UTM Zone 10 O	UTWIZONE 11 O OK Geographi	c (Latitude & Longitude) U
Coordinates: 604256		
4197481		
Habitat Description (plants & animals) pla	nt communities, dominants, associates, substra	ates/soils, aspects/slope:
Animal Rehavior (Describe observed hebavior	r such as territoriality foraging singing calling	conulating perching roosting etc. especially for avifauna):
Provession and Area	e motor in the firm	many many sof Adenosteria Enercial interestation
TIMUS Saundana and yourcu	Wistian wood and, since 1	Dear mangress a fillered with about
Brayana margins with lory	lis arounds, Aesculat contente	a proves areasins, - 11 /
Cardina's pychocophelies, merapos	t california, leptosigner citata	rear margins of Adenostema Interreptations, ia, Browns diandins, erigeral Interrepta- s, Ericaneria Interritatia, Tritika Laza,
Avena Satura	r e	t - ·
		C .
Site Information Overall site/accurrent	an anality/viability (aita + nanylatian)	O Excellent & Good O Fair O Poor
United and the analysis of the state of the	oe quanty/viability (site + population):	
Immediate AND surrounding land use:	open space grazing	
Visible disturbances: <u>none</u>		
Threats: Abre		
Comments: 6 1		
years expansion pot	enmal, good habitat but B	fromus drandrus is aboundant
Determination: (check one or more, and fill in bla	nks)	Photographs: (check one or more) Slide Print Digital
Keyed (cite reference):		
Compared with specimen housed at:		
		Plant / animal
Compared with photo / drawing in:		Plant / animal
		- Plant / animal

CDFW/BDB/1747 Rev. 8/10/2014

Mail to: California Natural Diversity Databa	250	(For Office Use Only	·)
California Dept. of Fish & Wildlife		Source Code:	Quad Co	ode:
1807 13 th Street, Suite 202		-		
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov	Elm Code:	Occ No.	· · · · · · · · · · · · · · · · · · ·
Date of Field Work (mm/dd/yyyy):	122/14	EO Index:	Map Ind	ex:
Clear Form California		ecies Fiel	d Survey Form	Print Form
Scientific Name: Helianthella		<u>.</u>		
Common Name: Diablo helic				
	If not found, why?	Reporte	r: Heath Bartosh	
Total No. Individuals: / 4/8 Subse	•		: 832 Zacober	
Is this an existing NDDB occurrence?			timez, Ca 91455	
	es, Occ. #	E-mail A	ddress: <u>hbartsheno</u>	madecologic term
Collection? If yes:		Phone:	(925) 228-102	7
Number	Museum / Herbarium			· · · · · · · · · · · · · · · · · · ·
Plant Information	Animal Informat	tion		
Phenology:	# adults	# juveniles	# larvae # egg masses	# unknown
Vegetative % flowering % fruiting	wintering	breeding nesting	g rookery burrow sit	e 🗌 lek 🗌 other
Location Description (please attach				
Barros South	el lestance	n out your chor		vv)
County: Contra Costa	Landown	or/Mar SRRP	Prodece Carto Caros	9 PI 5 C - 3 C + 3-
Dued Name			<u> Com a casina casina</u>	1125
Quad Name:				
T R Sec,1/4 of1/4,				
T R Sec,1/4 of 1/4,	-			1
DATUM: NAD27 O NAD83 O			,	meters/feet
Coordinate System: UTM Zone 10 〇 Coordinates: <u>くのの</u> /5の, イノタタ13ろ	UTM Zone 11 ()	OR Geograph	ic (Latitude & Longitude) (
Habitat Description (plants & animals) pla	nt communities, domina	ants, associates, substr	ates/soils, aspects/slope:	
Animal Behavior (Describe observed behavior	such as territoriality, fo	oraging, singing, calling,	, copulating, perching, roosting, e	c., especially for avifauna):
Animal Benavior (Describe observed benavior On north facing slope in Avena fatua, Bronnus curinatus Ericameria lineavifalia	100	th intermittent	Canopy with to,	icodendron diversitopy
Avena Intua, Bronnus curinatus	lathyous vest	htus Brann	duales a	
Ericameria linearifalia		() or smull	Grancines, Cardus	s pgensceptralus
Please fill out separate form for other rare taxa see	n at this site.		4 shad	fless Hecalo
Site Information Overall site/occurren	ce quality/viability	(site + population)		O Fair O Poor
mmediate AND surrounding land use:				-
visible disturbances:				
Threats: Lots of Brownes die	idrus. A lat a	f Insert di	umain an Smits	
Threats: Lots of Bronnes die		f Insect du	amage on Sruits	
Threats: Lots of Bronnes die		f Insect de	amaeja on Sruits	
Threats: Lots of Bronnes die Comments: 70 heads all Winter Determination: (check one or more, and fill in bla	wee	f Insect du	Photographs: (check one	or more)
Threats: Lots of Bronnes die Comments: 70 heads all Westw Determination: (check one or more, and fill in bla Careford (cite reference):	rke		<i>C</i>	or more) Slide Print Digital
Threats: Lots of Brownes die Comments: 70 heads all Winfor Determination: (check one or more, and fill in bla Keyed (cite reference): Compared with specimen housed at:	.¥CL		C Photographs: (check one Plant / animal Habitat	or more) Slide Print Digital
Determination: (check one or more, and fill in bla.	rks)	······································	C Photographs: (check one Plant / animal	or more) Slide Print Digital
Threats: Lots of Brownes dea Comments: 70 heads all work Determination: (check one or more, and fill in bla Compared with specimen housed at: Compared with specimen housed at:	rks)	······································	C Photographs: (check one Plant / animal Habitat	Slide Print Digital

