Dudek and Associates, Inc., "2006 Sensitive Plant Survey Results for the Newhall Ranch Specific Plan Area, Los Angeles County, California" (October 2006; 2006I)

2006 Sensitive Plant Survey Report

Newhall Ranch

OCTOBER 2006

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2006 Sensitive Plant Survey Results

for

Newhall Ranch Specific Plan Area Los Angeles County, California

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2006 Sensitive Plant Survey Results
Newhall Ranch Specific Plan Area

1.0 INTRODUCTION

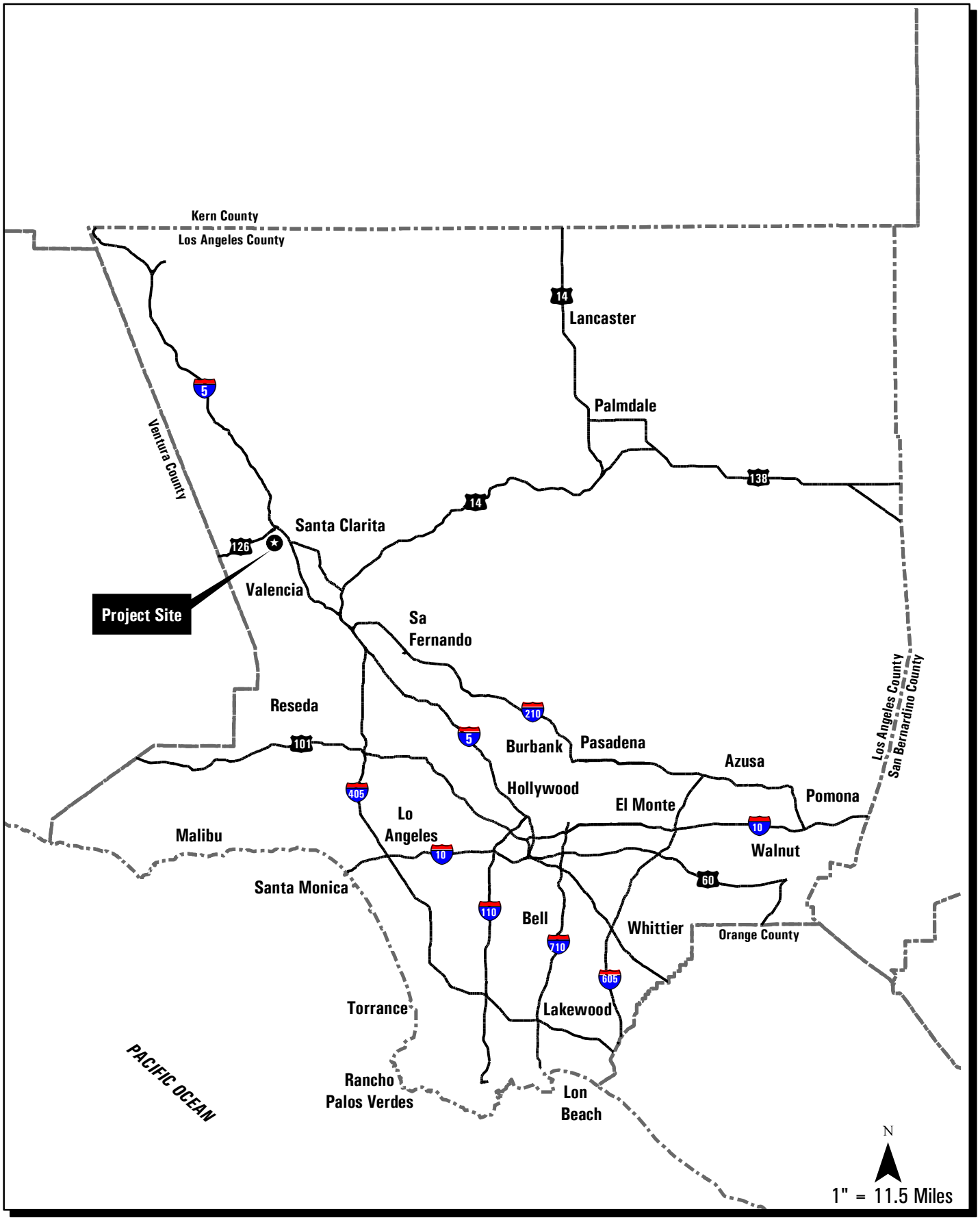
The purpose of this report is to document the results of surveys for sensitive plant species within the approximately 7,778-acre study area, a subset of the 11,963-acre Newhall Ranch Specific Plan (NRSP) area, for the 2006 field season. Surveys focused on known locatations of the state-listed endangered San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina;* SFVS). Other sensitive plant species were recorded if observed onsite.

2.0 SITE DESCRIPTION

The NRSP study area is located in an unincorporated portion of the Santa Clara River Valley in northwestern Los Angeles County (*Figure 1*). It lies roughly one-half mile west of Interstate 5 and largely southwest of the junction of I-5 and State Route 126 (SR-126), with portions of the Specific Plan site located in San Martinez Grande and Chiquito canyons north of SR-126. The City of Santa Clarita is located to the east of the study area and the Ventura County/Los Angeles County line lies along the western boundary. Site elevations range from 825 feet above mean sea level (AMSL) in the Santa Clara River bottom at the Ventura County/Los Angeles County line to approximately 3,200 feet AMSL on the ridgeline of the Santa Susana Mountains along the southern boundary (*Figure 2*).

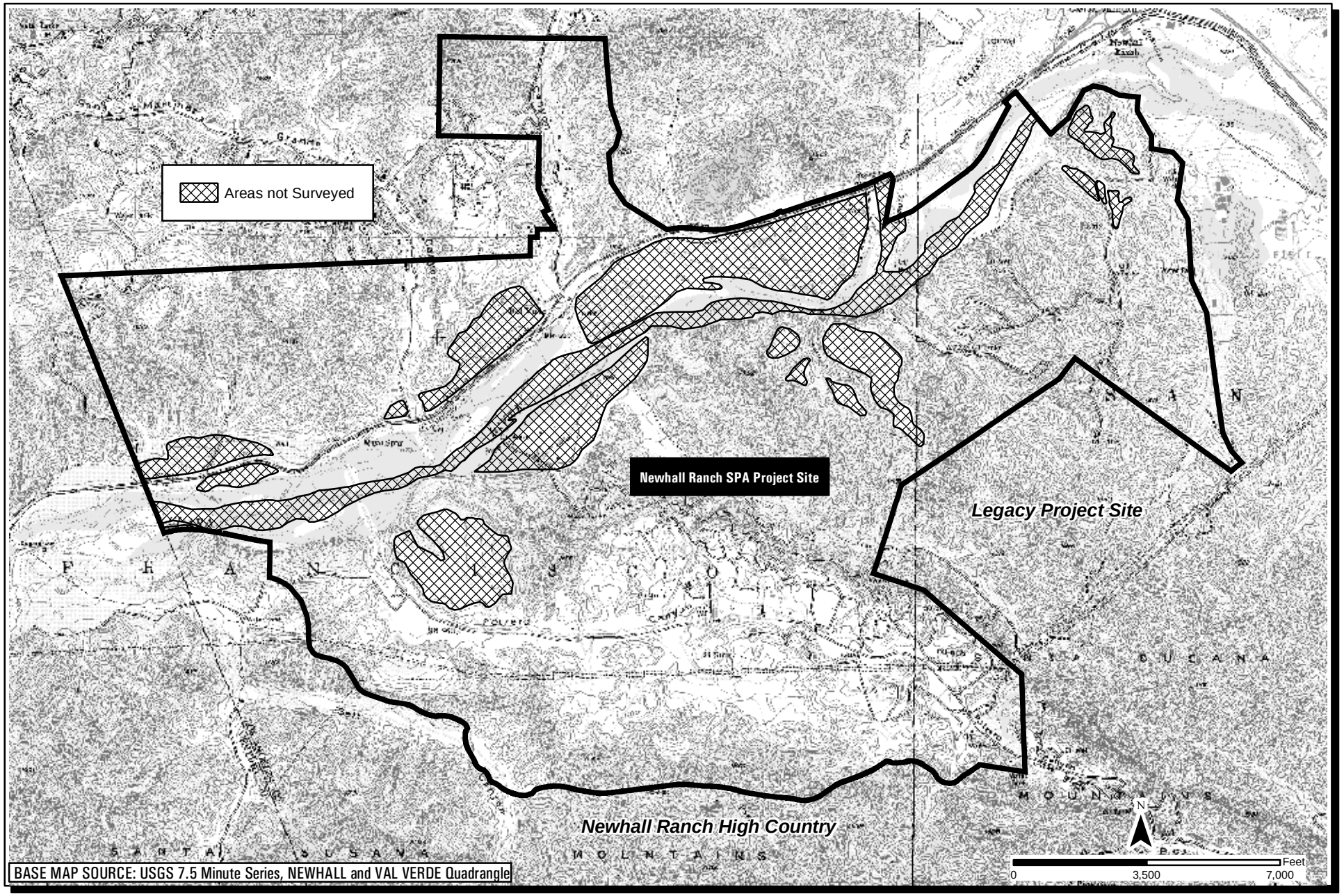
Dudek surveyed known locations of SFVS within areas that are designated for development according to the approved Specific Plan. The NRSP study area consists of approximately 7,778 acres, with the actual area surveyed containing approximately 6,644 acres. The study area includes areas north of SR-126 between Chiquito Canyon west to the Ventura County line; south of SR-126, it includes areas between the Airport Mesa and Potrero Canyon, including Middle, Dead-End, Lion, Humble, and Long canyons. However, the active channel in the Santa Clara River, agriculture fields (*e.g.*, Potrero Mesa) and areas currently proposed for conservation (most notably the "High Country" area) were excluded from the study area. This study area is dominated by east-, west-, and northwest-trending primary ridges, with north- and south-trending secondary ridges. Site elevations range from approximately 850 feet AMSL in the Santa Clara River floodplain to approximately 2,000 feet AMSL along the ridgeline, which separates Potrero Canyon from Salt Creek Canyon and Grave Canyon.

Slope gradients range from moderate to very steep in the hillside areas to very gentle within the Santa Clara River floodplain, tributary canyons and associated mesas. Distinctive elevated geographic features include Sawtooth Ridge; Razorback Ridge; Windy Gap; Ayers Rock; and Potrero, Grapevine, and Airport Mesas.



Newhall Ranch
Regional Map

FIGURE
1



Newhall Ranch
Vicinity Map

FIGURE
2

2.1 Plant Communities and Land Covers

Native and naturalized habitats within the study area are representative of those found in this region and provide examples of those plant communities found in the Santa Susana Mountains and the Santa Clara River ecosystems. Upland habitats dominate the landscape within the study area both north and south of the Santa Clara River. The majority of the site consists of the following upland plant communities: California sagebrush, California buckwheat, chamise, chamise-mission manzanita-woolyleaf ceanothus, coast live oak, valley oak, and California annual grassland series. The Santa Clara River supports a variety of riparian plant communities. These include Fremont's cottonwood, arroyo willow, mulefat, and arrow weed series along with freshwater marsh and seeps. Intermittent and ephemeral drainages onsite also provide habitat for scalebroom and Great Basin series and alluvial scrubs.

Newhall Land (Newhall) leases out portions of the study area for oil and natural gas production, cattle grazing and agricultural operations (*e.g.*, food crop production, dryland farming, honey farming). All such operations are currently ongoing. Grazing activities and oil and natural gas production have had a noticeable effect on much of the natural habitat onsite. Scrub habitats have been displaced by non-native grasslands as a result of grazing. Southern California Edison and Southern California Gas Company have distribution lines within easements onsite as well.

2.2 Geology and Soils

Geologically, the study area is located within the Transverse Ranges geomorphic province of southern California in the eastern portion of the Ventura depositional basin. This basin "was produced by tectonic downwarping in the geologic past to produce a large-scale synclinal structure in which a thick sequence of Cenozoic sediments has accumulated. These sediments have been lithified into a sequence of sedimentary rock that has subsequently been uplifted, tilted, and tectonically deformed (Allan E. Seward 2002, 2004)." They are cut by segments of the Del Valle and Salt Creek faults. Bedrock formations found onsite include the Modelo, Towsley, Pico, Saugus, and Pacoima formations, as well as Quaternary Terrace deposits. Surficial deposits include Quaternary alluvium, slopewash, soil, and artificial fill (Allan E. Seward 2002, 2004).

3.0 SURVEY METHODS

Data regarding botanical resources present on the project site were obtained through a review of the pertinent literature; field reconnaissance; and focused surveys for sensitive species, with varying levels of specificity; all of which are described below.

3.1 Literature Review

General floristic and sensitive botanical resources present or potentially present within the NRSP study area were identified through a literature search using the following sources: the California Natural Diversity Database for the Newhall, Santa Susana, Oat Mountain, Mint Canyon, San Fernando, Green Valley, Warm Springs Mountain, Whitaker Peak, Cobblestone Mountain, Piru, Simi, Thousand Oaks, and Val Verde quadrangle maps (CDFG 2004b); 2002 and 2003 Sensitive Plant Survey Results for Newhall Ranch Specific Plan Area (Dudek 2002, 2004a); 2003 Sensitive Plant Survey Results for Valencia Commerce Center, Castaic Mesa, Isola and Ventura Homestead Sites, Magic Mountain Entertainment Center (Entrada) Site, Castaic Junction Site, and Salt Creek (Dudek 2004b-g); 2004 Sensitive Plant Survey Results for Valencia Commerce Center, Entrada Site, Legacy, and Newhall Ranch Specific Plan Area (Dudek 2004h-k); *Biological Resource Assessment of the Proposed Santa Susana Mountains/Simi Hills Significant Ecological Area* (PCR, November 2000); CalFlora (University of California, Berkeley, May 2002); U.S. Fish and Wildlife Service (USFWS 1999); California Department of Fish and Game (CDFG 2002); *Inventory of Rare and Endangered Plants of California* (CNPS 2001); *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *Checklist of Rare Ventura County Plant Species* (Magney 2002); *A Flora of the Santa Barbara Region, California* (Smith 1976); *A Flora of the Santa Monica Mountains* (Raven *et al.* 1986); *Biology of the San Fernando Valley Spineflower, Ahmanson Ranch, Ventura County, California* (Glenn Lukos Associates, Inc. and Sapphos Environmental, Inc. 2000); *Report to the Fish and Game Commission on the Status of San Fernando Valley Spineflower* (CDFG 2001); *Biota Report, Newhall Ranch Specific Plan* (RECON and Impact Sciences, Inc. 1996); and herbarium specimens from Rancho Santa Ana Botanic Garden (RSA) and the University of California, Riverside (UCR) Herbarium. General vegetation communities information was obtained from Holland (1986), Sawyer and Keeler-Wolf (1995), and CDFG (2003). Plant species nomenclature follows Hickman (1993).

3.2 Field Reconnaissance Methods

Botanical surveys were conducted by Dudek staff biologists, with assistance provided by Anuja Parikh and Nathan Gale of FL*x*. All surveys were conducted on foot. Surveys were conducted in teams of two or more biologists, with at least one senior-level biologist included with each team. Resumes for survey personnel are provided in *Appendix A.*

Botanical surveys of the site were conducted between late May and early August of 2006 in accordance with the schedule provided in *Table 1*. Although slightly later than surveys conducted in 2005, the timeframe was appropriate for detecting SFVS because of the relatively

late blooming period resulting from lack of rainfall in late 2005 and early 2006. Approximately 860 person-hours (86 person-days) were spent conducting SFVS surveys within the study area. Biologists were able to observe reference populations of SFVS and other sensitive plant species in order to develop a search-image prior to conducting surveys of the project site. Surveys focused on the identification and location of SFVS within known populations. Additional sensitive plant species observed during SFVS surveys, including California Native Plant Society (CNPS) List 1B and 4 species, were also recorded.

TABLE 1
Survey Schedule & Personnel Newhall Ranch Specific Plan Area

DATE	BIOLOGISTS	PURPOSE	GENERAL GEOGRAPHIC AREA
5-23-06 to 5-26-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Airport Mesa
5-25-06	Colin Khoury, Makela Mangrich, Patricia Scuyler, Chris Oesch, Saudamini Sindhar	Focused surveys for SFVS; other sensitive plant species noted as observed.	Grapevine Mesa
5-27-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Airport Mesa, Exxon Canyon
5-29-06 to 6-2-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Airport Mesa
6-3-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Airport Mesa
6-5-06 to 6-7-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Airport Mesa
6-8-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Airport Mesa and Magic Mountain Canyon
6-9-06 to 6-10-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Potrero Canyon
6-12-06 to 6-14-06	Nathan Gale, Anuja Parikh	Focused surveys for SFVS; other sensitive plant species noted as observed.	Potrero Canyon
6-13-06 to 6-16-06	Doug Gettinger, Rebekah Krebs, Patricia Schuyler, Sara Townsend	Focused surveys for SFVS; other sensitive plant species noted as observed.	Grapevine Mesa

TABLE 1
Survey Schedule & Personnel Newhall Ranch Specific Plan Area

DATE	BIOLOGISTS	PURPOSE	GENERAL GEOGRAPHIC AREA
6-21-06 to 6-22-06	Vipul Joshi, Makela Mangrich, Clint Emerson, Sara Townsend	Focused surveys for SFVS; other sensitive plant species noted as observed.	Grapevine Mesa, Airport Mesa
7-10-06	Colin Khoury, Makela Mangrich, Callie Ford, Sara Townsend	Focused surveys for SFVS; other sensitive plant species noted as observed.	Dead End Canyon
7-11-06	Makela Mangrich, Callie Ford, Sara Townsend	Focused surveys for SFVS; other sensitive plant species noted as observed.	Potrero Canyon
7-12-06	Makela Mangrich, Callie Ford, Sara Townsend	Focused surveys for SFVS; other sensitive plant species noted as observed.	Long Canyon
7-13-06	Chris Oesch, Callie Ford, Sara Townsend	Focused surveys for SFVS; other sensitive plant species noted as observed.	San Martinez Canyon
7-24-06	Colin Khoury, Callie Ford	Focused surveys for SFVS; other sensitive plant species noted as observed.	Grapevine Mesa
8-3-06	Colin Khoury, Kam Muri	Focused surveys for SFVS; other sensitive plant species noted as observed.	Airport Mesa
8-4-06	Colin Khoury, Kam Muri	Focused surveys for SFVS; other sensitive plant species noted as observed.	San Martinez Canyon, Grapevine Mesa

All plant species encountered during the field surveys were identified and recorded for inclusion in *Appendix B*. Latin and common names of plants follow *The Jepson Manual* (Hickman 1993) or other recent published taxonomic treatments. Where not listed in Hickman (1993), common names were taken from Abrams (1923). Where not found in this reference, a variety of sources were used (*e.g.*, Abrams 1923, Dale 1986, or Roberts 1998).

Surveys in the NRSP study area during the 2006 field season focused on the observation of current year SFVS plants, with observations of other sensitive plant species noted when observed. Surveys for SFVS were focused in areas of known spineflower populations, generally open areas of California sagebrush, California sagebrush-purple sage series, California buckwheat and California annual grassland series (Sawyer and Keeler-Wolf 1995) on ridgelines, slopes, and escarpments with a southern, southwestern, or southeastern exposure. This strategy was based on information gathered during the documentation of SFVS populations flagged by

CDFG; information gathered during surveys by Dudek for SFVS populations on the Newhall Ranch project site during 2002, 2003, 2004 and 2005; information contained in the report prepared by Glenn Lukos Associates, Inc. and Sapphos Environmental, Inc. (2000); the status report prepared for the Fish and Game Commission (CDFG 2000); and conversations with Rick Reifner, the botanist who re-discovered SFVS at Ahmanson Ranch in 1999.

While surveying in the field and mapping SFVS, a four-meter (m) rule was used to separate polygons for mapping purposes. This distance is a heuristic mapping tool based on the topography, vegetation, detectability of the plants, the general accuracy of the GPS, and time constraints. This heuristic criterion is not specifically tied to SFVS biology (*i.e.*, reproductive biology, seed dispersal) and thus is not intended to reflect reproductively isolated sub-populations, the total extent of the SVFS seed bank, or any other feature of the species life history.

The outer perimeter of each spineflower polygon was searched in one continuous direction until returning to the starting point, with plants being located within at least every one to four m along the boundary, and points were stored with a Trimble GPS (that has sub-meter accuracy) manually to form the boundaries of the polygon. GPS points were taken every one to four m. Each SFVS polygon was given a unique identifier (*i.e.*, numbers and/or letters) in the field. Data was either directly entered into the GPS or on field data sheets for each of the spineflower polygons that include data on site conditions (*i.e.*, plant number estimates, associated species). A field checklist also was compiled of polygon numbers and method of data entry (i.e. GPS unit or field form) for each polygon surveyed each day. Polygons were analyzed in the lab and delineated based on a four m minimum convex polygon rule (all polygons within four m of each other will be joined using GIS software [*e.g.*, ArcGIS, AutoCAD], then delineated as one polygon with the outer boundary represented by a minimum convex polygon).

A modified magnitude scale was used to arrive at an estimate of the number of spineflower individuals (or other sensitive species when observed) within each polygon. After mapping the boundaries of the polygon, the number of individuals were counted/estimated in a rectangular "sample estimation area" (to account for the "clumped" nature of this species), which is a subset of the total polygon. The sample estimation area was between 200 centimeter squared (cm^2) (10 by 20 cm) and two m^2 (one m by two m) depending on various factors regarding the polygon (*e.g.*, size of the polygon, plant densities, variations in plant densities within the polygon). The number of subsets within the total polygon was determined and added/multiplied, resulting in a total estimate of the number of individuals of the polygon (*e.g.*, 4x125=500, 8x12=96,

9x100=900). This number was then rounded to the nearest magnitude or multiple of a magnitude (*e.g.*, 100; 500; 1,000).

