

**PRESERVE AND OPEN SPACE CONSERVATION  
VALUE ASSESSMENT**

**SOLANO HCP/NCCP  
SOLANO COUNTY CALIFORNIA**

Submitted to:

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### Pocket

Data Disk of Records Status – GIS Shapefiles

## INTRODUCTION

A panel of Science Advisors was convened in August 2002 to provide objective input and analysis for the preparation of the species conservation program for the Solano HCP/NCCP. The purpose of the Science Advisors Panel was to ensure that the best available science would be used to develop the HCP/NCCP. The Science Advisors' report was issued in November 2002 and concluded that some of the existing biological resources background information was not of sufficient detail or focus to facilitate science-based conservation planning and reserve design. The Science Advisors' report identified specific data gaps and recommended that efforts be made to address these gaps in further developments of the HCP/NCCP.

The Science Advisors noted several potential deficiencies in the baseline data for the current distribution of species within Solano County, including the inability to distinguish historical records from extant records. The project stakeholders have expressed concerns that decisions are being made using historical data that may not reflect current conditions. These baseline data relied primarily on records contained in the California Natural Diversity Database (CNDDDB), which is maintained and operated by the California Department of Fish and Game (CDFG). While many additional records may exist from other sources (and many have been compiled as part of the HCP/NCCP development), this information was also not in a form that was readily available for public use and review. The current CNDDDB data also only identify locations where species have been documented/recorded. Negative survey results can be extremely useful in assessing conservation strategies and in developing reserve design criteria. The current database does not include information for sites where surveys have been conducted, but the species have not been found. The CDFG obtained and granted Section 6 funding to the Solano County Water Agency (SCWA) to assist in addressing this identified data gap in the Science Advisors' report. The grant funding included two tasks:

1. **Update and Refine Baseline Occurrence Data for Special-status Species in Solano County.** Existing CNDDDB occurrence records are to be reviewed in an attempt to confirm whether occurrences of species are presumed extant or extirpated. If an occurrence is considered extirpated (from investigations by LSA and others, or as designated by the CNDDDB), the potential for undocumented occurrences within the vicinity (*i.e.*, presence of suitable habitat) is to be evaluated.
2. **Develop an HCP/NCCP Species Data Base.** Develop and implement a GIS-based database to incorporate the results of surveys and other local records to assist with development of the HCP/NCCP conservation strategies and long-term monitoring and compliance. The database should identify parcels/locations, where surveys for covered and other special-status species have been conducted, and establish a rating system that incorporates a relative assessment of the reliability of results based on study methodologies (*e.g.*, a low ranking for general habitat assessment to a high ranking for appropriately-timed, protocol-level surveys).

This report addresses the first task and notes revisions and other changes with respect to occurrence records included in the CNDDDB as of March 2004. It also includes GIS maps that distinguish between *presumed extant* and *extirpated* populations.

Additional species records from Task 2 were also obtained from other published and unpublished sources and added to the species records data base for the Solano HCP/NCCP. This information is presented in Appendix B, Species Descriptions, of Working Draft 1.0 and in ArcView GIS shape file on the attached disk.

## METHODS

Records of special-status species contained in the CNDDDB (May 2003) for Solano County were reviewed to assess the status of occurrence locations, habitats, threats (if any), and other relevant information. The occurrence locality information was examined using aerial photographs, which provided initial information on the conditions of the site (*e.g.*, had the site been impacted by development). Aerial photographic sources were:

- U.S.G.S. digital orthophoto quarter-quadrangles (DOQQs) (1993);
- 1:2000 black and white aerial photographs (1999); and
- Infrared aerial photographs (San Francisco Estuary Institute 1985).

Based on the examination of the aerial photographs, occurrences were initially classified as:

- **Presumed Extant** - if the habitat at a site appeared to be suitable for the species (*e.g.*, undisturbed/mildly disturbed);
- **Extirpated** - if the habitat associated with the species was absent (*e.g.*, converted to agricultural or urban areas);
- **Unknown or Questionable** - if the occurrence locality was:
  - Surrounded by urban development;
  - Indiscernible on the photograph;
  - Along a road that might be/have been affected by road construction/maintenance;
  - On cultivated farmland;
  - Threatened, according to the CNDDDB (2003) and CNPS (2004).

The occurrence sites of *unknown* or *questionable* status were visited by LSA staff in 2003 to assess the quality/condition of the habitat and, in some cases, the presence/absence of a target species. All observations were made from public roads or rights-of-way, unless landowners granted permission for access. Most of the locations of occurrences designated as extirpated in the CNDDDB were also field checked by LSA. to assess the presence/absence of suitable habitat for a target species within ¼ mile of the original locality. This observation provided an evaluation of the potential for the species to be present in suitable habitat in the vicinity of the original site.

Additional occurrence records that were added in the March 2004 edition of the CNDDDB (59 records) were displayed separately and overlaid on a USGS DOQQ within the Geographic

Information System (GIS). The occurrence locations were evaluated as to whether habitat for the target species is currently present or absent by judging it against an aerial photographs (see above). None of the additional CNDDDB 2004 records sites have been field checked.