\mathcal{B}°	110	Y;
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Mail to: California Natural Diversity Databa	ase (For Office Use Only			
California Dept. of Fish & Wildlife Source		Source Code:	Quad Code	e:		
1807 13 th Street, Suite 202 Sacramento, CA 95811						
Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov	Elm Code:	Occ No.:			
Date of Field Work (mm/dd/yyyy): 4	3/14	EO Index:	Map Index:			
COMPACT NEW CONTRACTOR CONT		cies Field	Survey Form	Print Form		
Scientific Name: Hesperever	caulescans					
Common Name: hogwallows st						
Species Found? Ø O	If not found, why?	Reporter:	Heath Bartosh			
Total No. Individuals: $\frac{15}{5}$ Subse) No Address:	832 Escobar			
	<u> </u>	Unk. Mart	-mez, Ca. 94553			
		E-mail Ad	dress: <u>hbartoch Enon</u>	radecology com		
Collection? If yes:	Museum / Herbarium		(925) 228-1027	07		
Plant Information	Animal Information					
Phenology:		·	######################################			
	# adults	# juveniles		# unknown		
% vegetative % flowering % fruiting	wintering bree		rookery burrow site	lek other		
Location Description (please attach	-		· · ·			
On south east facing slop						
County: <u>Contra Costa</u>	Landowner / I	Mgr: <u>SBRPD</u>	/ Contra Costa Conserv	mary		
Quad Name:		· · · · · · · · · · · · · · · · · · ·	Elevation:	32517		
T R Sec,1/4 of 1/4,			oordinates (GPS, topo. map & t	ype):		
T R Sec,1/ ₄ of1/ ₄ ,	-	O GPS Make 8	& Model:			
DATUM: NAD27 O NAD83			,	meters/feet		
Coordinate System: UTM Zone $10 \emptyset$	UTM Zone 11 O	R Geographic	(Latitude & Longitude) O	:		
Coordinates: 60 3990 4 198794			,			
11/077/						
Habitat Description (plants & animals) plan						
Animal Behavior (Describe observed behavior,						
Silty clay pocket with	sparse regets	tion cover	(30-40%) with	i		
Brown hordenceus, Hospereva	x sparsettere spa	rsillora, Pli	agelobothyrs acantho	carpus,		
Brown horderceas, Hespereva Erodum accutation, lepidium	nitidum, Festucia	perennis, C.	rassula conatta.	r		
			<u> </u>			
Please fill out separate form for other rare taxa see Site Information Overall site/occurrent	n at this site.	- 1412	Shapetale = 1	tesc l		
Site Information Overall site/occurren	ce quality/viability (site	e + population):	O Excellent 🖉 Good	⊖ Fair ⊖ Poor		
Immediate AND surrounding land use:	por land, and	Zing				
Visible disturbances: <u>hone</u>		~				
Comments: hone		[]]	f			
Comments: This location has he Soils seem atypica	s screens thread	5. like the	asire weeds.			
Poils seen atypica	I due to high	slit conte	ent			
Determination: (check one or more, and fill in blan	nks)		Photographs: (check one or n	nore)		
Keyed (cite reference):			Plant / animal	Slide Print Digital		
Compared with specimen housed at: Compared with photo / drawing in:			Habitat			
By another person (name):			Diagnostic feature			
Other:			May we obtain duplicates at our e	expense? O yes O no		

CDFW/BDB/1747 Rev. 8/10/2014

A.H. _ 71 (
Mail to: California Natural Diversity Databa		Fe	or Office Use Only	
		Source Code: Quad Code:		
1807 13 th Street, Suite 202				
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov	n Code:	Occ No.:	
Date of Field Work (mm/dd/yyyy):	19/14 LEC	Index:	Map Index:	
Clear Form California	Native Speci	es Field Sı	urvey Form	Print Form
Scientific Name: Hesperewax C	aulescens		·	
Common Name: hogwallow ST				
Species Found? O	If not found, why?	Reporter: <u></u>	oth Bartosh	
	quent Visit? () Yes () N	o Address: _ 송	32 Escobar	
Is this an existing NDDB occurrence?		Martine:	z, Ca. 94553	
		E-mail Address	: hbatoshenome	decology. com
Collection? If yes:		- Phone: (924	5) 228-1027	VØ
Number	Museum / Herbarium			
Plant Information	Animal Information			
Phenology:	# adults #	ijuveniles # lar	vae # egg masses	# unknown
% vegetative % flowering % fruiting	wintering breeding	nesting	rookery burrow site	lek other
Location Description (please attach	map AND/OR fill out	vour choice of c	coordinates below)	
North side of dear valle	y on Roddy	-	-	
County: <u>Castra Casta</u> Quad Name:	Landowner / Ma	E EBRPD/Co	rtra Losta Conse	er wencuy
Quad Name:			Flevation:	2093+
T R Sec,1/4 of 1/4,				
T R Sec,1/4 of 1/4,			el:	
DATUM: NAD27 O NAD83 Ø		Horizontal Accurac		meters/feet
Coordinate System: UTM Zone 10 Ø			tude & Longitude) O	
Coordinates: 606342 4197836			,	
Habitat Description (plants & animals) plan Animal Behavior (Describe observed behavior,				specially for avifauna):
In clay barren on south dominated by medicago	furino alone.	on north side	i of deer valle	the las
	Jacomy supe			5
alominated by hearings	polymorpha			
Please fill out separate form for other rare taxa see Site Information Overall site/occurrent	n at this site.		shipefile = 1	Lesc 2
Site Information Overall site/occurrent	ce quality/viability (site +	population): O E	xcellent Ø Good () Fair () Poor
Immediate AND surrounding land use:	per space to	razing-	- <u></u>	
Visible disturbances: <u>None</u>	· · · · ·	0		
Threats: hone				
Comments:				
				x.
Determination: (check one or more, and fill in blar	iks)	Pho	tographs: (check one or mo	pre)
Keyed (cite reference):			Plant / animal	Slide Print Digital
Compared with specimen housed at: Compared with photo / drawing in:			Habitat	
By another person (name):			Diagnostic feature	
□ Other:			we obtain duplicates at our ex	pense? Oyes Ono
		•	CI	DFW/BDB/1747 Rev. 8/10/2014

