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

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Prepared for

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Section 1. INTRODUCTION

The purpose of this report is to present the results of surveys conducted in 2012 for select covered[1] and no-take[2] plant species on East Contra Costa County Habitat Conservancy (Conservancy) preserve system acquisitions (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; recommendations for management; and photographs.

The Conservancy is the implementing entity of the East Contra Costa Habitat Conservation Plan/Natural Community Conservation Plan, referred to herein as the "HCP" 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. 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).

During the course of these studies four covered plant species were observed within acquisition properties: San Joaquin spearscale (*Atriplex joaquinana*), big tarplant (*Blepharizonia plumosa*), Diablo helianthella (*Helianthella castanea*), and Mount Diablo fairy lantern (*Calochortus pulchellus*). In addition, non-covered plant species including Contra Costa manzanita (*Arctostaphylos manzanita* subsp. *laevigata* CRPR[3] 1B.2), crownscale (*Atriplex coronata* var. *coronata*; CRPR 4.2), small-flowered morning glory (*Convolvulus simulans* CRPR 4.2), serpentine bedstraw (*Galium andrewsii* subsp. *gatense* CRPR 4.2), and sylvan microseris (*Microseris sylvatica* CRPR 4.2) were also observed within acquisition properties.

[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] CRPR = California Rare Plant Rank which is formerly known as CNPS List.

Figure 1. Preserve Acquisitions Surveyed in 2012

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

SPECIES NAME	COMMON NAME
COVERED SPECIES	
Arctostaphylos auriculata	Mount Diablo manzanita
Atriplex depressa	brittlescale
Atriplex joaquinana	San Joaquin spearscale
Blepharizonia plumosa	big tarplant
California macrophylla	round-leaved filaree
Calochortus pulchellus	Mount Diablo fairy lantern
Delphinium recurvatum	recurved larkspur
Helianthella castanea	Diablo helianthella
Hesperolinon breweri	Brewer's dwarf flax
Madia radiata	showy madia
Navarretia nigelliformis subsp. *nigelliformis*[4]	adobe 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

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. This 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 this 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.

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] 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.

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 eleven unprotected occurrences of grassland-dependent covered plants
    - Objective 17.1: Protect populations of covered plants that are at least as large and healthy[5] as populations lost to covered activities.
    - Objective 17.2: Protect at least **two** occurrences[6] 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
    - Objective 27.5: Protect at least **one** occurrence of **Mount Diablo fairy lantern** 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 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.

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 2012)

California Department of Fish and Game (CDFW):

- State and Federally Listed Endangered, Threatened and Rare Plants of California (CDFW 2012a)
- Special Vascular Plants, Bryophytes, Lichens List (CDFW 2012b)
- California Natural Diversity Database (CNDDB) (CDFW 2012c)
- List of California Vegetation Alliances. The Vegetation Classification and Mapping Program (CDFW 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, 2012)
- Consortium of California Herbaria (CCH 2012)
- East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (Jones & Stokes 2006)
- Annotated Checklist of the East Bay Flora (CNPS 1997)
- 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 (Jepson Flora Project 2012). Common names of plant species are derived from The Calflora Database (Calflora 2012). Nomenclature for special-status plant species conform to the Inventory of Rare and Endangered Plants of California (CNPS 2001, 2012) and Special Vascular Plants, Bryophytes and Lichens List (CDFW 2012b).

2.2. SURVEY METHODOLOGY

2.2.1 PERSONNEL AND FIELD INVESTIGATIONS

The following personnel conducted focused botanical surveys and report preparation:

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Mr. Bartosh and Ms. McDermott conducted field surveys on April 17 and 20; May 4, 7, 8, 9 and 16; June 14 and 15; August 6 and 15; and September 20, 21, 25, and 26, 2012. 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 parcels, 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, several preserves were identified as high priority for inventorying (Table 2). Table 5 also shows whether each preserve contains 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 2012, or if the preserve was surveyed in 2011. Table 2 only contains covered/no-take plant species for which there is suitable habitat present on these acquisitions and does not include all 17 covered/no-take plant species.

Surveys for target species were conducted within suitable habitat (Table 3) by walking transects up to 10 meters apart depending on the topography or subject plant community. These visual surveys are considered adequate for determining the presence or absence of special-status plant species that have a potential to occur within preserve acquisitions. 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 recorded.

Table 2. High Priority Acquisition Properties Surveyed in 2011 and 2012

Target Species	Affinito	Ang	Barron	Chaparral Springs	Fox Ridge	Grandma's Quarter	Irish Canyon	Land Waste Management	Lentzner	Martin	Moss Rock	Souza I	Souza III	Thomas Kreigor	Thomas North	Vaquero Farms Central	Vaquero Farms North	Vaquero Farms South
Amsinckia grandiflora large-flowered fiddleneck	---	---	---	---	---	'11	---	'11	---	---	---	P	'11	---	---	---	---	---
Astragalus tener var. *tener* alkali milkvetch	---	---	---	---	---	'11	---	'11	---	---	---	E	'11	---	---	---	'11	'11
Atriplex depressa brittlescale	---	---	---	---	---	'11	---	'11	E	'11	---	E	'11	---	---	E	'11	'11
Atriplex joaquinana San Joaquin spearscale	---	---	---	---	---	'11	---	'11	E	'11	---	'11	'11	---	---	E	'11	'11
Blepharizonia plumosa big tarplant	E	P	P	E	E	'11	P	P	P	---	---	---	'11	P	E	---	'11	'11
California macrophylla round-leaved filaree	---	---	---	---	---	'11	---	'11	---	---	---	P	'11	---	---	---	P	---
Delphinium recurvatum recurved larkspur	---	---	---	---	---	'11	---	'11	---	'11	---	P	'11	---	---	---	---	---
Helianthella castanea Diablo helianthella	E	E	P	E	---	---	---	---	P	---	E	---	---	P	---	---	---	---
Lasthenia conjugens Contra Costa goldfields	---	---	---	---	---	'11	---	'11	---	---	---	P	'11	---	---	---	---	---
Madia radiata showy madia	---	---	---	---	---	'11	---	'11	---	---	---	P	'11	---	---	---	---	---
Navarretia nigelliformis subsp. *nigelliformis*[7] adobe navarretia	---	---	---	---	E	'11	---	'11	---	'11	---	'11	'11	---	---	---	E	'11

E = Entire area of suitable habitat surveyed within property in 2012.
P = Partial survey of suitable habitat within property in 2012.
'11 = Surveys conducted in suitable habitat in 2011. See Nomad 2011b.

[7] See footnote 4 above.

Table 3. Habitat Requirements of Survey Targets

SPECIES	LAND COVER TYPES	ADDITIONAL HABITAT NOTES
Amsinckia grandiflora large-flowered fiddleneck (N)	Annual grassland	None
Astragalus tener var. *tener* alkali milk-vetch (N)	Alkali wetland Annual grassland Seasonal wetland	None
Atriplex depressa brittlescale (C)	Alkali grassland Alkali wetland	Restricted to soils of the Pescadero or Solano soil series; generally found in southeastern region of plan area
Atriplex joaquinana San Joaquin spearscale (C)	Alkali grassland Alkali wetland	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
California macrophylla round-leaved filaree (C)	Annual grassland	Heavy clay soils
Delphinium recurvatum recurved larkspur (C)	Alkali grassland	None
Helianthella castanea Diablo helianthella (C)	Chaparral and scrub Oak savanna Oak woodland	Elevation above 650 feet; typically found on the ecotone of these habitats
Lasthenia conjugens Contra Costa goldfields (N)	Alkali grassland Annual grassland Seasonal wetland	Generally found in vernal pools
Madia radiata showy madia (C)	Annual grassland Oak woodland	None
Navarettia nigelliformis subsp. nigelliformis[8]) Adobe navarretia (C)	Seasonal wetland	Generally found in vernal pools[9]

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 alkali milk-vetch (*Astragalus tener* var. *tener*), brittlescale (*Atriplex depressa*), San Joaquin spearscale (*Atriplex joaquinana*), big tarplant (*Blepharizonia plumosa*), Mount Diablo fairy lantern (*Calochortus pulchellus*), Diablo helianthella (*Helianthella castanea*), Brewer's dwarf flax

[8] See footnote 4 above.

[9] Based on personal observations (H. Bartosh) and opinions of the experts the habitat for this species is uplands on heavy clay soils with a low abundance of annual grasses.

(*Hesperolinon breweri*), and adobe navarretia (*Navarretia nigelliformis* subsp. *radians*[10]) were visited at reference sites with similar characteristics to the acquisition properties such as habitat, topography, and climate.

On April 5, 2012, two known populations of round-leaved filaree were visited. The first population is located 1.6 air miles south-southeast of the intersection of Lone Tree Way and Deer Valley Road in Antioch. This occurrence is recorded in the CNDDB (EONDX #67137). At least twelve individuals were observed in bud, flower, or fruit on this date (Photo 2). However this population has been seeded annually from garden propagated individuals based on mitigation requirements from Pacific Gas & Electric Company substation expansion. A second known population of round-leaved filaree was also visited on the same date, located within Black Diamond Mines Regional Preserve (EONDX # 67134). This is a naturally occurring population that is not augmented with garden grown seed. No individuals were observed at this location. Due to the inconsistency and low abundance of precipitation during the 2011/2012 rainy season it is likely that naturally occurring populations of this annual species did not germinate this year. A further indication of this is that only 12 individuals at the mitigated population were observed this year, where a total of 200 individuals have been recorded at this site in 2005. Therefore surveys for this species in 2012 were not conducted as conditions were suboptimal for this taxon.

On April 18, 2012, a known population of alkali milk-vetch was observed in the North Livermore Valley. Although this is a known occurrence it has not yet been recorded in the CNDDB. This population is near the intersection of Hartford Avenue and Lorraine Road at approximately 515 feet in elevation. A single individual was observed at this location and was in full flower. Presumably, the below average rainfall for the 2011/2012 rainy season did not provide optimal conditions for this species to germinate. Therefore it was determined that surveys for this taxon during 2012 were not optimal. Therefore surveys for this species in 2012 were not conducted as conditions were suboptimal for this taxon.

Also on April 18, 2012, known populations of brittlescale and San Joaquin spearscale were visited. These populations are located within the East Bay Regional Park District Vaquero Farms acquisitions. The brittlescale occurrence is recorded in the CNDDB (EONDX #6898). Hundreds of individuals were observed however none had begun to flower. The San Joaquin spearscale location is yet to be recorded in the CNDDB however it is known from Vaquero Farms. Only leaves of this species were observed at this location. Due to the state of flowering phenology observed during this visit it was determined that surveys should be conducted for these species in late May, or early June.

On May 9, 2012, a new population of Mount Diablo fairy lantern was observed at the recent East Bay Regional Park District Moss Rock acquisition. This population is located on the west side, midway up Morgan Territory Road, approaching from the north, at approximately 1,160 feet in elevation. This occurrence is not yet recorded in the CNDDB. Approximately 27 individuals were observed at this location and of these, a majority of the inflorescences were in flower. Based on this observation it was determined that surveys for this species should be conducted within a week of this observation.

Also on May 9, 2012, a new population of Diablo helianthella was observed at the recent East Bay Regional Park District Lentzner acquisition. This population is located on the south side of Oil Canyon, near its eastern end at approximately 975 feet in elevation. This occurrence is not yet recorded in the CNDDB. Approximately 60 individuals were observed at this location,of these individuals, 50 percent were in flower and the rest were reproductively immature seedlings. Based on this observation it was determined that surveys for this species should be conducted within two weeks of this observation.

[10] See footnote 4 above.

On May 14, 2012 a known population of adobe 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 40 plants were observed at this location. Based on the condition of the individuals at this location, it was determined that surveys for this species should be conducted within the same week on similar habitat and soil types.