Additional species records were obtained from a variety of sources such as technical reports on file with the Solano HCP/NCCP participants, personal observation of LSA staff , other consultants, and agency personnel who submitted information, and other available sources such as *University and Jepson Herbaria*. SMASCH Project ( [www.mip.berkeley.edu/www\\_apps/smasch/smasch\\_accession.html](http://www.mip.berkeley.edu/www_apps/smasch/smasch_accession.html)) and Jepson Prairie Plant list ([www.vernalpools.org/jepson/byname/00list.htm](http://www.vernalpools.org/jepson/byname/00list.htm)). These additional records were added to the Solano HCP/NCCP GIS database.

## RESULTS

### CNDDDB ASSESSMENT

The CNDDDB (May 2003) contained 769 records of special-status species for Solano County. Table 1 provides a breakdown of the distribution of the 2003 records by species. The number of occurrence records was increased by 59 in the March 2004 edition of the CNDDDB for a total of 828 occurrence records.

After review of the aerial photographs in 2003, the presence/absence status of 49 occurrences (excluding Contra Costa goldfields, see below) were considered *unknown or questionable* and, therefore, field-checked (see Table 2). Based on LSA's investigation, 39 occurrences are extirpated, some of which were also designated as extirpated in the CNDDDB. Extirpation of populations of a species has occurred primarily because of urban developments, highway construction, and the conversion of natural plant communities to actively cultivated land or areas of intensive livestock grazing. The status of ten (10) records remains *unknown or questionable* after the field surveys. Tricolored blackbird (*Agelaius tricolor*) occurrences (5) were not investigated as location information for this species is withheld (CNDDDB 2004).

The additional 59 records included in the CNDDDB between May 2003 and March 2004 are primarily those of Swainson's hawk observations (48) provided by the CDFG for sightings within the last few years. None of these occurrences were field-checked by LSA. The remaining 11 records were recently updated (in 2003) and represent occurrences that are all presumed extant.

Table 1 summarizes the results of LSA's examination of aerial photographs and fieldwork conducted in 2003. The purpose was to determine the current status (presence/absence) of selected occurrences of plants and animals recorded in the CNDDDB and to determine if suitable habitat for a species is present within ¼ mile of the original locality. It also includes the results from examined records using aerial photographs in 2004. The table includes:

- Unique CNDDDB occurrence identifiers (EONDX #);
- Occurrence record # within each species;
- Number of occurrences of each species in Solano County according to the CNDDDB;
- Number of occurrences of the species in California according to the CNDDDB;
- Additional occurrences assembled by LSA from other sources (LSA observations; SMASH project [UC Berkeley herbaria], etc.);
- Year the species was last seen at a reported locality;
- "Presence" according to the CNDDDB;
- "Presence" based on LSA's investigations in 2003 (and other sources);
- Approximate location of the occurrence and habitat notes, if available;
- Current conditions at the occurrence locality;
- Assessment of suitable habitat of a species within ¼ mile of the original locality.

Of the species considered in the Solano HCP/NCCP, one species, Contra Costa goldfields (*Lasthenia conjugens*) is of particular concerns with respect to future urban development as the majority of this species known distribution lies within the planned urban boundaries of the cities of Fairfield and Suisun. Following is a summary of the status of this species information.

### Contra Costa Goldfields

Table 3 lists the 14 occurrences of Contra Costa goldfields reported from Solano County (13 records from the CNDDDB and 1 record from another source). This species is considered “extremely rare” by the CDFG and its preservation is of critical importance, as the current distribution is primarily limited to developed areas and areas proposed for development within the urban boundaries of Fairfield and Suisun City. The following describes in greater detail five of the 13 CNDDDB record sites that were field-checked by LSA in 2003.

Contra Costa goldfields occur in a variety of vernal pools ranging from small pools and swales to large pools, often in alkaline soils. Historically, this species was found in counties surrounding San Francisco Bay and along the coast, from Santa Barbara County to Mendocino County. Many historical occurrences are considered extirpated. Currently, this species is known from about 20 presumed extant populations in California. Thirteen (13) occurrences of Contra Costa goldfields are included in the CNDDDB (2004) for Solano County. The greatest concentration of populations (11) is in the Fairfield-Suisun City area. The CNDDDB designates one of the 13 occurrences as *extirpated* and two as *possibly extirpated* (total of 3 sites).

The three occurrence sites were visited on April 21, 2003, by LSA senior botanist Eva Buxton, assisted by botanist Greg Gallagher. The sites [EONDX #21904 (occ #5); EONDX #21918 (occ #7), and EONDX #568 (occ #24)] were thoroughly searched during the survey. The surveys were timed to coincide with known Contra Costa goldfields populations in bloom in the vicinity of the sites surveyed. A fourth occurrence [EONDX #9463 (occ #19)] designated as possibly extirpated (CNDDDB 2004) is likely extant. A fifth site [EONDX #42506 (occ #33)] near Cordelia was viewed from across a fence, as the site could not be accessed [private property with access denied].

**EONDX #21904 (Occ # 5).** This population, last seen in 1974, was mapped as a non-specific polygon in a ditch along Vanden Road, north of the junction with Cannon Road. Surveys were conducted in 1988 with a dry spring by Joe Callizo, and again in 1993 with a very wet spring by Ann Howald. No plants were observed in either year (CNDDDB 2003).