Mail to:	E	or Office Use Only
California Natural Diversity Database California Dept. of Fish & Wildlife	Source Code:	-
1807 13 th Street, Suite 202		
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov	Elm Code:	Occ No.:
Date of Field Work (mm/dd/yyyy): 6/6/14	EO Índex:	Map Index:
Clear Form California Native	Species Field Su	urvey Form Print Form
Scientific Name: Hegerstinon brewer		
Common Name: Brewers Lwast Slax		
Species Found?	Reporter: <u> <i>e</i>a</u>	th Bartosh
Total No. Individuals: 2000 Subsequent Visit?		2 Escobar st
	No DUnk. Martinez	<u>, Ca 94553</u>
Yes, Occ. #	E-mail Address	: hbartoshenemaderdon
Collection? If yes: <u>/// 2</u> Number Museum / Herbar	Phone: <u>(92</u> *	5) 228-1027
Plant Information Animal Infor		
Phenology:		
5 90 5 # adult		vae # egg masses # unknown
% vegetative % flowering % fruiting wintering		rookery burrow site lek other
Location Description (please attach map AND/O on north facing slope below road Ba	/	
County: <u>Cantra Casta</u> Land	owner/Mar: さらにPD/Con	tra Losta Contensation
Quad Name:	·/	Elevation:136811
T R Sec,1/4 of 1/4, Meridian: H O	MOSO Source of Coordin	ates (GPS, topo. map & type):
T R Sec,1/ ₄ of 1/ ₄ , Meridian: H O	MOSO GPS Make & Mode	əl:
DATUM: NAD27 O NAD83 O WGS84 O	Horizontal Accurac	cy: meters/feet
Coordinate System: UTM Zone 10 O UTM Zone 11	O OR Geographic (Lati	tude & Longitude) O
Coordinates: 597986 4200427		
Habitat Description (plants & animals) plant communities, de		
Animal Behavior, (Describe observed behavior, such as territorial	htty, foraging, singing, calling, copulati	ng, perching, roosting, etc., especially for avitauna):
grassiant stope relow road	petween pond and	barn in open
On North facing slope below road grassland with Demandera lo	obic, testuca peren	sus, Gridelia composium,
angun tepeon, chloroolalum	pomeridianain Brown	s hard-error Calochartus araillosus
Er yngun tepronii, chloroplalum elymus caput wedrica, spiblam brachyerpar Please fill out separate form for other rare taxa seen at this site.	n Castille ja rubienada si	aspit there as provide as
Please fill out separate form for other rare taxa seen at this site.	Lay warda materia	Shoptik = Heer 1
Site Information Overall site/occurrence quality/viab		xcellent Ö Good O Fair O Poor
Immediate AND surrounding land use: <u>CPCa CC42</u> Visible disturbances: <u>Mona</u>	of the second	
	1 Lucano	
Threats: <u>Medusahead</u> gust <u>abes</u> Comments:	water in an our	
· · · ·		
Determination: (check one or more, and fill in blanks)	Pho	tographs: (check one or more)
Keyed (cite reference): Compared with specimen housed at:		Slide Print Digital
Compared with specifien housed at: Compared with photo / drawing in:		Plant / animal
		Habitat
By another person (name): Other:		

Mail to: California Natural Diversity Databas California Dept. of Fish & Wildlife 1807 13 th Street, Suite 202 Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wilo	Sour	For Office		e:
Date of Field Work (mm/dd/yyyy): 5 /		idex:	Map Index	
	Native Specie	s Field Surve		Print Form
Scientific Name: Hesperolinon	1		,	
Common Name: Brewers				
Species Found? O	f not found, why?	Reporter: Heath B		
Total No. Individuals: 63 Subsec	•	Address: 832 2	scolar st	reet
Is this an existing NDDB occurrence?	🛛 🗍 Unk	Martinez, C.		i
, · · · · ·		E-mail Address: hbar		decology com
Collection? If yes: <u>//00/ //002</u> <u>///</u> Number	<u>д сро</u> Museum / Herbarium	Phone: $(925)22$	8-1627	
Plant Information	Animal Information			
Phenology:	# adults # ju	veniles # larvae	# egg masses	# unknown
% vegetative % flowering % fruiting	wintering breeding	nesting rookery	burrow site	iek other
Quad Name:	Meridian: H O M O S O WGS84 O UTM Zone 11 O <i>OR</i>	GPS Make & Model: Horizontal Accuracy: Geographic (Latitude &	Longitude) O	type):
Habitat Description (plants & animals) plan Animal Behavior (Describe observed behavior, This paint represents two colour 1) East friend close of crossie for Secunda (Abundent), Br 2) North west facing slope in Arm drum Brown Ruby the Please fill out separate form for other rare taxa seer	such as territoriality, foraging, sin 50,1, 50,56 side of 50,1, 50,56 side of 50,1, 50,56 side of 1, 50,1, 50,56 side of 0000,1,255 station do active of the office of the active of the office of the active of the office of the active of the office of the office of the active of the office of the office of the active of the office of the office of the office of the active of the office of the office of the office of the active of the office of the office of the office of the office of the active of the office	ging, calling, copulating, perci- evaluacy with s-	hing, roosting, etc., frya palebre manancha la evi manancha la evi constant Advinced chill construction	actor paperations
Site Information Overall site/occurrenc			t 🕅 Good	O Fair O Poor
Immediate AND surrounding land use: <u> </u>	spen space gras	ing	×	
Threats: Annual public and an	<			
Comments:) Highly 1 h h h h +	with Lew weeds			
Threats: <u>Annual exotic grasse</u> . Comments: 1) Highly intact habitat 2) annual exotic gra	spes, needs some	grading		
Determination: (check one or more, and fill in blan			bhs: (check one or n	more)
Keyed (cite reference):	· · · · · · · · · · · · · · · · · · ·		nt / animal	Slide Print Digital
Compared with specimen housed at:			bitat	
By another person (name):			gnostic feature	
Other:		May we obtain	n duplicates at our e	expense? O yes O no

CDFW/BDB/1747 Rev. 8/10/2014

N.M				~
Mail to: California Natural Diversity Databa	sa (For Office Use Only	
California Natural Diversity Database California Dept. of Fish & Wildlife Source Code:			•):
1807 13 th Street, Suite 202				
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wild	llife.ca.gov	Elm Code:	Occ No.:	
	5/20/14	EO Index:	Map Index:	
Clear Form California	Native Spe	cies Field	Survey Form	Print Form
Scientific Name: Hesperslinon	breweri			
Common Name: Brewers d	$\wedge \wedge$			
Species Found? Q O	f not found, why?	Reporter:	Heath Bartosh	
		Address:	832 Escobar St	reet
Total No. Individuals: <u>88</u> Subsec	quent visit? () Yes (rez. Ca 9455	
Is this an existing NDDB occurrence?	No [1 1 1	,
		E-mail Ad	dress: hbartach@nom	ad ecology 6 Cor
Collection? If yes: 1006 Jep	S Museum / Herbarium	Phone:	(925) 228-1027	₩ ¥
Number				· · · · · · · · · · · · · · · · · · ·
Plant Information	Animal Information	7		
Phenology:	# adults	# juveniles	# larvae # egg masses	# unknown
$\frac{1}{2}$ $\frac{25}{2}$ $\frac{75}{2}$	wintering bre	•		tered tered
% vegetative % flowering % fruiting			rookery burrow site	
Location Description (please attach West end of Deer valley	U U			
County Contra Casta	Landowner /	Mar ZROPD	Hanber Insta Concer.	C 1. 34 10 10 10 10 10
County: <u>Contra Costa</u> Quad Name:			<u>r</u>	=79 \$4
Quad Name T R Sec,1/ ₄ of1/ ₄ ,				buno):
T R Sec, $1/_4$ of $1/_4$,			Model:	
$\frac{DATUM}{NAD27} \bigcirc NAD83 \bigotimes$, <u> </u>	meters/feet
Coordinate System: UTM Zone 10 \emptyset Coordinates: $65^{4}816$ 7197602	UTM Zone 11 () C	PR Geographic	(Latitude & Longitude) O	
Habitat Description (plants & animals) plan Animal Behavior (Describe observed behavior, On north west fucing stee Overcus douglesi - Adenostavia S Navarretia publicascens, Artem	such as territoriality forag	ina sinaina callina c	opulating perching roosting etc.	especially for avifauna): d by Avena fataa) Saliszus
Please fill out separate form for other rare taxa see Site Information Overall site/occurrence	n at this site.		Skopefile =	Hebr 3
Site Information Overall site/occurrence	e quality/viability (sit	e + population): _	ØExcellent O'Good	🔿 Fair 🛛 Poor
Immediate AND surrounding land use:	pen spale q.	azina í		
Visible disturbances: <u>None</u>	, , , , , , , , , , , , , , , , , , , ,	0		
Threats: <u>hone</u> Comments: Most plants 4-5 in	rehes with 3.	re byger	one up to 20 S	lowers
Determination: (check one or more, and fill in blan	ks)		Photographs: (check one or n	nore)
Keyed (cite reference):				Slide Print Digital
Compared with specimen housed at:			Plant / animal	
Compared with photo / drawing in:			Habitat Diagnostic feature	
By another person (name):	1.1.P.1.P.1.P.1.P.1.P.1.P.1.P.1.P.1.P.1		-	
			May we obtain duplicates at our e	
				CDFW/BDB/1747 Rev. 8/10/201