Polygons for other sensitive species were mapped by drawing polygons on maps with aerial photography and topographic lines. Professional judgment and experience were used to delineate these polygons based on the detectability of the species, topography, and vegetation. Perennial sensitive plants were mapped at a 10 to 20 m scale due to their population dynamics (including seed dispersal and pollination range), observability, habit, habitat limitations, and mapping accuracy. Information regarding the mapping for each sensitive species is included in the sections below (*Sections 4.2.1* through *4.2.7*).

3.2.1 Sensitive Plant Species

Sensitive plant species are those species that have been given special recognition by federal, state, or local conservation agencies and organizations due to limited, declining, or threatened population sizes. This includes those species listed by the state and federal government as threatened or endangered, those species proposed for state and/or federal listing or candidates, those plant species found on Lists 1A, 1B or 2 of the *CNPS Inventory of Rare and Endangered Plants of California* (CNPS 2001; *Inventory*) or CNPS online inventory (http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi), and those plant species which are found on the list of "Threatened and Endangered Species and Species of Concern, Los Angeles County" (http://www.losangelesalmanac.com/topics/Environment/ ev14b.htm). CNPS List 3 or List 4 species were included in discussions only when encountered during the field surveys.

3.2.2 Survey Limitations

Surveys were conducted in the late spring and summer of 2006. The timing of the surveys was coincident with the blooming period for SFVS and other early blooming annual species. Surveys continued passed the peak bloom period for the SFVS into the summer when SFVS became a highly visible brick red while all of the other plants dried and faded to pale straw colors. Surveying during these two time periods maximized the potential for detection of SFVS during the survey effort.

Surveys for SFVS were concentrated in areas of suitable habitat, which was generally in openings in vegetation and/or on south-facing slopes. Other sensitive species were recorded when observed.

The focused surveys for SFVS were conducted during daylight hours under weather conditions that did not preclude observation of sensitive plant species (*e.g.*, surveys were not conducted during heavy fog or rain).

4.0 RESULTS OF SURVEYS

4.1 Botany – Floral Diversity

The study area is situated at the nexus of the Transverse Ranges, Coast Ranges, Sierra Nevada, Mojave Desert, and coastal plains (Hickman 1993). Ecotone areas such as this are often characterized by higher biological diversity than similar-sized areas within the core of a physiographic region (Boyd 1999). As such, a high diversity of plant species is expected during a year of average rainfall for the area.

At least 562 plant species were identified within the Newhall Ranch study area. Of these, 406 species (72 percent) are native to the region and 156 species (28 percent) are non-native. The cumulative list of plant species identified on the site in 2002, 2003, 2004, 2005, and 2006 is provided as *Appendix B.*

4.2 Sensitive Plant Species

A total of eight sensitive plant species were identified within the study area between 2002 and 2006. These and other sensitive species that have the potential to occur within the Newhall Ranch project area, based on the presence of suitable habitat and soils, are listed in *Table 2.* This list is confined primarily to those species listed by the state and federal government as threatened or endangered, those species proposed for state and/or federal listing or candidates, those plant species found on Lists 1A, 1B, or 2 of the CNPS *Inventory of Rare and Endangered Plants of California* (CNPS 2001). The plant survey in 2006 focused primarily on SFVS, and a complete survey of the site was not conducted in 2006, therefore presence/absence data from 2006 is less reliable as presence/absence data from 2006. Those sensitive species that were observed during the 2006 field surveys are discussed in greater detail below. A number of species found on CNPS Lists 3 or 4 also have the potential to occur onsite (*e.g.*, *Calochortus catalinae*, *Acanthomintha obovata* ssp. *cordata*, *Mucronea californica*); however, due to their relatively low sensitivity level, they are only discussed in the following sections if observed onsite.

TABLE 2
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/ Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Arenaria paludicola	marsh sandwort	FE/SE	1B	dense freshwater marsh/perennial herb/May-August	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence is in the Santa Ana River. Limited suitable habitat onsite; very low likelihood of occurrence within the study area.
Astragalus brauntonii	Braunton's milk-vetch	FE/None	1B	chaparral, coastal sage scrub, grasslands; often on carbonate substrates/perennial herb/March-July	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence is in the Simi Hills. Suitable habitat exists onsite. Moderate likelihood of occurrence within study area.
Atriplex coulteri	Coulter's saltbush	None/None	1B	coastal sage scrub and grasslands on alkaline or clay substrate/perennial herb/March-October	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; however, suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Atriplex serenana var. *davidsonii*	Davidson's saltscale	None/None	1B	coastal bluff scrub and coastal sage scrub on alkaline substrate/annual herb/May-October	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads. *Atriplex serenana var. serenana* observed onsite. Low likelihood of occurrence within the study area.
Baccharis malibuensis	Malibu baccharis	None/None	1B	chaparral, coastal sage scrub, cismontane woodland/ deciduous shrub/August	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; closest known populations in the western Santa Monica Mountains near Malibu. Not expected to occur within the study area.
Berberis nevinii	Nevin's barberry	FE/SE	1B	chaparral, coastal sage scrub, riparian scrub, cismontane woodland on sandy or gravelly substrate/evergreen shrub/March-April	Not observed during 2006 field season. CNDDB records exist for San Francisquito Canyon at confluence with Santa Clara River; suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Brodiaea filifolia	thread-leaved Brodiaea	FT/SE	1B	clay substrate openings in chaparral, sage scrub, and grasslands/perennial herb (geophyte)/March-June	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence is in San Dimas. Suitable habitat present onsite. Low likelihood of occurrence within study area.
Calochortus clavatus var. *clavatus*	club-haired mariposa lily	None/None	4	chaparral and coastal sage scrub/ perennial herb (geophyte)/March-May	Not observed during 2006 field season. No CNDDB records exist for Newhall and Val Verde quads. Very low likelihood of occurrence in study area.
Calochortus clavatus var. *gracilis*	slender mariposa lily	None/None	1B	chaparral and coastal sage scrub/perennial herb (geophyte)/March-May	Observed during the 2006 field season on north tending slopes throughout the study area. This species was not

TABLE 2
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/ Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
					mapped throughout the entire study area in 2006. This species is locally abundant and 2 polygons were mapped in 2006 containing an estimated 322 individuals total. CNDDB records also exist for mouth of Pico Canyon.
Calochortus plummerae	Plummer's mariposa lily	None/None	1B	chaparral, coastal sage scrub, cismontane woodland, grasslands on rocky granitic substrate/perennial herb (geophyte)/May-July	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; however, records exist for the Santa Susana Mountains and Simi Hills. Suitable habitat exists onsite. Moderate likelihood of occurrence within study area.
Calochortus weedii var. *vestus*	late-flowered mariposa lily	None/None	1B	chaparral, cismontane & riparian woodland/perennial herb (geophyte)/ June-August	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; however, habitat similar to where species occurs in eastern Ventura County is present onsite. This species was observed at the head of the Salt Creek drainage in the Santa Susana Mountains to the southwest during the 2003 field season. Moderate likelihood of occurrence within study area.
Calystegia peirsonii	Peirson's morning-glory	None/None	4	chaparral, coastal sage scrub, cismontane woodland, grassland/ perennial herb/May-June	Observed in chaparral and California sagebrush throughout the survey area.
Calystegia sepium ssp. *binghamiae*	Santa Barbara morning-glory	None/None	1A	marshes and swamps/perennial herb/ April-May	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; however, limited suitable habitat present onsite. Low likelihood of occurrence within study area.
Centromadia [=*Hemizonia*] *parryi* ssp. *australis*	southern tarplant	None/None	1B	mesic edges of marshes in grasslands/ annual herb/May-November	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; however, suitable habitat present onsite. Low likelihood of occurrence within study area.
Cercocarpus betuloides var. *blancheae*	island mountain-mahogany	None/None	4	chaparral, closed-cone coniferous forest/evergreen shrub/February-May	Observed in mixed chaparral in the study area during the 2006 field season.

TABLE 2
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/ Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Chorizanthe parryi var. *fernandina*	San Fernando Valley spineflower	FC/SE	1B	Coastal sage scrub, sandy soils/annual herb/April-June	Observed onsite in five general areas within the survey area: Airport Mesa, Grapevine Mesa, Long Canyon, Potrero Canyon, and San Martinez Grande Canyon. A total of 313 polygons were mapped with an estimated 1,339,125 individuals during the 2006 growing season.
Deinandra [=*Hemizonia*] *minthornii*	Santa Susana tarplant	None/SR	1B	chaparral and coastal sage scrub on rocky substrate/deciduous shrub/July-November	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; however, records exist for the Simi Hills and Oat Mountain. Suitable habitat exists onsite. Moderate likelihood of occurrence within study area.
Delphinium parryi ssp. *blochmaniae*	dune larkspur	None/None	1B	maritime chaparral, coastal dunes/ perennial herb/ April-may	Not observed during 2006 field season. No likelihood of occurrence.
Dodecahema leptoceras	slender-horned spineflower	FE/SE	1B	Alluvial scrub on sandy substrate/annual herb/April-June	Not observed during 2006 field season; however, Santa Clara River bottom excluded from survey area. Historic CNDDB records exist for the Newhall or Val Verde quads in alluvial habitat similar to those present onsite. Moderate likelihood of occurrence within study area.
Dudleya blochmaniae var. *blochmaniae*	Blochman's dudleya	None/None	1B	clay openings in chaparral and coastal sage scrub, grasslands/perennial herb/April-June	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat present onsite. Low likelihood of occurrence within study area.
Dudleya cymosa ssp. *marcescens*	marcescent dudleya	FT/CR	1B	chaparral, often on volcanic substrate/perennial herb (geophyte)/ April-June	Not observed during 2006 field season. No CNDDB records exist for Newhall and Val Verde quads. Unidentified *Dudleya cymosa* observed on vertical sandstone cliffs and slopewash in 2002 are actually *D. lanceolata*, a common species. Low likelihood of occurrence within study area.
Dudleya cymosa ssp. *Ovatifolia*	Santa Monica Mountains dudleya	FT/None	1B	chaparral and coastal sage scrub, often on volcanic substrate/perennial herb (geophyte)/April-June	Not observed during 2006 field season. No CNDDB records exist for Newhall and Val Verde quads. Unidentified *Dudleya cymosa* observed on vertical sandstone cliffs and slopewash in 2002 are actually *D. lanceolata*, a common species. Low likelihood of occurrence within study area.

TABLE 2
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/ Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Dudleya multicaulis	many-stemmed dudleya	None/None	1B	coastal bluff scrub, coastal sage scrub, valley and foothill grassland, rocky, often clay substrate/perennial herb/ April-June	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; closest known occurrences are in Calabasas and San Dimas. Suitable habitat ex ists onsite. Moderate likelihood of occurrence within study area.
Dudleya parva	Conejo dudleya	FT/None	1B	coastal sage scrub and grassland on rocky, gravelly clays/perennial herb/May-June	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat exists onsite. Low likelihood of occurrence within study area.
Erodium macrophyllum	round-leaved filaree	None/None	2	cismontane woodland and grasslands on clay substrate/annual herb/March-May	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; however records exist for Simi Valley, and this plant was observed in the hills east of Castaic Lake in 2003. Suitable habitat present onsite; moderate likelihood of occurrence in study area.
Helianthus nuttallii ssp. *parishii*	Los Angeles sunflower	None/None	1A	marshes and swamps/perennial herb/ August-October	Not observed within study area during 2006 field season. A *Helianthus* population, discovered in 2002 at Castaic Spring, on the south side of the Santa Clara River between Middle Canyon and San Jose Flats, was determined by some experts to be this species, but determined by other experts not to be this species. Based on pollen electron microscopy and chromosome counts, it is likely that the Newhall *Helianthus* species is a hybrid between *H. nuttallii* and *H. californicus* or an intermediate evolutionary step between the two species (Porter and Fraga 2004). No suitable habitat observed in study area.
Horkelia cuneata var. *puberula*	mesa horkelia	None/None	1B	chaparral, cismontane woodland, coastal sage scrub on sandy or gravelly substrate/ perennial herb/February-December	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat present onsite. Low likelihood of occurrence within study area.
Juglans californica	southern California black walnut	None/None	4	chaparral, cismontane woodland, coastal sage scrub, alluvial scrub/ deciduous tree/March-May	Not observed onsite during 2006 field season. Observed in past years's surveys in California sagebrush and chaparral onsite. High likelihood of occurrence in study area.
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	None/None	4	coastal dunes, meadows, seeps, marshes, and swamps/ perennial herb/May-June	Observed in mesic riparian areas onsite.

TABLE 2
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/ Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Malacothamnus davidsonii	Davidson's bush mallow	None/None	1B	chaparral, coastal sage scrub, riparian woodland/ deciduous scrub/June-January	Not observed during 2006 field season. Nearest occurrences are in San Fernando and Sunland. Suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Nama stenocarpum	mud nama	None/None	2	edges of lakes, rivers, ponds, vernal pools/annual/January-July	Not observed during 2006 field season. Moderate likelihood of occurrence on banks of Santa Clara River and other mesic areas onsite. No CNDDB records exist for the Newhall or Val Verde quads. Limited suitable habitat present onsite. Low likelihood of occurrence within study area.
Nemophila parviflora var. *quercifolia*	oak-leaved nemophila	None/None	4	cismontane woodland, lower montane coniferous forest/annual herb/may-June	Not observed onsite during 2006 field season. Observed in past years's surveys in oak woodland east of Grapevine Mesa. High likelihood of occurrence in study area.
Nolina cismontana	chaparral nolina	None/None	1B	chaparral, coastal sage scrub on sandstone or gabbro substrate/ perennial shrub May-July	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads. Suitable habitat present onsite. Low likelihood of occurrence within study area.
Opuntia basilaris var. *brachyclada*	short-joint beavertail	None/None	1B	chaparral, Joshua tree woodland, Mojavean desert scrub/succulent shrub/ April-June	Not observed during 2006 field season. This plant was identified as onsite by Dudek in 2002; however, recent investigations indicate that the *Opuntia basilaris* plants on Newhall Ranch are not *O. basilaris* var. *brachyclada*, but are *O. basilaris* var. *ramosa*.
Pentachaeta lyonii	Lyon's pentachaeta	FE/SE	1B	openings in chaparral and coastal sage scrub, grasslands/annual herb/March-August	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrences are in the Simi Valley. Suitable habitat present onsite. Moderate likelihood of occurrence within study area.
Rorippa gambelii	Gambel's watercress	FE/ST	1B	Marsh and swamps (freshwater and brackish)/ perennial herb/April-June	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads. Limited suitable habitat present onsite. Low likelihood of occurrence within study area.
Senecio aphanactis	rayless ragwort	None/None	2	chaparral, coastal sage scrub, cismontane woodland on alkaline substrate/annual herb/January-April	Not observed during 2006 field season. Historic CNDDB record for Saugus, south of Santa Clara River. Suitable habitat onsite. Moderate likelihood of occurrence within study area.
Sidalcea neomexicana	salt spring checkerbloom	None/None	2	chaparral, coastal sage scrub, and playas on alkaline substrate/perennial herb/March-June	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; suitable habitat present onsite. Moderate likelihood of occurrence within study area.

TABLE 2
Sensitive Plant Species Observed or Potentially Occurring at Newhall Ranch

Scientific Name	Common Name	Status Federal/State	CNPS List	Primary Habitat Associations/ Life Form/Blooming Period	Presence or Likelihood of Occurrence Onsite
Thelypteris puberula var. *sonorensis*	Sonoran maiden fern	None/None	2	meadows and seeps/perennial herb/ fertile January-September	Not observed during 2006 field season. No CNDDB records exist for the Newhall or Val Verde quads; nearest occurrence at Point Dume. Limited suitable habitat present onsite. Low likelihood of occurrence within study area.

Legend

FE:	Federally-listed as endangered	CNPS List 1A:	Plants presumed extinct in California
FT:	Federally-listed as threatened	CNPS List 1B:	Plants rare, threatened, or endangered in California and elsewhere
FC:	Federal candidate for listing	CNPS List 2:	Plants rare, threatened, or endangered in California but more common elsewhere
SC:	State candidate for listing	CNPS List 3:	Plants about which we need more information – a review list
SE:	State-listed as endangered	CNPS List 4:	Plants of limited distribution – a watch list
ST:	State-listed as threatened		
SR:	State-listed as rare		

Figures 3 through *11* depict the locations of sensitive species, including SFVS, on the NRSP study area. Labels for each of the polygons in the figures correlate with those in *Tables 3* through *7*, which contain estimates for the numbers of individuals within each polygon. Any additional information regarding the mapping for each sensitive species is included in the sections below (*Sections 4.2.1* through *4.2.7*).

4.2.1 Slender Mariposa Lily (*Calochortus clavatus* var. *gracilis*)

Slender mariposa lily has no state or federal status but is a CNPS List 1B.2 plant. It is typically found in chaparral, coastal sage scrub, and grasslands, often on clay, and/or rocky soils. It has been documented to occur at the mouth of Pico Canyon and other canyons in the vicinity (Newhall Quad; CNDDB 2002). Other varieties of this species documented from southern California include: club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*) and pale mariposa lily (*C. clavatus* var. *pallidus*). The club-haired mariposa lily differs in that it is virtually a serpentine endemic (restricted to serpentine soils) and a very robust species, generally attaining a height of one m. Pale mariposa lily differs in that the petals are a paler yellow, the anthers are paler (yellow to pale purple), and the hairs on the petals are not as knobby or club shaped. Neither the club-haired mariposa lily nor pale mariposa have a prominent red line above the nectary on the petal, as is the case with the slender mariposa lily.

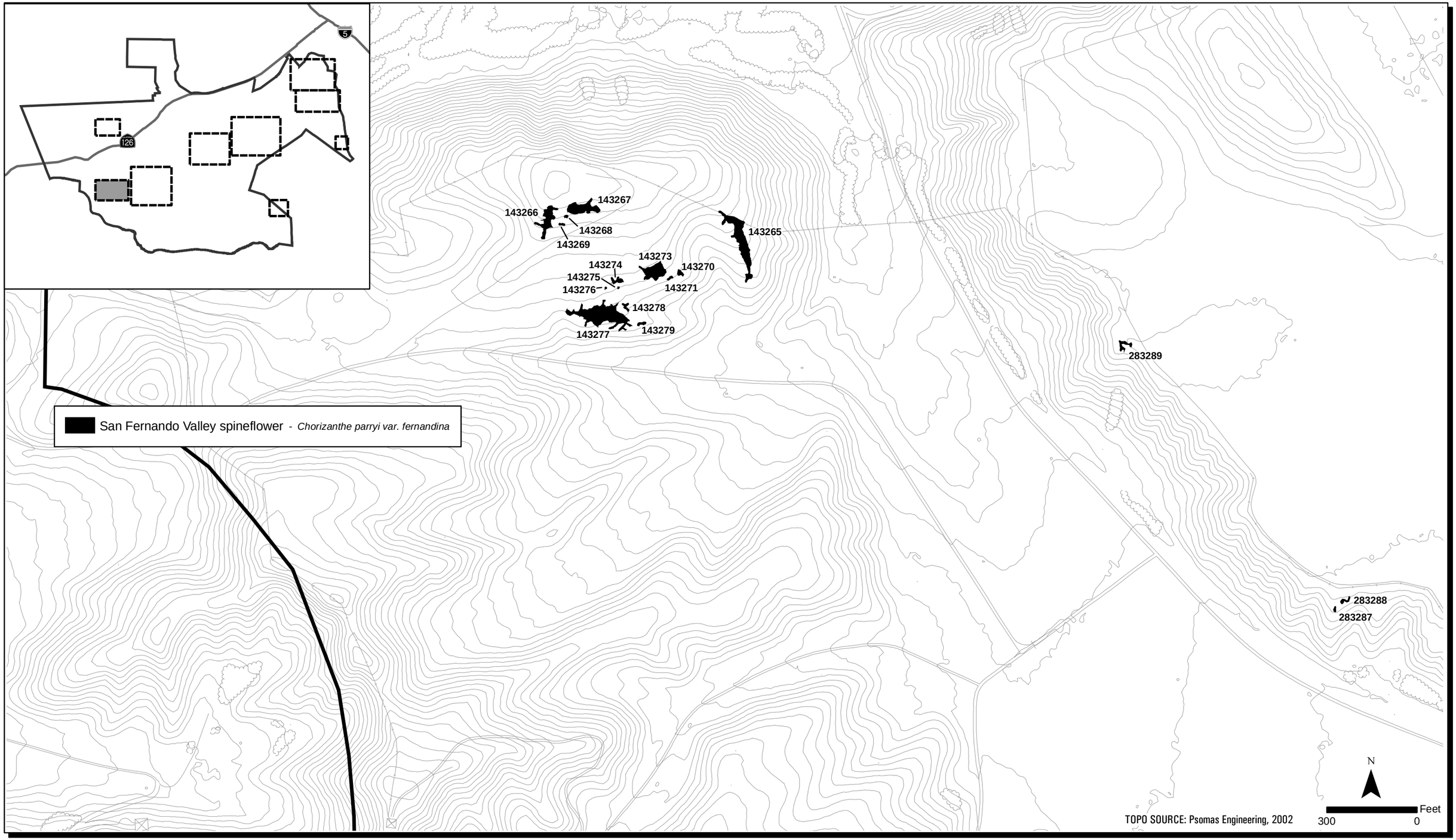
Two polygons of mariposa lily were mapped within the study area by drawing boundaries on aerial photograph field maps around the areas that contained the mariposa lily. Surveys within the study area were conducted during and after the blooming season for the slender mariposa lily; therefore, some estimates were made based on the number of fruiting individuals observed. The fruiting individuals were much more cryptic than the flowering plants; therefore, it is expected that only a portion of the plants that were in flower earlier were observed. It is not possible to estimate what portion was observed. Moreover, geophytes like *Calochortus* generally only have a percentage of the plants flower in any given year, and the non-flowering individuals are generally not as visible.