On May 25, 2012, a new population of Brewer's dwarf flax was observed on Save Mount Diablo's Viera North Peak property. This population is located near the head of the southern tributary of Perkins (Creek) Canyon. This occurrence is not yet recorded in the CNDDB. Approximately 25 individuals were observed at this location, of these, 50 percent were in flower, and the rest were in bud. Based on this observation it was determined that surveys for this species should be conducted within two weeks of this observation

On September 20, 2012, 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 250 were observed on this date, and of these a majority of the inflorescences were in flower. Based on this information, it was determined that surveys for this species should be conducted within a week of this observation.

Observations made during early spring reference population visits indicated that surveys for species with April blooming periods would likely result in false negative survey results. This is due to the absence or low abundance of individuals at round-leaved filaree (*California macrophylla*) and alkali milk-vetch (*Astragalus tener* var. *tener*) reference populations. As 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 surveys for April blooming species would not be conducted in 2012 and instead recommended that surveys for these taxa be conducted in following years when conditions favor high abundance of early blooming covered and no-take species.

Herbaria Specimens

An examination of herbaria specimens was performed for the remaining potentially occurring taxa using the Consortium of California Herbaria Database (CCH 2012). 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 4 for HCP/NCCP covered and no-take species considered targets during the 2012 studies. All of the species appearing in Table 4 have peak blooming periods during the months of April and May which match the months during which botanical surveys were conducted. Although Mount Diablo manzanita (*Arctostaphylos auriculata*) has a peak blooming period outside of the survey months, vegetative material of this woody shrub would have been detectable within the acquisition properties.

Table 4. Herbaria Specimen Collection Dates and Correspondence of Survey Timing

Target Species	Herbaria Specimen Collections Averaged By Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amsinckia grandiflora Large-flowered fiddleneck (N)	0%	0%	25%	**60%**	15%	0%	0%	0%	0%	0%	0%	0%
Eriogonum truncatum Mount Diablo buckwheat (N)	0%	0%	0%	**43%**	**43%**	14%	0%	0%	0%	0%	0%	0%
Eschscholzia rhombipetala diamond-petaled poppy	0%	9%	27%	**46%**	**18%**	0%	0%	0%	0%	0%	0%	0%
Delphinium recurvatum recurved larkspur (C)	0%	0%	15%	**61%**	20%	4%	0%	0%	0%	0%	0%	0%
Lasthenia conjugens Contra Costa goldfields (N)	0%	0%	11%	**49%**	33%	4%	0%	0%	0%	2%	0%	0%
Madia radiata showy madia (C)	0%	0%	30%	**51%**	17%	1%	0%	1%	0%	0%	0%	0%
Tropidocarpum capparideum caper-fruited tropidocarpum (N)	0%	5%	41%	**54%**	0%	0%	0%	0%	0%	0%	0%	0%

Note: Shaded areas indicate months when focused 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". 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:

- Physical condition: 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.

- Age structure: 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.

- Reproductive Success: 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.

- Availability of Suitable Habitat: 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.
- Diversity of suitable habitat: 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 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 April, May, June, August, and September 2012 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

Of the 15 preserve acquisitions surveyed in 2012, five Acquisition Zones are presented: Pittsburg Hills; Watersheds of Northern Tributaries of Marsh Creek; Clayton Area, Mount Diablo Foothills; Slopes of Mount Diablo and Main Stem Marsh Creek Watershed; and the Byron Hills. Table 5 summarizes preserve acquisitions surveyed by Acquisition Zone.

Table 5. Acquisition Properties by 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
Affinito	●				
Ang		●			
Barron		●			
Chaparral Springs			●		
Fox Ridge		●			
Irish Canyon		●			
Land Waste Management	●				
Lentzner		●			
Moss Rock				●	
Souza I					●
Thomas Kreigor		●			
Thomas North	●				
Vaquero Farms Central					●
Vaquero Farms North					●
Vaquero Farms South					●

3.1.1 ZONE 1

Surveys conducted in Zone 1 took place on three properties: Affinito, Land Waste Management, and Thomas North. This Zone represents the westernmost extension of the San Joaquin Valley habitat characteristics in Contra Costa County. The Land Waste Management acquisition straddles Kirker Pass Road and includes headwaters of Hess Creek. The Affinito property is located on the south side of Kirker Pass Road and abuts the Land Waste Management property on the east. The Thomas North property shares a boundary with the northwest corner of Black Diamond Mines Regional Preserve east of Nortonville Road. Land cover types within this property include alkali grassland, alkali wetland, grassland, oak woodland, oak savannah, permanent wetland, seasonal wetland, ponds, riparian, and urban. Floristically, these properties are located within the San Joaquin Valley Subregion of the California Floristic Province.

Areas surveyed within these properties focused on woodland/scurb ecotones in May as well as grasslands supported by Altamont Series and Altamont-Fontana Complex soils during the month of September. Primary covered species surveyed for on these properties included big tarplant and Diablo helianthella.

3.1.2 ZONE 2

Surveys conducted in Zone 2 included six properties: Ang, Barron, Fox Ridge, Irish Canyon, Lentzner, and Thomas Kreigor. The Ang, Barron, Irish Canyon, Lentzner, and Thomas properties 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. Prominent geographic features include Kreigor Peak, headwaters of Irish Canyon, Keller Ridge, and Oil Canyon. Fox Ridge is located west of Deer Valley Road and north of Briones Valley Road. It is a low elevation property that includes Briones Creek. These properties include land cover types such as grassland, alkali grassland, alkali wetland, chaparral, grassland, oak savannah, oak woodland, pond, and seasonal wetland. Ang, Barron, Fox Ridge, Irish Canyon, Lentzner, and Thomas Kreigor are located within the San Francisco Bay Subregion of the California Floristic Province. Fox Ridge is located within the San Joaquin Valley Subregion of the California Floristic Province.

Surveys on the Ang, Barron, Irish Canyon Lentzner, and Thomas Kreigor properties focused on woodland/scurb ecotones in May, and grasslands supported by Altamont Series and Altamont-Fontana Complex soils in September. Alkali habitats on Lentzner were surveyed in May and June. Surveys on Fox Ridge focused on clay soils in June and September. These surveys targeted the following covered species: brittlescale, San Joaquin spearscale, big tarplant, Diablo helianthella, and adobe navarretia.

3.1.3 ZONE 3

Surveys conducted in Zone 3 included a single property: Chaparral Springs. This property is located on the north side of Marsh Creek Road and adjoins the western boundary of EBRPD's Clayton Ranch Land Bank. Prominent geographic features of this property include Keller Ridge. This property includes land cover types such as grassland, chaparral, oak savannah, oak woodland, and pond. Chaparral Springs is located within the San Francisco Bay Subregion of the California Floristic Province.

Areas surveyed within this property focused on woodland/scrub ecotones in May as well as grasslands supported by Altamont Series and Altamont-Fontana Complex soils during the month of September. Primary covered species surveyed for on these properties included big tarplant and Diablo helianthella.

3.1.4 ZONE 4

Surveys conducted in Zone 4 included a single property: Moss Rock. This property is located on the west side of Morgan Territory Road and its western boundary and southern boundaries are shared with Mount Diablo State Park. Land cover type on this property is primarily oak woodland, but small amounts of grassland are also found. Moss Rock is located within the San Francisco Bay Subregion of the California Floristic Province.

Areas surveyed within these properties focused on woodland in May, surveying for Mount Diablo fairy lantern.

3.1.5 ZONE 5

Zone 5 surveys included four parcels: Souza I, Vaquero Farms North, Vaquero Farms Central, and Vaquero Farms South. This zone lies on the eastern foothills of the Diablo Range near the edge of the San Joaquin Valley. These acquisitions are located along the west side of Vasco Road. These properties are connected to Los Vaqueros watershed lands, owned by Contra Costa Water District, and EBRPD's Vasco

Caves Land Bank. The prominent geographic feature here is Brushy Creek. These parcels also include wind farm leases.

These are primarily treeless lands with an abundance of alkaline habitats influenced by the alkaline soils that support them. Brady and Weil (1999) define alkaline soils as any soil that has a pH greater than 7.0. What contributes to this basic chemistry is runoff influenced by the marine sedimentary rocks. These rocks add sodium chloride as well as carbonates and sulfates to the system, which are then concentrated upward in the soils through capillary action driven by evaporation rates that are four times the local rainfall (Edwards and Thayer 2008). In some swales within east Contra Costa County, this accumulation of salt and high levels of sodium in the soil has led to the development of alkali scalds. Alkali scalds exhibit saline or alkaline crusts on the soil surface, supporting little or no vegetation, due to an elevated soil ph, which can be toxic to most plant species.

Land cover types within these acquisitions include alkali grassland, alkali wetland, grassland, permanent wetland, ponds, riparian, ruderal, seasonal wetland, urban, and wind turbines. These properties are located within the San Joaquin Valley Subregion of the California Floristic Province.

Within these parcels, surveys focused on wetland and grassland habitats during early spring on Souza I prior to suspension of early spring surveys. Surveys on the remaining three properties targeted wetland habitats in May, and upland clay soils in June. Primary covered species surveyed for on these properties included brittlescale, San Joaquin spearscale, and adove navarretia.

Section 4. SURVEY FINDINGS

During plant surveys conducted in April, May, June, August, and September 2012, four Plan species were observed by Nomad botanists. Plan species observed include San Joaquin spearscale (*Atripiex joaquinana*), big tarplant (*Blepharizonia plumosa*), Diablo helianthella (*Helianthella castanea*), and Mount Diablo fairy lantern (*Calochortus pulchellus*). Overall, a total of eight populations of covered plant species were recorded with an estimated number of 730 individuals represented. Table 6 shows the number of covered species populations recorded on each acquisition property. No-take species were not observed during these studies.

Contra Costa manzanita (*Arctostaphylos manzanita* subsp. *laevigata* CRPR[11] 1B.2), crownscale (*Atriplex coronata* var. *coronata*; CRPR 4.2), small-flowered morning glory (*Convolvulus simulans* CRPR 4.2), serpentine bedstraw (*Galium andrewsii* subsp. *gatense* CRPR 4.2), and sylvan microseris (*Microseris sylvatica* CRPR 4.2) were also observed within aquisition properties. Although not a covered or no-take species it is considered rare and is therefore included in this inventory.

[11] CRPR = California Rare Plant Rank which is formerly known as CNPS List.

Table 6. Number of Covered Species Populations Recorded by Acquisition (2012)

Target Species	Affinito	Chaparral Springs	Lentzner	Moss Rock	Thomas Kreigor	Vaquero Farms Central	Total # of Populations
Atriplex joaquinana San Joaquin spearscale	0	0	0	0	0	1	1
Blepharizonia plumosa big tarplant	0	0	1	0	0	0	1
Calochortus pulchellus Mount Diablo fairy lantern	0	0	0	1	0	0	1
Helianthella castanea Diablo helianthella	1	1	1	0	2	0	5

Details of each of these populations are discussed below. Voucher specimens of all covered plant species populations encountered were collected. These 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 included in Attachment A.

4.1. Covered Plant Population Assessments

4.1.1 Zone 1 – Pittsburg Hills

Affinito

A single population of the covered plant species Diablo helianthella was observed within the Affinito property (Table 7, Figure 2). No extant populations of rare plant species were known from this property prior to these studies (CDFWc; CCH 2012).