Roman

Mail to:	(For Office	Use Only	
California Natural Diversity Databa California Dept. of Fish & Wildlift		Source Code:		•	
1807 13 th Street, Suite 202	,	Source Code.			······
Sacramento, CA 95811		Elm Codo		Oce No :	
Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov	Elm Code:		Occ No.:	
Date of Field Work (mm/dd/yyyy): 5	114/14	EO Index:		_ Map Index:	
Clear Form California	a Native Spe	cies Field	d Survey	Form	Print Form
Scientific Name: MILVOSEVIS S	ylvatica				
Common Name: Sylvan Scor					
Species Found? 🗭 🔴	If not found, why?	Reporter	Heath B	ortsh	
~	•	Address	832 2	cabar st	
Total No. Individuals: <u>2</u> Subse					
Is this an existing NDDB occurrence?	⊠ No [JUnk. Mart		194553	
	es, Occ. #	E-mail Ac	dress: hhar	toch @ moves	ndecology.com
Collection? If yes:			(925) 0.		No.
Number	Museum / Herbarium	Phone:	<u>(925)</u> 22	13-102+	
Plant Information	Animal Information	1			
Phenology:		•			
r henology.	# adults	# juveniles	# larvae	# egg masses	# unknown
% vegetative % flowering % fruiting	wintering bre	eding nesting	rookery	burrow site	☐ lek ☐ other
Location Description (please attach			e of coordina	ates, below)	
Western edge of horse Va	2	/			
County: Contra Costa	l andowner /	Mar EBROD	1 contra los	ta Consero	nees
Quad Name:			/	Elevation:	
T R Sec,1/4 of 1/4,		-			
T R Sec,1/4 of 1/4,	Meridian: HO MO S	SO GPS Make	& Model:		
DATUM: NAD27 \bigcirc NAD83 \oslash	WGS84 〇	Horizontal A	ccuracy:		meters/feet
Coordinate System: UTM Zone 10 Ø	UTM Zone 11 O	R Geographi	c (Latitude & L	onaitude) O	
Coordinates: 604466 4199057	_				
Habitat Description (plants & animals) plat Animal Behavior (Describe observed behavior,					specially for avifauna):
averens douglasi and Rh.	11 / 1			.g,	
asercus acogues, and Kh.	mammus ellicitale	~			
-					
Please fill out separate form for other rare taxa see Site Information Overall site/occurrent	n at this site.			shardle :	Misy 2
Site Information Overall site/occurrent	ce quality/viability (sit	e + population)		Ø Good () Fair O Poor
Immediate AND surrounding land use:	Dan to loud &				
Immediate AND surrounding land use:	Henry win h	Un silvery			
Visible disturbances: <u>none</u>		\$'			
Threats: <u>hone</u>					
Comments:					
Determination: (check one or more, and fill in blai			Photograph	S: (check one or mo	ore)
Keyed (cite reference):	,				Slide Print Digital
Compared with specimen housed at:				/ animal	
Compared with photo / drawing in:			Habit		
By another person (name):				nostic feature	
Other:			May we obtain o	luplicates at our ex	pense? O yes O no
					DFW/BDB/1747 Rev. 8/10/2014

Mail to: California Natural Diversity Databa	···· (For Office Use Only	
California Dept. of Fish & Wildlife		Source Code:		۵.
1807 13 th Street, Suite 202				····
Sacramento, CA 95811		Elm Code:	Occ No.:	
Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov			
Date of Field Work (mm/dd/yyyy):	1/22/14	EO Index:	Map Index	«
Clear Form California	a Native Spe	cies Field	l Survey Form	Print Form
Scientific Name: Navarne tra	gowenic			
Common Name: Lime Ridge y	V			
Species Found? Ø O	If not found, why?		Heath Bartosh	
		_ סאו כ	832 Escolar	
Is this an existing NDDB occurrence?		Unk. Mar	tinez (a 4455	3
	No	E-mail Ad	dress: hbartasheno	madecologuecore
Collection? If yes: 1007			(925) 228-1027	Çî/
Number	Museum / Herbarium	Phone: _	1 (a) in to be both the famil	
Plant Information	Animal Information	า		
Phenology:				
40 50 10	# adults	# juveniles	# larvae # egg masses	# unknown
% vegetative % flowering % fruiting	wintering bre	eding nesting	rookery burrow site	lek other
Location Description (please attach	map AND/OR fill o	out your choice	e of coordinates, below)
On Thomas Kriegor acquis	tion East of G	ortal and Bay		
County: Contra Costa	Landowner /	Mgr: _ SBRPD	Contra Costa Costa	rvency
Quad Name:		/	Elevation:)	43572
T R Sec,1/4 of 1/4,	Meridian: HO MO S	SO Source of Co	oordinates (GPS, topo. map &	type):
T R Sec,1/ ₄ of 1/ ₄ ,	Meridian: HOMOS	GO GPS Make &	Model:	
DATUM: NAD27 O NAD83 Ø	WGS84 O			meters/feet
Coordinate System: UTM Zone 10 Ø			: (Latitude & Longitude) O	
		ecographic		
4200221				
Habitat Description (plants & animals) plan				
Animal Behavior (Describe observed behavior,	such as territoriality, forag	ing, singing, calling, c	copulating, perching, roosting, etc.	, especially for avifauna):
North Jacuage slope on Class	barren hear	Querens do	uglassi but in gras	island with
North Facure slope on class love regration cover. Acco Chlorogalium pomerdian, Calod	cictes are F	estrea non	Barro barda	
Chlorogalium pomaradian, Caloci	norms araillas	us. Poa eac	n's Grounds month	a lunt a lunt
Clay lens is east also he	6,		sman, promus mad	records y car bear of
V with Beast also he	12 2 7 T 2 M			
Please fill out separate form for other rare taxa see Site Information Overall site/occurrent	n at this site.		chaperule =	Nago I
Site Information Overall site/occurrent	ce quality/viability (sit	e + population):	O Excellent O Good	O Fair O Poor
Immediate AND surrounding land use:	open Lpace	& grazina	,	
Visible disturbances: <u>hare</u>	: 7			
Threats: Element continued	Se a			
Comments: Elymus caput - med. heavy clay habit.		6 4		
e grace caput - mee.	usen on marc	lin or barr	try but it can pot	envalue invade
Nearry clay habite	". Revisit need	ed		
			T T	
Determination: (check one or more, and fill in blai	nksj		Photographs: (check one or	more) Slide Print Digital
Compared with specimen housed at:			Plant / animal	
Compared with photo / drawing in:			Habitat	
By another person (name):			Diagnostic feature	
Other:			May we obtain duplicates at our	expense? Oyes Ono