Within the NRSP study area, the slender mariposa lily was found primarily on east and northeast, ridges and slopes in California sagebrush, California buckwheat and California annual grassland series (*Figures 3* through *11*). The plants were generally mapped in areas of high vegetative cover and a variety of soil types (*e.g.*, gravelly loam, sandy loam, rocky clay). A total of 2 polygons were mapped during the 2006 field season with the number of individuals within each polygon ranging from 2 to 320, and a total of approximately 322 individuals. CNDDB forms for each occurrence on this site are included in *Appendix C*.

Newhall Ranch

2006 Sensitive Plant Survey Results

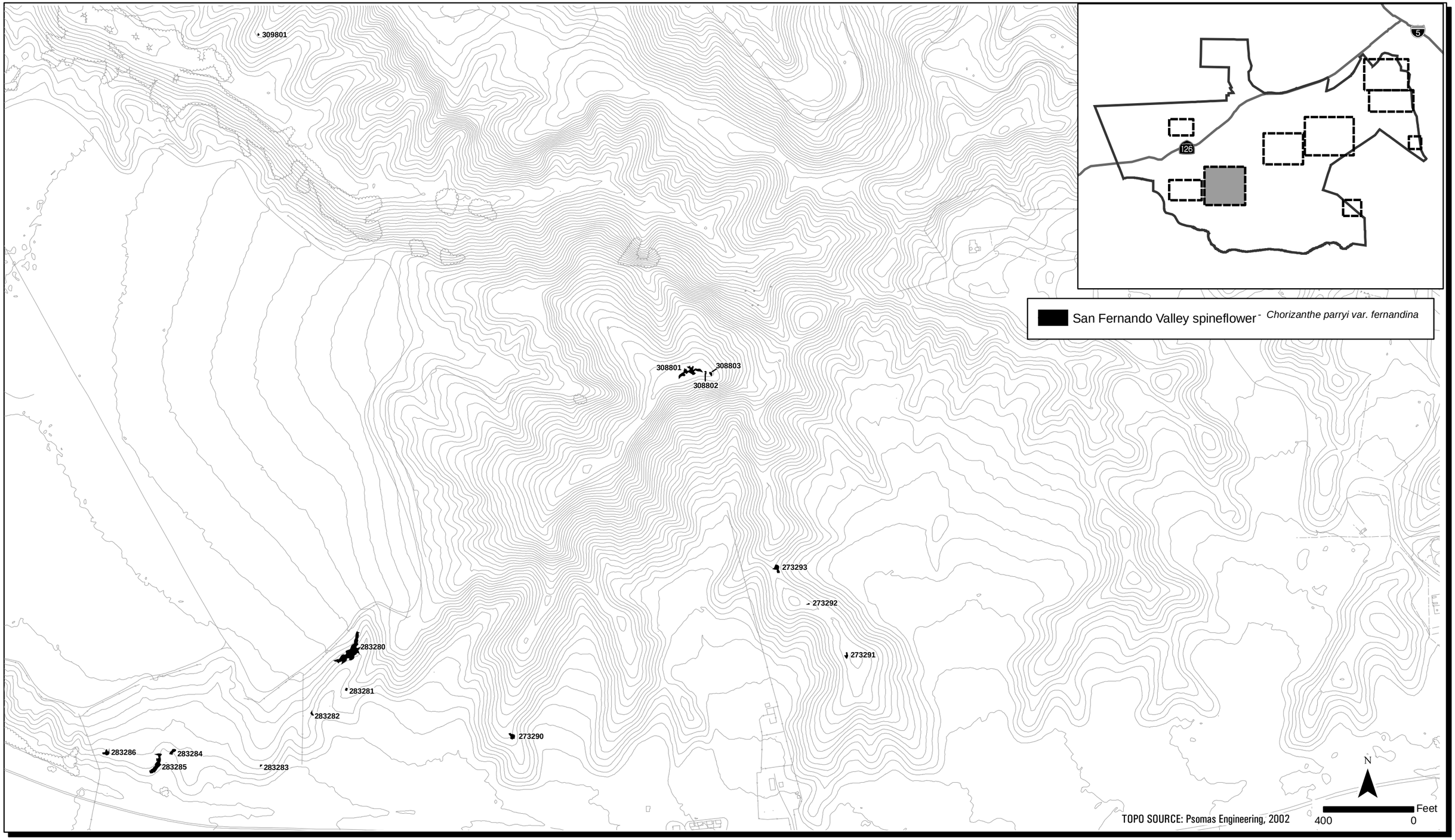
FIGURE 3



Newhall Ranch

2006 Sensitive Plant Survey Results

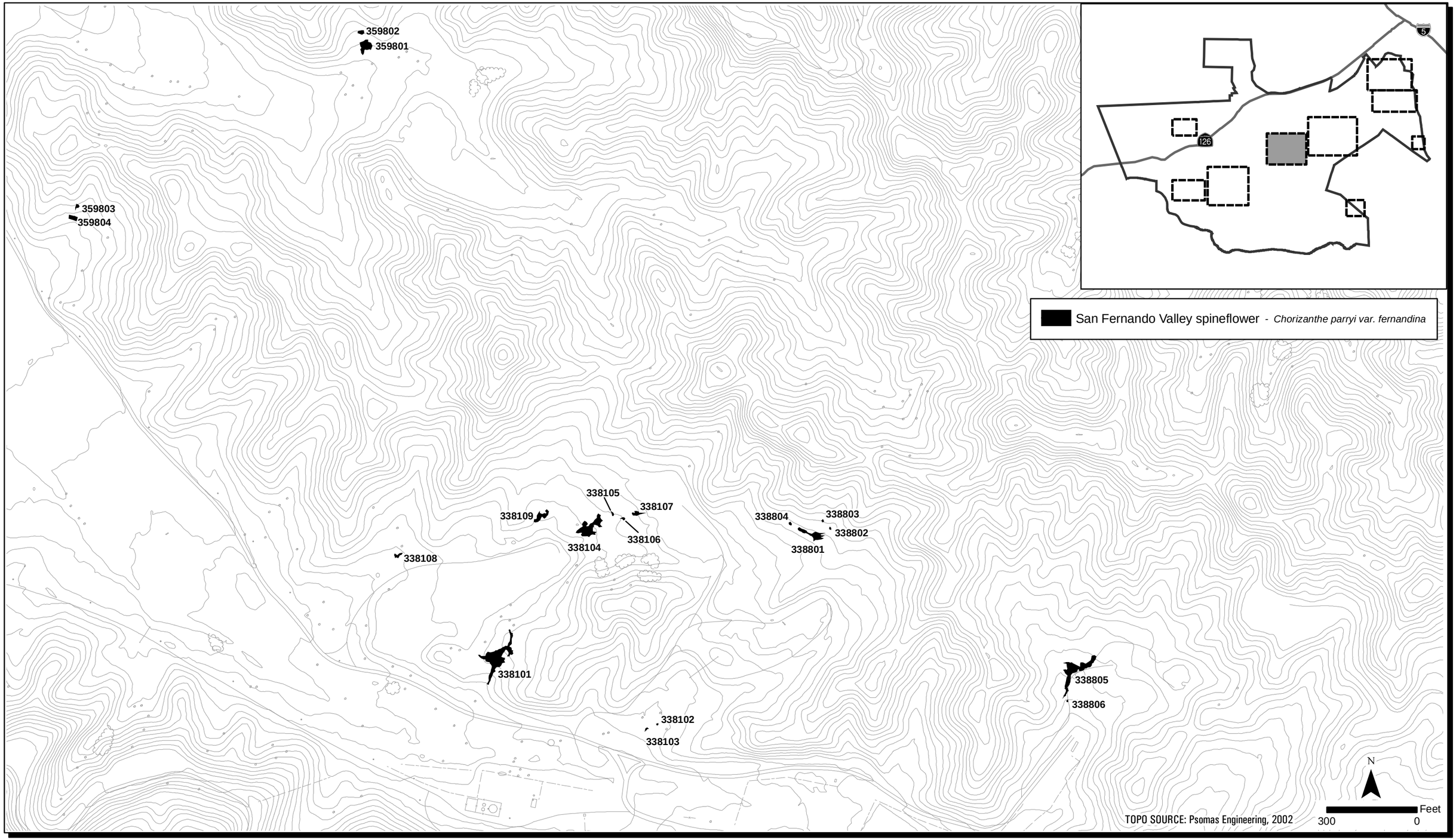
FIGURE 4



Newhall Ranch

2006 Sensitive Plant Survey Results

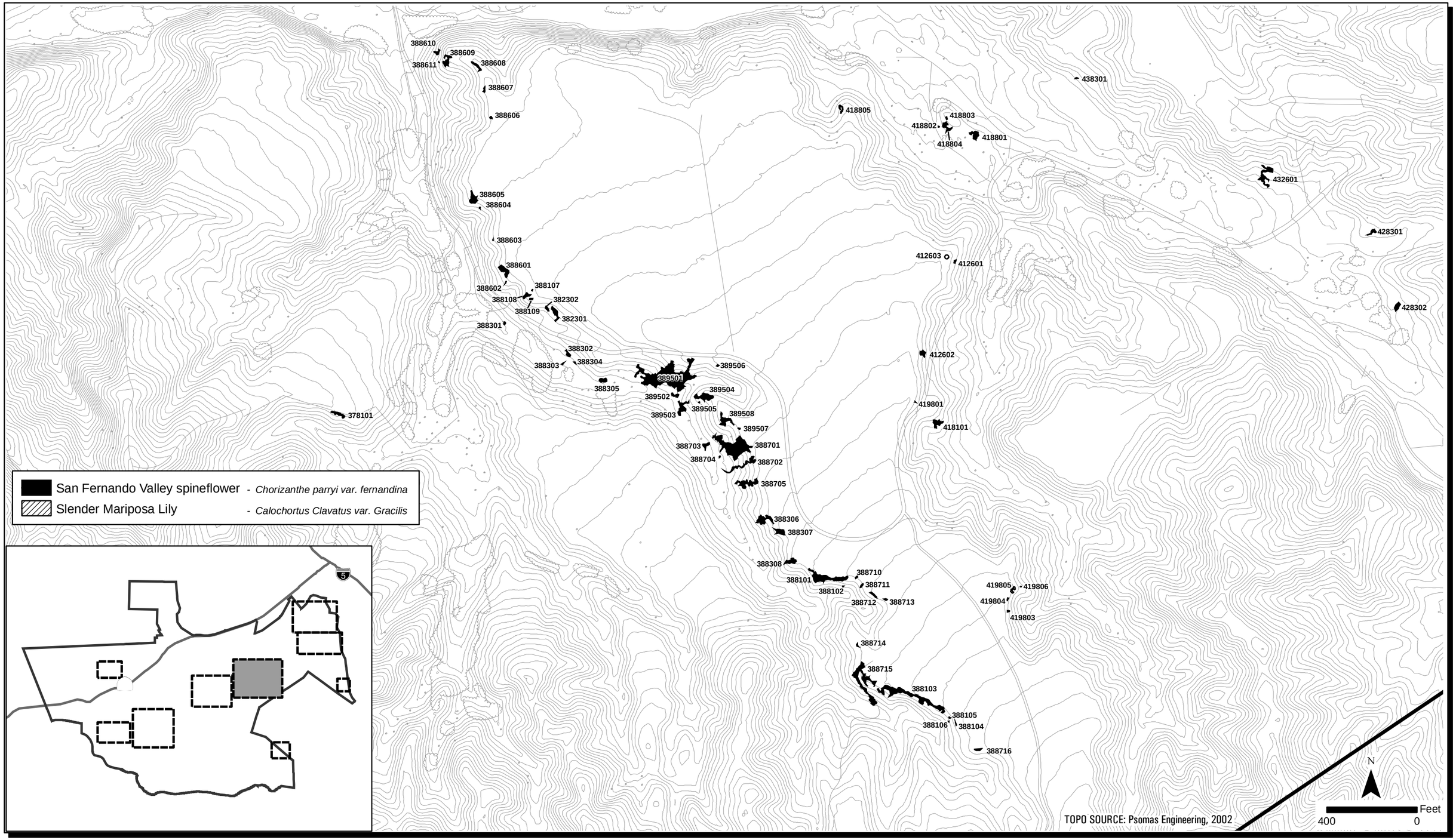
FIGURE 5



Newhall Ranch

2006 Sensitive Plant Survey Results

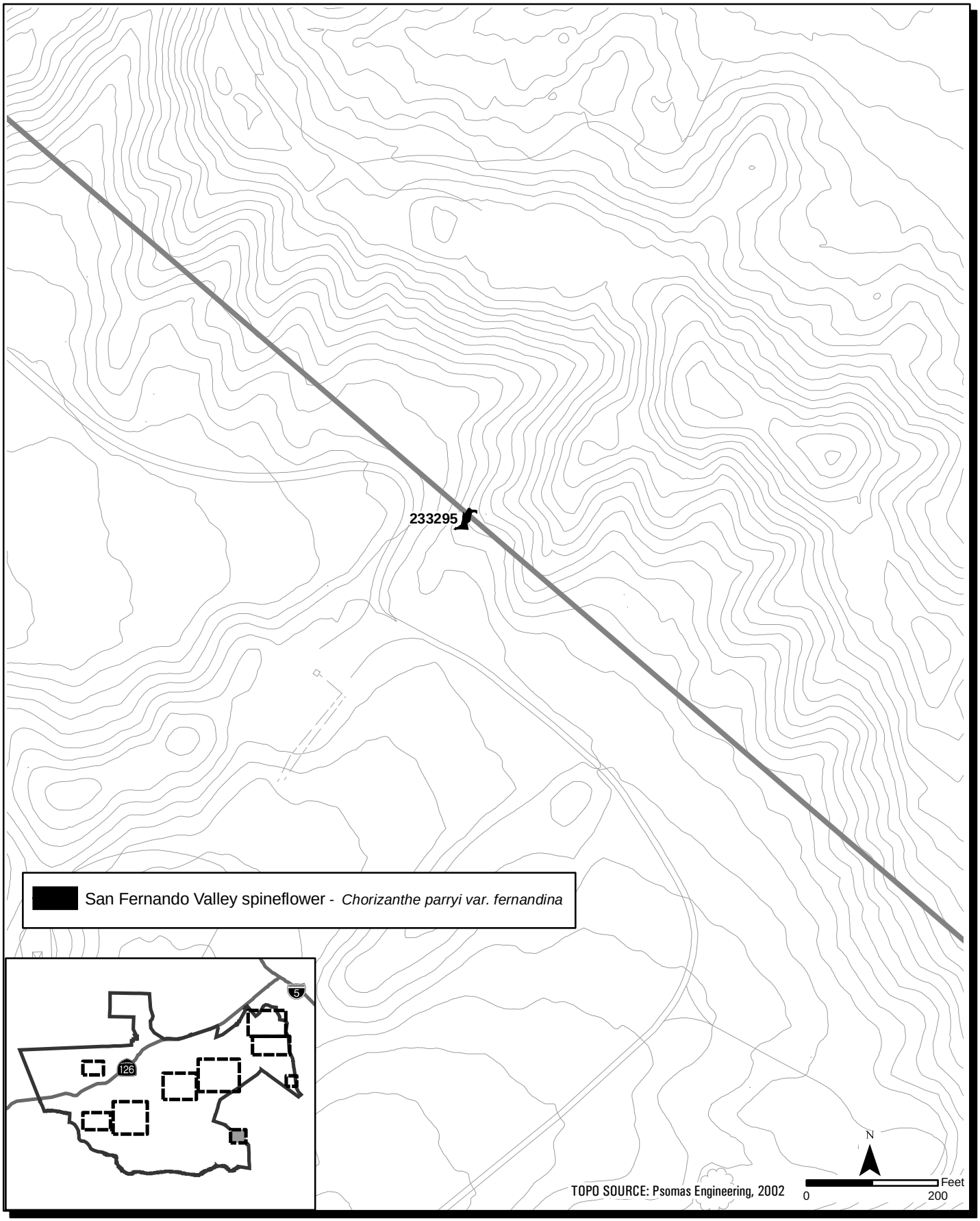
FIGURE 6



Newhall Ranch

2006 Sensitive Plant Survey Results

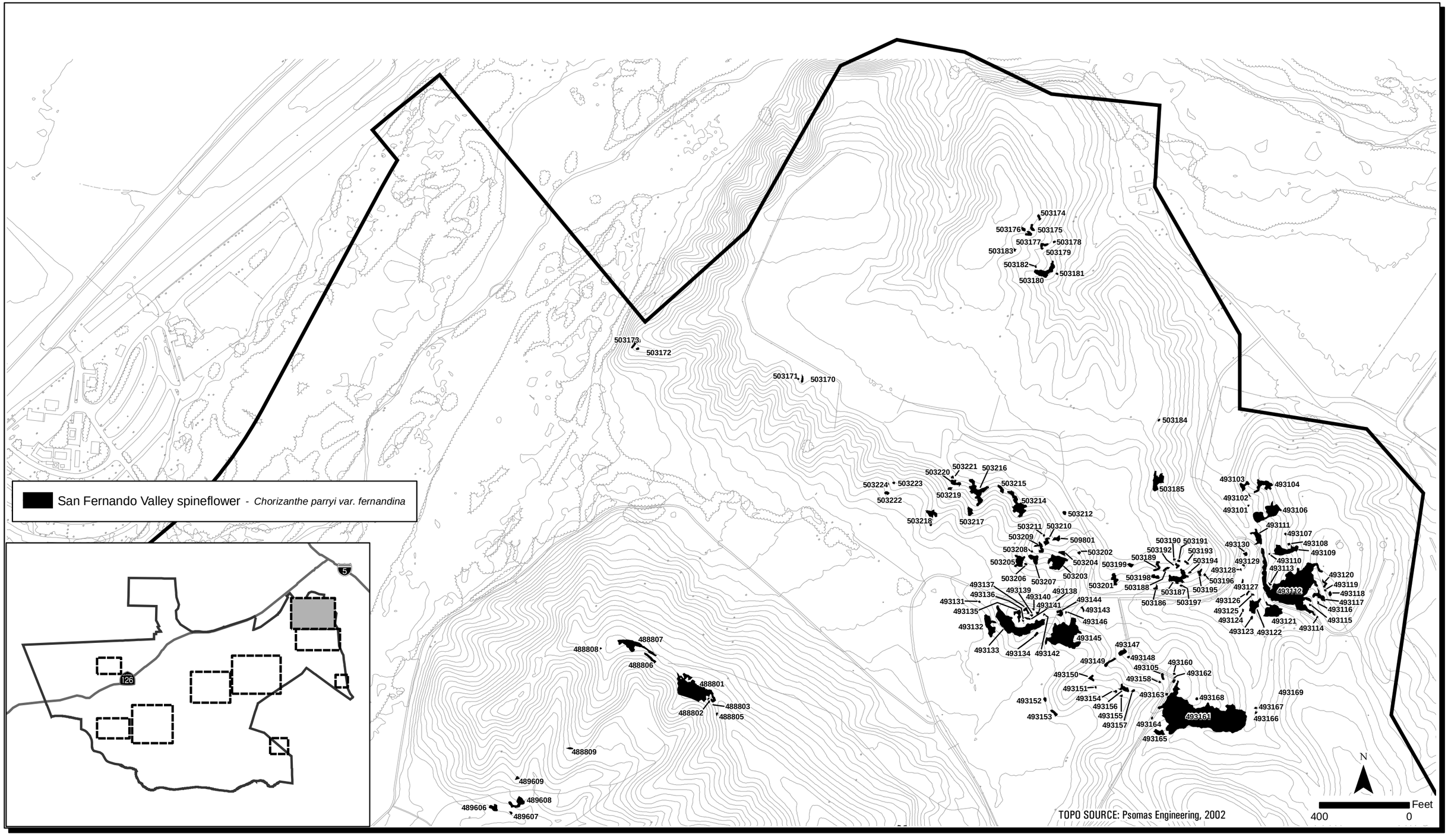
FIGURE 7



Newhall Ranch

2006 Sensitive Plant Survey Results

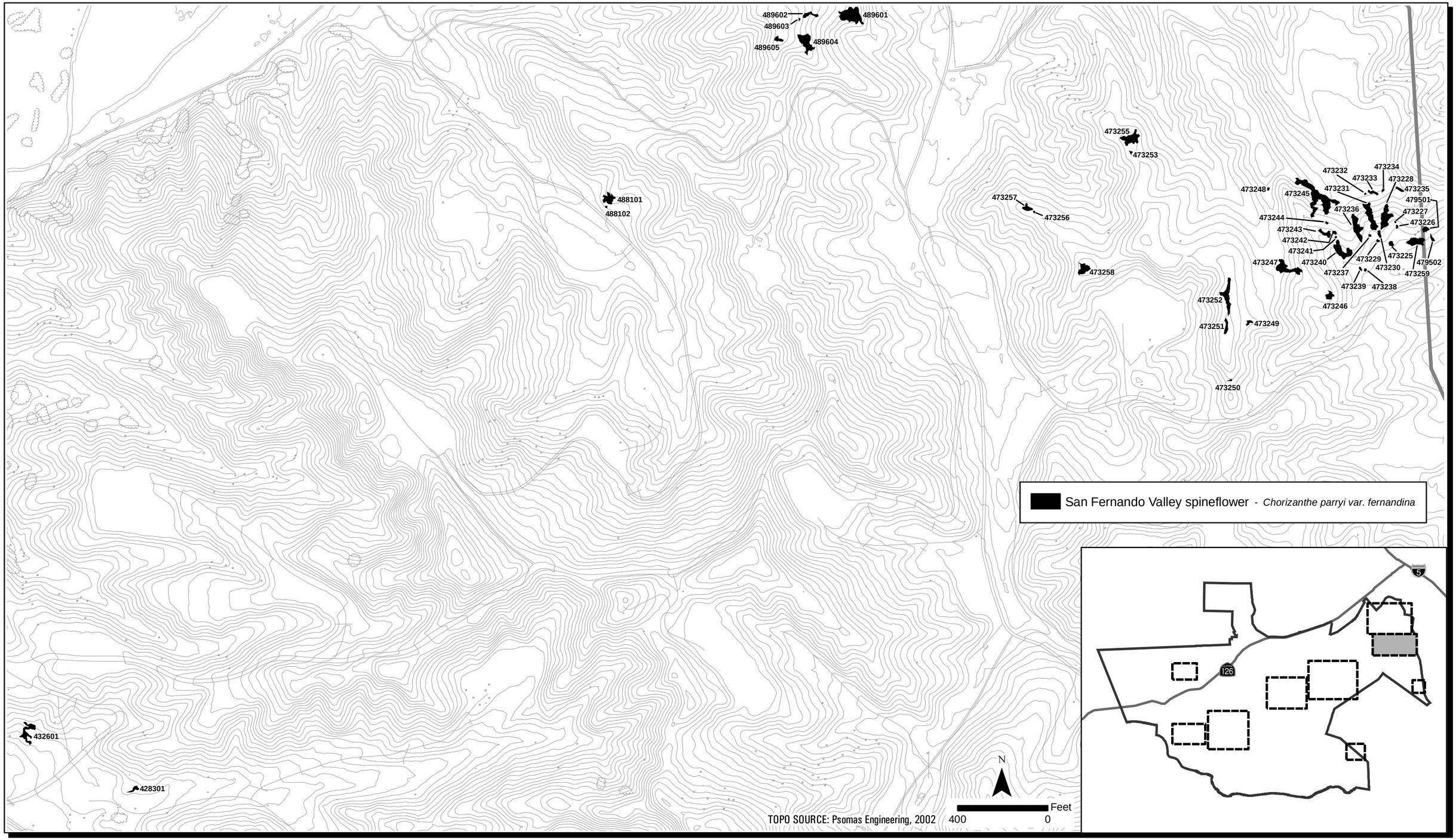
FIGURE 8



Newhall Ranch

2006 Sensitive Plant Survey Results

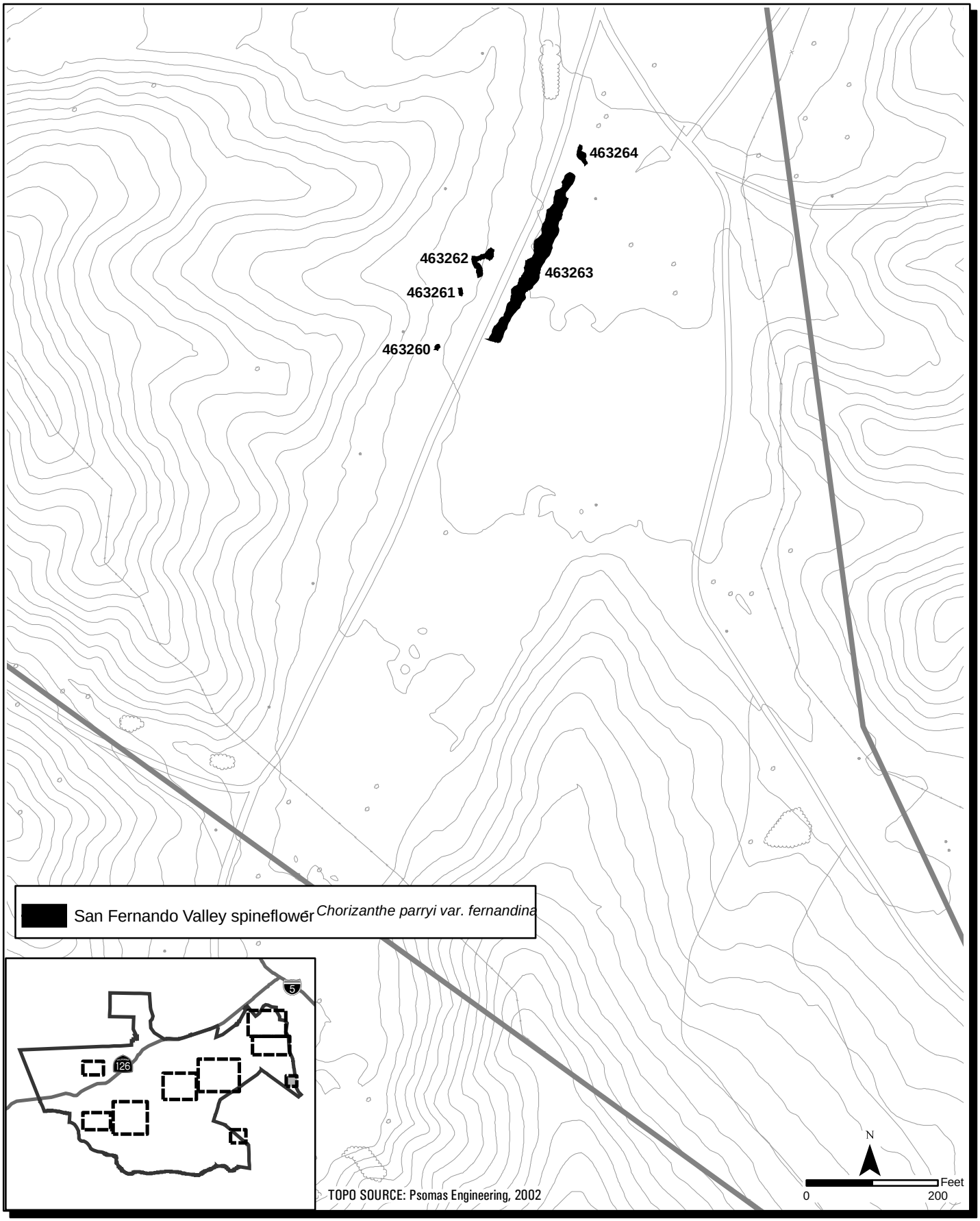
FIGURE 9



Newhall Ranch

2006 Sensitive Plant Survey Results

FIGURE 10



Newhall Ranch

2006 Sensitive Plant Survey Results

FIGURE 11

TABLE 3
San Fernando Valley Spineflower
Summary of Occurrence Data for the Airport Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
463260	32	12
463261	32	10
463262	424	400
463263	5106	15000
463264	192	10
473225	209	100
473226	34	20
473227	8	1
473228	2351	5000
473229	43	25
473230	153	100
473231	2272	4000
473232	10	1
473233	221	15
473234	31	12
473235	158	15
473236	2025	8000
473237	37	12
473238	34	20
473239	41	10
473240	2179	15000
473241	16	4
473242	97	25
473243	450	750
473244	27	4
473245	6043	35000
473246	537	3500
473247	2203	5000
473248	30	20
473249	158	200
473250	7	1
473251	374	300
473252	1876	10000
473253	20	10
473255	2066	10000

TABLE 3
San Fernando Valley Spineflower
Summary of Occurrence Data for the Airport Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
473256	14	2
473257	463	500
473258	1212	2000
473259	1558	2500
479501	284	1
479502	125	13
488101	1153	1
488102	15	11
488801	9323	5
488802	5	3
488803	3	1
488805	12	7
488806	359	1
488807	2473	3
488808	4	5
488809	51	4
489601	4186	11000
489602	420	380
489603	11	3
489604	2488	13000
489605	298	310
489606	493	600
489607	31	120
489608	1045	15
489609	69	92
493101	7	3
493102	5	1
493103	513	250
493104	1472	1000
493105	133	40
493106	3835	10000
493107	12	15
493108	32	25
493109	2313	20000
493110	4	5
493111	1061	1000

TABLE 3
San Fernando Valley Spineflower
Summary of Occurrence Data for the Airport Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
493112	25272	400000
493113	13	1
493114	6	4
493115	6	15
493116	10	3
493117	672	2000
493118	121	400
493119	9	3
493120	107	50
493121	2799	4000
493122	1478	2500
493123	50	100
493124	11	4
493125	17	10
493126	41	12
493127	18	8
493128	8	6
493129	15	10
493130	105	25
493131	8	4
493132	2000	1000
493133	8430	13000
493134	87	100
493135	446	250
493136	3	3
493137	121	75
493138	47	15
493139	19	30
493140	10	20
493141	25	5
493142	6	3
493143	48	30
493144	328	200
493145	10533	13000
493146	4	3
493147	424	250

TABLE 3
San Fernando Valley Spineflower
Summary of Occurrence Data for the Airport Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
493148	28	30
493149	276	100
493150	174	100
493151	9	1
493152	82	15
493153	204	100
493154	19	2
493155	15	2
493156	434	300
493157	42	25
493158	15	50
493160	22	40
493161	38618	450000
493162	58	40
493163	27	100
493164	17	12
493165	558	1000
493166	11	4
493167	16	30
493168	35	30
503170	77	50
503171	8	25
503172	34	10
503173	350	500
503174	84	100
503175	175	500
503176	143	100
503177	215	100
503178	23	8
503179	211	50
503180	1717	2000
503181	12	2
503182	11	1
503183	63	200
503184	19	2
503185	1788	5000

TABLE 3
San Fernando Valley Spineflower
Summary of Occurrence Data for the Airport Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
503186	82	100
503187	1631	15000
503188	110	7
503189	281	75
503190	17	3
503191	26	3
503192	99	25
503193	55	4
503194	23	25
503195	143	50
503196	22	3
503197	20	3
503198	260	200
503199	171	400
503201	555	2500
503202	30	10
503203	2883	65000
503204	206	1000
503205	1183	7000
503206	23	9
503207	753	10000
503208	15	7
503209	385	1500
503210	311	25
503211	11	12
503212	105	150
503214	2418	8000
503215	197	300
503216	2336	30000
503217	432	1000
503218	865	500
503219	67	6
503220	360	200
503221	35	25
503222	121	200
503223	22	12

TABLE 3
San Fernando Valley Spineflower
Summary of Occurrence Data for the Airport Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
503224	9	1
509801	290	10
Total	180413	1,216,626

TABLE 4
San Fernando Valley Spineflower Summary of Occurrence Data for the Grapevine Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
233295	286	250
338101	3425	20000
338102	5	9
338103	15	11
338104	1997	31
338105	17	15
338106	29	65
338107	151	500
338108	87	10
338109	513	16
338801	712	2400
338802	9	15
338803	8	6
338804	28	35
338805	2405	1
338806	0	4
359801	903	1
359802	135	62
359803	54	12
359804	245	1
378101	469	1
382301	611	1
382302	141	20
388101	2752	1
388102	9	4
388103	4236	1
388104	14	5

TABLE 4
San Fernando Valley Spineflower Summary of Occurrence Data for the Grapevine Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
388105	18	7
388106	3	1
388107	12	3
388108	337	1
388109	61	7
388301	52	120
388302	235	870
388303	32	36
388304	21	19
388305	412	150
388306	1206	1
388307	611	1
388308	639	1
388601	917	87
388602	10	3
388603	4	2
388604	4	1
388605	906	1
388606	58	1
388607	93	1
388608	303	1
388609	660	1
388610	174	1
388611	3	11
388701	6814	1
388702	900	1
388703	311	1
388704	17	12
388705	1357	1
388710	49	35
388711	88	29
388712	172	20
388713	58	25
388714	50	13
388715	3404	1
388716	174	9

TABLE 4
San Fernando Valley Spineflower Summary of Occurrence Data for the Grapevine Mesa Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
389501	13401	1
389502	198	67
389503	1005	1
389504	1341	1
389505	8	1
389506	39	10
389507	24	32
389508	945	1
412601	65	28
412602	400	2100
418101	658	1200
418801	713	4
418802	525	6
418803	36	24
418804	11	11
418805	186	1
419801	7	6
419803	36	150
419804	34	3
419806	7	2
428301	253	81
428302	487	1800
432601	1335	3100
438301	22	14
Total	61153	33,596

TABLE 5
San Fernando Valley Spineflower Summary of Occurrence Data for the Potrero Canyon Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
143265	5169	30000
143266	2026	5000
143267	2505	15000
143268	50	8
143269	59	15
143270	181	250
143271	61	9
143273	2588	4000
143274	320	50
143275	9	1
143276	12	2
143277	7207	20000
143278	150	30
143279	136	30
273290	256	1000
273291	84	50
273292	2	1
273293	321	2000
283280	3378	6000
283281	30	15
283282	22	15
283283	3	10
283284	190	250
283285	1072	4000
283286	231	500
283287	60	10
283288	150	100
283289	343	250
308801	917	20
308802	1	1
308803	63	40
309801	8	2
Total	27603	88,659

TABLE 6
San Fernando Valley Spineflower Summary of Occurrence Data for the San Martinez Grande Canyon Vicinity

Polygon Name	Polygon Area (sq. ft.)	Estimated Number of Individuals
068601	9137	1
068602	25553	1
068603	4574	45
068604	309	40
068605	62	10
068801	53	7
068802	14	15
068803	105	27
068804	5	6
068805	104	27
068806	288	62
068807	3397	2
069801	672	807
Total	44274	1050

TABLE 7
San Fernando Valley SpineflowerSummary of Occurrence Data for the Newhall Ranch SPA

Polygon Name	Estimated Number of Individuals
Airport Mesa	1,216,626
Grapevine Mesa	33,596
Potrero Canyon	88,659
San Martinez Grande Canyon	1050
Totals for the Newhall Ranch SPA	1,339,931

4.2.2 San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)

San Fernando Valley spineflower is state-listed as endangered, a candidate for federal listing, and found on List 1B.1 of the *CNPS Inventory*. Until its rediscovery in 1999 at Laskey Mesa on Ahmanson Ranch in Ventura County, it was thought to be extinct. A review of information of historic occurrence of SFVS in the CNDDB indicate that it was previously thought to occur in sandy to gravelly soils of washes, riverbeds, and upland areas primarily on the margins of the