LSA staff walked the entire length of the ditch but did not find Contra Costa goldfields at this site during the 2003 survey. The installation of a petroleum pipeline along the ditch has severely disturbed the substrate and vegetation. The ditch is dominated by non-native grasses and forbs such as Italian wildrye (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), curly dock (*Rumex crispus*), and loose-strife (*Lythrum hyssopifolium*) but also supports native “generalist” wetland species such as spikerush (*Eleocharis macrostachya*) and coyote thistle (*Eryngium* sp.).

**Conclusion.** Habitat for Contra Costa goldfields is severely degraded in the ditch. As the population has not been observed since 1974 (also checked in 1988 and 1993) and not found by LSA in 2003, the population is highly likely to be extirpated at this site. However, suitable vernal pool habitat is present for this species in areas south of Cannon Road and east of Vanden Road. Goldfields are present in the area, but the exact species has not been identified.



**EONDX #21918 (Occ #7).** Two colonies of this species were lumped into one population (CNDDDB, November 2003) represented by “old” occurrence records #7 and #27 (CNDDDB April 2003). Occurrence #7 is reported as extirpated in the CNDDDB (2004). This occurrence presently represents two colonies, one colony (A) northwest of the junction of Air Base Parkway and Walters Road and another colony (B) southeast of the junction. Colony A was last seen in 1958 and, like the above site (occurrence #5), was investigated by Joe Callizo and Ann Howald in 1988 or 1993, respectively. It was also checked in 1974. No plants were found during any of the three surveys (CNDDDB 2003). Colony B contained approximately 300,000 plants in 2000 (CNDDDB 2004). A large number of Contra Costa goldfields in this colony B was observed by LSA from Walters Road in 2003.

LSA staff surveyed the colony A site in 2003 but did not find any Contra Costa goldfields. It appears that an industrial park and a lumber yard were developed on, or in the vicinity of the site. Vernal pool habitat no longer exists, instead a drainage ditch with running/standing water supports cattail (*Typha* sp.) and water-plantain (*Alisma plantago-aquatica*) and the remainder of the roadside supports weedy species such as wild oats (*Avena* sp.) and Italian thistle (*Carduus pycnocephalus*).

(A known population of Contra Costa goldfields (Occ #26) around McCoy reservoir, located directly northwest of the colony A site, was observed by LSA in 2003 from Air Base Parkway and the colony A site. The site was fenced and was not surveyed.)

(Occurrence #7 was reported as extirpated by the CNDDDB in 2004. Roxanne Bittman (CNDDDB) has been notified by Eva Buxton of the existence of the two colonies, one of which is extirpated and the other extant in [March 2004].)

**Conclusion.** Habitat for Contra Costa goldfields is no longer present northwest of the junction of Airforce Parkway and Walters Road (colony A). As the population has not been observed since 1958 (also checked in 1988 and 1993) and was not observed in 2003, this population is considered extirpated. Colony B southeast of the road junction is extant.

**EONDX # 568 (Occ # 24).** Two colonies of this species were lumped into one population (CNDDDB, November 2003) represented by “old” occurrence records #24 and #25 (CNDDDB April 2003). Occurrence #24 is reported as presumed extant in the CNDDDB (2004). The colonies occur northeast and southwest of Vanden High School. Colony A (southwest of the school) was reported to the CNDDDB by Eva Buxton (LSA) in 1994 and was at the time estimated to comprise approximately 1,300 plants. In 1994 the plants grew in a few depressions and man-made furrows throughout portions of the predominantly flat site. Colony B (northeast of the school) was reported by Carol Witham in 1995 and estimated at least 250,000 plants.

LSA surveyed the colony A site in 2003 and determined that the site and its substrate had been altered since 1994; several vernal pools of various sizes and other low lying areas were present in the southwestern portion of the site. It was evident that portions of the site had been scraped; some areas had little or no vegetation and low berms, created by some type of vehicle, were present near the pools. The pools had up to 50 percent cover by vernal pools species such as downingia (*Downingia* sp.) and slender pop-corn flower (*Plagiobothrys stipitatus* ssp. *micranthus*). Other wetland species observed include Fitch’s tarweed (*Hemizonia fitchii*) and toad-rush (*Juncus bufonius*). Approximately 50 individuals of Contra Costa goldfields were sparsely distributed around two of the pools.

**Conclusion.** Habitat for Contra Costa goldfields is present at the colony A site and 50 individuals of these goldfields were observed during LSA's 2003 surveys. The decline in number of plants from 1994 (1,300) to 2003 (50) is likely due to disturbance to the substrate. It appears that the substrate and its vegetation have recently been scraped, based on the low percentage of absolute cover in some of the pools and adjacent upland areas and the presence of low berms near some pools. The colony B site was not surveyed by LSA in 2003.

**EONDX # 9463 (Occ #19).** This population, recorded from west of Suisun Cty, near the junction of Cordelia Road and Pennsylvania Road was last seen in 1985 (CNDDDB 2004). Eva Buxton searched the site in 1994 but no Contra Costa goldfields were observed at that time. In 2002, John Vollmar (Vollmar Environmental Consulting) observed Contra Costa goldfields at the site, however, the occurrence is designated as possibly extirpated in the CNDDDB (2004).