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Mail to:		For Off	ce Use Only	
California Natural Diversity Database California Dept. of Fish & Wildlife S		ce Code:	•	
1807 13 th Street, Suite 202				<u> </u>
Sacramento, CA 95811	Elm	Code:	Occ No.:	
Fax: (916) 324-0475 email: CNDDB@will	dlife.ca.gov	ndex:		
Date of Field Work (mm/dd/yyyy): 05	123/14			
	Native Specie		y Form Print For	m
Scientific Name: Navarretin Mig.	elliformis subsp. rad	dears		
Common Name: A dobe navarr				
Species Found? $\bigotimes_{\text{Yes}} \bigcirc_{\text{No}}$	If not found, why?	_ Reporter: Heath 1	Partoch	
Total No. Individuals: 50 Subse			Escobar st.	
Is this an existing NDDB occurrence?		Martinez Ca	94553	
	es, Occ. #	E-mail Address: <u>h</u>	artosh Quomas ecology.	Cong
Collection? If yes: <u>/ ୦୦ ୧</u>		- Phone: (925)22	28-1027	
Number	Museum / Herbarium			
Plant Information	Animal Information			
Phenology:	# adults # i	uveniles # larvae	# egg masses # unknown	
Vo 80 10 % vegetative % flowering % fruiting	wintering breeding	nesting rookery		other
Location Description (please attach			Land Land	
	map AND/OK mi out y		nates, below)	
		./		
County: Contro Casta	Landowner / Mar:	C. C. Marker 15	KØR N	
Quad Name:			Elevation: <u>1497 f</u>	
T R Sec,1/4 of 1/4,				
T R Sec,1/4 of1/4,	-			
DATUM: NAD27 O NAD83 O		Horizontal Accuracy:	-	s/teet
Coordinate System: UTM Zone 10 O		Geographic (Latitude 8		
Coordinates: 597744 420 0340				
Habitat Description (plants & animals) plan			•	
Animal Behavior (Describe observed behavior,	,			una):
Clay lens in grassland. I	Cominates' Festuca	pessone, known n	nadrotansis reports	
Brown's hordcaceous, Elymus ca	pt-machusa			
Associates: Grindella comportant Clarkia allins	, Eryngium Jepson	i, Calochortus a	gillosus, poa second.	a,
North cast facing in the st	ope between 5-10		shapf. le = Nam;	
Site Information Overall site/occurren		opulation): O Excelle	5 -	⊿ oor
Immediate AND surrounding land use: _c				
Visible disturbances:	· · · · · · · · · · · · · · · · · · ·	e		
Threats: Elizana capat-machusca	" quell establish	ect. observations	have been works in a	Alexa
Comments: Class lens anno?	shere it has filly	established and	Seemingly success	÷.
Comments: Clay Lens and - machisca Gondanter & and	mintals		υų j	C
		<u>.</u>		
Determination: (check one or more, and fill in blan	nks)	Photogra	phs: (check one or more)	
Keyed (cite reference):		PI	Slide Print D	
Compared with specimen housed at: Compared with photo / drawing in:				
By another person (name):		Di	agnostic feature	
Other:		May we obta	in duplicates at our expense? O yes	O no
			CDFW/BDB/1747 Rev. 8/	/10/2014

Thomas	
Non Marco	^`\

Mail to:	(For Office Use Only	
California Natural Diversity Databa California Dept. of Fish & Wildlift		Source Code	•	e:
1807 13 th Street, Suite 202	-			
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov	Elm Code:	Occ No.:	
Date of Field Work (mm/dd/yyyy): مرم	1/15/14	EO Index:	Map Index:	·
Clear Form California	Native Spe	cies Field	l Survey Form	Print Form
Scientific Name: Navarretia	nigelliformis su	beo. radia.	3.5	
Common Name: Adore harrar	U	ł.		
Species Found? 🕅 🔿	If not found, why?	Reporter:	Brian Ritersoni	
Total No. Individuals: 405 Subse	· •	Address:	832 Escober St	
		Warti	Nez 6 94553	
Is this an existing NDDB occurrence?	es, Occ. #	E-mail Ad	dress: <u>h bartesh Quen</u>	madecology.com
Collection? If yes:	Museum / Herbarium	Phone: _	(Fas) 228-1027	UV
Plant Information	Animal Information	<u> </u>		
Phenology:	# adults	# juveniles	# larvae # egg masses	# unknown
· 7 € 2 Ø % vegetative % flowering % fruiting	wintering brea			lek other
Location Description (please attach	J			
Sunth Ranch South of				
		. Anash	11010	
County: Contra Costa Cornty.	Landowner /	Mgr: <u>ZBRFD</u>	/ contra Lesta Longera	200 Si
Quad Name:	Meridian: H O M O S	SO Source of Co	Elevation	type):
$T_{} R_{} Sec_{}, -1/4 of -1/4,$,	
DATUM: NAD27 O NAD83 O	wgs84 \bigcirc	Horizontal A	ccuracy:	meters/feet
Coordinate System: UTM Zone 10 O	UTM Zone 11 O	DR Geographic	c (Latitude & Longitude) O	
Coordinates: 603177				
Habitat Description (plants & animals) pla Animal Behavior (Describe observed behavior	such as territoriality, forag	ina, sinaina, callina, c	copulating, perching, roosting, etc.,	especially for avifauna):
South west slope, open	non-matine gras	sland, with	Gradium cicutarius	wy 2
Hesperevary sparsifiora vor. sp	parsiflora, Brown	2 devidence,	Aver Jahren	
Clay barren Cours - 30	,	ل		
			d Herry	E
Please fill out separate form for other rare taxa see Site Information Overall site/occurren	ce quality/viability (sit	e + nonulation).	$\bigcirc \text{Excellent} \emptyset \text{ Good}$	<u>∕ ⊖</u> O Fair O Poor
Immediate AND surrounding land use:	Then Space 4	Graziste		
Visible disturbances: <u>Cittle graze</u>	nay the second	0 0		
Threats: <u>none</u> .	<i>U</i>			
Comments:				
Determination: (check one or more, and fill in bla	nks)		Photographs: (check one or i	more)
Keyed (cite reference):			Plant / animal	Slide Print Digital
Compared with specimen housed at: Compared with photo / drawing in:	- 		Habitat	
By another person (name):			Diagnostic feature	
Other:			May we obtain duplicates at our	expense? O yes O no