San Fernando Valley at the base of the Santa Susana Mountains, San Gabriel Mountains, and the Simi Hills. Munz (1974) provides distribution information to include Orange and San Diego counties. SFVS was not observed onsite during limited focused surveys for sensitive plant species conducted in 1992 (Dames and Moore 1993) or general botany surveys conducted in 1995 (RECON and Impact Sciences 1996).

SFVS polygons were identified in several general locations of the study area for the Newhall Ranch Specific Plan including areas around Airport Mesa (including Dead-End Canyon), Grapevine Mesa (including Lion Canyon and Long Canyon), Potrero Canyon, and San Martinez Canyon. The polygons for these occurrences are depicted in *Figures 3 through 11*. Labels for each of the polygons in these figures correlate with those in *Tables 3* through *7*, which contain estimates for the numbers of individuals within each polygon.

Most of the SFVS were found on slopes with a south-facing component in habitat that was open California sagebrush, California buckwheat, ecotonal California sagebrush/California buckwheat and California annual grassland series, or at the edge of agricultural fields on mesas. Most of the observed SFVS were found on soils mapped by the USDA (1969) as slightly eroded to eroded Castaic-Balcom silty clay loam (30-50 percent slopes) or Terrace Escarpments. Plants in the vicinities of Grapevine and Airport mesas were observed down slope of terrace surfaces capped by Zamora clay loam (2-9 percent slopes). Elevations at SFVS locations onsite range from approximately 1,000 to 1,300 feet AMSL.

Vegetative cover in the area of SFVS occurrences ranged from 20 to 100 percent, but was more commonly between 75 and 90 percent. The soil type for all mapped SFVS occurrences on the project site consisted of sandy loams.

A total of 313 SFVS polygons were mapped ranging in size from less than one to 38,618 square feet. The number of individuals within each polygon ranges from one (1) to approximately 45,000. At Airport Mesa there were an estimated 1,216,626 individuals in 181 polygons (*Table 3*). At Grapevine Mesa there were an estimated 33,596 individuals in 87 polygons (*Table 4*). At Potrero Canyon there were 88,659 individuals in 32 polygons (*Table 5*) and at San Martinez Grande Canyon there were 244 individuals in 13 different polygons (*Table 6*). The entire Newhall Ranch SPA contained an estimated 1,339,125 SFVS individuals for the 2006 field season (*Table 7*). CNDDB forms are included in *Appendix C* for each of the four occurrences onsite.

4.2.3 Peirson's Morning-glory (*Calystegia peirsonii*)

Peirson's morning-glory has no state or federal status, but is found on List 4.2 of the CNPS *Inventory*. This morning-glory is rhizomatous perennial that typically is found in more desert-like areas (*e.g.*, creosote bush, Joshua tree series) at elevations which exceed 3,000 feet AMSL, although there are records in the CNDDB for lower elevations in the local area. It was RECON's opinion (1996) that chaparral morning-glory (*Calystegia macrostegia* ssp. *cyclostegia*) was the more common species; however, after reviewing the floral bracts, leaf shape, and its glabrous nature, it is Dudek's opinion that the morning-glory observed in the study area is Peirson's morning-glory. This species was also recorded onsite during limited focused surveys for sensitive plant species conducted in 1992 (Dames and Moore 1993).

While never abundant, Peirson's morning-glory is widespread onsite and was observed on virtually all ridges and slopes, weakly climbing over mixed chaparral, California sagebrush, California buckwheat, and in California annual grassland series throughout the study area. CNDDB forms were not completed for this species because of its relatively low sensitivity.

4.2.4 Island Mountain-mahogany (*Cercocarpus betuloides* var. *blancheae*)

Island mountain-mahogany has no state or federal status, but is found on List 4.3 of the CNPS *Inventory*. It is an evergreen shrub that occurs as part of the chaparral in Los Angeles and Ventura counties, as well as on several of the Channel Islands (CNPS 2001). This species was not observed during limited focused surveys for sensitive plant species conducted in 1992 (Dames and Moore 1993) or general botany surveys conducted in 1995 (RECON and Impact Sciences 1996).

Onsite, island mountain-mahogany occurs as an occasional component of chaparral series at the base of north-facing slopes. CNDDB forms were not completed for this species because of the relatively low sensitivity of this species.

4.2.5 Everlasting (*Gnaphalium* sp. *Nova*)

The undescribed species of *Gnaphalium* documented within the study area during the 2004 field season was observed again during the 2005 field season. Plants of this unnamed everlasting were previously ascribed to the species *Gnaphalium leucocephalum*, which is not thought to occur west of the Peninsular and Transverse Ranges in California. These specimens, rather, are thought by UC Riverside (UCR) and Rancho Santa Ana Botanic Garden (RSA) botanists to be

an undescribed taxon (*Gnaphalium* species *nova*). The *Gnaphalium* plants on the Newhall Ranch SPA differ from *Gnaphalium leucocephalum* in stature, pubescence, and phyllary characters.

A search of three herbaria (UCR, RSA, and the San Diego Natural History Museum) by Dudek biologist Marc Doalson revealed that 14 collections of this plant have been made in Ventura, Orange, Riverside, Los Angeles, and San Diego Counties. Eight collections date from 1901 to 1987 (1901, 1918, 1922, 1928, 1931, 1959, 1985 and 1987). There are six more recent collections dating from 1994 to 2003 (1994, two from 1995, 1997 and two from 2003). Many are from somewhat vague localities, such as "San Fernando Valley" and "Pasadena." Modern collections have come mostly from the Santa Ana Mountains region and especially Temescal Wash in western Riverside County, with several collections from adjacent San Diego County. In addition to the herbaria specimens, the *G.* sp. *nova* has been observed in 2003 and 2004 along Castaic Creek and the Santa Clara River in Los Angeles County (Dudek 2004). Plants are almost always associated with alluvial soils, often being found on the benches along major washes.

In 2005, the two occurrences in the NRSP study area consisted of approximately 800 individuals and five individuals. This species was not mapped this year and therefore CNDDB forms were not completed for this species.

4.2.6 Southwestern Spiny Rush (J*uncus acutus* var. *leopoldii*)

Southwestern spiny rush has no state or federal status, but is found on List 4.2 of the *CNPS Inventory*. It is a perennial herb that grows in mesic areas such as meadows, marshes, and seeps. It is widespread occurring from San Louis Obispo to Baja California, Mexico (CNPS 2001). Southwestern spiny rush was occasional in mesic riparian areas such as along the Santa Clara River. CNDDB forms were not completed for this species because of its relatively low sensitivity.

4.2.7 Bryophytes and Lichens

Bryophytes (non-vascular plants including mosses, liverworts, and hornworts) are plants which lack true vascular tissues (specialized water and nutrient conducting vessicles) found in angiosperms (*i.e.* flowering plants) and gymnosperms (*i.e.* cone producing plants). Since these non-vascular plants lack water transporting tissues, their life histories require that they inhabit areas of high humidity or places where water is immediately available. These areas can be found

adjacent to permanent or temporary water sources or in microhabitats which provide sufficient moisture. Overall, the Newhall Ranch site is typical of the Mediterranean climate in Southern California and does not exhibit conditions favorable for a diverse flora of bryophytes. However, bryophytes were detected during surveys along north facing slopes, shady areas in canyons, and along cut banks in ephemeral drainages.

Lichens are not classified as true plants but are rather a symbiotic relationship between fungi and green algae and/or cyanobacteria. The relationship between the organisms of these phyla have allowed for their colonization of diverse niches throughout the world. Lichens were detected in the surveys of the Newhall Ranch site; however, appropriate habitat for lichens was limited to scattered non-granitic rocks and soils and fallen wood of trees and shrubs.

No sensitive bryophytes or lichens are recorded as occurring in the proximity of the Newhall Ranch project site (CDFG 2004).