Table 7. Covered Plant Species Populations Recorded on the Affinito Property

Population Number	Species Name	Common Name	Status	Number of Individuals
Heca2	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	12

Keller Canyon

Land Waste Management

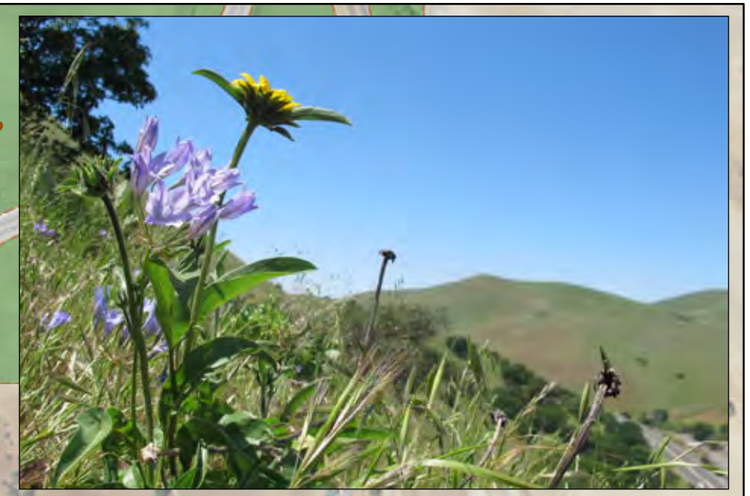
Keller Canyon

PG&E

Save Mt Diablo

Affinito

Land Waste Management



Population Number	Species Name	Common Name	Status	Number of Individuals
Heca2	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	12

December 2012

2012 Covered Plant Species Inventory

Legend

Covered Plant Species
Scientific Name
Helianthella castanea

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 2

Covered Plant Species Observed on Affinito

East Contra Costa County Habitat Conservancy

1:7,200

0 300 600

Feet

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

Diablo Helianthella (Heca2)

On May 7, 2012, a single population (Heca2[12]) of Diablo helianthella was observed on the edge of California buckeye (*Aesculus californica*) and valley oak (*Quercus lobata*) woodlands among a diffuse stand of silver bush lupine (*Lupinus albifrons* var. *albifrons*). This population is located near the northeastern corner of the property (Figure 2). Among the two colonies, the population totals an estimated 12 individuals, and occupies approximately 2,000 square feet (0.05 acre) on woodland/scrub/grassland ecotone habitat. These colonies are between 800 and 960 feet in elevation. This occurrence is located on a northern aspect. The soils that support this population are of the Altamont-Fontana complex which is a heavy clay soil type (USDA 1977). Plant species associated with this population include Ithurial's spear (*Triteleia laxa*), yarrow (*Achillea millefolium*), Great Valley gumweed (*Grindelia camporum*), poison sanicle (*Sanicula bipinnata*), Italian ryegrass (*Festuca perennis**), gray mule ears (*Wyethia helenioides*), wild oats (*Avena fatua**), Indian paintbrush (*Castilleja affinis* subsp. *affinis*), and common fiddleneck (*Amsinckia intermedia*).

This population is significant as it represents the northernmost station for this taxon in the inventory area.

Photo 1. Heca2, looking northeast at occupied habitat.

[12] This population is represented by two colonies separated by approximately 240 feet of elevation.

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

Photo 2. Flowering individual of Heca2, Kirker Pass Road in view.

- Physical Condition: Ten of the twelve plants appeared in excellent physical condition and were either fruiting or flowering. The remaining two were immature, and had only produced leaves. 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 5 inches to 24 inches tall and 8 inches to 28 inches in basal diameter.

- Age Structure: Ten plants were considered mature in age since they were either in fruit or flower. The smaller plants, not flowering, were considered immature. The smaller the circumference (or fewer number basal leaves), the younger the plant is presumed to be. No assessment of the seed bank was attempted. With more mature plants than seedlings representing this population, it is possible the population is in decline.

- Reproductive Success: Approximately 42 percent of the individuals of this this population were flowering, 42 percent were in fruit, and the remaining 16 percent only presented vegetative material. Based on the presence of seedlings the population is shown to be reproducing.

  It is estimated that a single inflorescence has the potential to result in approximately 111 seeds (number of fertile disk flowers estimated). At this time it is unknown whether a population size of 12 individuals is self-sustaining over the long term. Because seed dispersal is limited due to the weight and smoothness of the seed, it is presumed these colonies are slow to radiate and possibly struggling to stay established, although they may just maintain small population sizes. Management considerations for this taxon should be focused on annual population monitoring paying particular attention to seed production and herbivory. Based on personal observations (H. Bartosh 2012) of Diablo helianthella populations in the region, a low number of seeds reach maturity annually. Possible reasons for this include aborted ovules, not being pollinated, or from insect herbivory. Monitoring should be focused on actual production of viable seed.

- Availability of Suitable Habitat: Throughout its range, which almost entirely occurs within Contra Costa County, this taxon prefers partially shaded habitat on the ecotone of oak woodland, scrub or chaparral, and grassland habitats on clay and loam soils (CDFW 2012c; Bartosh pers. observation). This species also prefers slopes between 30 to 75 percent (CDFW 2012c; Bartosh pers. observation). Population Heca2 is small in relation to the unoccupied suitable habitat it is surrounded by. There is also an abundance of clay and loam soils with the appropriate vegetation associations throughout the Affinito property. 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: 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 are more general in nature. The only requirements this taxon prefers are clay or loamy soils, moderately steep slopes, and the appropriate vegetation ecotones. 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 criteria.

4.1.2 ZONE 2 – WATERSHEDS OF NORTHERN TRIBUTARIES OF MARSH CREEK

Lentzner

Two populations of covered plant species were observed within the Lentzner Property (Table 8, Figure 3): big tarplant and Diablo helianthella. No extant populations of rare plant species were known from this property prior to these studies.

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

POPULATION NUMBER	SPECIES NAME	COMMON NAME	STATUS	NUMBER OF INDIVIDUALS
Blpl3	*Blepharizonia plumosa*	big tarplant	Covered CRPR 1B.1	162
Heca3	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	62

Population Number	Species Name	Common Name	Status	Number of Individuals
Blpl3	*Blepharizonia plumosa*	big tarplant	Covered CRPR 1B.1	162
Heca3	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	62

December 2012

2012 Covered Plant Species Inventory

Legend

Covered Plant Species
Scientific Name
- Blepharizonia plumosa
- Helianthella castanea

- Acquisition Parcels
- Public Land and Easements
- Survey Areas

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.

Figure 3

Covered Plant Species Observed on Lentzner

East Contra Costa County Habitat Conservancy

1:7,200

0 300 600 Feet

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

Big tarplant (Blpl3)

On September 25, 2012, a single population (Blpl3) of big tarplant was observed near the southeast corner of the Lentzner property (Figure 3). This population totaled an estimated 162 individuals and occupied approximately 2,100 square feet (0.05 acre) of grassland and roadway habitat at 1,020 feet in elevation. It mainly occupies the road prism of the dirt access road on a northeast facing slope before it reaches the southern property boundary. A small part of this population was observed in the grassland on the north side of the access road. This road was bladed at some time prior to our visit but based on the size and condition of the plants it was likely bladed in mid to late spring. The soils that support this population are of the Altamont-Fontana Complex (USDA 1977). Associate plant species observed include prickly lettuce (*Lactuca serriola**), wild oats (*Avena fatua**), vinegar weed (*Trichostema lanceolatum*), and soft chess (*Bromus hordeaceus**).

Photo 3. Blpl3 Looking southwest at occupied habitat (in the roadway and grassland)

Photo 4. Flowering individual of Blpl3, looking southeast toward Briones Valley.

- Physical Condition: The plants growing in the grassland, outside of the access road, appeared in excellent physical condition. The plants growing within the roadway appeared to have been damaged either by blading activities or vehicles passing along the road and running them over. Otherwise, no signs of disease, virus, herbivory, or nutrient deficiencies were observed on any individuals. Due to the presence of terpenoids produced by this plant species, they are unpalatable to cattle and are therefore not grazed by cattle. This population is expected to survive and reproduce. Individuals were setting seed at the time of the observation. Size of individuals ranged from approximately 2.5 to 16 inches, however most of them were between 12 and 16 inches.

- Age Structure: This characteristic is not applicable as big tarplant is an annual species.

- Reproductive Success: At the time of the observation, approximately 90 percent of the individuals were either flowering or fruiting. The remaining 10 percent were only in bud or had not yet become reproductively mature. All of the fruits/seeds inspected were either mature or maturing. An average of 14 inflorescences was estimated per 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, possible number of seeds produced, and an assumption of aborted cypsela it is presumed that 108,864 seeds (672 seeds per plant) were produced by this population in 2012. It is unknown at this time whether a population size of 162 individuals is self-sustaining over the long term, given this is an annual plant population prone to fluctuations in population numbers based on climactic conditions and it was only observed at one time (not over multiple years).

- 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 Blpl3 is small in relation to the unoccupied suitable habitat it is surrounded by, particularly downslope. There is also an abundance of Altamont soils along the northern boundary of the Lentzner property in the open

grassland. Within these areas, population expansion could be attempted on northern aspects. Management considerations should be directed at understanding the timing of big tarplant germination at this location so that blading activities can be timed prior to this event to avoid unnecessary big tarplant mortality.

- 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 , 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.

Diablo Helianthella (Heca3)

On May 9, 2012, a single population (Heca3) of Diablo helianthella was observed near the mouth of Oil Canyon on the southeast side of the Lentzner Property (Figure 3). This population totaled an estimated 62 individuals and occupied approximately 4,800 square feet (0.11 acres) of oak woodland/scrub/grassland ecotone habitat between 900 to 1,180 feet in elevation among six colonies. These colonies occupy both north and west facing slopes of an Oil Canyon tributary on the south side. The vegetation at these locations is primarily blue oak and interior live oak (*Quercus wislizeni* var. *wislizeni*) woodlands with low canopy cover, near savannah-like. On the west facing slope, two of the colonies are established on the edge of chamise chaparral. All of these colonies are on steep slopes, with northern or western aspects, in partial shade. The soils that support this population are of the Los Gatos series (USDA 1977). Other plant species associated with this population include narrowleaf goldenbush (*Ericameria linearifolia*), California sagebrush (*Artemisia californica*), woolly sunflower (*Eriophyllum lanatum* subsp. *achilleoides*), ripgut brome*, royal larkspur (*Delphinium variegatum* subsp. *variegatum*), poison oak (*Toxicodendron divsersilobum*), serpentine bedstraw (*Galium andrewsii* subsp. *gatense*), fringe pod (*Thysanocarpus curvipes*), pitcher sage (*Lepechinia calycina*), and goldback fern (*Pentagramma triangularis* subsp. *triangularis*).

Photo 5. Heca3 Looking northeast at occupied habitat, with narrowleaf goldenbush

Photo 6. Flowering individual of Heca3

- Physical Condition: All plants appeared in excellent physical condition. Of the 62 individuals, 32 individuals were mature and either fruiting or flowering. The other individuals lacked reproductive structures and were only in leaf and considered reproductively immature. 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 6 inches to 22 inches tall , expressed as single individuals, and clustered plants.

- Age Structure: With 50 percent of the population considered immature the age structure of the population suggests a stable and positive rate of population growth. No assessment of the seed bank was attempted.
- Reproductive Success: Approximately 52 percent of the individuals of this population were flowering. 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 3,552 (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 Heca3 is small in relation to the unoccupied suitable habitat it is surrounded by (approximately 10 acres). There is also an abundance of loam soils with the appropriate vegetation associations throughout the Lentzner property, particularly on the south side of Oil Canyon on 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 this population.
- Diversity of Suitable Habitat: This population occupies habitat that is typical for this taxon in Contra Costa County. However, there are slight differences in microclimate and species associates of this population compared to other reserve populations recorded during 2011 and 2012 surveys. The ability to occupy these different landscape positions with different vegetation associations, makes this population the best seed source for population expansion observed to date.

Thomas Kreigor

A total of two populations of the covered plant species Diablo helianthella were observed within the Thomas Kriegor Property in 2012 (Table 9, Figure 3). No extant populations of rare plant species recorded in the CNDDB were known from this property prior to these studies. One covered plant species population, big tarplant, was recorded during 2011 surveys (Nomad 2011).