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Mail to:						
California Natural Diversity Database			For Office	Use Only		
California Dept. of Fish & Wildlife	Sour	ce Code:		Quad Code:		
1807 13 th Street, Suite 202				_		
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wildlift	Elm (Code:		_ Occ No.: _		
		ndex:		_ Map Index:		
	Native Specie	s Field	Survey	Form	Prin	t Form
	ultitormis subsp	. <i>100201</i> 3				······
Common Name: Adobe havain Species Found? Ø O	<u>Stien</u>		Heath I	D / I		
Yes No If n	ot found, why?			colar st		<u></u> .
Total No. Individuals: /00 Subsequ	ent Visit? OYes ONo			94553		
Is this an existing NDDB occurrence? Yes.	No 🗍 Unk		<u> </u>	17552	/ /	
	Occ. #	E-mail Add	Iress: <u>hbar</u>	tosh Enon	un old to l	eg chilom
Collection? If yes: <u>966</u>	Museum / Herbarium	Phone:	925) 27	28-1027		V U
	Animal Information					
Phenology: (1) 50 50	# adults # iu	uveniles	# larvae	# egg masses	# unknov	
			_		-	
% vegetative % flowering % fruiting	wintering breeding	nesting	rookery	burrow site	lek	other
Location Description (please attach m	iap AND/OR fill out y	our choice	of coordina	ates, below)		
		1				
County: Contra Casta	Landowner / Mgr:	EBRPD/C.	stra Costa	Conservence	= 1	
County: <u>Contra Costa</u> Quad Name:		1		Elevation: 2	(7)Ft	
T R Sec,1/4 of 1/4, Me						
T R Sec,1/ ₄ of 1/ ₄ , Me						
					m	
			curacy:			
Coordinate System: UTM Zone 10 Ø U		Geographic	(Latitude & Lo	ongitude) 🔾		
Coordinates: 606531						
11-17-771						
Habitat Description (plants & animals) plant (communities dominants asso	ciatas substrata	s/soils_aspects/			
Habitat Description (plants & animals) plant of Animal Behavior, (Describe observed behavior, su					specially for	avifauna):
Animal Behavior (Describe observed behavior, su	ıch as territoriality. foraging, sir	naina, callina, co	pulating, perchir	a. roostina. etc e	specially for	avifauna):
Animal Behavior (Describe observed behavior, su	ıch as territoriality. foraging, sir	naina, callina, co	pulating, perchir	a. roostina. etc e	specially for	avifauna): righ
Animal Behavior (Describe observed behavior, su	ıch as territoriality. foraging, sir	naina, callina, co	pulating, perchir	a. roostina. etc e	specially for , th b hocare	ravifauna): righ S
Animal Behavior (Describe observed behavior, su	ıch as territoriality. foraging, sir	naina, callina, co	pulating, perchir	a. roostina. etc e	specially for	ravifauna): righ S)
	ıch as territoriality. foraging, sir	naina, callina, co	pulating, perchir	a. roostina. etc e	specially for with b hocarp	avifauna): righ rS) ric∼
Animal Behavior (Describe observed behavior, su South facing clay barren Mes Matrue Integerty with Hesperer Microsonis douglasis deplosis, Colond, perennis, Eredium cumbarium.	ich as territoriality, foraging, sin st of a trongla. Veg var sparstfora spar rinca ciliatas . Mun	nging, calling, cc yetation orflora, P or arrount	lagicbethics	g, roosting, etc., e 36-52%, k grs acant, grs avuers	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren Mes Matrue Integerty with Hesperer Microsonis douglasis deplosis, Colond, perennis, Eredium cumbarium.	ich as territoriality, foraging, sin st of a trongla. Veg var sparstfora spar rinca ciliatas . Mun	nging, calling, cc yetation orflora, P or arrount	lagicbethics	g, roosting, etc., e 36-52%, k grs acant, grs avuers	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren wes Matrixe Integerty with Hesperen Microsoris claugiasi scontasti, Colond, perennis, Enodium cumarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site.	nging, calling, co gradient on a erflora, P or arround	Devlating, perchir Sagrobethy Sagrobethy Sagrobethy	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren wes Matrixe Integerty with Hesperen Microsoris clave asin similarly colord, perennis, Erodium cumarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site.	nging, calling, co gradient on a erflora, P or arround	Devlating, perchir Sagrobethy Sagrobethy Sagrobethy	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren Wes Matrice Integerty with Hesperen Microsoris claugesti deglasti, Colond, perennis, Eradium cumbarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site.	nging, calling, co gradient on a erflora, P or arround	Devlating, perchir Sagrobethy Sagrobethy Sagrobethy	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South friend clay barren Wes Matrie Integerty with Hesperer Microsons clauges: devlosi, Colord, perennis, Eredium cuntarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site.	nging, calling, co gradient on a erflora, P or arround	Devlating, perchir Sagrobethy Sagrobethy Sagrobethy	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren Wes Matrice Integerty with Hesperen Microsoris claugesti deglasti, Colond, perennis, Eradium cumbarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site.	nging, calling, co gradient on a erflora, P or arround	Devlating, perchir Sagrobethy Sagrobethy Sagrobethy	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South friend clay barren Wes Matrie Integerty with Hesperer Microsons clauges: devlosi, Colord, perennis, Eredium cuntarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site.	nging, calling, co gradient on a erflora, P or arround	Devlating, perchir Sagrobethy Sagrobethy Sagrobethy	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South friend clay barren Wes Matrie Integerty with Hesperer Microsons clauges: devlosi, Colord, perennis, Eredium cuntarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats:	ich as territoriality, foraging, sin st of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site.	nging, calling, co gradient on a erflora, P or arround	Devlating, perchir Sagrobethy Sagrobethy Sagrobethy	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	hocarp hocarp is, Festi	righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren Wes Matrixe Integerty with Hespeace Microsoris douglasis doubsil, Colondo Perennis; Eradium cumarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats: Comments:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site. quality/viability (site + p Gen Land f graz i	nging, calling, co gradient on a erflora, P or arround	O Excellent	ng, roosting, etc., e 3 - 42%, b yrs acant, prs avvens Shapetile O Good (Dith b hocarp is, fest -Nanc D Fair (righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren Wes Matrixe Integerty with Hespear Microseris douglasis sociality follow percenses Errodium cumarium. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats: Comments:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Mun at this site. quality/viability (site + p Gen Land f graz i	nging, calling, co gradient on a erflora, P or arround	O Excellent	g, roosting, etc., e 3 - 40%, k grs acant, prs avvers <u>Shapehla</u> O Good	Dith b hocarp is, fest D Fair (D Fair (righ vSj ver
Animal Behavior (Describe observed behavior, su South facing clay barren Wes Matrice Integerty with Hespear Microsons clayes: deviating following perennis; Eredium cumarum. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats: Comments: Determination: (check one or more, and fill in blanks) Keyed (cite reference):	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a ciliates Munu at this site. quality/viability (site + p Gen Land & graz 1	nging, calling, co gradient on a erflora, P or arround	Photograph	ng, roosting, etc., e 3 - 42%, b yrs acant, prs avvens Shapetile O Good (Dith b hocarp is, fest D Fair (D Fair (11gh 25) 242 2 Poor
Animal Behavior (Describe observed behavior, su South facing clay barren Wes Matrice Integerty with Hesperen Microseris develosi devlosity follow perennist Eredium cumartum. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats: Comments: Determination: (check one or more, and fill in blanks) Keyed (cite reference): Compared with specimen housed at:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a collaters Munu at this site. quality/viability (site + p Gen Land f graz (nging, calling, co gradient on a erflora, P or arround	Pulating, perchir	ng, roosting, etc., e 3 - 40%, k yrs avers <u>Shapetile</u> O Good S: (check one or ma 1 animal at	Dith b hocarp is, fest D Fair (D Fair (11gh 25) 242 2 Poor
Animal Behavior (Describe observed behavior, su South facing clay barren Wes hatrie Integerty with Hesperen microsens douglass doubting following percenses Eradium cumarum. Please fill out separate form for other rare taxa seen a Site Information Overall site/occurrence Immediate AND surrounding land use: Visible disturbances: Threats: Comments: Determination: (check one or more, and fill in blanks) Keyed (cite reference): Compared with specimen housed at:	ich as territoriality, foraging, sin ist of a trongla. Veg var sparstlain spar (in a collaters Munu at this site. quality/viability (site + p Gen Land f graz (nging, calling, co gradient on a erflora, P or arround	Pulating, perchir	ng, roosting, etc., e 3 - 42%, k y (3 QCant, prs avoers <u>Shapetia</u> O Good (S: (check one or ma / animal	Dith b hocarp is, fest D Fair (D Fair (11gh 25) 242 2 Poor