5.0 ACKNOWLEDGMENTS

Makela Mangrich prepared this report, with review by Sherri Miller and staff at Newhall. Mark McGinnis provided graphics and GIS mapping analyses. Tonette Foster provided word processing.

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APPENDIX A

Resumes of Survey Personnel

CLINT J. EMERSON
Botanist

EDUCATION AND CERTIFICATIONS

BS Botany/Plant Pathology, Oregon State University, 1997
Certified Lichenologist, Pacific Northwest Lichenologists

SUMMARY OF QUALIFICATIONS

Clint Emerson has nine years of experience working in environmental regulation, permitting and biological surveying. He has a broad range of experience and perspectives because he has worked extensively in both the private and public sectors. Knowledge and experience includes projects pertaining to the National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), Biological Evaluations (BE), wetland delineation reports, wetland mitigation plans, Clean Water Act Section 404 permitting, rare plant mitigation plans, endangered plant species conservation agreements, noxious weed/ vegetation management plans, and vegetation assessments and mapping.

EXPERIENCE

Ferber Ranch Development, The Planning Group, Orange County, California. Conducted rare plant surveys for up to 48 species of Threatened, Endangered, and/or Sensitive (TES) plant species within the 1,000-acre ranch. Located and mapped several new populations of rare plant species.

Newhall Ranch Development, Newhall Land Development, Los Angeles County, California. Monitoring of the endangered plant San Fernando Valley spineflower. Flagged existing populations and GPS-surveyed the boundaries for population trend analyses.

Bark Beetle Abatement Project, Southern California Edison, Riverside County, California. Biological monitoring of specific areas outlined for snag tree removal. Resource management recommendations for sensitive waterways (streams, wetlands), wildlife habitats/nests/species, and TES plant species.

Lone Pine Development, Icon Holdings Inc., Wasco County, Oregon. Conducted a wetland delineation on a large development project in The Dalles, Oregon along the Columbia River. Completed a wetland delineation report and worked with GIS personnel to accurately map the extensive wetlands onsite. Submitted pertinent documents to the Oregon Department of State Lands (DSL) and began the permitting process.

Schoenborn Property Development, Olson Engineering Inc., Clark County, Washington. Conducted an extensive wetland delineation and habitat assessment for a 30-acre property in southern Washington state. Prepared biologic reports for wetlands and wildlife habitats protected by federal and state laws. Submitted the permit application package to the Army Corps of Engineers (ACE) and the local Clark County jurisdiction for concurrence.

French Flat Area of Critical Environmental Concern (ACEC) Environmental Analysis (EA), Bureau of Land Management, Josephine County, Oregon. Led a team of scientists in the preparation of an EA for the protection of French Flat ACEC. Prepared all necessary documents, held public and in-house meetings, met with concerned citizens one on one, and consulted with US Fish and Wildlife service biologists.

Rogue River Neighborhood Fuels Reduction Project EA, Bureau of Land Management, Josephine County, Oregon. Worked with a team of scientists to prepare several EA documents for forest and brush thinning around private properties adjacent to Medford District Bureau of Land Management (BLM) lands along the Rogue River in Southern Oregon. Led rare plant surveys and prepared several sensitive plant BEs and noxious weed risk analyses for the EAs.

Rum Creek Late Successional Reserve (LSR) Thinning EA, Bureau of Land Management, Josephine County, Oregon. Worked as a member of an ID team preparing an EA for the reduction of fire hazard through thinning trees in the understory of old growth Douglas fir forest within land designated LSR. Led and conducted rare plant, lichen, bryophyte, and fungi surveys over the 1,000-acre project area. Analyzed data and prepared report outlining the findings of the surveys.

Diamond Lake Restoration Project, US Forest Service, Douglas County, Oregon. As an employee of the forest service Mr. Emerson served as a key player on the interdisciplinary team (ID team) which conducted an extensive NEPA analysis in the form of an Environmental Impact Statement (EIS) for this very high-profile project. State senators and congressman were present at several of the public meetings advocating for the removal of a non-native species of chub from Diamond Lake through the use of rotenone poisoning. Mr. Emerson served as the lead botanist for the project and conducted extensive surveys and monitoring of pristine wetlands, bogs, fens, and upland ecosystems surrounding the lake and its tributaries. An extensive botanical report was prepared in which Mr. Emerson summarized collected data and prepared GIS ArcMap graphics to display the findings.

Oak Flats Restoration Project, US Forest Service, Douglas County, Oregon. Designed and led an ID team of several individuals from diverse scientific backgrounds. Held public meetings bringing long-time adversaries to the table to negotiate a plan that met all parties' needs. Worked through divisive issues developing site plan restoration through burning, revegetation, thinning

of Douglas fir, protection and mitigation of heritage sites, and construction of wildlife habitat features.

Lemolo Lake Timber Sale Environmental Impact Statement (EIS), US Forest Service, Douglas County, Oregon. Served as a key member on an ID team completing a large scale EIS for timber management of a 2,500-acre area along the crest of the southern Cascade Mountains of Oregon. Coordinated a large survey effort for TES vascular plants, lichens, bryophytes, fungi, and noxious weeds. Prepared extensive documentation within the EIS format summarizing data collected in the field. Responded to several public comments as part of the EIS process.

Pacific Power Vegetation Management Plan, US Forest Service, Douglas County, Oregon. Served as a lead member on a team analyzing vegetation management practices within rights-of-way for Pacific Power lines, canals, and stations within national forest lands. Developed unique strategies for dealing with noxious weed species and coordinated with company personnel and consultants. Prepared sections of a large management plan while serving as the lead botanist on the team.

MEMBERSHIPS

California Native Plant Society (CNPS), American Bryological and Lichenological Society, California Botanical Society

CALLIE FORD
Biologist

EDUCATION AND CERTIFICATIONS

BS Environmental Management & Protection with Minor in GIS, California Polytechnic State University, San Luis Obispo, 2006 – *Cum Laude*

SUMMARY OF QUALIFICATIONS

Callie Ford is committed to professional management of environmental resources, including land conservation. As a biologist with Dudek, Ms. Ford has prepared biological technical reports and focused survey reports on multiple projects.

EXPERIENCE

Environmental Services for Newhall Land and Farming Company, Santa Clarita, California. Performed biological surveys for spineflower, a state endangered and sensitive plant species, including population counts and using GPS to locate the boundaries of the populations. Also performed biological monitoring of known spineflower populations, including population counts and point-intercept transects, and performed vegetation mapping for multiple vegetation classes. Assisted with writing related reports.

San Diego Metropolitan Wastewater District As-Needed Contract, San Diego, California. Reviewed and analyzed plant survey forms and incorporated pertinent information into a biological report.

Hazard Tree Removal Project, San Bernardino and San Jacinto Mountains, Southern California Edison, San Bernardino and Riverside Counties, California. Performed biological monitoring for trees affected by bark beetle infestations, including sensitive plant surveys and nesting wildlife species, and provided recommendations for removing trees in environmentally sensitive areas (e.g., riparian zones).

Mid-County Parkway Project, County of Riverside, California. Performed wildlife surveys for the sensitive burrowing owl species.

Aliso Creek Water Quality SUPER Project, South Orange County Wastewater Authority, Laguna Niguel, California. Reviewed willow flycatcher and least Bell's vireo survey records and assisted with writing the focused survey report for the Aliso Creek area.

High Tech Project, High Tech High Learning, City of Chula Vista, California. Reviewed willow flycatcher and least Bell's vireo survey records and assisted with writing the focused survey report for the High Tech High School Development project.

Santa Clara River Watershed Basin Analysis, Counties of Ventura and Los Angeles, California. Researched permits issued by the Army Corps of Engineers (ACOE) and other documents related to the Santa Clara River Watershed Basin Analysis project regarding impacts to jurisdictional waters and any sensitive plant or wildlife species.

Gobernadora Multipurpose Basin Project, Santa Margarita Water District, Rancho Santa Margarita, California. Assisted writing the Biological Technical Report for the Canada Gobernadora Multiuse Basin, which is located next to the Canada Gobernadora Creek and north of the Gobernadora Ecological Reserve Area.

City of San Diego, Multiple Species Conservation Program Section – Intern, June 2005 – September 2005

- Performed biological surveys for native vegetation using hand-held GIS system, and uploaded new GIS information into database.
- Reviewed plans with property within the Multiple Habitat Plan Area and made sure the plan was following the correct guidelines for that plan (i.e., riparian buffer zones, landscape plans, etc).
- Revised management plans per comments from local organizations and agencies.
- Organized property information for land put into a trust as part of mitigation measures.

Cal Poly University Foundation, Dr. James Vilkitis – Student Assistant, March 2005 – June 2005

- Graded quizzes and exams, entered grades into computer, made copies, proctor exams, organized office materials, researched information, and typed supplemental student materials. Provided photo documentation of Brizzolara Creek Restoration Project progress.
- Revised student edition Lecture Notes for Environmental Impact Analysis and Management.

CLE Engineering, Inc, Murrieta, California – Administrative Assistant, 2000 – 2004

- Responsible for answering phones, assisting clients with projects (surveying and Civil Engineering), typing proposals, entering all new clients and projects into computer program.
- Made up and filed all contracts, project folders and all corresponding paperwork.
- Developed and maintained database lists for all clients, projects and project information in Microsoft Excel for the office employees to utilize as needed.

- Researched project information for other employees, made copies of maps, filed all maps, created packages for clients, and maintained office spaces.

Morro Bay National Estuary Program, Morro Bay, California – Water Quality Testing Volunteer, 2004 – Present

- Perform water quality testing, including testing for nitrogen, phosphates, dissolved oxygen, turbidity, pH, and flow (using FloMaster).

MEMBERSHIPS

Association of Environmental Professionals (AEP)

NATHAN GALE
Principal Scientist, FL*x*

EDUCATION AND CERTIFICATIONS

PhD, Geography, University of California, Santa Barbara, 1985.
MA, Geography, University of California, Santa Barbara, 1980.
PWS, Certified Professional Wetland Scientist #1216, Society of Wetland Scientists, 1999.

SUMMARY OF QUALIFICATIONS

Dr. Gale has 24 years of experience managing and conducting multidisciplinary projects ranging from methodology development to applied environmental impact assessments, planning studies, and restoration programs. His management experience includes proposal preparation; contract negotiation and client relations; cost control and schedule monitoring; document production supervision; and quality assurance review. His specific technical work has involved experimental and sampling design; photographic documentation; and mapping of natural vegetation, environmental constraints, and land use. He also has field experience in quantitative vegetation sampling, environmental data collection, and wetland delineation. Dr. Gale is skilled in qualitative and quantitative data analysis for numerous applications including ecological and environmental impact assessment as well as mitigation and monitoring planning. He has been responsible for the preparation of NEPA/CEQA environmental documents, planning studies, and technical reports for the Department of Defense (DOD), the Department of Energy (DOE), the Department of Interior (DOI), and for state and local agencies. In addition, he has published extensively in the fields of geography, ecology, planning, and environmental studies.

EXPERIENCE

Vegetation and Rare Plant Surveys and Wetlands Delineations, Ventura and Los Angeles Counties, CA. Impact Sciences, Inc. Vegetation surveys and mapping of plant communities, rare plant surveys, field wetland surveys, delineation of jurisdictional wetlands, and report preparation for more than 30 sites in various locations in Ventura and Los Angeles counties.

Ventura River Estuary Enhancement Project. California Department of Parks and Recreation. Design and implementation of a five-year vegetation monitoring program for restoration efforts at Emma Wood State Beach, Ventura County, CA. The project involves monitoring four vegetation types: willow-cottonwood forest, saltbush scrub, dune scrub, and foredune vegetation. Activities include botanical surveys, survival and growth surveys, photodocumentation, data collection and comparative analysis of natural and revegetated areas, evaluation of exotics eradication, and recommendations for ongoing restoration.

Peacekeeper Rail Garrison Mitigation Program, San Antonio Terrace, Vandenberg AFB. U.S. Air Force and The Earth Technology Corporation. Technical advisor and senior data analyst for wetland creation, upland dune scrub habitat restoration, coast live oak revegetation, and vegetation monitoring for a five-year biological mitigation and monitoring program. Activities included initial planning, budgeting, methodology development, sampling design, vegetation sampling, data analysis, preparation and review of annual monitoring reports.

UCSB Campus Lagoon Wetland Restoration. The Herbarium, Museum of Systematics and Ecology, University of California, Santa Barbara. Design and implementation of a five-year vegetation monitoring program for wetland plant communities restored at the UCSB Campus Lagoon, Santa Barbara County, CA, as required by the Streambed Alteration Agreement of the California Department of Fish and Game. The project included plant species identification, vegetation sampling, data analysis, photo documentation, and report preparation.

Guadalupe Oil Field Restoration. California Department of Fish and Game and Hagler Bailly Consulting, Inc. Initial restoration planning, including background research, historical air photo assessment, and analysis of restoration alternatives at the Guadalupe Oil Field. Results from these tasks were used in the evaluation of potential restoration options, and to anticipate biological, hydrological, ecological, logistical, economic, and other issues associated with each restoration option.

Restoration of Coastal Dunes and Associated Wetlands in California. California Department of Fish and Game and Hagler Bailly Consulting, Inc. Principal scientist responsible for compiling and annotating a comprehensive bibliography of restoration and revegetation projects in coastal California, with an emphasis on coastal dune habitats and coastal wetlands.

Restoration Planning and Implementation, Former Guadalupe Oil Field, San Luis Obispo County, CA. Unocal Corporation. Preparation and implementation of site-specific restoration plans, including the development of revegetation specifications, monitoring methods, performance criteria, and performance evaluation.

Controlled Burn Monitoring, Vandenberg AFB. U.S. Air Force and Museum of Systematics and Ecology, University of California, Santa Barbara. Pre-burn monitoring of vegetation and plant species in coastal sage scrub and chaparral at two prescribed burn sites, South Vandenberg AFB.

Natural Resources Surveys and Environmental Assessments, Vandenberg AFB. U.S. Air Force and Tetra Tech, Inc. Principal environmental scientist responsible for conducting field surveys and preparing report sections for vegetation, wildlife, and wetland resources for 17

environmental assessments of facility and infrastructure development projects, and for an EIS on San Antonio Creek.

Integrated Natural Resources Management Plan, Vandenberg AFB. U.S. Air Force and Tetra Tech, Inc. Principal scientist responsible for preparing sections on existing conditions, issues of concern, and management objectives for vegetation, wildlife, and wetland resources for a basewide five-year plan.

EIS and Environmental Assessments. U.S. Air Force. Program manager and contract administrator, under a contract with the Strategic Air Command (SAC), for eight environmental assessments and one EIS for proposed USAF real estate, facility construction, and training actions. Impact analyses were conducted for the full range of environmental and socioeconomic issues; major areas of focus involved endangered species' habitats, cultural and historical resources, and hazardous waste sites.

Rare Plant Census. All American Pipeline, L.P. Rare plant monitoring census for Gaviota tarplant (*Hemizonia increscens* ssp. *villosa*) in permanent plots established at Gaviota, CA.

Vernal Pool Restoration Monitoring, Isla Vista, CA. Isla Vista Recreation and Park District. Vegetation monitoring, data analysis, and publication preparation for a 10-year assessment of restored and created vernal pools at the Del Sol Open Space and Vernal Pool Reserve.

Plant Surveys and Wetland Delineations for Five Land Parcels, Isla Vista, CA. County of Santa Barbara Planning and Development. Field surveys and report preparation for botanical and wetland resources, including jurisdictional wetland delineations and mapping, in coastal mesa vernal pool habitat along Del Playa Drive, Isla Vista.

Santa Barbara County Oak Restoration Program. University of California, Santa Barbara. Vegetation monitoring in savanna and woodland habitats of blue oak, valley oak, and coast live oak, for the long-term assessment of cattle grazing impacts on oak seedling recruitment at Sedgwick Ranch, Santa Barbara County, CA.

Goleta Revitalization EIR/EIS. County of Santa Barbara Planning and Development. Wetland delineations at sixteen creek crossings and plant surveys for street extensions, bike paths and a multipurpose trail.

Oil and Gas Exploration and Facilities Development EIRs/EISs. Santa Barbara County and California State Lands Commission. Environmental analyst for EIRs/EISs of oil and gas development projects located offshore California.

Supplemental Environmental Impact Report for the 1990 Long Range Development Plan. University of California, Santa Barbara. Program manager for a supplemental EIR focused on growth-related impacts to local school districts, and potential secondary environmental impacts to sensitive wetland habitats that could be caused by needed school facility expansion.

Recovery Plan for Two Federally Endangered Plant Species. U.S. Fish and Wildlife Service. Technical advisor responsible for developing strategy and task recommendations for the recovery plan for marsh sandwort (*Arenaria paludicola*) and Gambel's watercress (*Rorippa gambelii*). Key aspects of the plan included an outline of steps for habitat protection, species and habitat monitoring, biological and ecological research, and the establishment of new populations.

Implementation of Recovery Activities for Two Federally Endangered Plant Species. California Department of Fish and Game and University of California. Research on species biology and ecology, plant propagation, experimental establishment of new populations, and monitoring of existing and new populations of marsh sandwort (*Arenaria paludicola*) and Gambel's watercress (*Rorippa gambelii*). Reporting of species and habitat status and progress of recovery activities.

Restoration Plans for Installation of VTS Fiber-Optic Cable System, Honda Ridge Road Repair, and El Rancho Road Bridge Project, Vandenberg AFB. U.S. Air Force and Tetra Tech, Inc. Preparation of restoration plans including sections on ecological background, revegetation measures, monitoring and maintenance methods, performance criteria for assessing success, and restoration schedule for sites at North and South Vandenberg AFB.

Implementation of Restoration Plans, South Base and VTS Fiber-Optic Cable Systems, Vandenberg AFB. U.S. Air Force and Foster Wheeler Environmental Corp. Native plant species restoration, long-term monitoring, and restoration evaluation at four sites at Vandenberg AFB, CA.

Biological Monitoring for Installation of CITS, VTS, South Base, and Tranquillon Mountain Fiber-Optic Cable Systems, Vandenberg AFB. U.S. Air Force, Tetra Tech, Inc., and Foster Wheeler Environmental Corporation. Onsite biological monitoring for cable installation activities to ensure avoidance of adverse impacts to sensitive biological and wetland resources.

Biological Surveys and Monitoring for Installation of Building 3000 Fiber-Optic Cable System, Vandenberg AFB. U.S. Air Force and System Technology Associates. Field surveys and onsite biological monitoring for cable installation activities to ensure avoidance of adverse impacts to sensitive biological and wetland resources.

Biological Monitoring for Honda Ridge Road Repair and Point Sal Road Repair, Vandenberg AFB. U.S. Air Force, Tetra Tech, Inc., and Ace Engineering, Inc. Onsite biological monitoring for road repair activities to ensure avoidance of adverse impacts to sensitive biological and wetland resources.

MEMBERSHIPS

California Botanical Society; California Exotic Pest Plant Council; Society of Wetland Scientists; Society of Ecological Restoration; The International Mountain Society.

SELECTED PUBLICATIONS

Dr. Gale has been an author and collaborator on numerous academic publications, government research grant reports, and presentations at national and international professional conferences. In addition, he has contributed to environmental and planning documents. A summarized count of his work includes: Refereed Journal Articles - 28; Book Chapters - 5; Papers in Conference Proceedings - 3; Government Research Reports - 13; Contributions to Planning Studies - 44; Contributions to Environmental Documents - 55.

Journal Articles

"Coast Live Oak Revegetation on the Central Coast of California," (with A. Parikh), *Madroño*, 45(4), 1998, 301-309.

"Vegetation Monitoring of Created Dune Swale Wetlands, Vandenberg Air Force Base, California," (with A. Parikh), *Restoration Ecology*, 6(1), 1998, 83-93.

"The Analysis of Class Dispersion Patterns Using Matrix Comparisons," (with L.E. Harvey and F.W. Davis), *Ecology*, 69(2), 1988, 537-542.

"Tests of Randomness: Unidimensional and Multidimensional," (with L.J. Hubert, R.G. Golledge, and C.M. Costanzo), *Environment and Planning A*, 17, 1985, 373-385.

"Measuring Association Between Spatially Defined Variables: An Alternative Procedure," (with L.J. Hubert, R.G. Golledge, and C.M. Costanzo), *Geographical Analysis*, 17, 1985, 36-46.

"Unclassed Matrix Shading and Optimal Ordering in Hierarchical Cluster Analysis," (with W.C. Halperin and C.M. Costanzo), *Journal of Classification*, 1, 1984, 775-92.

Conference Proceedings

"Review of Ten Years of Vernal Pool Restoration and Creation in Santa Barbara, California," (with W.R. Ferren Jr., D.M. Hubbard, S. Wiseman, and A. Parikh), in C.W. Witham, E.T. Bauder, D. Belk, W.R. Ferren Jr., and R. Ornduff (Eds.) Ecology, Conservation, and Management of Vernal Pool Ecosystems, Proceedings from a 1996 Conference, California Native Plant Society, Sacramento, CA, 1998, 206-216.

"Vegetation Monitoring of Created Wetland Sites on the San Antonio Terrace, Vandenberg Air Force Base, California," (with A. Parikh), in M.C. Landin (Ed.) Proceedings of the National Interagency Workshop on Wetlands: Technology Advances for Wetlands Science, Technical Report, Wetlands Research and Technology Center, U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS, 1995, 153-55.

"Wetland Creation and Vegetation Monitoring in a Stabilized Sand Dune Ecosystem, San Antonio Terrace, Vandenberg Air Force Base, California," (with A. Parikh and T. Waddell), in M.C. Landin (Ed.) Proceedings of the 13th Annual Meeting of the Society of Wetland Scientists (SWS), New Orleans, LA, 1993, 368-76.