**Conclusion.** Although not observed in 1985 (CNDDDB), habitat for Contra Costa goldfields appears to be present at the site, as viewed from Highway 12 and Pennsylvania Road (LSA 2003). John Vollmar reported it as extant in 2002.

**EONDX #42506, (Occ # 33).** This population was observed in Cordelia in 1998 (Dr. R. Chan) and described as follows: "Stray individuals growing on grassy causeway; dispersed from dense patches growing along shared pond of adjacent property." No other information for this site is available in the CNDDDB.

LSA staff visited the site in 2003 but could not investigate the population, as the pond is on private property and access was not permitted. Contra Costa goldfields were observed occurring in abundance at the pond from approximately 100 feet away, but no estimate of number of plants could be made.

**Conclusion.** A relatively large population of Contra Costa goldfields at this site was observed by LSA in 2003 from a distance of about 100 feet. The edge of the pond and adjacent grassland provide suitable habitat.

## ADDITIONAL SPECIES RECORDS

An additional 128 records for 38 species were added to the overall record list for covered species. The location for these records information is presented in Appendix B, Species Descriptions, of Working Draft 1.0 and in ArcView GIS shape file on the attached disk. The GIS shape file information also contains the source information for each record.

Two additional Contra Costa goldfield records were identified during the preparation of the Solano HCP/NCCP. One record of Contra Costa goldfields from Gridley Ranch, north of the Jepson Prairie Reserve was reported by AMEC and Foothill Associates (2001). This site was searched in 2003 for Contra Costa goldfields and none were found. Given that this species is not known from the Jepson Prairie region (C. Witham, pers. comm.) and the inability to relocate this species at the site (other species of goldfields were identified), this report is likely a misidentification.

The second record is from Travis Air Force Base and is reported by Collinge (2003). The report is a published note describing the apparent success of a seeding experiment of Contra Costa goldfields into 64 constructed vernal pools. Collinge reports goldfields abundance increasing from an average of 12 individuals in seeded plots in 2000 to an average 240 individuals in 2002 and 317 individuals in 2003.

## REFERENCES

AMEC Earth Environmental and Foothill Associates. 2001. *Gridley Trust Mitigation Bank Monitoring Report*. Santa Barbara and Roseville, California.

California Department of Fish & Game (CDFG). 2003. *California Natural Diversity Data Base (CNDDDB)*. Sacramento, California.

----- 2004. CNDDDB. Sacramento, California

Collinge, S. 2003. Constructed vernal pool seeding experiment aids in recovery of Contra Costa goldfields (California). *Ecological Restoration* 21:4 pp. 316-317

Miriam Green Associates. 2002. Tooby IV Property, Solano County, California. Special status plant survey report. Prepared for Gibson and Skordal Wetland Consultants, Sacramento.

Solano County Water Agency. 2003a. *Draft Sections of the Habitat Conservation Plan --Vernal Pool Conservation Strategies*. (<http://www.scwa2.com/HCP/Vernal%20Pool%20Ecosys.htm>)

Solano County Water Agency. 2003b. *Draft Sections of the Habitat Conservation Plan --Vernal Pool Conservation Strategies*. (<http://www.scwa2.com/HCP/plan.htm>)

### Personal Communications

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**Table 1. Occurrence of Special Status Species in Solano County\***