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Mail to: California Natural Diversity Databa			For Office Use Only	
California Dept. of Fish & Wildlife		ce Code:	Quad Code	ə :
1807 13 th Street, Suite 202				
Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wil	dlife.ca.gov Elm	Code:	Occ No.:	
Date of Field Work (mm/dd/yyyy): ۲//	17/14 EOI	ndex:	Map Index	·
Clear Form California	Native Specie	s Field	Survey Form	Print Form
Scientific Name: Navarnatia n.	gelliformis subsp.	radians		
Common Name: Alobe naviori	V,			
Species Found? Ø	If not found, why?	_ Reporter:	Heath Bartosh	
	quent Visit? \bigcirc Yes \bigcirc No	Address:	832 Escobar st	
Is this an existing NDDB occurrence?			nez, Ca. 94553	
	es, Occ. #	E-mail Add	ress: <u>hbartosh@non</u>	adecology Low
Collection? If yes: <u>958</u>		- Phone:	725)228-1027	
Number	Museum / Herbarium			
Plant Information	Animal Information			
Phenology:	# adults # ju	uveniles	# larvae # egg masses	# unknown
% vegetative % flowering % fruiting	wintering breeding	nesting	rookery burrow site	lek other
Location Description (please attach				
On South east facing a	lope of moderate grade.	· e., fr		
County: <u>Contra</u> Costa Quad Name:	Landowner / Mgr:	EBRPD/C	iontrea Casten Courser.	Aller har been
Quad Name:	U	/	Elevation:	32015+
T R Sec,1/ ₄ of 1/ ₄ ,				
T R Sec,1/4 of 1/4,			Model:	
DATUM: NAD27 O NAD83 Ø	WGS84 〇			meters/feet
Coordinate System: UTM Zone 10 \emptyset	UTM Zone 11 O OR		Latitude & Longitude) O	
Coordinates: 603862				
4198812				
Habitat Description (plants & animals) pla	nt communities dominants asso	ciates substrates	choile aspects/slope:	
Animal Behavior (Describe observed behavior.	such as territoriality, foraging, si	naina, callina, col	pulatina, perchina, roostina, etc.	especially for avifauna):
Sily days parket with spars	e vegetation caser i	(30-40%)	with Roman to	2
Hesperxuax sparsillara sparsifiara, nitidum, Festuca perennis, casso	Plaatopothars an	- other way	S & malance 1	talkeys,
nitidum, Festuca perennis, coassu	ila corrata, Hespere	var caues	ens	m, lepidium
Plants many single headed a. Barrer in promisive sciencity.	though few with ma	thele inflore	come 1-2" tall. Statel	le sity day
Barren in monduelle scinify,	<i>V</i>	· 1	,	v v
Please fill out separate form for other rare taxa see Site Information Overall site/occurrent	n at this site.		Shape	naw 3
Site Information Overall site/occurrent	ce quality/viability (site + p	opulation): (CExcellent Ø Good	⊖ Fair ⊖ Poor
Immediate AND surrounding land use: <u>c</u>	per land " grazi	T	v	·
Visible disturbances: <u>pone</u>	V. Cr	-		
Threats: hone				
Comments: This boatton has no s Sols seem atypical due to	arms threats like i	nuosive men	eds, no mista. de cos	3C 5 0 - 20 - 26
Solls Seem atypical due to	high shit content		, , , , , , , , , , , , , , , , , , , 	\mathcal{O}
Determination: (check one or more, and fill in blar	nks)		Photographs: (check one or n	nore)
Keyed (cite reference):	·			Slide Print Digital
Compared with specimen housed at:			Plant / animal Habitat	
Compared with photo / drawing in: By another person (name):			Diagnostic feature	
Other:			May we obtain duplicates at our e	expense? Oyes Ono