"First-Year Vegetation Monitoring of Created Wetlands on the San Antonio Terrace, Vandenberg Air Force Base, California," (with A. Parikh and T. Waddell), in A.E. Leviton and M.L. Aldrich (Eds.) Proceedings of the Pacific Division, American Association for the Advancement of Science, University of California, Santa Barbara, June 1992, p. 46.

DOUGLAS GETTINGER
Habitat Restoration Specialist

EDUCATION
B.S. Landscape Architecture, California State Polytechnic University at Pomona, 1979
B.S. Ornamental Horticulture, California State Polytechnic University at Pomona, 1980

REGISTRATION/CERTIFICATIONS
California Agricultural Pest Control Adviser License No. 01369 (expires 12/31/04)

PROFESSIONAL AFFILIATIONS
Member, Society for Ecological Restoration
Member, California Invasive Plant Council
Member, California Agricultural Production Consultants Association

EXPERIENCE
Mr. Gettinger has more than a decade of experience in habitat restoration work, including biological construction monitoring, and the design, implementation, and monitoring of habitat restoration projects. His training in landscape architecture and ornamental horticulture, coupled with his experience working on large construction projects help bring habitat restoration and endangered species habitat creation projects to a successful conclusion. He holds a California Pest Control Adviser License, which allows him to legally act as an expert and make recommendations for the control of invasive plant species. His project experience includes restoration of chaparral, coastal sage scrub, coastal salt marsh, freshwater marsh, limestone forest, riparian woodland, southern willow scrub, and oak woodland habitats implemented under agreements with various federal, state, and local agencies. He has experience working safely around the large earth-moving equipment found at various construction projects and has worked at hazardous materials sites requiring OSHA 40-hour hazardous worker training.

PROFESSIONAL ASSIGNMENTS

Metropolitan Wastewater Department As-needed Biological Services Contract 2000-2005, San Diego Metropolitan Wastewater Department, City of San Diego, California. Served as a biological construction monitor on numerous emergency sewer repair and maintenance projects in sensitive habitat areas located in canyons for the City of San Diego Metropolitan Wastewater Department on the as-needed biological services contract 2000-2005. Many tasks included emergency sewer repair projects where sewage was flowing into live stream conditions, which required immediate response from DUDEK staff. Other tasks included monitoring emergency sewer cleaning activities where temporary equipment access was needed in sensitive habitat canyon areas. Scheduled and coordinated the work of other biological monitors, as needed.

Initial assessment reports, biological resources reports, and/or impact assessment reports were then prepared for each task, depending on project requirements.

San Diego County Water Authority Emergency Storage Reservoir Program, San Diego County Water Authority, County of San Diego, California. Assisted in focused biological surveys and helped prepare alternatives analysis for the environmental impact report for the San Diego County Water Authority Emergency Storage Reservoir Program. Performed extensive tree inventory surveys and mapping of coast live oak (*Quercus agrifolia*) and mesa oak (*Q. engelmannii*) in proposed project alternative areas.

Metropolitan Water District Pipeline Project, Metropolitan Water District of Southern California, Hemet, California. Collected seed from several sensitive species, including San Jacinto Valley crownscale (*Atriplex coronata var. nutatior*), little mousetail (*Myosurus minimus ssp. apus*), dwarf peppergrass (*Lapidium latipes*), and woolly marbles (*Psilocarpus brevissumus*) on a Metropolitan Water District pipeline right-of-way prior to construction in Riverside County, California. Seed was sent to Rancho Santa Ana Botanic Garden for counting, cleaning, and storage. Later sewed seed in appropriate locations along right-of-way after pipeline construction was completed. Also counted population and collected seed for Parish's brittlescale (*Atriplex parishii*), a species formerly presumed extinct.

Cannon Road Extension Project, City of Carlsbad Engineering Department, City of Carlsbad, California. Biological construction monitor for Phase 2 of the Cannon Road Extension Project in Carlsbad, California through sensitive habitat containing wetlands habitat for the federally endangered least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and western clapper rail (*Rallus longirostris*), as well as coastal sage scrub habitat for the federally-listed threatened coastal California gnatcatcher (*Polioptila californica*). Prepared monthly project progress reports and reported permit violations to the agencies. Project included oversight of subcontractors performing paleontological monitoring and recovery, and construction noise monitoring. Also monitored the installation and 120-day maintenance period for the temporary impacts wetland mitigation area.

Scripps Poway Parkway Extension Project, City of Poway Engineering Department, City of Poway, California. Biological monitor during two years of road construction through four miles of sensitive habitat for the Scripps Poway Parkway Extension Project in Poway, California. Located appropriate preserve habitat in the City and transplanted Coast Barrel Cactus (*Ferrocactus viridescens*) growing in the project right-of-way prior to impacts. Worked with City inspectors, surveyors, and the contractor to insure that impacts stayed within permitted limits. Monitored erosion and sediment control implementation and maintenance, and revegetation planting and seeding.

Puente Hills Landfill Wetland Mitigation Project, Sanitation Districts of Los Angeles County, City of Whittier, California. Provided horticultural and botanical monitoring for the wetland habitat restoration project associated with the Puente Hills Landfill in Whittier, California. Work was performed for the Sanitation Districts of Los Angeles County. The wetland restoration area is adjacent to the Puente Hills Landfill and also provides visual screening of the landfill for adjacent residents. Also directed staff performing the required wildlife monitoring and provided consultation for coast live oak (*Quercus agrifolia*) mitigation being implemented on weedy mustard covered slopes adjacent to the landfill, coastal sage scrub restoration being attempted on the landfill's canyon fill slopes, and ornamental buffer landscape to provide visual screening.

Rocketdyne Ecological Risk Assessment Project, Boeing Integrated Defense Systems, County of Ventura, California. Assisted with focused biological surveys to map vegetation communities and search for sensitive plant and wildlife species at a contaminated site. Surveys were the first stage in conducting an ecological risk assessment for the Santa Susana Field Laboratory, Ventura County, California.

Rancho Pacfifica Cottages Habitat Enhancement Plan, Taylor-Woodrow Homes, Inc., City of Encinitas, California. Prepared a plan to control invasive exotic plant species such as giant reed (*Arundo donax*) that infests the creek channel within a biological open space being preserved on the property. The plan provides for the removal and control of invasive plant species and the planting of native wetland and upland species in their place.

Village 11 Project, Brookfield Homes, Chula Vista, California. Biological construction monitor for grading of the Village 11 project in Otay Ranch in Chula Vista, California. Grading of the approximately 500-acre site in the eastern portion of the Otay Valley was adjacent to the Salt Creek Open Space Preserve containing wetlands and habitat for the federally-listed threatened coastal California gnatcatcher. Dudek directed and monitored soil and biomass salvaging from suitable habitat areas within the project footprint and is currently monitoring installation of the wetland mitigation area.

Rolling Hills Ranch Wetland Mitigation Monitoring Project, McMillin Land Development, City of Chula Vista, California. Biological construction monitor for the installation and long-term monitoring of Phases I and II of the wetland mitigation for the Rolling Hills Ranch development in Chula Vista, California. Rolling Hills Ranch is an approximately 300-acre mixed use project. The wetland mitigation program, involves expanding wetland habitat along Salt Creek and controlling invasive, exotic salt cedar on the project site. The wetland mitigation was installed in two phases, approximately two years apart. Oversaw the collection of botanical data and preparation of the annual reports for the two phases.

Henry Ranch Biological Construction Monitoring and Wetland Mitigation Project, William Lyon Homes, City of San Ramon, California. Directed staff performing pre-construction surveys for federally-listed threatened California red-legged frog (*Rana aurora draytonii*) and nesting birds, and biological construction monitoring for permitted wetland impacts and initial land clearing at the Henry Ranch Project in San Ramon, California. Also oversaw and directed implementation of conceptual wetland mitigation pond plan, as well as other required enhancement measures.

Fieldstone Brush Management and Summer Holly Preservation Project, The Fieldstone Company, City of San Diego, California. Supervised a brush management and summer holly (*Comarostaphylos diversifolia*) preservation program at a housing project on the rim of Los Peñasquitos Canyon Preserve, San Diego, California.

Baldwin *Brodiaea* Preserve, The Baldwin Company, City of San Marcos, California. Supervised the planting of native purple needlegrass (*Nasella pluchra*) plants in a preserve for the federal and State-listed endangered thread-leaf brodiaea (*Brodiaea filifolia*) in San Marcos, California.

Newhall Ranch, Newhall Land and Farming Company, County of Los Angeles, California. Assisted with focused surveys for the state-listed endangered San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina)* on the approximately 6,000 acres in 2002 and 14,500 acres in 2003 on Newhall Ranch in Los Angeles County, California.

Talone Lake Wetland Mitigation Project, Gatlin Development Company, City of Oceanside, California. Designed a wetland mitigation plan, oversaw construction impacts and mitigation installation for the loss of wetland habitat associated with a mixed-use project development for the Rancho del Oro project around Talone Lake, in Oceanside, California. Project site includes habitat for the federally-listed endangered least Bell's vireo (*Vireo bellii pusillus*). Assisted in preparation of a draft habitat management plan for the project and processed the 404 application with the U.S. Army Corps of Engineers and 1603 Streambed Alteration Agreement with the California Department of Fish and Game. Project included coastal sage scrub buffer zone around a wetland.

Ocean Trails Habitat Restoration Project, Ocean Trails L.P., City of Rancho Palos Verdes, California. Biological and horticultural monitor at the 92 acres Ocean Trails Restoration Project in Rancho Palos Verdes, California. The Ocean Trails project is restoring coastal sage scrub, southern cactus scrub, and coastal bluff scrub in ruderal and degraded native habitat. The restoration program is creating additional habitat for the federally-listed threatened coastal California gnatcatcher (*Polioptila californica*), which is already expanding into the still developing habitat.

Potrero Canyon Wetland Mitigation Plan, City of Los Angeles Department of Recreation and Parks, City of Los Angeles, California. Developed a riparian mitigation plan for impacts in a coastal canyon being filled to stabilize landslides and prevent further property losses at Potrero Canyon in the Pacific Palisades neighborhood in Los Angeles, California. Made an extensive search for offsite mitigation alternatives in the area. Attended community workshops to explain mitigation and learn neighborhood concerns about the project. Plan was prepared for presentation to the California Coastal Commission.

COLIN KHOURY
Environmental Planner/Biologist 1

EDUCATION AND CERTIFICATIONS

BA Agricultural Ecology, Thesis in Seed Conservation; Prescott College, 2000
Course work in Plant Genetics, University of Arizona, 2003

SUMMARY OF QUALIFICATIONS

Colin Khoury is an experienced biologist, having worked in educational, research, and agricultural ecology related positions for the past 10 years. Mr. Khoury's general duties as an Environmental Planner/Biologist I with Dudek include sensitive plant surveys, vegetation mapping, wetlands delineations, and preparation of biological technical reports. Mr. Khoury has a strong foundation in plant taxonomy, ecology, biology, and genetics. He possesses strong organizational, communication, and teaching skills, and is experienced in managing employees in a variety of agricultural environments. Among Mr. Khoury's specialties are plant breeding, seed conservation techniques, and descriptor systems for the characterization of field crops. Mr. Khoury is also fluent in Spanish and proficient in Portuguese.

EXPERIENCE

Newhall Ranch Project, Newhall Land and Farming, Counties of Los Angeles and Ventura, California. Conducted focused surveys for the state-listed endangered San Fernando Valley spineflower (Chorizanthe parryi var. fernandina) and other sensitive plants on over 10,000 acres. Surveyed high country of Newhall property for vegetation mapping leading toward a designated preserve and slender mariposa lily replanting mitigation site.

Chula Vista Seniors Housing Project, City of Chula Vista, California. Conducted biological assessments including vegetation mapping and rare plant surveys. Produced the biological resources section of the 2005 EIR for the project.

Portola Hills, County of Orange, California. Conducted vegetation mapping and wetlands delineations for 250-acre site. Assisted in the production of biological technical reports and projected rare plant surveys analysis.

Ferber Ranch, County of Orange, California. Conducted rare plants surveys and wetland delineations.

Arbor Creek, City of Vista, California. Conducted rare plant surveys.

Warner Ranch, County of San Diego, California. Conducted rare plant surveys.

Stallion Ridge, County of San Diego, California. Performed rare plant surveys.

Centre Point, City of Santa Clarita, California. Conducted rare plant surveys and geographical positioning systems (GPS) data collection.

Winchester Ranch, County of San Diego, California. Conducted rare plant surveys.

San Marcos Creek, City of San Marcos, California. Conducted rare plant surveys within riparian habitat.

Marine Corps Base Camp Pendleton, County of San Diego, California. Conducted rare plant surveys for Pendleton button celery (Eryngium pendletonensis) on 246 acres. Produced a biological technical report covering findings related to rare plant distribution and abundance.

Mid-County Parkway, County of Riverside, California. Conducted rare plant surveys and assisted in the production of a biological technical report concerning rare plant findings.

Oceanside to Escondido Rail Project, North County Transit District (NCTD), Cities of Oceanside, Vista, San Marcos, and Escondido and County of San Diego, California. Produced proposals for production of an oak tree mitigation plan, oak tree impact surveys, and upland mitigation plans.

Carlsbad Municipal Golf Course, City of Carlsbad, California. Performed construction monitoring and oversight for project grading and vegetation removal.

Torrey Pines State Reserve, County of San Diego, California. Monitored removal of irrigation equipment by Urban Corps following successful revegetation project for Metropolitan Wastewater District.

Southern California Edison Bark Beetle Project, San Bernardino National Forest, California. Provided biological monitoring for power line construction and tree removal.

Laboratory of J. Tewksbury, Santa Cruz, Bolivia. Field research for the University of Washington. Study of Capsicum annum, involving field mapping, test plot installation, and fungal resistance experiments.

Native Seeds/Search, Tucson, Arizona. Crop Curator for Phaseolus, including seed bank conservation and documentation, and three years of field grow-outs (data collection and regeneration). Conservation Farm Coordinator for 60-acre grow-out site, including management of three employees and many volunteers. General seed bank conservation, distribution, and documentation duties for entire collection. Publications of Phaseolus-related articles in the organization newsletter.

Prescott College, Prescott, Arizona. Adjunct faculty in the Environmental Studies Program. Twice taught an undergraduate-level course in agricultural Seed Conservation.

Prescott Creek Preservation Association, Prescott, Arizona. Riparian restoration and well monitoring.

Green Oak Ranch Native Plant Nursery, Vista, California. Assistant in California native plant nursery.

Agriculture and Seed Production (experience in farming and nursery operations and in vegetable seed companies)

- Turtle Tree Seed, Copake, New York.
- Peters Seed and Research, Myrtle Creek, Oregon.
- Organic Botanicals, Fallbrook, California.
- Exotica Rare Fruit Nursery, Vista, California.
- Birdsfoot Farm, Canton, New York.
- Rancho Rasayana, La Ribera, Baja California Sur, Mexico.
- Camp Joy Gardens, Boulder Creek, California.
- Live Power Community Farm, Covelo, California.
- CIESA, El Bolson, Argentina.

MEMBERSHIPS

California Native Plant Society (CNPS), San Diego Chapter.

REBEKAH KREBS
Environmental Specialist

EDUCATION AND CERTIFICATIONS

BA Environmental Studies, Florida Gulf Coast University, 2002
AA Associate in Arts, Valencia Community College, 1999
Plant ID Coursework, Florida Gulf Coast University
38 Hours of Army Corps of Engineers Wetland Delineation and Management Training
DEP Wetland Delineation and Management Training

SUMMARY OF QUALIFICATIONS

Rebekah Krebs' interest in environmental education, sustainable land activities and methods, environmental auditing, sustainable design, and wildlife rehabilitation make her a valuable asset to Dudek. Ms. Krebs' general duties as an Environmental Specialist with Dudek include: She specializes in Lee, Collier, Charlotte, and Hendry County protected species surveys; bald eagle monitoring; red cockaded woodpecker surveys and cavity tree searches; FWCC deer and hog spotlight and track surveys; gopher tortoise surveys and relocation; wetland flagging and delineation; environmental resource permits and other permitting documents; wetland monitoring; and reviewing exotic vegetation control.

EXPERIENCE

Environmental Scientist I, Boylan Environmental, Inc., Ft. Myers, Florida, 2004. Completed permitting-associated activities and reports for the following agencies: DEP, ASOE, FWCC, USFWS, and SFWMD. Created maps used for environmental permitting with the use of AutoCAD and associated programs. Performed wetland delineation and monitoring as well as wildlife monitoring and surveying duties.

Ecologist I, Passarella and Associates, Inc., Ft. Myers, Florida, 2002–2004. Completed permitting-associated activities and reports for the following agencies: DEP, ACOE, FWCC, USFWS, and the SFWMD. Carried out wetland delineation, monitoring, and sustainability reporting duties, as well as wildlife monitoring, relocation, and surveys.

Internship, CREW Land and Water Trust, Ft. Myers, Florida, 2001–2002. Designed and implemented environmental curriculum for guided hikes and school field trip, assisted in land stewardship of public lands, participated in community outreach programs, and assisted in the operation of a non-profit environmental organization.

MEMBERSHIPS

Florida Association of Environmental Professionals, Society of Wetland Scientists, California Native Plant Society; Society of Wetland Scientists; Society of Ecological Restoration; California Botanical Society.

VIPUL JOSHI
Biologist

EDUCATION

B.S., Evolution, Behavior, Ecology, University of California, San Diego, 1997

EXPERIENCE

Mr. Joshi has five years professional experience as a biological consultant specializing in botanical surveying, permit acquisition, permit compliance, and project management. Mr. Joshi is well experienced with southern California flora and environmental regulations. Mr. Joshi also has had experience managing constraints analysis, entitlement processing, permit acquisition, and biological construction monitoring for a variety of public and private projects.

Mr. Joshi has specific experience with CEQA processing with a variety of local jurisdictions, state and federal Endangered Species Act permit processing, wetlands permitting including Nationwide and Individual Permits from the U.S. Army Corps of Engineers, and management of permit compliance. Specific biological survey skills include full rare plant surveys, focused presence/absence surveys for the state- and federally-listed quino checkerspot butterfly and vernal pool fairy shrimp, project-level vegetation mapping, wetlands delineation, vernal pool identification, vernal pool watershed mapping, and general biological assessment of functions and values.

PROFESSIONAL ASSIGNMENTS

Cielo del Norte, San Diego County, California. Provided baseline vegetation and rare plant surveys for project in Harmony Grove area. Drafted biological technical report and endangered species permitting strategy for 500-acre development in a critical preserve planning area. Participated in multiple screencheck EIR processing with the County. Provide project management for ongoing entitlement process.

Nickel Creek, Ramona, California. Provided baseline vegetation, wetlands delineation, and rare plant mapping for 14-acre multi-family residential development on the Santa Maria River. Coordinated with architect on least impactive development design and coordinated with County of San Diego to design a multi-use trail connection along the river while avoiding impacts to jurisdictional waters. Provided Biological Resources Technical Report evaluating project impacts pursuant to CEQA.

Manchester Avenue Residential Development, Encinitas, California. Provided project management for entitlement processing of medium-scale residential subdivision on coastal property supporting numbers rare vegetation communities and plant species. Project capabilities included vegetation mapping, rare plant surveys, wetlands delineation, impact assessment

pursuant to CEQA, and permitting strategy for impacts to jurisdictional wetlands, state- and federal endangered species.

Levatino Property, Carlsbad, California. Provided biological resource mapping, rare plant surveys, and wetlands delineation for 20-acre property. Evaluated development constraints in consideration of regional planning efforts, state and federal regulations.

Maldanado Property, Carlsbad, California. Provided biological resource mapping, rare plant surveys, and wetlands delineation for 50-acre property. Evaluated development constraints in consideration of regional planning efforts, state and federal regulations.

Santa Fe Meadows, Santa Fe Valley, California. Provided vegetation mapping, rare plant survey, and wetlands delineation for 40-acre residential development area.

Shaw Property, San Diego, California. Provided vegetation mapping, rare plant, and wetlands delineation for 40-acre property.

Via de la Valle, San Diego, California. Provided biological resources mapping, wetlands delineation, rare plants survey, and development constraints analysis for 20-acre property on

Our Lady of Mt. Carmel Catholic Church, San Diego, California. Conducted baseline vegetation surveys, wetlands delineation, rare plants survey, vernal pool identification, and vernal pool watershed mapping. Drafted Biological Resources Technical Report for Mitigated Negative Declaration and participated in community meetings and response to comments. Drafted Resource Management Plan for onsite open space management and avoidance of long-term impacts to adjacent USFWS National Wildlife Refuge property.

Lux Art Institute, Encinitas, California. Provided biological resource mapping, including vegetation mapping, wetlands delineation, and rare plant survey for 20-acre property. Provided constraints analysis, evaluation of project impacts pursuant to a Habitat Loss Permit under Section 4(d) of the federal Endangered Species Act, and management of permit compliance.

Fry's Electronics, San Marcos, California. Provided initial vernal pool identification and mapping, utilizing portable GPS system, wetlands delineation, and rare plant mapping. Rare plant mapping included pool by pool floral inventory and mapping of state- and federally-listed endemic vernal pool plant species.

San Jacinto Valley, Riverside County, California. Provided biological resource mapping, wetland delineation, and rare plant survey for endemic alkali species within San Jacinto River floodplain.

San Marcos Creek Roadway Improvements Project, City of San Marcos, City of San Marcos, California. Delineated wetlands, prepared vegetation map, and conducted rare plant surveys along San Marcos Creek from State Route 78 to Lake San Marcos.