<b>Common Name</b>	<b>#</b>	<b>%</b>	<b># extirpated</b>
Swainson's Hawk	122	16.14	
Burrowing Owl	80	10.58	4
Delta Tule Pea	70	9.26	1**
Suisun Marsh Aster	49	6.48	
Salt-Marsh Harvest Mouse	44	5.82	1**
Mason's Lilaeopsis	33	4.37	1**
Dwarf Downingia	24	3.17	
Alkali Milk-Vetch	18	2.38	4
Vernal Pool Fairy Shrimp	16	2.12	4**
Vernal Pool Tadpole Shrimp	16	2.12	1
Contra Costa Goldfields	14	1.85	3**
Soft Bird's-Beak	14	1.85	
Legenere	13	1.72	2**
California Linderiella	12	1.59	2**
Carquinez Goldenbush	12	1.59	
California Black Rail	11	1.46	
California Clapper Rail	11	1.46	
Saltmarsh Common Yellowthroat	10	1.32	
Suisun Shrew	10	1.32	1**
California Red-legged Frog	9	1.19	2
Sacramento Splittail	9	1.19	
San Joaquin Saltbush	9	1.19	1**
Suisun Song Sparrow	9	1.19	
Midvalley Fairy Shrimp	8	1.06	
Fragrant Fritillary	7	0.93	1
California Tiger Salamander	6	0.79	1
Delta Mudwort	6	0.79	
Heartscale	6	0.79	1
Valley Elderberry Longhorn Beetle	6	0.79	
Boggs Lake Hedge-hyssop	5	0.66	
Brittlescale	5	0.66	
Conservancy Fairy Shrimp	5	0.66	
White-tailed Kite	5	0.66	
Northern Claypan Vernal Pool	4	0.53	
Suisun Thistle	4	0.53	
Brewer's Western Flax	3	0.4	
Delta Green Ground Beetle	3	0.4	
Delta Smelt	3	0.4	
Giant Garter Snake	3	0.4	
Monarch Butterfly	3	0.4	
Mountain Plover	3	0.4	
Showy Indian Clover	3	0.4	2**
Colusa Grass	2	0.26	
Crampton's Tuctoria or Solano Grass	2	0.26	
Northwestern Pond Turtle	2	0.26	
Saline Clover	2	0.26	
San Pablo Song Sparrow	2	0.26	
Western Pond Turtle	2	0.26	
Adobe-lily	1	0.13	2
Baker's Navarretia	1	0.13	
Bearded Popcorn-Flower	1	0.13	
Big Tarplant	1	0.13	1
Big-scale Balsamroot	1	0.13	
Callippe Silverspot Butterfly	1	0.13	
Caspian Tern	1	0.13	
Congdon's Tarplant	1	0.13	1**
Ferris's Milk-vetch	1	0.13	
Foothill Yellow-legged Frog	1	0.13	
Golden Eagle	1	0.13	
Great Blue Heron	1	0.13	
Great Egret	1	0.13	
Heckard's Pepper-Grass	1	0.13	
Hispid Bird's-Beak	1	0.13	
Marin Knotweed	1	0.13	
Osprey	1	0.13	1
Rayless Ragwort	1	0.13	
Recurved Larkspur	1	0.13	1**
Ricksecker's Water Scavenger Beetle	1	0.13	
Rose-mallow	1	0.13	1
Sacramento Anthicid Beetle	1	0.13	
Short-eared Owl	1	0.13	
Vernal Pool Smallscale	1	0.13	
Yellow-breasted Chat	1	0.13	
<b>Total</b>	<b>736</b>	<b>100%</b>	<b>38</b>

\* Data from a compilation of records from the California Natural Diversity Database may not represent the total number of occurrences of a species in Solano County.

\*\* Number of extirpated species/habitats with suitable habitat within ¼ mile where the species that was at that site might be reestablished.

Table 2 - Special-status Species Occurrences in the CNDDDB (March 2004) Investigated by LSA in 2003 and 2004 as to Presence/Absence Status

EONDX #	Occ #	Species	No. of Occs in Solano Cty. (CNDDDB 3/2004)	No. of Occs from other Sources	No. of Occs in Calif. (CNDDDB 3/2004)	Year Last Seen	Presence (CNDDDB 3/2004)	Presence Based on LSA Investigations	Habitat and/or Location of Occ (CNDDDB)	Current Conditions at Occ Site	Suitable Habitat within 1/4 mile
		<b>PLANTS</b>									
		<b><i>Astragalus tener</i> var. <i>tener</i> -- Alkali milkvetch</b>	24	2 <sup>1,2,3</sup>	64						
7746	33	Alkali milkvetch				1979	Extirpated	Extirpated	Alkaline flat along Tremont Road.	Cultivated farmland.	No
6852	40	Alkali milkvetch				1922	Possibly extirpated	Extirpated	Subalkaline flats along RR-tracks at Tolenas.	Plowed field; invasive exotics dominating ditch.	No
2457	30	Alkali milkvetch				1896	Possibly extirpated	Extirpated	Flooded low ground, vernal pools at "Little Oaks" near Vacaville (exact location unknown).	City street or agricultural land.	No
19248	34	Alkali milkvetch				1959	Possibly extirpated	Extirpated	Low ground, alkali flats along Sikes, Hackman, and Tremont roads.	Cultivated farmland; roadsides with invasive exotics.	No
8368	29	Alkali milkvetch				1966	Possibly extirpated	Extirpated	Low ground, alkali flats W of Bunker Station.	Cultivated farmland.	No
		<b><i>Atriplex cordulata</i> -- Heartscale</b>	6	1 <sup>2</sup>	57						
2456	5	Heartscale				1887	Extirpated	Extirpated	Alkali flats, scalds at "Little Oaks" near Vacaville.	Developed area of Vacaville.	No
		<b><i>Atriplex joaquiniana</i> -- San Joaquin saltbush</b>	9		66						
16736	22	San Joaquin saltbush				1891	Presumed extant	Extirpated	Rio Vista	Within Rio Vista city limits.	Yes