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Mail to:	(For Office Use Only	
California Natural Diversity Databa California Dept. of Fish & Wildlif		Source Code	Quad Cod	e.
1807 13t ^h Street, Suite 202 Sacramento, CA 95811 Fax: (916) 324-0475 email: CNDDB@wil		Elm Code:	Occ No.:	
Date of Field Work (mm/dd/yyyy): 4		EO Index:	Map Index	
e			d Survey Form	Print Form
Scientific Name: Navaratia	nigelliformis.	5-050. radi	ans	
Common Name: Adobe Navarr	<u>icha</u>	ñ .		
Species Found? 🕅 🔘	If not found, why?	Reporter	: Heath Bartosta	
		No Address:	832 Escobar	54
Is this an existing NDDB occurrence?			met Ca 94553	
· _ ·	es, Occ. #	E-mail Ac	dress: hourtosh Casu	and to long
Collection? If yes: <u>971</u>	Museum / Herbarium		(925) 228-1027	
Plant Information	Animal Information	7		
Phenology: 20 60 20	# adults	# juveniles	# larvae # egg masses	# unknown
% vegetative % flowering % fruiting	wintering bree	eding nesting	rookery burrow site	iek other
Location Description (please attach		out your choic	e of coordinates, below)
South turing slope on Ro	V.			
County: Contra Casta	Landowner /	Mgr: <u> </u>	Monta Costa Conserva	(Fell)
Quad Name:			Elevation: _	· 32176
T R Sec,1/4 of 1/4,				
T R Sec,1/_4 of 1/_4, DATUM: NAD27 \bigcirc NAD83 \bigotimes			& Model: Accuracy:	meters/feet
Coordinate System: UTM Zone 10 Ø			c (Latitude & Longitude) O	· · · · · · · · · · · · · · · · · · ·
Coordinates: 604567 4199351				
Habitat Description (plants & animals) pla Animal Behavior (Describe observed behavior)				especially for avifauna).
On west faring clay bas	rren with 30-1	50% COUCY	· With Eradium	oot vusj
On west Saring clay bas Hesperenar sparellula sparell Lots providence	-ra microseris do	ugasi. Supp	Davalasii, medaraar	polyernophe.
Lows provedure	,	V k		r and a
Please fill out separate form for other rare taxa see				yre - Nanth
Site Information Overall site/occurren	ce quality/viability (site	e + population):	O Excellent O Good	🛈 Fair 🛛 Poor
Immediate AND surrounding land use: Visible disturbances: <u>Cattle hoot</u> Threats: <u>Summe cafet-mediasia</u>	Parate to	Prozingr 1		
Threats: 2 mms cafet modersen	on east fac	ina. slope on	oppiste hill.	
Comments:		1	11	
Determination: (check one or more and fill in bla			Photographs' (sheet one as	more)
Determination: (check one or more, and fill in blan Keyed (cite reference):			Photographs: (check one or i	^{more)} Slide Print Digital
Keyed (cite reference): Compared with specimen housed at:			Plant / animal Habitat	^{more)} Slide Print Digital
Keyed (cite reference):			Plant / animal	

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Mail to:				
California Natural Diversity Databas	se (For Office	e Use Only	· · · · · · · · · · · · · · · · · · ·
California Dept. of Fish & Wildlife	Source	Code:	Quad Code:	
1807 13 th Street, Suite 202				
Sacramento, CA 95811	Elm Co	de:	Occ No.:	
Fax: (916) 324-0475 email: CNDDB@wild	life.ca.gov			
Date of Field Work (mm/dd/yyyy): 5 /	[///// EO Inde	ex:	Map Index:	
Clear Form California	Native Species	Field Survey	Form	Print Form
Scientific Name: Piperia mid	raelii			
Common Name: Michael's v	ein orchid			
Species Found? & O	not found, why?	Reporter: Heath	Bartosp	
	uent Visit? OYes ONo	Address: <u>832</u> 2	scobar	
Is this an existing NDDB occurrence?		Martinez, Co	94553	
	s, Occ. #	E-mail Address: <u>/hbar</u>	toshermand	ecology, lam
Collection? If yes:		Phone: $(925) 22$		V 6
Number	Museum / Herbarium	$\frac{1}{2} \frac{1}{2} \frac{1}$		
Plant Information	Animal Information			
Phenology:				
	# adults # juve	niles # larvae	# egg masses	# unknown
% vegetative % flowering % fruiting	wintering breeding	nesting rookery	burrow site	lek 🚺 other
Location Description (please attach	map AND/OR fill out vo	ur choice of coordin	ates, below)	
west side of Dear Jully	s on Roddy Aprich		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
County: Contra Costa	Landowner / Mor:	EBRAD/contra C	asta Conserva	a they have
Quad Name:		1	Elevation: 87	25 71
T R Sec,1/4 of 1/4, I		CD		
T R Sec,1/ ₄ of1/ ₄ , I	-			
DATUM: NAD27 O NAD83		lorizontal Accuracy:		meters/feet
Coordinate System: UTM Zone 10 🖉 🕔	JTM Zone 11 O OR G	eographic (Latitude & L	ongitude) O	
Coordinates: 603635				
4/197558				
· · · · · · · · · · · · · · · · · · ·				
Habitat Description (plants & animals) plan				
Animal Behavior (Describe observed behavior,		ing, calling, copulating, perchi	ng, roosting, etc., espe	cially for avifauna):
Quercus dowglass just off	dirt road			
			01	
Please fill out separate form for other rare taxa seer	i at this site.		sharefile = Pr	w. 1
Please fill out separate form for other rare taxa seer Site Information Overall site/occurrence	e quality/viability (site + por	oulation). O Excellent	M Good O F	air O Poor
Immediate AND surrounding land use	o quality (allo pop	71 mint	×	
Immediate AND surrounding land use: Visible disturbances:	fra practice : contra			
Threats: Morre				
Comments:				
	<u> </u>	·····		
Determination: (check one or more, and fill in blan	ks)	Photograph	ns: (check one or more)	Slido Drint Digital
		Plan	t / animal	Slide Print Digital
Compared with specimen housed at:				
Compared with photo / drawing in:				
		Diau	nostic feature	
Other:		I ~ ~	nostic feature duplicates at our exper	

	11	
ĸ	e plan	