Otay Ranch, Chula Vista, California. Provided biological resource surveys and documentation for various developments covering over 4,000 acres of vacant land. Tasks have included vegetation mapping, rare plants surveys, wetlands delineations, fairy shrimp surveys, and quino checkerspot surveys. Provided Biological Resource Technical Report pursuant to CEQA documentation, assisted in preparation of Second Tier EIR, development wetlands and endangered species permitting strategies, preparing and processing Section 404 Nationwide Permits 14 and 39, Section 401 Water Quality Certification, Section 1601 Streambed Alternation Agreement, and Section 7 Biological Opinion, and managing compliance with various permit conditions.

Irvine Company, Irvine, California. Provided vegetation mapping, wetlands delineation, and rare plant mapping for over 5,000 acres of vacant land.

Fanita Ranch, Santee, California. Provided vegetation mapping, rare plant, and wetlands delineation for 2,000 acre property.

Salt Creek Gravity Sewer, City of Chula Vista, California. Developed project alternatives permitting strategy with City and project engineers for 11-mile gravity sewer along north edge of Otay River Valley. Provided baseline vegetation mapping, wetlands delineation, and rare plant surveys. Prepared biological technical report and EIR biological evaluation for CEQA compliance. Submitted and coordinated acquisition of Section 404 Nationwide Permit 12, Section 401 Water Quality Certification, Section 1603 Streambed Alternation Agreement, and Section 7 Biological Opinion, including identification of mitigation alternatives. Coordinated construction monitoring and permit compliance.

North Agua Hedionda Sewer Rehabilitation, City of Carlsbad, California. Provided project management for half-mile sewer rehabilitation and shoreline protection project adjacent to coastal lagoon. Assignments included vegetation mapping, tidal wetlands delineation, rare plant surveys, development of engineering alternatives, permitting strategies, public scoping meetings, analysis of alternative impacts, EIR biological resources documentation, tidal wetlands mitigation identification, permit preparation for Section 404 Nationwide Permit 14, Section 401 Water Quality Certification, Section 1603 Streambed Alternation Agreement, Coastal Development Permit, Section 7 Biological Opinion, and project planning in terms of scheduling and budget.

Yucapia Non-Potable Water Distribution System, Yucapia Valley Water District, Counties of San Bernardino and Riverside, California. Provided baseline vegetation mapping, wetlands delineation, and rare plant surveys for 500-acre riparian study area.

Pipe 6, Metropolitan Water District, Riverside County, California. Conducted rare plant surveys and quino checkerspot butterfly surveys over approximately 20 mile long alignment.

Perris Valley Storm Drain, Lateral B, Riverside County Flood Control District, California. Provided wetlands delineation and focused rare plant surveys for the two mile long open flood control channel for deepening and widening project. Analyzed CEQA and wetlands permitting strategies and provided Biological Resources Technical Report and wetlands permit applications for Section 404 Nationwide Permits 3, 12, and 14, Section 1603 Streambed Alteration Agreement, and Section 401 Water Quality Certification. Met with ACOE staff to confirm wetlands delineation.

Canada Gobernadora, Santa Margarita Water District, Orange County, California. Conducted rare plant surveys, which included a focused survey for San Diego tarplant (*Deinandra [Hemizonia] paniculata*), southern tarplant (*Centromadia parryi* spp. *australis*), and many-stemmed dudleya (*Dudleya multicaulis*).

SR-125 South, Caltrans/CTV, California. Provided support in preparation of Section 7 Biological Assessment and permit compliance negotiations. Conducted vegetation mapping, rare plant, and quino checkerspot surveys for various mitigation site alternatives. Drafted conceptual revegetation and management plans for various mitigation sites including sites on south edge of Otay River Valley, Otay Mesa, and Otay Mountain..

LaBorde Canyon off-Highway Vehicle Park Study, County of Riverside, California. Provided baseline vegetation mapping and plant species inventory.

MAKELA N. MANGRICH
Environmental Analyst

EDUCATION AND CERTIFICATIONS

MS Community and Regional Planning, University of Texas at Austin, 2000
BS Botany, Iowa State University, 1996
CEQA Basics Workshop, Association of Environmental Professionals, Fall 2005
National Wildfire Coordinating Group (TWCG) courses on prescribed burn techniques and protocols, The Nature Conservancy, Fall 2004
Ecological restoration seminars, Lady Bird Johnson Wildflower Center, 2002–2003

SUMMARY OF QUALIFICATIONS

Makela Mangrich has over eight years' experience in resource conservation planning and environmental and policy document preparation. Project experience includes NEPA and CEQA report preparation, vegetation mapping, rare plant surveys, general wildlife surveys, biological resource surveys, data collection and analysis, wetlands delineations, mitigation monitoring, and endangered species surveys. Projects include issues relative to the California Fish and Game Code, the federal Clean Water Act (Sections 401 and 404), the National Environmental Policy Act (NEPA), the Migratory Bird Treaty Act, and the Endangered Species Act (ESA). Ms. Mangrich has also successfully completed a background course in the California Environmental Quality Act (CEQA).

EXPERIENCE

Western Riverside Multiple Species Habitat Conservation Plan (MSHCP), County of Riverside, California. Reviewed development proposals for compliance with Plan, tracked implementation progress and compliance of projects in Plan area.

Land Steward/Projects Director, Hill Country Conservancy (HCC), Austin, Texas. Managed stewardship and long-term monitoring of preserve land to protect the Barton Spring Edwards Aquifer. Managed Geographic Information System (GIS) for preserve land.

Macon County Conservation District, City of Decatur, Illinois. Project manager and primary author of strategic plan for large, growing conservation district, focused on resource management plans for l3,600 acres of preserve land.

Comprehensive Plan, City of Darlington, Wisconsin. Project manager and primary author of comprehensive plan for economically challenged community in southwest Wisconsin focusing on agricultural preservation and economic development.

Comprehensive Plan, Village of Paddock Lake, Wisconsin. Project manager and primary author of comprehensive plan for rapidly growing community in southeast Wisconsin focusing on rebuilding a dilapidated commercial strip and ensuring that the Village maintains high-quality built and natural environments as it grows.

Air Quality Program, City of Austin, Texas. Developed policy documents and served as Secretary for task force charged with creating and implementing emission reduction measures to move the Austin region back into attainment of the National Ambient Air Quality Standard for ground level ozone.

Envision Central Texas, Austin, Texas. Facilitated numerous groups meetings and served on technical advisory team for the Envision Central Texas Project, a regional planning process for the five-county Austin/San Marcos MSA.

Comprehensive Plan, City of Dubuque, Iowa. Managed development of 2000 Comprehensive Plan. Identified staged expansion areas of City based on utility and transportation infrastructure to curb sprawl and promote more compact, orderly growth and development.

USH 14/STH 11 Expansion, Wisconsin Department of Transportation, Madison, Wisconsin. Assisted with needs assessment and impact analysis for highway improvement study focused on rapidly growing portion of southeast Wisconsin. Provided guidance on land use, cumulative, and secondary impacts of proposed project.

USH 51 Expansion, Wisconsin Department of Transportation, Madison, Wisconsin. Assisted with needs assessment and impact analysis for highway improvement study between Madison and Stoughton, WI. Provided guidance on land use, cumulative, and secondary impacts of proposed project.

Kelly Parkway Project, Texas Department of Transportation, San Antonio, Texas. Managed GIS impact analysis for large highway project in low-income minority neighborhood near Kelly Air Force Base per NEPA requirements.

Heritage Trail Extension, City of Dubuque, Iowa. Compiled successful grant applications garnering almost $1 million in funds for City bike/hike trail system and riverfront development efforts. Facilitated design and development of Heron Pond Wetland Nature Trail.

Vineyards Specific Plan, City of Vista, California. Provided biological resource mapping, general wildlife survey, coast live oak mapping using GPS, and impact analysis pursuant to CEQA.

Target Commercial Center, City of Vista, California. Assisted with a delineation of "waters of the United States" and wetlands under the jurisdiction of the US Army Corps of Engineers and California Department of Fish and Game on approximately 20 acres.

Valley Sanitary District Expansion Plans, Indio, California. Documented and reported on biological impacts associated with the Valley Sanitary District's expansion plans, which affect riparian habitat and sensitive bird species, including a burrowing owl observed on site. The biological report dealt with ways to minimize and avoid impacts to this burrowing owl, a probable resident of the project property.

Bark Beetle Infestation Project, Southern California Edison, California. Monitored removal of pine trees killed by bark beetle infestation in San Bernardino Forest to ensure that logging practices minimized and avoided impacts to resources.

Sorrento Valley Utilities Improvement Project, San Diego, California. Monitored removal of irrigation equipment in revegetated salt marsh and riparian area.

Hale Avenue Resource Recovery Facility (HARRF) Project, City of Escondido, California. Assisted with long-term monitoring of revegetation plans for the HARRF project, which included plant identification along established transects.

KAMARUL MURI
Biologist/Environmental Specialist

EDUCATION

B.S., Ecology Behavior and Evolution, University of California, San Diego, 2001

REGISTRATION/CERTIFICATIONS

US Fish and Wildlife Service Quino checkerspot 10(a) Permit # TE051250-0; issued 3/04/2002, expires 03/03/2006

California Department of Fish and Game Rare, Threatened and Endangered Plant Voucher Collecting Permit # 05077; issued 3/10/2003, expires 3/10/2006.

EXPERIENCE

Mr. Muri has more than two years experience as a consultant and field biologist through involvement in a wide array of projects in San Diego, Riverside, Orange, Los Angeles and San Bernardino Counties. Project experience includes biological resource surveys; data collection and analysis; California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation; environmental assessments; wetlands permitting, mitigation design and monitoring; and endangered species surveys. Projects include issues relative to the California Coastal Act, the California Fish and Game Code, the federal Clean Water Act (Sections 401 and 404), the Rivers and Harbors Act, the Coastal Zone Management Act, the Migratory Bird Treaty Act, federal Endangered Species Act (fESA) and state Endangered Species Act (sESA). Mr. Muri currently holds a federal permit to conduct surveys for the federally-listed endangered adult Quino checkerspot butterfly and is working towards obtaining a permit to conduct surveys for the federally-listed threatened coastal California gnatcatcher.

PROFESSIONAL ASSIGNMENTS

Rancho Santa Fe Road Realignment and Bridge Construction Project, City of Carlsbad, California. Conducting biological monitoring of construction and ensuring compliance with resource permits during construction of the project. Resource permits issued for the project involve the federally-listed threatened coastal California gnatcatcher and wetlands regulated by the California Department of Fish and Game, the U.S. Army Corps of Engineers and the California Regional Water Quality Control Board. Also assisted with breeding season surveys to monitor nesting activity of gnatcatcher pairs located adjacent to the project.

Oceanside to Escondido Bikeway Project, North County Transit District, Cities of Vista and San Marcos, California. Monitored the removal of wetlands vegetation associated with construction activities for the project.

Salt Creek Channel Widening Project, Riverside County Flood Control and Water Conservation District, Riverside County, California. Conducted surveys of an existing smooth tarplant population to identify areas most suitable for translocation in support of a channel widening project. Helped to prepare specifications for the translocation effort and coordinated seed collection.

Perris Valley Lateral 'B' Stage 2 Project, Riverside County Flood Control and Water Conservation District, Riverside County, California. Conducted biological resource mapping, a delineation of jurisdictional wetlands and prepared a biological resources technical report in support of the channel widening project. Project impacts to jurisdictional areas were processed with a joint permit application for compliance with Section 1600 of the California Fish and Game Code, Sections 401and 404 of the federal Clean Water Act (CWA). Compliance with Section 404 of the federal CWA was achieved through the use of several Nationwide Permits for project-related improvements to roads and utilities.

Non-potable Water Distribution System Project, Yucaipa Valley Water District, Riverside and San Bernardino Counties, California. Conducted vegetation mapping and a jurisdictional wetlands delineation within a six-mile study area along San Timoteo Creek and evaluated impacts to undeveloped areas over approximately 200,000 linear feet of proposed non-potable water pipeline. Documents prepared in support of the project include a biological resources technical report and wetlands permit applications. Provided assistance in preparing the Draft Environmental Impact Report/ Environmental Impact Statement in accordance with the California Environmental Policy Act and the National Environmental Protection Act. Used aerial photographs to estimate historical vegetation density within San Timoteo Creek over a 42-year period to support the design of a Habitat Monitoring Program based on adaptive management principles.

San Diego Pipeline No. 6, Metropolitan Water District of Southern California, Riverside County, California. The project consists of a 30-mile nine-foot diameter water conveyance pipeline. Mr. Muri provided assistance in conducting habitat assessments for sensitive and federally-listed wildlife species.

Bark Beetle Tree Removal Project, Southern California Edison, San Bernardino, San Gabriel, and Santa Rosa Mountains, California. Conducting wildlife surveys, botanical surveys, habitat assessments and surveys for sensitive and U.S. Forest Service Threatened, Endangered, and Sensitive species throughout the San Bernardino, San Gabriel and Santa Rosa Mountains along Southern California Edison power line routes. The surveys are supporting implementation of a Bark Beetle tree removal project along existing power lines within Riverside and San Bernardino County.

Southern California Edison Utility Pole Maintenance Project, San Bernardino and San Gabriel Mountains, California. Monitored pole maintenance activities in biologically sensitive areas to ensure avoidance of impacts to potentially-occurring sensitive and U.S. Forest Service Threatened, Endangered and Sensitive species.

Cathedral High School Project, Catholic Diocese of San Diego, City of San Diego, California. Processed wetlands permitting package for the high school project to obtain authorization for impacts to jurisdictional waters under Section 401/404 of the federal Clean Water Act and Section 1603 of the California Fish and Game Code. Also responsible for monitoring construction and ensuring compliance with resource permits during construction of the project.

Beach Street Project, Taylor Woodrow Homes, City of Encinitas, California. Project manager for an 8.3-acre single- and multi-family residential development project on Requeza Street in the City of Encinitas. Conducted biological surveys and prepared a biological resources technical report to support environmental processing of the project pursuant to CEQA. Other tasks managed as part of the project included gaining approval from the City and the California Department of Fish and Game for encroachment into the 50-foot wetlands buffer required according to City guidelines, preparing an application for a Section 1603 Streambed Alteration Agreement to authorize habitat enhancement activities within wetlands onsite, and coordinating the completion of pre-construction nesting bird surveys.

El Apajo Estates Development Project Sensitive Amphibian Surveys, Rancho Santa Fe, California. Assisted with nocturnal relocation surveys for sensitive toad species on the 40-acre El Apajo development property located along the San Dieguito River in Rancho Santa Fe.

Mediterranean Village Residential Development, City of San Diego, California. Provided biological resource mapping, wetlands delineation, and impact analysis pursuant to CEQA.

Trabuco Canyon Private Residence Project, County of Orange, California. Conducted general biological reconnaissance surveys and focused surveys for California gnatcatcher within an undeveloped property near Trabuco Canyon in southern Orange County. Preparing a biological resources technical report to support development permit application.

Costa Del Sol Project, Barratt American, City of San Diego, California. Monitoring construction activities adjacent to sensitive native habitats to be preserved within the Multiple Habitat Planning Area of the City of San Diego's Multiple Species Conservation Program.

White Horse Estates Project, Barratt American, City of San Diego, California. Monitoring construction activities adjacent to sensitive native habitats to be preserved within the Multiple Habitat Planning Area of the City of San Diego's Multiple Species Conservation Program.

Newhall Ranch Rare Plant Surveys, Newhall Ranch and Farming Company, Los Angeles and Ventura Counties, California. Conducted focused surveys for the state-listed endangered San Fernando Valley spineflower and other sensitive plants on approximately 6,000 acres in 2002 and 14,500 acres in 2003. In addition, collected San Fernando Valley spineflower seed from nine occurrences on Newhall Ranch.

Western Riverside County Multiple Species and Habitat Conservation Plan, County of Riverside, Calfornia. Assisted in the document research and preparation of species accounts for endangered, threatened, sensitive and other key species in the County of Riverside.

RELEVANT EXPERIENCE

Attended San Diego Natural History Museum class "Sensitive Butterflies of San Diego County" in December, 2003. The class specialized in the biology and identification of the nine most sensitive butterfly species in San Diego County.

Attended Association of Environmental Professionals "CEQA Basics" seminar in November, 2003.

Attended Building Industry Association seminar on Storm Water Sampling and Analysis Strategy in March, 2003.

CHRISTOPHER E. OESCH
Habitat Restoration Specialist

EDUCATION

M.S., Environmental Systems; International Development Technology Humboldt State University Arcata, California, 2003
B.A., International Agriculture, Eastern Mennonite University, 1998

THESIS WORK

Mr. Oesch's thesis work focused on Hardscape Stream Channel Naturalization. The thesis examines modification of cement channelized stream sections, commonly found in urban settings, for mitigating their negative impacts to native plant and animal populations. This is achieved by incorporating aspects of natural stream hydrology and morphology into an existing hardscape channel. This approach is intended for improving habitat in existing hardscape channels when total removal of the hardscape structure is not an option. The thesis was modeled for the hardscape channel west of I-5 on Rose Creek, San Diego, California.

EXPERIENCE

Upon completing his Bachelors degree in International Agriculture, Mr. Oesch worked on sustainable agriculture restoration and development projects in Guatemala and Honduras. He has recently completed graduate research in hardscape urban wetland restoration modeled for Rose Creek in San Diego, California. He is currently working on a variety of habitat restoration projects at DUDEK involving freshwater marsh, salt marsh, riparian, urbanized/disturbed, chaparral, stream channel, and coastal sage scrub habitats.

PROFESSIONAL ASSIGNMENTS

Lake Val Sereno/La Jolla Crossroads Off-Site Mitigation, Encinitas, California. Project monitor for the La Jolla Crossroads off-site mitigation located at Lake Val Sereno. This project involves the enhancement of 5.37 acres of freshwater wetland to fulfill the requirements of agency permits ACOE NWP-12, CDFG 1601 agreement and RWQCB 401 certification. Duties include advising on the removal of exotic and invasive plant species, documenting progress of planted native plants, collecting quantitative transect data, and recommending courses of action to improve site success in meeting performance standards.

Famosa Slough Saltmarsh/ Sorrento Creek Dredging Mitigation, San Diego, California. Author of the conceptual plan for a .5 acre enhancement area of saltmarsh. This enhancement is to fulfill mitigation requirements from the Sorrento Creek Maintenance Dredging performed by City of San Diego, Engineering and Capital Projects Department. This project is designed to fulfill the criteria of permits CDFG 1601 and ACOE 404. The enhancement area will include middle and lower saltmarsh plant species, bordered by a coastal sage scrub habitat buffer strip.

Poggi Creek Streambed Modification, Chula Vista, California. Conceptual plan designer for a streambed erosion control project. This grade control structure design uses a low-profile, biodegradable approach to avoid being classified as "channel fill". The intended purpose is to prevent streambed scour, encourage sediment deposition, and promote native freshwater plant species establishment.

Torrey Hills Basin Wetland Mitigation, San Diego, California. Project monitor for site involving the creation of approximately 3 acres of wetland habitat to mitigate for impacts of the adjacent Torrey Hills housing development. His duties include advising on the removal of exotic and invasive plant species, documenting progress of planted native plants, collecting quantitative transect data, and recommending courses of action to troubleshoot hydrologic adversities in the performance of the basin's morphology.

Meadowbrook Villages Development Wetland Mitigation Project, Escondido, California. Assisted in design of the stormwater detention/ wetland creation basin for a retirement development. The basin created opportunity for onsite wetland mitigation as well as provided increased stormflow storage capacity along Reidy Creek to prevent flooding. Also assisted in preliminary soil sampling and biotic surveying.

Las Virginas Creek Hardscape Naturalization Proposal, Los Angeles, California. Assisted in a proposal for the naturalization of a section of concrete hardscape channel along Los Virginas Creek (see thesis work). Goals of the naturalization would be to create sediment deposition sufficient to grow wetland plant species, add topography to the channel bottom and sides which would encourage a more natural hydrologic regime, and to achieve these goals while passing floodwater efficiently as to not promote flooding.

Vista Sorrento Parkway Alkali Marsh Mitigation Project, San Diego, California. Biological monitor for the project. This includes collecting transect data, recommendations on weed removal and native plant mortality. The project entails creation/enhancement of 1 acre of coastal sage scrub, mulefat scrub, and salt marsh habitats as mitigation for impacts from the Caltrans ROW project.

Los Penasquitos Lagoon Saltmarsh Mitigation Project, San Diego, California. Assisted in the monitoring of native saltmarsh and coastal sage scrub habitat including transect data collection, advisement on remedial plantings, and non-native plant removal.

Rolling Hills Ranch Wetland Mitigation Project, Chula Vista, California. Assisted in annual monitoring efforts and transect data collection for 2 acres of created wetland habitat. This creation area was in mitigation for the surrounding Rolling Hills Ranch housing development.

Green Valley Mobile Home Park Slope Stabilization Project, Vista, California. Project monitor for stream-side mitigation project which includes freshwater marsh, riparian and disturbed habitats. This project is designed to fulfill requirements of CDFG 1603 and ACOE 404 permits. Mitigation was triggered when the mobile home park owners placed riprap along the stream banks covering freshwater marsh habitat and disturbing hydrology. Monitor duties include: recommendations on weed removal, native plantings and general maintenance.

Summit Ridge Business Park Mitigation Project, San Diego, California. Biological monitor for 10 acres of coastal sage scrub, with a 1 acre freshwater marsh component. This project is mitigation for the development of the Summit Ridge Business Park. Monitoring duties include biotic surveys, transect data collection, weed removal recommendations, and native planted species survival.

Newhall Ranch *Chorizanthe* Seed Collection, Santa Clarita, California. Participated with a team of biologists collecting seed of the rare and endangered *Chorizanthe perryi fernadina* (spineflower). Polygons of spineflower locations were GPSed and mapped. Teams then returned to collect seed.