Table 9. Covered Plant Species Populations Recorded on the Thomas Kreigor Property

Population Number	Species Name	Common Name	Status	Number of Individuals
Heca4	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	60
Heca5	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	65

Population Number	Species Name	Common Name	Status	Number of Individuals
Heca4	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	60
Heca5	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	65

December 2012

2012 Covered Plant Species Inventory

Legend

Covered Plant Species
Scientific Name
Helianthella castanea

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 4

Covered Plant Species
Observed on Thomas Kreigor

East Contra Costa County
Habitat Conservancy

1:9,600
0 400 800
Feet

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

Diablo Helianthella (Heca4)

On May 8, 2012 a single population (Heca4) of Diablo helianthella was recorded the northeastern corner of the three properties that form the Thomas Kreigor aquisition (Figure 4). This population comprises two separate colonies totaling an estimated 60 individuals and occupying approximately 800 square feet (0.02 acres) of oak woodland understory at 1,800 feet in elevation. These colonies occupy north facing slopes on the north side of the eastern ridge that is connected to Kriegor Peak. This is the highest elevation population of Diablo helianthella recorded on HCP acquisition properties. These colonies grow in a low to medium density coast live oak woodland with a mixture of coast live oak (*Quercus agrifolia* var. *agrifolia*) and interior live oak as this is the transition zone (edge of the coastal fog incursion zone) of these two species. Generally these colonies are on gentle slopes near a small knoll in partial shade near the drip lines of the oak trees. The soils that support this population are of the Los Gatos series (USDA 1977). Other plant species associated with this population include ripgut brome*, Italian ryegrass*, wine cup clarkia (*Clarkia affinis* subsp. *affinis*), yarrow, and long beaked filaree (*Erodium botrys**).

Photo 7. Heca4 Looking southwest at occupied habitat in woodland understory.

Photo 8. Flowering individual of Heca4

- Physical Condition: All plants appeared in excellent physical condition. Of the 60 individuals, 42 individuals were mature, and either fruiting or flowering. The other individuals lacked reproductive structures, and were only in leaf and considered reproductively immature. 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 5 inches to 20 inches tall , expressed as both single individuals and clustered plants.
- Age Structure: With 70 percent of the population considered mature, reproductive, suggests that the age structure of the population may be senescent due to a disproportionate number of mature plants (42) to seedlings (18). No assessment of the seed bank was attempted.
- Reproductive Success: Approximately 70 percent of the individuals of this population were flowering. 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 4,662 (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 may be in decline.
- Availability of Suitable Habitat: Population Heca4 is small in relation to the unoccupied suitable habitat it is surrounded by, primarily to the west within the woodlands on the north slope of

Kriegor Peak. 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. However, as the highest (in elevation) population within the Black Diamond Mines area, it implies that the population is suited for occupying the upper elevational range for this species within this more xeric range of its habitat. It is also noteworthy that this population did not include any shrub species as associates typical of other populations in the region.

Diablo Helianthella (Heca5)

On June 14, 2012, a single population (Heca5) of Diablo helianthella was recorded on the southern portion of the three properties that for the Thomas Kreigor acquisition (Figure 3). This population comprises three separate colonies totaling an estimated 65 individuals and occupying approximately 900 square feet square feet (0.02 acres) of oak woodland and chamise chaparral understory at 1,400 feet in elevation along Keller Ridge. Two of these colonies occupy the north facing slope (north of the ridge road), the eastern colony among chamise chaparral and the western colony under interior live oak woodland. The third colony is positioned on the ridge (south of the ridge road) with a slight northern aspect in the understory of chamise chaparral. The soils that support this population are of the Los Gatos series soils and areas mapped as rock outcrops (USDA 1977). Other plant species associated with the oak woodland colony include poison oak, California sagebrush, and narrowleaf goldenbush. Plant species associated with the chamise chaparral colonies include California melic grass (*Melica californica*), coyote mint (*Monardella villosa* subsp. *villosa*), naked stem buckwheat (*Eriogonum nudum* var. *auriculatum*), and Hartweg's tauschia (*Tauschia hartwegii*).

Photo 9. Heca5 Looking north into chaparral occupied habitat

Photo 10. Heca5 Looking southeast into oak woodland understory occupied habitat

- Physical Condition: All plants appeared in excellent physical condition. Of the 65 individuals, 35 individuals were mature and either fruiting or flowering. The other individuals lacked reproductive structures, were only in leaf, and considered reproductively immature. 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 5 inches to 26 inches tall and was expressed as single individuals and clustered plants.
- Age Structure: With 54 percent of the population considered mature and reproductive, this suggests that the age structure of the population is stable with an equal number of plants mature and immature (46 percent). No assessment of the seed bank was attempted.
- Reproductive Success: Approximately 35 percent of the individuals of this population were flowering. 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 3,885 (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 stable.
- Availability of Suitable Habitat: Population Heca5 is small in relation to the unoccupied suitable habitat it is surrounded by, primarily on the north side of Keller Ridge in the oak woodland understory. Although there is unoccupied habitat in chamise chaparral on the south side of Keller Ridge, the low canopy height typical of this vegetation community may make population expansion difficult, due to the impenetrable structure of hard chaparral. 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. However, the southern exposure colony is less typical and could be a source for potential expansion areas with higher temperatures.

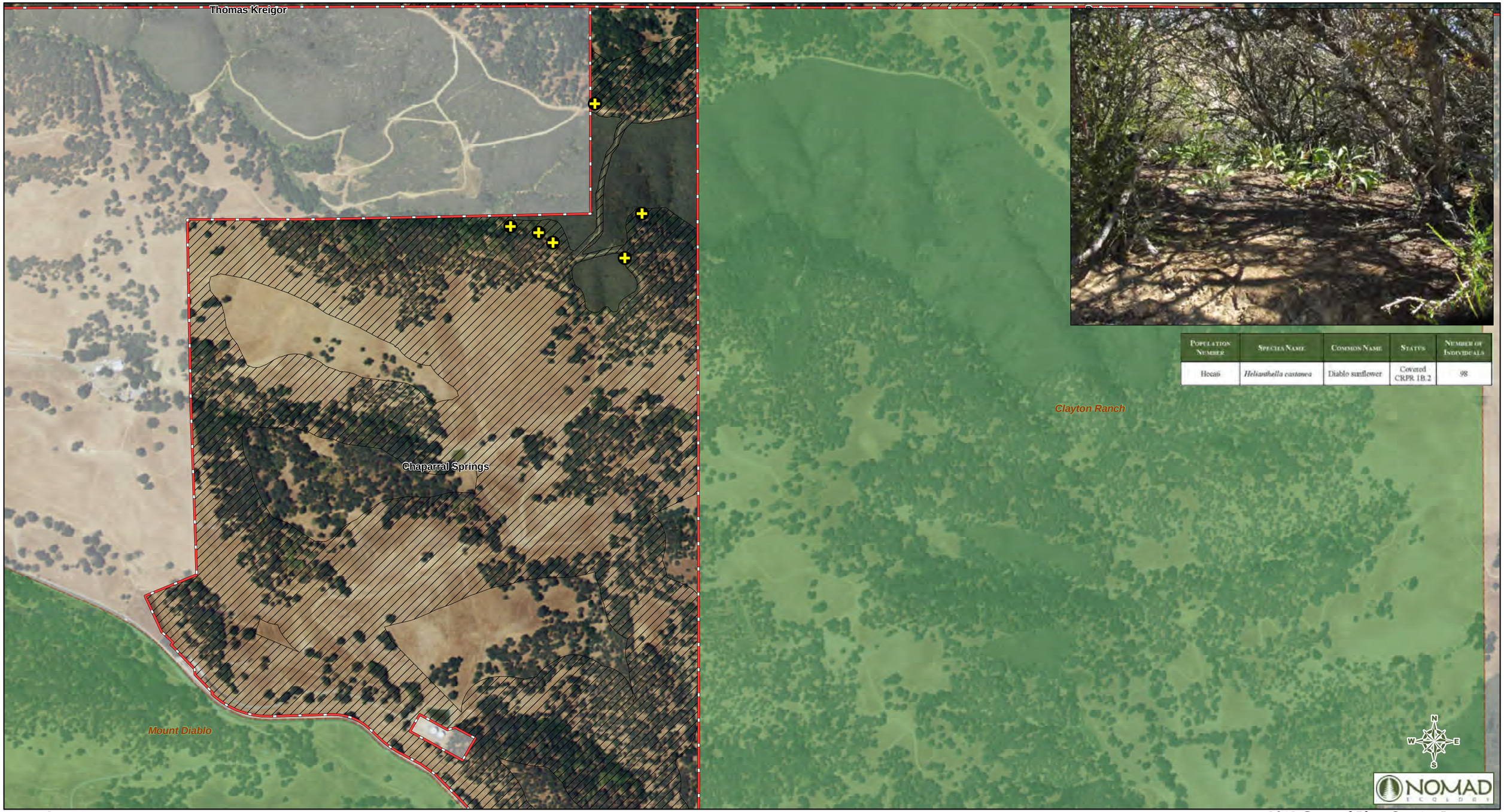
4.1.3 ZONE 3 – CLAYTON AREA, MOUNT DIABLO FOOTHILLS

Chaparral Springs

A single population of the covered plant species Diablo helianthella was observed within the Chaparral Springs property (Table 10, Figure 5). A single extant population of Diablo helianthella (discussed below) is known from this property prior to these studies. There are also CNDDB reports of big tarplant (EONDX# 51068) and Brewer's dwarf flax (EONDX# 84809) from the vicinity of the property. However, the location information for these occurrences is not specific and surveys conducted in 2012 did not locate these populations. In addition, a collection record of big tarplant (Accession # JEPS107064) housed at the UC and Jepson Herbaria is labeled as vouchered from Chaparral Springs by Barbara Ertter in 1994. In October Mr. Bartosh, Ms. Ertter, and David Gowen attempted to relocate this population. This relocation attempt was unsuccessful.

Table 10. Covered Plant Species Populations Recorded on the Chaparral Springs Property

POPULATION NUMBER	SPECIES NAME	COMMON NAME	STATUS	NUMBER OF INDIVIDUALS
Heca6	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	98



Population Number	Species Name	Common Name	Status	Number of Individuals
Hecat6	*Helianthella castanea*	Diablo sunflower	Covered CRPR 1B.2	98

December 2012

2012 Covered Plant Species Inventory

Legend

Covered Plant Species
Scientific Name
Helianthella castanea

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 5

Covered Plant Species
Observed on Chaparral Springs

East Contra Costa County
Habitat Conservancy

1:7,200
0 300 600
Feet

East Contra Costa County
Habitat Conservancy

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

Contra Costa County, California

Diablo helianthella (Heca6)

On May 4 and June 14, 2012, a single population of Diablo helianthella (Heca6) was observed within the Chaparral Springs property (Figure 3). This population totaled an estimated 98 individuals and occupied approximately 7,000 square feet (0.16 acre) among six colonies at the ecotone of blue oak (*Quercus douglasii*) woodland and chamise (*Adenostoma fasciculatum* var. *fasciculatum*) chaparral between 1,300 and 1,620 feet in elevation in partial shade. It is primarily situated on the flanks of a north-south trending ridge that descends from Keller Ridge. Three of these colonies are located in a north facing slope at the headwaters of Goethels Canyon. Two of the colonies occupy the eastern flank of this ridge, on east facing slopes, at the headwaters of an unnamed stream that drains Clayton Ranch Land Bank. The last colony is located on the north slope of Keller Ridge. The soils that support this population are of the Los Gatos and Los Osos series which are loam and clay loam soils (USDA 1977). Associate plant species observed include woolly fruited lomatium (*Lomatium dasycarpum* subsp. *dasycarpum*), yarrow, ripgut brome (*Bromus diandrus**), black sage (*Salvia mellifera*), California broom (*Acmispon glaber* var. *glaber*), and soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*).

The colony located on the north side of Keller Ridge is known as CNDDB occurrence #95 (EONDX# 83517). This occurrence was reported in 2002 by East Bay Regional Park District. No population estimate was provided with the submission of this location. All colonies recorded within Chaparral Springs will be attributed to this existing population as they all lie within 0.25 mile of this CNDDB location.