EONDX #	Occ #	Species	No. of Occs in Solano Cty. (CNDDDB 3/2004)	No. of Occs from other Sources	No. of Occs in Calif. (CNDDDB 3/2004)	Year Last Seen	Presence (CNDDDB 3/2004)	Presence Based on LSA Investigations	Habitat and/or Location of Occ (CNDDDB)	Current Conditions at Occ Site	Suitable Habitat within 1/4 mile
		<b><i>Blepharizonia plumosa</i> ssp. <i>plumosa</i> -- Big tarplant</b>	1		40						
51042	40	Big tarplant				1917	Possibly extirpated	Extirpated	Grassland near Benicia (exact location unknown).	Private developed property.	No
		<b><i>Centromadia parryi</i> ssp. <i>congdonii</i> -- Congdon's tarplant</b>	1		62						
5831	1	Congdon's tarplant				1930	Extirpated	Extirpated	About 2 miles N of Benicia along highway to Cordelia.	Commercial/residential development within Benicia City limits.	No
		<b><i>Cordylanthus mollis</i> ssp. <i>mollis</i> - Soft bird's-beak</b>	15		27						
17830	2	Soft bird's-beak				1885	Possibly extirpated	Extirpated	Saltmarsh on Mare Island.	Weedy vacant area in marina parking lot.	?
17821	13	Soft bird's-beak				1982	Possibly extirpated	?	Saltmarsh at Dutchman Slough.	Unknown; site inaccessible. (Habitat in poor condition in 1993 [CNDDDB 2003]).	?
8059	6	Soft bird's-beak				1986	Possibly extirpated	?	Saturated bottomlands along Montezuma Slough.	Suitable habitat appears present.	Yes
		<b><i>Delphinium recurvatum</i> - Recurved larkspur</b>	1		77						No

EONDX #	Occ #	Species	No. of Occs in Solano Cty. (CNDDDB 3/2004)	No. of Occs from other Sources	No. of Occs in Calif. (CNDDDB 3/2004)	Year Last Seen	Presence (CNDDDB 3/2004)	Presence Based on LSA Investigations	Habitat and/or Location of Occ (CNDDDB)	Current Conditions at Occ Site	Suitable Habitat within 1/4 mile
51926	12	Recurved larkspur				1940	Presumed extant	Extirpated	In alkaline soil along Browns Valley Road, N of Vacaville (exact location unknown).	Developed area of Vacaville.	
		<b><i>Fritillaria liliacea</i> -- Fragrant fritillary</b>	8		58						
23650	43	Fragrant fritillary				1875	Presumed extant	Extirpated	Mare Island.	Neighborhood park.	No
		<b><i>Fritillaria pluriflora</i> -- Adobe-lily</b>	2		97						
45410	25	Adobe-lily				1910	Presumed extant	Extirpated	Dixon.	Developed area of Dixon.	No
45336	26	Adobe-lily				1913	Presumed extant	Extirpated	Bennet's Hill, Vacaville (exact location unknown).	Developed area of Vacaville.	No
		<b><i>Hibiscus lasiocarpus</i> -- Rose-mallow</b>	1		129						
20816	36	Rose-mallow				1891	Presumed extant	Extirpated	Sacramento River bank, near Rio Vista.	Developed area in Rio Vista.	Yes
		<b><i>Lasthenia conjugens</i> - Contra Costa goldfields</b> (Please see Table 2 and text in report.)	13		32 - many extirpated						
		<b><i>Lathyrus jepsonii</i> var. <i>jepsonii</i> -- Delta tulle pea</b>	71		123						

EONDX #	Occ #	Species	No. of Occs in Solano Cty. (CNDDDB 3/2004)	No. of Occs from other Sources	No. of Occs in Calif. (CNDDDB 3/2004)	Year Last Seen	Presence (CNDDDB 3/2004)	Presence Based on LSA Investigations	Habitat and/or Location of Occ (CNDDDB)	Current Conditions at Occ Site	Suitable Habitat within 1/4 mile
8097	55	Delta tule pea				1989	Presumed extant	Extirpated	In narrow strip between water's edge and paved area within marina.	Privately owned marina.	Yes
		<b>Legenere limosa -- Legenere</b>	13		59						
7224	3	Legenere				1982	Extirpated	Extirpated	In trenches along RR-tracks; ~1 mile N and 1 mile E of Suisun Station.	Residential development.	No
17390	2	Legenere				1890	Extirpated	Extirpated	Near Elmira.	Residential development.	No
		<b>Lilaeopsis masonii -- Mason's lilaeopsis</b>	35		149						
17216	120	Mason's lilaeopsis				1995	Presumed extant	Extirpated	Brackish marsh on E side of Mare Island.	Open water.	Yes
		<b>Trifolium amoenum -- Showy Indian clover</b>	3		23						
45523	11	Showy Indian clover				1892	Presumed extant	Extirpated	Vacaville (exact location unknown).	Likely developed area of Vacaville.	Yes
46520	12	Showy Indian clover				1909	Presumed extant	Extirpated	Elmira (exact location unknown).	Likely developed area of Elmira.	Yes
<b>ANIMALS</b>											
		<b>Ambystoma californiense -- California tiger salamander</b>	6	9	753						
28402	59	California tiger salamander				1953	Extirpated	Extirpated	2 miles E of Dixon.	Agricultural land in crops.	No