Photo 11. Heca6 Looking south at occupied chaparral habitat

Photo 12. Heca 6 looking south at oak woodland habitat on the north slope.

- Physical Condition: 44 of the 98 plants appeared in excellent physical condition and were either fruiting or flowering. The remaining 54 were immature and had only produced leaves. 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 6 to 32 inches tall and 7 inches to 29 inches in basal diameter.
- Age Structure: 44 plants were considered mature in age since they were either in fruit or flower. The smaller plants, not flowering, were considered immature. The smaller the circumference (or fewer number basal leaves) the younger the plant is presumed to be. Based on the balance of mature versus immature individuals this population is presumed to be sustaining. No assessment of the seed bank was attempted.
- Reproductive Success: Approximately 10 percent of the individuals of this population were flowering, 35 percent were in fruit, and the remaining 55 percent only presented vegetative material. Based on the presence of seedlings the population is shown to be reproducing. Due to the high number of immature plants this population appears to be reproducing well.
- Availability of Suitable Habitat: Population Heca3 occupies much of the appropriate ecotone habitat on the south side of Keller Ridge, although there is available suitable habitat between the existing colonies. On the north side of Keller Ridge there is an abundant amount of unoccupied

suitable habitat and any attempts to expand this population should begin there. 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. Surveys, acquisition, and any introduction activities related to this taxon should be directed at these criteria.

4.1.4 ZONE 4 – CLAYTON AREA, MOUNT DIABLO FOOTHILLS

Moss Rock

A single population of the covered plant species Mount Diablo fairy lantern was observed within the Moss Rock property (Table 11, Figure 6). No extant populations of rare plant species were known from this property prior to these studies.

Table 11. Covered Plant Species Populations Recorded on the Moss Rock Property

POPULATION NUMBER	SPECIES NAME	COMMON NAME	STATUS	NUMBER OF INDIVIDUALS
Capu1	*Calochortus pulchellus*	Mount Diablo fairy lantern	Covered CRPR 1B.2	27

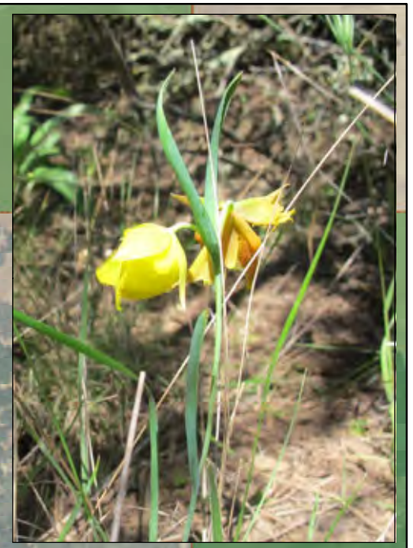
Seeno

Schwartz

Moss Rock

Mount Diablo

Morgan Territory



Population Number	Species Name	Common Name	Status	Number of Individuals
Capul	*Calochortus pulchellus*	Mount Diablo fairy lantern	Covered CRPR 1B.2	27

December 2012

2012 Covered Plant Species Inventory

Legend

Covered Plant Species
Scientific Name
Calochortus pulchellus

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 6

Covered Plant Species
Observed on Moss Rock

East Contra Costa County
Habitat Conservancy

1:7,200
0 300 600
Feet

East Contra Costa County
Habitat Conservancy

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

Contra Costa County, California

Mount Diablo Fairy Lantern (Capu1)

On May 9, 2012, a single population (Capu1) of Mount Diablo fairy lantern was observed in the understory of dense coast live oak woodland, scattered throughout the southwestern half of the Moss Rock property, but generally concentrated in colonies (Attachment A). This population totaled an estimated 27 individuals scattered over approximately 108,900 square feet (2.5 acre) between 1,080 and 1,320 feet in elevation. It occupies northeast facing slopes in full shade with an open to intermittent understory of shrubs. The soils that support this population are of the Dibble series (USDA 1977). Associate plant species observed include scattered blue oaks, California bay (*Umbellularia californica*), false brome (*Brachypodium distachyon**), slender tarweed (*Madia gracilis*), poison oak, Pacific pea (*Lathyrus vestitus* var. *vestitus*), wood fern (*Dryopteris arguta*), hounds tongue (*Cynoglossum grande*), dogtail grass (*Cynosurus echinatus**), blue wildrye (*Elymus glaucus* subsp. *glaucus*), rough hedge nettle (*Stachys rigida* var. *quercetorum*), sweetcicely (*Osmorhiza berteroi*), and wood rose (*Rosa gymnocarpa*),

Photo 13. Capu1 individual in flower and beginning to fruit.

- Physical Condition: All plants encountered appeared to be in excellent physical condition and phenologically were producing buds and fruits at the time of the survey. 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 5 to 16 inches tall.

- Age Structure: Given that all individuals encountered were producing reproductive structures it is assumed that this population is mature. However it is challenging to determine the age structure of any populations of this taxon due to the difficulty in positively identifying resting leaves to

species and estimating the number of immature bulbs under the soil. Therefore an accurate age structure was not possible for this population as no assessment of the abundance of dormant or immature bulbs was made or positive identification for any resting leaves was made for this population.

- Reproductive Success: At the time of the observation, 100 percent of all individuals encountered were in bud, flowering or fruiting. However the larger portion of the population, approximately 80 percent were either in bud or flowering leaving 20 percent in the process of forming fruit. Assuming that all individuals produced 1 ripe fruit, the total number of seed potentially produced for this population is 675. This estimation is based on the known anatomy of this taxon as each fruit develops between approximately 20 and 30 seeds. It is unknown at this time whether a population size of 27 above ground (without knowledge of below ground/dormant bulbs) individuals is self-sustaining over the long term.

- Availability of Suitable Habitat: Throughout its range this taxon prefers partial to full shade primarily on northerly aspects in the understory or edge of oak woodland or chamise chaparral habitat (Bartosh pers. observation). Population Capu1 is small in relation to the unoccupied suitable habitat it is surrounded by, particularly downslope from the two colonies and above the exposed cobbles and bedrock of Marsh Creek along the north edge of the property.

- 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 are northerly aspects, loam soils, and vegetation such as live oak (interior or coast) or chamise chaparral. These general habitat requirements are abundant in the western portion of the inventory area and allows for this statewide rare species to be locally common. The Moss Rock population occupies habitat that is typical of oak woodland populations of this species. It could also be considered part of an upper Marsh Creek watershed metapopulation that represents the southernmost stations for this species' range.

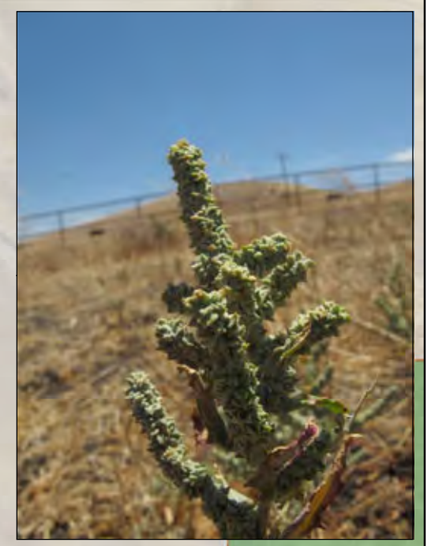
4.1.5 ZONE 5 – BYRON HILLS

Vaquero Farms Central

A single population of the covered plant species San Joaquin spearscale was observed within the Vaquero Farms Central Property (Table 12, Figure 7). No extant populations of rare plant species recorded in the CNDDB were known from this property prior to these studies.

Table 12. Covered Plant Species Populations Recorded on the Vaquero Farms Central Property

POPULATION NUMBER	SPECIES NAME	COMMON NAME	STATUS	NUMBER OF INDIVIDUALS
Atjo6	*Atriplex joaquinana*	San Joaquin spearscale	Covered CRPR 1B.2	244



Population Number	Species Name	Common Name	Status	Number of Individuals
Atjo6	*Atriplex joaquinana*	San Joaquin spearscale	Covered CRPR 1B.2	244

Vaquero Farms Central

Vaquero Farms South

Souza 2

Martin

Martin

Souza 2

Byron

Byron Airport

N

W

E

S

NOMAD ecology

December 2012

2012 Covered Plant Species Inventory

Legend

Covered Plant Species
Scientific Name
Atriplex joaquinana

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 7

Covered Plant Species Observed on Vaquero Farms Central

East Contra Costa County Habitat Conservancy

1:7,200

0 300 600

Feet

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

San Joaquin Spearscale (Atjo6)

On June 15, 2012, a single population (Atjo6) of San Joaquin spearscale was observed within the western half of a horse paddock in scattered patches in alkali grassland and wetland habitat near the southeastern corner of the Vaquero Farms Central property (Figure 7). This population totaled an estimated 244 individuals in scattered patches over approximately 21,870 square feet (0.5 acre) at 112 feet in elevation. The population occupies a gentle slope that is nearly level but has a slight northern aspect in full sun on soils mapped as the Pescadero series (USDA 1977). Associate species observed with this population include Mediterranean barley (*Hordeum marinum* subsp. *gussoneanum**), crownscale (*Atriplex coronata* var. *coronata*), hare barley (*Hordeum murinum* subsp. *leporinum*), wild beet (*Beta vulgaris*), lamb's quarters (*Chenopodium album**), tumbleweed (*Amaranthus albus**), Italian ryegrass*, Little Oak orach (*Atriplex fruticulosa*), and alkali heath (*Frankenia salina*), and cocklebur (*Xanthium strumarium*).

Photo 14. Atjo6 Looking northwest at occupied habitat in the horse paddock.

Photo 15. Fruiting individual of Atjo6.

- Physical Condition: Most plants appeared in excellent physical condition. Although there were no signs of disease, virus, herbivory, or nutrient deficiencies some individuals appeared to have been trampled. These trampled individuals still exhibited vigorous growth and were fruiting. These populations were expected to have survived and reproduced. Size of individuals ranged from approximately 2 inches to 14 inches tall.
- Age Structure: This characteristic is not applicable as San Joaquin spearscale is an annual species.
- Reproductive Success: All individuals had produced buds, flowers, and fruits at the time of the surveys. Approximately 70 percent of the individuals of these populations were fruiting and the remaining 30 percent were in flower. Attaining a visual estimate of viable seeds for this taxon is difficult due to the small size of the seeds and the fact that they are enclosed in pistillate bracts. However, the number of viable fruits per plant was estimated. On average there are 126 fruits (pistillate flower) per flowering inflorescence spike and 1.5 inflorescence spikes per individual on average. Assuming that one viable seed results from each pistillate flower it is presumed that 46,116 seeds (189 seeds per plant) were produced by this population in 2012. It is unknown at this time whether a populations size of 244 is self-sustaining over the long term, given this is an annual plant population prone to fluctuations in population numbers based on climactic conditions and it was only observed at one time (not over multiple years).

- Availability of Suitable Habitat: Throughout its range, especially within Contra Costa County, this taxon prefers the margins of alkaline scalds and vernally wet valley bottoms and drainages. It is less particular when it comes to soil types. This taxon can tolerate (and can prefer) clay soil types with a highly elevated pH such as Pescadero and Solano series soils. However it has also been recorded on neutral clay soils, and seldom on loam soil (CDFW 2012c; Bartosh pers. observation).

  Population Atjo6 supports an abundance of individuals within the area of habitat it occupies, which may not be suitable for population enhancement, especially if horses continue to occupy this paddock. However, upstream in this drainage is ample unoccupied suitable habitat on vernally wet heavy clay soils where population expansion could be attempted.

- Diversity of Suitable Habitat: This taxon can occupy a variety of soil types as long as the landscape position and early spring hydrology are appropriate (CDFW 2012c; Bartosh pers. observation). This population can tolerate alkaline conditions which may indicate that they represent genotypes adapted to soils with an elevated pH. This should be taken into consideration if population expansion is a goal.