EONDX #	Occ #	Species	No. of Occs in Solano Cty. (CNDDDB 3/2004)	No. of Occs from other Sources	No. of Occs in Calif. (CNDDDB 3/2004)	Year Last Seen	Presence (CNDDDB 3/2004)	Presence Based on LSA Investigations	Habitat and/or Location of Occ (CNDDDB)	Current Conditions at Occ Site	Suitable Habitat within 1/4 mile
		<b><i>Athene cunicularia</i> -- Burrowing owl</b>	84	5	636						
4370	219	Burrowing owl				1994	Presumed extant	Extirpated	Vacant lot in Dixon	Industrial development.	No
11960	113	Burrowing owl				1983	Extirpated	Extirpated	Hillside Drive in Fairfield	Housing development.	No
11967	109	Burrowing owl				1979	Extirpated	Extirpated	NE edge of Vallejo.	Housing development.	No
12261	117	Burrowing owl				1992	Presumed extant	Possibly extirpated	In vicinity of Officers' Club, Travis Air Force Base.	Within Fairfield city limits.	No
48656	484	Burrowing owl				Hist. site; sp. not seen in 1989	Possibly extirpated	Extirpated	S of Dixon Ave. in Dixon.	City subdivision.	No
48654	482	Burrowing owl				Hist. site; sp. not seen in 1989	Possibly extirpated	?	3.8 miles SW of Dixon.	Cultivated farmland, but habitat may exist in roadside ditch.	?
48655	483	Burrowing owl				Hist. site; sp. not seen in 1989	Possibly extirpated	Extirpated	1 mile S of Dixon.	?	?
48658	485	Burrowing owl				Hist. site; sp. not seen in 1989	Possibly extirpated	?	2 miles SE of Dixon.	Cultivated farmland, but habitat may exist in roadside ditch.	?
7322	145	Burrowing owl				Hist. site; sp. not seen in 2001	Possibly extirpated	?	W side of Potrero Hills Lane	Suitable habitat present.	Yes

EONDX #	Occ #	Species	No. of Occs in Solano Cty. (CNDDDB 3/2004)	No. of Occs from other Sources	No. of Occs in Calif. (CNDDDB 3/2004)	Year Last Seen	Presence (CNDDDB 3/2004)	Presence Based on LSA Investigations	Habitat and/or Location of Occ (CNDDDB)	Current Conditions at Occ Site	Suitable Habitat within 1/4 mile
		<b>Branchinecta lynchi -- Vernal pool fairy shrimp</b>	16	12	339						
2649	19	Vernal pool fairy shrimp				1995	Presumed extant	Extirpated	Vernal pools N of Vacaville.	Cultivated farmland.	Yes
30612	172	Vernal pool fairy shrimp				1993	Presumed extant	Extirpated	Seasonal wetland NE of Vacaville.	Highway right-of-way.	No
30613	173	Vernal pool fairy shrimp				1993	Presumed extant	Extirpated	Vernal pool SW of Dixon	Ranch equipment yard.	No
48443	331	Vernal pool fairy shrimp				2002	Presumed extant	Possibly Extirpated	Ponded depressions, Tolenas.	Cultivated farmland.	Yes
		<b>Buteo swainsoni -- Swainson's hawk</b>	177	5	1267						
14112	389	Swainson's hawk				1992	Possibly extirpated	Extirpated	2.75 miles NNE of Dixon.	Nesting trees removed.	No
43628	859	Swainson's hawk				2000	Extirpated	Extirpated	2 miles S of Elmira	No suitable trees for nesting.	No - trees within 1/2 mile.
		<b>Elaphrus viridis -- Delta green ground beetle</b>	3		3						
23142	2	Delta green ground beetle				1986	Extirpated	Presumed extant	In mudcracks of vernal pools, 0.6 mile N of Dozier.	Open grazing-land; suitable habitat likely remains.	Yes
		<b>Lepidurus packardi -- Vernal pool tadpole shrimp</b>	16	8	172						
1767	26	Vernal pool tadpole shrimp				1995	Presumed extant	Extirpated	1.1 km NE of Elmira Road-Interstate 80 junction.	Cultivated farmland or highway development.	No
		<b>Lindieriella occidentalis -- California linderiella</b>	12	1	212						

EONDX #	Occ #	Species	No. of Occs in Solano Cty. (CNDDDB 3/2004)	No. of Occs from other Sources	No. of Occs in Calif. (CNDDDB 3/2004)	Year Last Seen	Presence (CNDDDB 3/2004)	Presence Based on LSA Investigations	Habitat and/or Location of Occ (CNDDDB)	Current Conditions at Occ Site	Suitable Habitat within 1/4 mile
48444	207	California linderiella				2002	Presumed extant	Extirpated	Seasonally ponded depressions along RR tracks, Fairfield.	City subdivision.	No
48455	211	California linderiella				2002	Presumed extant	Extirpated	Seasonally ponded depressions, just N of Suisun City.	Plowed field.	No
		<b><i>Pandion haliaetus</i> -- Osprey</b>	1		351						
4981	142	Osprey				1990	Presumed extant	Extirpated	Piledriver in Vallejo (at Napa River) used as nesting platform.	Piledriver removed from site.	No
		<b><i>Rana aurora draytonii</i> -- Red-legged frog</b>	9		715						
6246	77	Red-legged frog				1993	Presumed extant	Extirpated	Page Flat area at N end of Vallejo.	Golfcourse.	Yes
		<b><i>Reithrodontomys raviventris</i> -- Saltmarsh harvest mouse</b>	45	1	121						
13332	120	Saltmarsh harvest mouse				1995	Possibly extirpated	Extirpated	W side of Van Sickle Island, Suisun Marsh	Dredge-spoil disposal site.	Yes
23860	71	Saltmarsh harvest mouse				1996	Possibly extirpated	Presumed extant	Hillslough Wildlife Area.	Suitable habitat appears to exist.	Yes
		<b><i>Sorex ornatus sinuosus</i> - Suisun shrew</b>	10		10						
24370	2	Suisun shrew				1950	Presumed extant	Extirpated	In Lake Chabot seepage.	Vallejo Fairgrounds parking lot.	Yes
24374	1	Suisun shrew				1983	Presumed extant	Extirpated	Grizzly Island, near CDFG head-quarters.	Agricultural equipment yard.	Yes