4.2. NON-COVERED RARE PLANT OCCURRENCES

In addition to covered plant species, five rare plant species (Table 13) not covered by the HCP were observed during 2012 surveys. These plant species are included in the California Native Plant Society's *Inventory of Rare and Endangered Plants* (CNPS 2001; 2013). These species include: Contra Costa manzanita (*Arctostaphylos manzanita* subsp. *laevigata,* CRPR 1B.2), crownscale (*Atriplex coronata* var. *coronata*; CRPR 4.2), small-flowered morning glory (*Convolvulus simulans* CRPR 4.2), serpentine bedstraw (*Galium andrewsii* subsp. *gatense* CRPR 4.2), and sylvan microseris (*Microseris sylvatica* CRPR 4.2).

Table 13. Number of Non-Covered Rare Plant Populations Recorded by Acquisition (2012)

NON-COVERED RARE PLANTS	CHAPARRAL SPRINGS	FOX RIDGE	SOUZA I	THOMAS KREIGOR	VAQUERO FARMS CENTRAL	VAQUERO FARMS NORTH	VAQUERO FARMS SOUTH	TOTAL # OF POPULATIONS
Arctostaphylos manzanita subsp. *laevigata* Contra Costa manzanita	1	0	0	0	0	0	0	1
Atriplex coronata var. *coronata* crownscale	0	1	1	0	1[13]	0	0	3
Convolvulus simulans small-flowered morning glory	0	0	0	0	0	1[14]	1	2
Galium andrewsii subsp. *gatense* serpentine bedstraw	1	0	0	0	0	0	0	1
Microseris sylvatica sylvan microseris	0	0	0	1	0	0	0	1

[13] Considered part of population Atco4, which was recorded during 2011 survey efforts.
[14] This population is introduced.

4.2.1 CONTRA COSTA MANZANITA

During surveys conducted in 2012, a single individual (Arla1) of Contra Costa manzanita, a Contra Costa County endemic, was recorded on June 14, 2012 (Table 14, Figure 8). The location of this individual is mapped as growing on Los Osos Series soils (USDA 1977) on a steep southeast facing slope in chaparral habitat at approximately 1,400 feet in elevation.

Table 14. Location of Contra Costa Manzanita within Preserves

POPULATION NUMBER	PROPERTY	NUMBER OF INDIVIDUALS
Arla1	Chaparral Springs	1

December 2012

2012 Covered Plant Species Inventory

Legend

Special-Status Plant Species
Scientific Names
Arctostaphylos manzanita subsp. laevigata

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 8

Contra Costa Manzanita Location

East Contra Costa County Habitat Conservancy

1:7,200

0 300 600

Feet

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

4.2.2 CROWNSCALE

During surveys conducted in 2012, a total of three crownscale populations were recorded within acquisition properties (Table 15, Figure 9). These populations total approximately 12,890 individuals. Locations of these populations are included in Figure 9. Crownscale has a Central Valley distribution. It is common on alkaline habitat in the interior East Bay, however alkaline habitat is uncommon.

Table 15. Locations of Crownscale within Preserves.

POPULATION NUMBER	PROPERTY	NUMBER OF INDIVIDUALS
Atco4	Vaquero Farms Central	12,755
Atco7	Fox Ridge	100
Atco8	Souza I	35

The population observed on Vaquero Farms Central (Atco4) in 2011 was expanded to include two additional colonies, one to the east and one to the west. These three colonies comprised an estimated population of 12,755 individuals growing in alkali grassland and wetland habitat on Pescadero series soils (USDA 1977). This population is located on the southern half of Vaquero Farms Central in valley bottom habitat between 100 and 140 feet in elevation.

A crownscale population (Atco7) was recorded on the Fox Ridge acquisition on August 6, 2012. This small population was estimated at 100 individuals growing in alkali grassland and alkali wetland habitat on Capay Series soils which can be moderately alkaline (USDA 1977). This population is located on the north side of the property at approximately 280 feet in elevation in a valley bottom.

On Souza I a small population (Atco8) of crownscale was recorded on May 2, 2012. This small population was estimated at 35 individuals growing in alkali grassland and seep fed alkali wetland habitat on soils mapped as Altamont-Fontana Complex (USDA 1977) though it might have a small unmapped inclusion of an alkaline soil type. It is unusual in that it is growing on a south-facing slope. This population is located on the north-central portion of Souza I at approximately 500 feet in elevation.

Atco4	Vaquero Farms Central	12,755
Atco7	Fox Ridge	100
Atco8	Souza I	35

CCWD
Fan
Atco7
Fox Ridge
CCWD
Save Mt Diablo
Save Mt Diablo
Cowell
Marsh Creek
Marsh Creek
Cowell
Seeno
Round Valley
Los Vaqueros
Morgan Territory
Los Vaqueros
Shapell
Shapell
Vaquero Farms North
Vaquero Farms Central
Atco4
Atco4
Atco4
Martin
Souza 2
Martin
Byron
Vaquero Farms South
Byron Airport
Atco8
Souza 1
Souza 3
Grandma's Quarter

December 2012

2012 Covered Plant Species Inventory

Legend

Special-Status Plant Species
Scientific Name
Atriplex coronata var. coronata

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 9

Crownscale Locations

East Contra Costa County Habitat Conservancy

1:47,535
0 0.375 0.75 Miles

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

4.2.3 SMALL-FLOWERED MORNING GLORY

During surveys conducted in 2012 a total of two populations of small-flowered morning glory were recorded within acquisition properties (Table 16, Figure 10). One population was a result of a translocation effort. The impetus for this introduction is to mitigate for potential impacts to an existing population of this plant species related to the Contra Costa County Public Works Department's Deer Valley Road Shoulder Widening Project (Nomad 2011a). These populations total approximately 23 individuals (Table 16). Locations of these populations are included in Figure 10. 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. There are only four collection records for this species, likely attributed to two locations, making this plant very rare locally.

Table 16. Locations of Small-Flowered Morning Glory within Preserves.

POPULATION NUMBER	PROPERTY	NUMBER OF INDIVIDUALS
Cosi1	Vaquero Farms South	20
Cosi2	Vaquero Farms North	3

The population observed on Vaquero Farms South (Cosi1) was recorded on April 17, 2012. This population was estimated at 20 small statured individuals growing on clay barrens, with little vegetative cover, supported by soils mapped as Altamont-Fontana Complex (USDA 1977). This population is located on the northern portion of Vaquero Farms South on a gently sloping terrace at approximately 500 feet in elevation.

On Vaquero Farms North three introduction sites were established on December 16, 2010. During 2012 surveys three individuals from VFN P1 (Cosi2) were observed in fruit. Individuals at this location were growing in clay barrens mapped as Altamont Series soils (USDA 1977). This population is located on a gently sloping southwestern aspect at approximately 200 feet in elevation.

Cosi1	Vaquero Farms South	20
Cosi2	Vaquero Farms North	3

Cosi2

Vaquero Farms North

Vaquero Farms Central

Los Vaqueros

Martin

Souza 2

Martin

Vaquero Farms South

Cosi1

N

W E

S

NOMAD ECOLOGY

December 2012

2012 Covered Plant Species Inventory

Legend

Special-Status Plant Species

Scientific Name

Convolvulus simulans

Acquisition Parcels

Public Land and Easements

Survey Areas

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.

Figure 10

Small-Flowered Morning Glory

Locations

East Contra Costa County

Habitat Conservancy

East Contra Costa County Habitat Conservancy

1:14,400

0 600 1,200

Feet

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

Contra Costa County, California

Photo 16. Small-flowered morning glory in flower and fruit.

4.2.4 SERPENTINE BEDSTRAW

During surveys conducted in 2012, a single population (Gaga1), comprising two colonies,of serpentine bedstraw, was recorded on June 14, 2012 (Table 17). The location of both of these colonies is a north to south running ridge that descends from Keller Ridge as a finger of chaparral habitat (Figure 11). These colonies total approximately 40 individuals and are in areas mapped as rock outcrop (USDA 1977). This population is located is between 1,440 and 1,500 feet. 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.

Table 17. Location of serpentine bedstraw within Preserves.

POPULATION NUMBER	PROPERTY	NUMBER OF INDIVIDUALS
Gaga1	Chaparral Springs	40

Gaga1	Chaparral Springs	40

Thomas Kreigor

Barron

Chaparral Springs

Clayton Ranch

Mount Diablo

N

W

E

S

NOMAD ECOLOGY

December 2012

2012 Covered Plant Species Inventory

Legend

Special-Status Plant Species

Scientific Name

Galium andrewsii subsp. gatense

Acquisition Parcels

Public Land and Easements

Survey Areas

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.

Figure 11

Serpentine Bedstraw

Locations

East Contra Costa County

Habitat Conservancy

1:7,200

0 300 600

Feet

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

Photo 17. Serpentine bedstraw in flower.

4.2.5 SYLVAN MICROSERIS

On May 8, 2012, a single population (Misy1), comprising two colonies, of sylvan microseris was recorded on the Thomas Kreigor property (Table 18). The location of both of these colonies is on the north slope of Kreigor Peak, immediately north and west of the summit, in the understory of live oak woodland (Figure 12). These colonies total approximately 12 individuals and are in areas mapped as Los Gatos Series soils (USDA 1977). This population is located at approximately 1,800 feet in elevation. Although this species is widespread, ringing the edge of the Central Valley, it is extremely rare in the East Bay having only been recorded from three previous sites.

Table 18. Location of Sylvan Microseris within Preserves.

POPULATION NUMBER	PROPERTY	NUMBER OF INDIVIDUALS
Misy1	Thomas Kreigor	12

		Number of
Misy1	Thomas Kreigor	12

Black Diamond Mines

Ang

Thomas Kreigor

Irish Canyon

Barron

N

W E

S

NOMAD ECOLOGY

December 2012

2012 Covered Plant Species Inventory

Legend

Special-Status Plant Species
Scientific Name
Microseris sylvatica

Acquisition Parcels
Public Land and Easements
Survey Areas

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.

Figure 12

Sylvan Microseris Locations

East Contra Costa County Habitat Conservancy

1:9,600

0 400 800

Feet

East Contra Costa County Habitat Conservancy

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

Contra Costa County, California

Photo 18. Sylvan microseris in flower.

Section 5. SUMMARY AND RECOMMENDATIONS

5.1. SUMMARY

Based on the results of the 2012 surveys conducted during the months of April, May, June, August, and September, a total of eight populations of covered plant species were recorded. To date, 66 percent of the population specific goals for four of the covered species, with population specific goals, have been met (Table 19). No population specific goals were identified for San Joaquin spearscale 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. Most populations also comprised low cover of non-native invasive weeds. However, the population of big tarplant that is located in a routinely bladed roadway and populations of other covered plant species with a low number of individuals may be declining.

Table 19. Summary of Biological Goals Met Based on 2011 and 2012 Surveys.

SPECIES RECORDED	BIOLOGICAL GOALS – # OF POPULATIONS TARGETED FOR PROTECTION	2011 POPULATIONS RECORDED (NOMAD 2011)	2012 POPULATIONS RECORDED	POPULATIONS NEEDED TO MEET BIOLOGICAL GOALS
Atriplex depressa brittlescale	2	1	0	1
Atriplex joaquinana San Joaquin spearscale	N/A	6*	1	N/A
Blepharizonia plumosa big tarplant	5^	2	1	2
California macrophylla round-leaved filaree	2	1**	0	1
Calochortus pulchellus Mt. Diablo fairy lantern	1	0	1	0
Helianthella castanea Diablo helianthella	2	1	5	0

^ There is a discrepancy between Biological Goals as presented in Table 5-1 (3 populations) and page 5-126 (5 populations) of the HCP.
* 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, meeting biological goals as outlined in the HCP/NCCP, taxonomic changes, and review of the HCP/NCCP.

5.2.1 ROAD BLADING

The Lentzner population of big tarplant (Blpl3) occurs within a maintained dirt access road in addition to the adjacent grassland. However, the majority of the population lies within the roadway and appeared to have been damaged either by blading activities or vehicles passing along the road and running them over.

In order to prevent long term damage to this population, a summary previous blading activitie dates should be compiled to understand the preferred time for access by blading equipment and if blading happens at approximately the same time every year. This information will illustrate constraints in the timing of blading activities and helped to ascertain if there was a detrimental effect to this population in 2012. If feasible the timing of blading activity should be conducted to avoid the plants from seedling stage to the time when its seeds are fully mature, generally between the months of mid-May to early October.

5.2.2 POPULATION MONITORING

Of the covered plant species populations recorded in 2012, six were recorded as having small population numbers (Table 20). Based on 2012 observations, it is possible these populations may either be in decline or too small to be viable for the long term. The HCP 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. 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 although low numbers of Diablo helianthella individuals were recorded for a majority of the populations, the largest population was observed at Chaparral Springs over the largest diversity of habitat. Based on this we presume this population to be stable. However, the remainder of the Diablo helianthella populations' long-term viability may be in question at this time possibly due to factors such as limited seed dispersal, slow rates of population radiation, or a low number of seeds reaching maturity. Management considerations for this taxon should be focused on annual population monitoring paying particular attention to seed production and herbivory. Based on personal observations, (H. Bartosh 2012) of Diablo helianthella populations in the region, a low number of seeds reach maturity annually. Possible reasons for this include aborted ovules, reduced pollination, or insect herbivory. Monitoring should be focused on actual production of viable seed. Therefore, monitoring activities should assess the number of mature seeds each inflorescence produces and if seeds are being predated upon by insects.

Table 20. Covered Plant Species Populations with Low Population Numbers.

POPULATION NUMBER	SPECIES NAME/ COMMON NAME	PROPERTY	PREVIOUS CNDDB CENSUS DATA (# OF INDIVIDUALS)	NUMBER OF INDIVIDUALS (2011)
Atjo6	*Atriplex joaquinana* San Joaquin spearscale	Vaquero Farms Central	No Data	244
Blpl3	*Blepharizonia plumosa* big tarplant	Lentzner	No Data	162
Heca2	*Helianthella castanea* Diablo sunflower	Affinito	No Data	12
Heca3	*Helianthella castanea* Diablo sunflower	Lentzner	No Data	62
Heca4	*Helianthella castanea* Diablo sunflower	Thomas Kreigor	No Data	60

Population Number	Species Name/ Common Name	Property	Previous CNDDB Census Data (# of Individuals)	Number of Individuals (2011)
Heca5	*Helianthella castanea* Diablo sunflower	Thomas Kreigor	No Data	65

5.2.3 Weed Control

Non-native exotic weeds were observed growing sympatrically with the Vaquero Farms Central population of San Joaquin spearscale (Atjo6). These weed species were lamb's quarters* and tumbleweed* and they have the potential to outcompete this San Joaquin spearscale population if not monitored and possibly controlled. An attempt should be made at removing these species, especially from within occupied and nearby unoccupied habitat. Removal of these weed species should be attempted by hand, as feasible, at a time when this plants are visible but have not yet flowered. During weed removal activities care should be taken to avoid impacting any developing individuals.

5.2.4 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 2013. These surveys should be directed at unsurveyed Conservancy parcels, or at the remaining portions of unsurveyed 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 and the direction of Conservancy personnel.

5.2.5 Adobe Navarretia

During the development of this HCP, the subspecies of *Navarretia nigelliformis* that was thought to occur in Contra Costa County was *N. n.* subsp. *nigelliformis.* Recently, through the work of East Bay botanist David Gowen, an expert in the genera *Navarretia* and *Eriastrum*, a determination has been made that the populations occurring in Contra Costa County are *N. n.* subsp. *radians.* Accessioned specimens at the UC and Jepson Herbaria at the University of California have been annotated to reflect this taxonomic correction. *Navarretia nigelliformis* subsp. *radians* has a CRPR of 1B.2 while subspecies *nigelliformis* has a CRPR of 4.2.

The main difference between these two subspecies is that subspecies *radians* produces a smaller flower and gray green herbage. Subspecies *nigelliformis* has larger flowers than *radians* and herbage that is dark green. After visiting two of the known populations in Contra Costa County Mr. Bartosh agrees with Mr. Gowen's assessment that *radians* is the subspecies that occurs in the HCP Inventory area. Based on these observations (H. Bartosh 2012) and concurrence by Mr. Gowen, the habitat given in the HCP is incorrect, which states this species occurs in vernal pools. An accurate description of the habitat for subspecies *radians* is adobe clay barrens typically on gently sloping uplands.

Based on this taxonomic change and evaluation of occupied habitat we recommend the Conservancy produce a memorandum recognizing the following:

- That subspecies *radians* is the taxon that occurs in Contra Costa County.
- Subspecies *radians* be substituted for subspecies *nigelliformis* in the HCP.

- Subspecies *radians* supplants subspecies *nigelliformis* in the Planning Survey Report.
- Habitat for subspecies *radians* is recognized as grasslands in clay soils.

5.2.6 BIG TARPLANT BIOLOGICAL GOALS

There is a discrepancy of the number of big tarplant populations the Conservancy is required to protect based on biological goals presented in the HCP. Objective 17.3 in Table 5-1 requires that "three" occurrences (populations) be protected outside currently (as of October 2007) held public lands. However, table on page 5-126 of the HCP the goal for big tarplant states "five" occurrences need to be protected to meet the biological goal. Because the inventory area of the HCP represents the extreme northern end of the range for big tarplant we recommend correcting this discrepancy by accepting that five population be required to meet this goal. The remaining big tarplant populations that lie outside Conservancy property represent peripheral populations that may contain important genetic diversity for this taxon, therefore the maximum amount should be protected.

Section 6. REFERENCES

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Personal Observations

Bartosh, Heath. 2002-2012. Rare plant field observations of numerous populations in Contra Costa County.

APPENDIX A CNDDB FIELD FORMS

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 06/14/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Arctostaphylos manzanita subsp. laevigata

Common Name: Contra Costa manzanita

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number Jepson Museum / Herbarium

Reporter: Heath Bartosh
Address: Nomad Ecology
Martnez, CA
E-mail Address: hbartosh@nomadecology.com
Phone: (925) 228-3027

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCCHCP

Quad Name: _____ Elevation: 1400

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): _____

GPS Make & Model _____

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☐

Horizontal Accuracy _____ meters/feet

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

Coordinates:

598842 4197683

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

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

Chaparral ; Los Osos soil series

steep Southeast facing slope

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

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

Immediate AND surrounding land use: —

Visible disturbances:

Threats: —

Comments: —

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

☒ Keyed (cite reference): Jepson
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital

Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes☐ no☐

CDFW/BDB/1747 Rev. 4/26/13

Vaquero farms central area

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 05/02/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Atriplex coronata var coronata

Common Name: crownscale

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 35 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number Jepson Museum / Herbarium

Reporter: Heath Bartosh

Address: Nomad Ecology

E-mail Address: _____

Phone: _____

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCHCP

Quad Name: _____ Elevation: 500

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): GPS

GPS Make & Model Garmin etrex

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐

Horizontal Accuracy _____ meters/feet

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

Coordinates:

616587 4186084

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

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

alkali grassland + seep fed alkali wetland habitat on soils mapped as Altamont-Fontana Complex; south facing slope

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

Site Information

Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances: —

Threats: —

Comments: —

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

☒ Keyed (cite reference): Jepson

☐ Compared with specimen housed at: _____

☐ Compared with photo / drawing in: _____

☐ By another person (name): _____

☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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Atco8

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 08/06/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Atriplex coronata var. coronata

Common Name: crownscale

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 100 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number Jepson Museum / Herbarium

Reporter: Heath Bartosh

Address: Nomad Ecology

E-mail Address: _____

Phone: _____

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCHCP

Quad Name: _____ Elevation: 280

T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐

T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): GPS

GPS Make & Model garmin etrex

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐

Horizontal Accuracy _____ meters/feet

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

Coordinates:

607994 4195781

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

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

alkali grassland + alkali wetland; Capay Series soils; valley bottom

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

Site Information

Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances: —

Threats: —

Comments: —

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

☒ Keyed (cite reference): Jepson

☒ Compared with specimen housed at: _____

☐ Compared with photo / drawing in: _____

☐ By another person (name): _____

☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Atco7

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 06/14/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Atriplex coronata var coronata

Common Name: crownscale

Species Found? [X] Yes [ ] No _____ If not, why?

Total No. Individuals 12,755 Subsequent Visit? [ ] yes [X] no

Is this an existing NDDB occurrence? _____ Yes, Occ. # [X] no [ ] unk.

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

Reporter: Heath Bartosh

Address: Nomad Ecology

E-mail Address: _____

Phone: _____

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

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

[ ] wintering [ ] breeding [ ] nesting [ ] rookery [ ] burrow site [ ] other

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

County: Contra Costa Landowner / Mgr.: ECCHCP

Quad Name: _____ Elevation: 100-140 ft

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H[ ] M[ ] S[ ] Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H[ ] M[ ] S[ ] GPS Make & Model Garmin etrex

DATUM: NAD27 [ ] NAD83 [X] WGS84 [ ] Horizontal Accuracy _____ meters/feet

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

Coordinates:

616774 4189018

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

alkali grassland and wetland on Pescadero series soils, valley bottom

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

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

Immediate AND surrounding land use:

Visible disturbances: –

Threats: –

Comments: –

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

Photographs: *(check one or more)* Slide Print Digital
Plant / animal [ ] [ ] [ ]
Habitat [ ] [ ] [ ]
Diagnostic feature [ ] [ ] [ ]

May we obtain duplicates at our expense? yes [ ] no [ ]

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ATC04

Mail to:
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California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 06/15/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Atriplex joaquinana

Common Name: San Joaquin spearscale

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 244 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Heath Bartosh
Address: Nomad Ecology
Martinez, CA
E-mail Address: hbartosh@nomadecology.com
Phone: (925) 228- 3027

Plant Information

Phenology: _____% vegetative 30% flowering 70% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCCHCP
Quad Name: _____ Elevation: 112 ft
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex
DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☒ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates:

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
alkali grassland wetland habitat; gentle slope, northern aspect, Pescadero soil series, Associates include: Mediterranean barley (Hordeum murinum subsp. grosseanum), crownscale (Atriplex coronata var coronata) hare barley (Hordeum murinum leporinum) wild beet (Beta vulgaris), lamb's quarter (Chenopodium album) tumbleweed (Amaranthus albus) Italian ryegrass (Lolium multiflorum) Little oak orach (Atriplex fruticulosa)

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

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

Immediate AND surrounding land use: alkali heath (Frankenia salina), cocklebur (Xanthium strumarium)
Visible disturbances: some plants appeared trampled
Threats:

Comments:

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

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes☐ no☐

CDFW/BDB/1747 Rev. 4/26/13

Atjo6

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 09/25/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Blepharizonia plumosa

Common Name: big tarplant

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 162 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☐ unk.