**Table 3 - Status of Contra Costa Goldfields (*Lasthenia conjugens*) Occurrences in Solano County  
CNDDDB Records (March 2004) and Observations in Spring of 2003**

<b>CNDDB EONDX# (Occ#)</b>	<b>Location</b>	<b>Population Observed by LSA (or others)</b>	<b>Population Last Seen (according CNDDDB)</b>	<b>CNDDB Status of Population</b>	<b>Comments</b>
16733(3)	Cordelia Rd, W of Suisun City, 0.4 mile E of O'Rehr Rd, especially along Ledgewood Creek.		2002	Presumed Extant	Last seen by J. Vollmar (Vollmar Environmental Consulting) in 2002. Suitable habitat presumed to remain in preserved wetlands. Industrial development approved
16731(4)	S of Travis AFB, along N side of Hwy. 12, about 0.5 mile E of Branscombe Rd, E of Fairfield.		1999	Presumed extant	First reported by Dr. R. Ornduff in 1960. Not observed in 1988. Reported again in 1999 by State Lands Commission.
21904(5)	Roadside ditch beside railroad tracks, approximately 2 miles NE of Vanden.	2003	1974	Extirpated	No plants found in 2003. - See text in report.
21918(7)	W of Travis AFB, approximately 0.2 mile SE of Walters Rd junction with Airbase Pkwy – and NW of same junction (along road S of railroad tracks, 1.1 miles W of Peabody Rd, between Fairfield and Travis AFB).	2003	1958  2002	Extirpated - Colony NW of junction (see location info)  Extant – Colony SE of junction.	Two colonies. No plants observed in 2003 by LSA NW of road junction. Habitat destroyed by development, including lumber yard. Remaining land highly disturbed.  Colony SE of junction - more than 300,000 plants observed in 2000. A large number of plants observed in 2003 by LSA from Walters Rd. - See text in report.
9463(19)	Just W of Suisun City, near junction of Cordelia Rd and Pennsylvania Ave.	2002	1985	Presumed extant	Site disked in 1994. No plants found after disking. Plants observed again in 2002 and 2003 by J. Vollmar (Vollmar Environmental Consulting). -- See text in report.
17769(20)	S of Travis AFB, along both sides of Scally Rd and S of Hwy 12, E of Fairfield.	2003 (2004)	1999	(Presumed) extant	Population observed by Jane Valerius (Valerius Consulting) in 2003 and by LSA W of Scally Road in 2004.
21933(22)	Along and S of Travis AFB landing strip, S of Airbase Drive and W of Travis AFB hospital.		1993	Presumed extant	Approx. 22,000 plants observed in 1993.
568(24)	N of Vanden Highschool, S of Center School and Vanden Rd, S of junction of SP RR and Sacramento Northern RR – and - NW of Travis AFB, W of Vanden Highschool, S of Markley Rd, E of Peabody Rd.	2003 (colony W of Vanden Highschool)	1995	Presumed extant	Two colonies. At least 250,000 plants observed in 1995 N of Vanden High School. Current status unknown. Approximately 50 plants observed by LSA in 2003 SW of school. – See text in report.
565(26)	W of Travis AFB, mostly on N side of SP Railroad tracks, extending from N shore of reservoir (McCoy), E for 1.35 miles.	2003	1996	Presumed extant	At least 100,000 plants observed in 1996. – Large populations observed around reservoir from Airbase Parkway by LSA in 2003.
541(28)	NE of Fairfield, 0.1 mile N of Airbase Pkwy, 1.75 air miles due S of summit of Cement Hill.		1993	Presumed extant	About 10 plants in 1993. Reported present in 1999 but absent 2002 (MGA 2002).
42506(33)	Along Cordelia Rd, Cordelia, about 0.7 mile E of Pitman Rd, SW of Fairfield.	2003	1998	Presumed extant	Unknown number of plants observed by LSA in 2003. No access to property. – See text in report.
43586(34)	S of Travis AFB, along N side of Hwy. 12, about 1.2 miles E of Branscombe Rd, E of Fairfield.		1999	Presumed extant	Observed by State Lands Commission (1999). Population size unknown.
51716(36)	Little Oak, in vicinity of Vacaville (exact location unknown).		1918	Presumed extant	Collection By Jepson. (LSA considers this population extirpated based on its location within the city limits of Vacaville.
Not recorded	Travis Air Force Base	2003 (Collinge)			Extant. Collinge (2003) reports establishment of Contra Costa goldfields in mitigation pools between 200 and 2003.