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

Reporter: Heath Bartosh

Address: Nomad Ecology
Martinez, CA

E-mail Address: hbartosh@nomadecology.com

Phone: (925) 228-3027

Plant Information

Phenology: _____% vegetative 45% flowering 45% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCCHCP

Quad Name: _____ Elevation: 1020

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

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

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

Coordinates:

601448 4198235

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
grassland/roadway; northeast slope; Altamon-Fontana complex; Plant association: prickly lettuce (Lactuca serriola), wild oats (Avena fatua), vinegar weed (Trichostema lanceolatum), + soft chess (Bromus hordeaceus)

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

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

Immediate AND surrounding land use:

Visible disturbances: —

Threats: —

Comments: —

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

☒ Keyed (cite reference): Jepson manual
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital

Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

CDFW/BDB/1747 Rev. 4/26/13

Bipl 3

Mail to:
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1807 13th Street, Suite 202
Sacramento, CA 95811
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Date of Field Work (mm/dd/yyyy): 05/09/12

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Elm Code _____ Occ. No. _____
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Reset

California Native Species Field Survey Form

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Scientific Name: Calochortus pulchellus

Common Name: Mount Diablo Fairy Lantern

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 27 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number Jepson Museum / Herbarium

Reporter: Heath Bartosh
Address: Nomad Ecology Martinez, CA
E-mail Address: hbartosh@nomadecology.com
Phone: (925) 228-3027

Plant Information

Phenology: _____% vegetative 40% flowering 40% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCCHCP

Quad Name: _____ Elevation: 1080 - 1320 ft

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

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

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

Coordinates:

601868 4189455

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

Diablo soil series, northeast facing slope in full shade, coast live oak woodland, Associates- blue oaks, Cali. bay (umbellularia cali) false brome (brachypodium distachyon), slender tarweed (madia gracilis) poison oak (toxico divers), Pacific Dea (Lamyrus vestitus var vestitus) woodfern (Dryopteris arguta), hounds tongue (Cynoglossum grande), dogtail grass (Cynosurus echinatus), blue wildrye (Elymus glaucus subsp glaucus) rough, hedge nettle (stachys rigida var

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

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

Immediate AND surrounding land use: overstory: sweet cicely (Osmorhiza berteroi) + woodrose (Rosa gymnocarpa)

Visible disturbances: —

Threats: —

Comments:

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

☒ Keyed (cite reference): Jepson
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital

Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

CDFW/BDB/1747 Rev. 4/26/13

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Source Code _____ Quad Code _____
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California Native Species Field Survey Form

Send Form

Scientific Name: Convolvulus simulans

Common Name: Small flowered morning glory

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 3 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

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

Reporter: Heath Bartosh

Address: Nomad Ecology

E-mail Address: _____

Phone: _____

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCHCP

Quad Name: _____ Elevation: 200

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): GPS

GPS Make & Model Garmin Etrex

DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐

Horizontal Accuracy _____ meters/feet

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

Coordinates:

616553 4189934

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

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

Clay barren, Altamont series soil, gentle sloping southwestern aspect

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

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

Immediate AND surrounding land use:

Visible disturbances: /

Threats: /

Comments: /

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

☒ Keyed (cite reference): Jepson

☐ Compared with specimen housed at: _____

☐ Compared with photo / drawing in: _____

☐ By another person (name): _____

☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital

Plant / animal ☐ ☐ ☐

Habitat ☐ ☐ ☐

Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

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1 of 2

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Date of Field Work (mm/dd/yyyy): 04/17/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Convolvulus simulans

Common Name: Small flowered morning glory

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 20 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Heath Bartosh

Address: Nomad ecology

E-mail Address: _____

Phone: _____

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCHCP

Quad Name: _____ Elevation: 500

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

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

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

Coordinates:

614897 4187136

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

Clay barrens; Altamont - Fontana complex; gentle sloping terrace

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

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

Immediate AND surrounding land use: —

Visible disturbances: —

Threats:

Comments: —

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

- ☒ Keyed (cite reference): Jepson Man.
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital

- Plant / animal ☐ ☐ ☐
- Habitat ☐ ☐ ☐
- Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

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Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 06/14/12

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EO Index No. _____ Map Index No. _____

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California Native Species Field Survey Form

Send Form

Scientific Name: Galium andrewsii subsp. gatense
Common Name: serpentine bedstraw

Species Found? ☒ Yes ☐ No _____ If not, why?
Total No. Individuals 40 Subsequent Visit? ☐ yes ☒ no
Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.
Collection? If yes: _____ Number _____ Museum / Herbarium jepson

Reporter: Heath Bartosh
Address: Nomad Ecology
E-mail Address: _____
Phone: _____

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

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

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

County: contra costa Landowner / Mgr.: ECCHCP
Quad Name: _____ Elevation: 1440 - 1500
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin etrex
DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☒ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates:
598734 4197729

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

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

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use:
Visible disturbances:
Threats:
Comments:

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

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

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Date of Field Work (mm/dd/yyyy): 05/04/12

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Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

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California Native Species Field Survey Form

Send Form

Scientific Name: Helianthella castanea

Common Name: Diablo sunflower

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 98 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? 95 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number Jepson Museum / Herbarium

Reporter: Heath Bartosh
Address: Nomad Ecology
Martinez, CA
E-mail Address: hbartosh@nomadecology.com
Phone: (925) 228-3027

Plant Information
Phenology: 55 % vegetative 10 % flowering 35 % fruiting

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

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

County: Contra Costa Landowner / Mgr.: ECCCHCP
Quad Name: _____ Elevation: 1,300-1,620 ft
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex
DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☒ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐
Coordinates:
598612 4197643

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
blue oak woodland chamise chaparral; Los Gatos + Los Osos soil series; woolly fruited lomatium (Lomatium dasycarpum subsp dasycarpum), yarrow (Achilea millefolium), ripgut brome (Bromus diandrus), black sage (Salvia mellifera), Ca. broom (Acmispon glaber var glaber), soup plant (Chlorogalum pomeridianum var. pomeridianum)
Please fill out separate form for other rare taxa seen at this site.

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

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

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

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California Native Species Field Survey Form

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Scientific Name: Helianthella castanea

Common Name: Diablo sunflower

Species Found? [X] Yes [ ] No _____ If not, why?

Total No. Individuals 65 Subsequent Visit? [ ] yes [X] no

Is this an existing NDDB occurrence? _____ Yes, Occ. # [X] no [ ] unk.

Collection? If yes: _____ Number Jepson Museum / Herbarium

Reporter: Heath Bartosh
Address: Nomad Ecology
Martinez, CA
E-mail Address: hbartosh@nomadecology.com
Phone: (925) 228-3027

Plant Information
Phenology: _____% vegetative 27% flowering 27% fruiting

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

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

County: Contra Costa Landowner / Mgr.: EBRPD HCP
Quad Name: _____ Elevation: 1400
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H[ ] M[ ] S[ ] Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H[ ] M[ ] S[ ] GPS Make & Model Garmin Etrex
DATUM: NAD27 [ ] NAD83 [X] WGS84 [ ] Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 [X] UTM Zone 11 [ ] *OR* Geographic (Latitude & Longitude) [ ]
Coordinates:
598791 4197600

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Los Gatos soil series, 3 pop. - 2 N. facing slope - 1 ridge slight N aspect
Oakwoodland / chamise chaparral
Poison oak (toxico diver) Cal. sagebr (art. cal.) narrowleaf golden bush (Ericameria linearifolia)
chamise chap. assoc - Cal. melic grass (Melica cal.) coyote mint (Monardella villosa subsp. villosa) naked stem buckwheat (Eriogonum nudum var auriculatum), Hartweg's tauschia (Tauschia hartwegii)

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

Site Information Overall site/occurrence quality/viability (site + population): [X] Excellent [ ] Good [ ] Fair [ ] Poor
Immediate AND surrounding land use:
Visible disturbances: —
Threats: —
Comments: —

Determination: *(check one or more, and fill in blanks)*
[X] Keyed (cite reference): Jepson Manual
[ ] Compared with specimen housed at: _____
[ ] Compared with photo / drawing in: _____
[ ] By another person (name): _____
[ ] Other: _____

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

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California Native Species Field Survey Form

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Scientific Name: Helianthella castanea

Common Name: Diablo sunflower

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

Total No. Individuals 60 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? ☒ no ☐ unk. Yes, Occ. #

Collection? If yes: _____ Number Jepson Museum / Herbarium

Reporter: Heath Bartosh

Address: Nomad Ecology Martinez, CA

E-mail Address: hbartosh@nomadecology.com

Phone: (925) 228-3027

Plant Information

Phenology: _____% vegetative 70% flowering _____% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCCHCP

Quad Name: _____ Elevation: 1800

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin eTrex

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

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

Coordinates:

598346 4200114

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

North facing slope oak woodland understory ripgut brome (Bromus diandrus) Italian ryegrass (Lolium multiflorum), wine cup clarkia (Clarkia affinis subsp. affinis) yarrow (Achillea millefolium), long beaked filaree (Erodium botrys)

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

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

Immediate AND surrounding land use:

Visible disturbances:

Threats:

Comments: Noteworthy that this population did not include any shrub species as associates typical of other populations in the region.

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

- ☒ Keyed (cite reference): Jepson Man.
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

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California Native Species Field Survey Form

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Scientific Name: Helianthella castanea

Common Name: Diablo sunflower

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 62 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☐ unk.

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

Reporter: Heath Bartosh
Address: Nomad Ecology
Martinez, CA
E-mail Address: hbartosh@nomadecology.com
Phone: (925) 228-3027

Plant Information

Phenology: _____% vegetative 52% flowering _____% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCC HCP
Quad Name: _____ Elevation: 900-1,180 ft
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex
DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☒ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐
Coordinates:
601011 4198673

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
oak woodland/scrub/grassland/; partial shade on steep slopes w/northerly + western aspects; Los Gatos soil series, Plant associations — narrowleaf goldenbush (Ericameria linearifolia), Cali sagebr (Artemisia californica) woolly sunfl (Eriophyllum lanatum subsp. achilleoides) ripgut brome (Bromus diandrus) royal larkspur (Delphinium variegatum subsp variegatum), poison oak (Toxico diversi) serpentine bedstraw (Galium andrewsii subsp. gatense), fringe pod (Thysanocarpus curvipes), pitcher sage (Lepechinia calycina), goldback fern (Pentagramma triangularis subsp triangularis)

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

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

Immediate AND surrounding land use: —

Visible disturbances: —

Threats: —

Comments: —

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

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

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

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California Native Species Field Survey Form

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Scientific Name: Helianthella Castanea

Common Name: Diablo sunflower

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 12 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number Jepson Herb. Museum / Herbarium

Reporter: Heath Bartosh
Address: Nomad Ecology
Martinez, CA
E-mail Address: hbartosh@nomadecology.com
Phone: (925) 228-3027

Plant Information
Phenology: 16 % vegetative 42 % flowering 42 % fruiting

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

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

County: Contra Costa Landowner / Mgr.: ECCCHLP
Quad Name: _____ Elevation: 800-960 ft
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Etrex
DATUM: NAD27 ☐ NAD83 ☒ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☒ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☐
Coordinates:
595965 4203429

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Woodland/ Scrub/ grassland ecotone habitat; Northern aspect; Altamont - Fontana complex; Plant species associated — Ithuriel's spear (Triteleia laxa), yarrow (Achillea millefolium), Great valley gumweed (Grindelia camporum) poison sanicle (Sanicula bipinnata), Italian ryegrass (Festuca perennis), gray mule ears (Wyethia helenoides), wild oats (Avena fatua), Indian paintbrush (Castilleja affinis subsp affinis), common
Please fill out separate form for other rare taxa seen at this site. fiddleneck (Amsinkia intermedia)

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

Determination: *(check one or more, and fill in blanks)*
☒ Keyed (cite reference): Jepson Man.
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

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

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 05/08/12

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Microseris sylvatica

Common Name: sylvan microseris

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 12 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

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

Reporter: Heath Bartosh

Address: NOmad Ecology

E-mail Address: _____

Phone: _____

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

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

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

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

County: Contra Costa Landowner / Mgr.: ECCHLP

Quad Name: _____ Elevation: 1800

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GRS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model garmin etrex

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

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

Coordinates:

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

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

Los gatos series soil, northslope, understory of live oak woodland

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

Site Information

Overall site/occurrence quality/viability (site + population): ☒ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances:

Threats:

Comments:

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

☒ Keyed (cite reference): Jepson

☐ Compared with specimen housed at: _____

☐ Compared with photo / drawing in: _____

☐ By another person (name): _____

☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