Rose Creek/Nature School Habitat Enhancement Plan, San Diego, California. Mapped 13 acres of the Rose Creek riparian corridor directly east I-5. Plants and habitat locations were GPSed and a biotic survey was taken.

Agricultural Support/Development Project, El Peten, Guatemala. Coordinated an agricultural support and development project for several Mayan Indigenous communities in the Peten region of Guatemala. This involved working with government officials for importation of agricultural supplies from Belize, traveling between site locations and exploring possibilities for reestablishing crops. The project was necessitated by crops lost to fire and drought.

Carroll Canyon Emergency Maintenance Sewer Project, San Diego, California. Assisted in designating access routes around sensitive habitat for Metropolitan Wastewater vehicles to gain access to sewer clean-out locations.

Sorrento Valley Utilities Revegetation, San Diego County, California. Monitored work crews in the removal of non-native plant species in biologically sensitive saltmarsh, freshwater marsh, and coastal sage scrub habitats.

Sorrento Creek Maintenance Dredging Project, San Diego, California. Monitored City of San Diego work crews in removal of sediment from the channel bottoms of Carroll Canyon, Los Peñasquitos, and Sorrento creeks. Monitoring was to insure the least possible impacts to

surrounding vegetation, aquatic and terrestrial animal habitats. The project site contained potential Clapper rail (*Rallus longirostris*) habitat, which required flushing prior to beginning work in the channel areas. Duties also included: water samples taken daily and tested for total suspended solids (TSS) to ensure that discharge downstream of the project met TSS level requirements.

Tecolote Canyon Tree-of-Heaven Removal Project, San Diego, California. Monitored work crews in removal of tree-of-heaven (*Ailanthus altissima*) and other exotics from a section of Tecolote Canyon. Duties included: advisement of routes of least impact to surrounding native habitats, felling trees, and cut biomass dispersal.

ANUJA K. PARIKH
Principal Ecologist, FL*x*

EDUCATION AND CERTIFICATIONS

Ph.D., Plant Geography, University of California, Santa Barbara, 1989.
M.S., Geography, University of Bombay, India, 1981.
B.S., Zoology and Geology, University of Bombay, India, 1979.
PWS, Certified Professional Wetland Scientist #841, Society of Wetland Scientists, 1995.

SUMMARY OF QUALIFICATIONS

Dr. Parikh has years of field and research experience in the areas of botany, plant ecology, wetlands, biogeography, and earth resources. Her work has included environmental baseline inventories and impact assessments, rare and endangered plant species surveys, revegetation and mitigation plans, restoration and monitoring of native upland and wetland habitats, and coast live oak revegetation studies. She has expertise in field vegetation sampling, plant species identification, wetland delineation, and the collection of physical environmental data. Using aerial photography and field surveys, she has prepared vegetation maps based on classification and quantification of plant communities in a variety of habitats; she also has mapped environmental constraints, incorporating data on sensitive species, natural habitats, and physiographic and man-made features. Dr. Parikh is experienced with experimental design as well as processing and analyzing ecological data using statistical and graphics software.

EXPERIENCE

Vegetation and Rare Plant Surveys and Wetlands Delineations, Ventura and Los Angeles Counties, CA. Impact Sciences, Inc. Vegetation surveys and mapping of plant communities, rare plant surveys, field wetland surveys, delineation of jurisdictional wetlands, and report preparation for more than 30 sites in various locations in Ventura and Los Angeles counties.

Peacekeeper Rail Garrison Mitigation Program, San Antonio Terrace, Vandenberg AFB, CA. U.S. Air Force and The Earth Technology Corporation. Project biologist responsible for directing, planning, and implementing biological field activities related to wetlands creation, upland habitat restoration, coast live oak revegetation, and vegetation monitoring for all mitigation and restoration sites.

Vegetation Mapping and Plant Species Surveys. Santa Barbara County, CA. Vegetation mapping using aerial photographs of riparian communities along the Santa Ynez River, Santa Barbara County; field vegetation and topographical data collection from transects, species

identification, rare and endangered plant species surveys, and report preparation for the County Flood Control District.

Rare and Endangered Plant Species Surveys. California Department of Water Resources. Rare and endangered plant species identification and mapping along a proposed aqueduct route in the Lompoc and Lake Cachuma areas in Santa Barbara County, and near Santa Margarita, San Luis Obispo County; field verification, ground truthing and mapping of vegetation communities along the Santa Ynez River, CA.

Rare and Endangered Plant Species Surveys. Metropolitan Water District and ERC Environmental and Energy Services Co. Plant species identification and sensitive plant species surveys at proposed reservoir and mitigation sites (Potrero Creek, Harford Springs, Crown/Rawson Valleys, Motte Rimrock Reserve, Domenigoni Valley, Santa Rosa Plateau Preserve, Lake Skinner, and Vail Lake) for the Metropolitan Water District's Eastside Reservoir Project, Riverside County, CA.

Floristic and Vegetation Surveys. U.S. Department of Agriculture, Forest Service. Preparation of floras and vegetation surveys in the Los Padres National Forest at Mt. Pinos, a lower subalpine community in Ventura and Kern counties, and at Alder Creek Botanical Area, Monterey County, CA. Identification of plant species and collection of vegetation and site data in permanent plots established in blue oak woodland in San Luis Obispo County, CA, as part of a Forest Service project on vegetation and habitat inventory and classification.

Wetland Vegetation Surveys, Mapping, and Monitoring. Dames & Moore. Vegetation mapping using aerial photographs, calculations of riparian habitat acreages, and field botanical surveys for a land development project along the Santa Clara River, Los Angeles County, CA. Biological construction monitoring for an archaeological site investigation in the Los Carneros wetlands, Goleta, CA. Field surveys and mapping of wetlands and vernal pools at Beale AFB, CA.

Rare and Endangered Plant Species Surveys and Vegetation Mapping. Jones and Stokes Associates, Inc. Field surveys for rare and endangered plant species at the proposed Los Vaqueros Reservoir site near Livermore, Contra Costa and Alameda counties, CA, and along ephemeral drainages near Taft in the Central Valley, Kern County, CA, for a project involving clean-up of oil and brea deposits. Habitat mapping and field surveys of riparian vegetation and plant species on transects along the Lower Ventura River, for an aquatic biology survey.

Ecological Survey Reports for Candidate Research Natural Areas. U.S. Department of Agriculture, Forest Service. Field work, literature reviews, and document preparation for the

San Emigdio Mesa and Sawmill Mountain Candidate Research Natural Areas, Los Padres National Forest, Ventura County, CA.

Santa Barbara County Oak Restoration Program. University of California, Santa Barbara. Plant identification and vegetation monitoring in savanna and woodland habitats of blue oak, valley oak, and coast live oak, for the long-term assessment of cattle grazing impacts on oak seedling recruitment at Sedgwick Ranch, Santa Barbara County, CA.

Controlled Burn Monitoring, Vandenberg AFB. U.S. Air Force and Museum of Systematics and Ecology, University of California, Santa Barbara. Pre-burn monitoring of vegetation and plant species in coastal sage scrub and chaparral at two prescribed burn sites, South Vandenberg AFB.

Rare Plant Census. All American Pipeline, L.P. Rare plant monitoring census for Gaviota tarplant (*Hemizonia increscens* ssp. *villosa*) in permanent plots established at Gaviota, CA.

Ventura River Estuary Enhancement Project. California Department of Parks and Recreation. Design and implementation of a five-year vegetation monitoring program for restoration efforts at Emma Wood State Beach, Ventura County, CA. The project involves monitoring four vegetation types: willow-cottonwood forest, saltbush scrub, dune scrub, and foredune vegetation. Activities include botanical surveys, survival and growth surveys, photo documentation, data collection and comparative analysis of natural and revegetated areas, evaluation of exotics eradication, and recommendations for ongoing restoration.

Restoration Planning and Implementation, Former Guadalupe Oil Field, San Luis Obispo County, CA. Unocal Corporation. Preparation and implementation of site-specific restoration plans, including the development of revegetation specifications, monitoring methods, performance criteria, and performance evaluation.

Restoration Plans for Installation of VTS Fiber-Optic Cable System, Honda Ridge Road Repair, and El Rancho Road Bridge Project, Vandenberg AFB. U.S. Air Force and Tetra Tech, Inc. Preparation of restoration plans including sections on ecological background, revegetation measures, monitoring and maintenance methods, performance criteria for assessing success, and restoration schedule for sites at North and South Vandenberg AFB.

Implementation of Restoration Plans, South Base and VTS Fiber-Optic Cable Systems, Vandenberg AFB. U.S. Air Force and Foster Wheeler Environmental Corp. Native plant species restoration, long-term monitoring, and restoration evaluation at four sites at Vandenberg AFB, CA.

Vernal Pool Restoration Monitoring, Isla Vista, CA. Isla Vista Recreation and Park District. Vegetation monitoring, data analysis, and publication preparation for a 10-year assessment of restored and created vernal pools at the Del Sol Open Space and Vernal Pool Reserve.

UCSB Campus Lagoon Wetland Restoration. The Herbarium, Museum of Systematics and Ecology, University of California, Santa Barbara. Design of a five-year vegetation monitoring program for wetland plant communities restored at the UCSB Campus Lagoon, Santa Barbara County, CA, as required by the Streambed Alteration Agreement of the California Department of Fish and Game. The monitoring project included plant species identification, vegetation sampling, data analysis, photo documentation, and report preparation.

Integrated Natural Resources Management Plan, Vandenberg AFB. U.S. Air Force and Tetra Tech, Inc. Principal ecologist responsible for preparing sections on existing conditions, issues of concern, and management objectives for vegetation, wildlife, and wetland resources for a basewide five-year plan.

Natural Resources Surveys and Environmental Assessments, Vandenberg AFB. U.S. Air Force and Tetra Tech, Inc. Principal environmental scientist responsible for conducting field surveys and preparing report sections for vegetation, wildlife, and wetland resources for 17 environmental assessments of facility and infrastructure development projects, and for an EIS on San Antonio Creek.

Natural Resources Management Plans. U.S. Air Force and Higginbotham/Briggs & Associates. Participation in data collection, field visits, agency coordination, document preparation and review for Natural Resources Management Plans prepared for Kaena Point Satellite Tracking Station, HI, and Onizuka AFB, CA.

Recovery Plan for Two Federally Endangered Plant Species. U.S. Fish and Wildlife Service. Ecologist and principal author responsible for background research and all botanical elements of the recovery plan for marsh sandwort (*Arenaria paludicola*) and Gambel's watercress (*Rorippa gambelii*).

Implementation of Recovery Activities for Two Federally Endangered Plant Species. California Department of Fish and Game and University of California. Research on species biology and ecology, plant propagation, experimental establishment of new populations, and monitoring of existing and new populations of marsh sandwort (*Arenaria paludicola*) and Gambel's watercress (*Rorippa gambelii*). Reporting of species and habitat status and progress of recovery activities.

Wetlands Management Plan. Department of Geography and Campus Wetlands Committee, University of California, Santa Barbara. Field and literature surveys of hydrology and sedimentation of the campus-owned wetland resources in Devereux Slough and the Storke Campus wetlands.

Goleta Revitalization EIR/EIS. County of Santa Barbara Planning and Development. Wetland delineations at sixteen creek crossings and plant surveys for street extensions, bike paths and a multipurpose trail.

Plant Surveys and Wetland Delineations for Five Land Parcels, Isla Vista, CA. County of Santa Barbara Planning and Development. Field surveys and report preparation for botanical and wetland resources, including jurisdictional wetland delineations and mapping, in coastal mesa vernal pool habitat along Del Playa Drive, Isla Vista.

Biological Monitoring, Environmental Quality Assurance Program (EQAP), Santa Barbara County, CA. Storrer Environmental Services. Biological monitoring for the Level (3) fiber-optic cable installation project, and for the All-American Pipeline relocation at Gaviota Creek.

Watershed Surveys. U.S. Department of Agriculture, Forest Service. Geomorphological, botanical, and hydrological field work in preliminary watershed surveys in Santa Barbara and Ventura counties, CA.

Vegetation Surveys and Analysis. The Herbarium, Department of Biological Sciences, University of California, Santa Barbara. Plant species identification and vegetation sampling in upland and wetland areas for baseline data inventory of botanical resources and rare plants at Fish Slough, Inyo and Mono counties, CA. Project design and field surveys of topography, riparian vegetation, and plant species in the Ventura River estuary, Ventura County, CA; computer graphics, analysis, and document preparation of environmental relationships and distribution of species and vegetation communities. Computer analysis for a project on the botanical wetland resources of the Carpinteria salt marsh, Santa Barbara County, CA.

Research Activities. Department of Geography, University of California, Santa Barbara. Sampling and monitoring regeneration of tree and herbaceous species in the riparian zone of a chaparral watershed recovering from wildfire (N. Fork Matilija Creek, Ventura County); topographic channel surveys, computer plotting, ecological and botanical field, laboratory and greenhouse experiments, literature review, and data analysis. Vegetation sampling, inventory and analysis, and topographical surveys in chaparral ecosystems and oak woodlands in Burton Mesa chaparral, Santa Barbara County. Field sampling in coniferous forests of the Mendocino National Forest Reserve, CA.

MEMBERSHIPS

California Native Plant Society; Society of Wetland Scientists; Society of Ecological Restoration; California Botanical Society.

SELECTED PUBLICATIONS AND REPORTS

"Coast Live Oak Revegetation on the Central Coast of California," (with N. Gale), *Madroño*, 45(4), 1998, 301-309.

"Vegetation Monitoring of Created Dune Swale Wetlands, Vandenberg Air Force Base, California," (with N. Gale), *Restoration Ecology*, 6(1), 1998, 83-93.

"Review of Ten Years of Vernal Pool Restoration and Creation in Santa Barbara, California," (with W.R. Ferren Jr., D.M. Hubbard, S. Wiseman, and N. Gale), in C.W. Witham, E.T. Bauder, D. Belk, W.R. Ferren Jr., and R. Ornduff (Eds.) Ecology, Conservation, and Management of Vernal Pool Ecosystems, Proceedings from a 1996 Conference, California Native Plant Society, Sacramento, CA, 1998, 206-216.

"Peacekeeper Rail Garrison and Small ICBM Mitigation Program, San Antonio Terrace, Vandenberg AFB, California Annual Wetlands Monitoring Report, Annual Upland Monitoring Report, Year 5," Prepared for the U.S. Department of the Air Force, Detachment 10, Space and Missile Systems Center, San Bernardino, CA, February 1996.

"Vegetation Monitoring of Created Wetland Sites on the San Antonio Terrace, Vandenberg Air Force Base, California," (with N. Gale), in M.C. Landin (Ed.) Proceedings of the National Interagency Workshop on Wetlands: Technology Advances for Wetlands Science, Technical Report, Wetlands Research and Technology Center, U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS, 1995, 153-55.

"Recovery Plan for Marsh Sandwort (*Arenaria paludicola*) and Gambel's Watercress (*Rorippa gambelii*)," (with N. Gale), U.S. Fish and Wildlife Service, Ventura, CA, August 1994.

"Wetland Creation and Vegetation Monitoring in a Stabilized Sand Dune Ecosystem, San Antonio Terrace, Vandenberg Air Force Base, California," (with N. Gale and T. Waddell), in M.C. Landin (Ed.) Proceedings of the 13th Annual Meeting of the Society of Wetland Scientists (SWS), New Orleans, LA, 1993, 368-76.

"First-Year Vegetation Monitoring of Created Wetlands on the San Antonio Terrace, Vandenberg Air Force Base, California," (with N. Gale and T. Waddell), in A.E. Leviton

and M.L. Aldrich (Eds.) Proceedings of the Pacific Division, American Association for the Advancement of Science, University of California, Santa Barbara, June 1992, p. 46.

"Biotic Inventory and Ecosystem Characterization for Fish Slough, Inyo and Mono Counties, California," (with the Fish Slough Research Team), Report to State of California, The Resources Agency, Department of Fish and Game, by the Departments of Biological Sciences, Geography, and Geological Sciences, University of California, Santa Barbara, June 1991.

"Ecology of a Mediterranean-Climate Estuarine Wetland at Carpinteria, California: Plant Distributions and Soil Salinity in the Upper Marsh," (with R. Callaway, S. Jones, W. Ferren), *Canadian Journal of Botany*, 68, 1990, 1139-1146.

"Botanical Resources at Emma Wood State Beach and the Ventura River Estuary, California: Inventory and Management," (with W. Ferren, M. Capelli, D. Magney, K. Clark, and J. Haller), Report to the State of California Department of Parks and Recreation, Environmental Report No. 15, The Herbarium, Department of Biological Sciences, University of California, Santa Barbara, August 1990.

"UCSB Campus Wetlands Management Plan, Part IICTechnical ReportCHydrology, Water Quality, and Sedimentation of West and Storke Campus Wetlands," (with F. Davis, D. Theobald, and R. Harrington), Report to the California Coastal Conservancy and Campus Wetlands Committee, University of California, Santa Barbara, CA, 1990.

"Recovery of the Chaparral Riparian Zone After Wildfire," (with F. Davis, E. Keller, and J. Florsheim), Proceedings of the California Riparian Systems Conference, September 22-24, 1988, Davis, CA, Protection, Management, and Restoration for the 1990s, Gen. Tech. Rep. PSW-110, U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, 1989, 194-203.

"Plant Communities and Flora of the Proposed Botanical Reserve on Mt. Pinos, Ventura and Kern counties, CA," (with D. Capralis), Survey Report, U.S. Department of Agriculture, Forest Service, Los Padres National Forest Headquarters, Goleta, CA, August 1988.

"Terrestrial Vegetation of Rattlesnake Canyon," (with F. Davis), Proceedings of the Chaparral Ecosystems Research Conference, Santa Barbara, CA, Report No. 62, California Water Resources Center, University of California, Davis, CA, 1986, 13-17.

PATRICIA SCHUYLER
Biologist

EDUCATION AND CERTIFICATIONS

MS Environmental Science, Washington State University, 2005
BA Environmental Studies, University of Redlands, 2003
AA Business Administration, MiraCosta College, 2001

EXPERIENCE

San Marcos Unified School District. Permit preparation including Section 404 Nationwide Permit, Section 401 Water Quality Certification, and Section 1601 Streambed Alteration Agreement; assisted in permit processing, mitigation identification, and development of a conceptual wetlands mitigation plan.

Vista Unified School District. Permit preparation including Section 404 Nationwide Permit, Section 401 Water Quality Certification, and Section 1601 Streambed Alteration Agreement.

Southern California Edison Utility Pole Maintenance Project, San Bernardino Mountains, California. Monitored tree removal and pole maintenance activities in biologically sensitive areas to ensure avoidance of impacts to potentially-occurring sensitive and US Forest Service Threatened, Endangered, and Sensitive species. Preparation of Biological Assessments and Biological Evaluations associated with pole replacement activities.

City of San Marcos, Barham Drive Widening Project, City of San Marcos, California. Permit preparation including Section 404 Nationwide Permit, Section 401 Water Quality Certification, and Section 1601 Streambed Alteration Agreement.

Oceanside to Escondido Rail Project, North County Transit District (NCTD), Cities of Oceanside, Vista, San Marcos, and Escondido and County of San Diego, California. Surveyed for potential oak tree habitat in conformance with the mitigation plan.

Brown-Headed Cowbird Trapping Program, Oceanside to Escondido Rail Project, NCTD, City of Oceanside, California. Assisted in the daily operation and maintenance of a cowbird trapping program along Loma Alta Creek in the City of Oceanside. The trapping program is a USFWS requirement as mitigation for impacts to habitat for federally-listed species, including least Bell's vireo, southwestern willow flycatcher, and California gnatcatcher.

Mid-County Parkway, County of Riverside, California. Assisted in fairy shrimp surveys for potential alignment alternative study for a proposed 32-mile transportation corridor. Surveys for burrowing owl habitat currently in progress.

Newhall Specific Plan, Newhall Land and Farming, Inc., Counties of Los Angeles and Ventura, California. Conducted focused surveys for sensitive plant species, including the state-listed San Fernando Valley spineflower.

Otay Ranch, Chula Vista, California. Rare plant survey.

City of San Diego Metropolitan Wastewater Department (MWWD) As-Needed Biologist, City of San Diego, California. Assisted in the preparation of a biological resources technical report for a MWWD project involving necessary sewer line maintenance.

Non-Potable Water Distribution System Project, Yucaipa Valley Water District, Riverside and San Bernardino Counties, California. Conducted a jurisdictional wetlands delineation within a six-mile study area along San Timoteo Creek. Assisted in the preparation of a biological resources technical report and wetland permit applications.

Sorrento Valley Utilities Improvement Revegetation Project, City of San Diego, California. Monitored the removal of irrigation equipment used for wetlands creation and enhancement efforts.

Ferber Ranch, County of Orange, California. Conducted vegetation mapping and wetlands delineation for additional parcels. Surveys for burrowing owl habitat currently in progress.

SARA TOWNSEND
Biologist

EDUCATION AND CERTIFICATIONS

MA Marine Affairs and Policy, Rosenstiel School of Marine and Atmospheric Science, University of Miami, 2002
BS Ecology and Evolution, University of California, Santa Barbara, 1996
BA Environmental Studies, University of California, Santa Barbara, 1996
Marine Naturalist, University of Hawaii, 1997

EXPERIENCE

Newhall Specific Plan, Newhall Land and Farming, Inc., Counties of Los Angeles and Ventura, California. Conducted spineflower surveys and mapping to estimate population and location. Carried out non-random stratified sampling to evaluate the monitoring methods proposed in the Spineflower Conservation Plan.

Otay Ranch Specific Plan Area, Otay Ranch, City of Chula Vista, California. Drafted least Bell's vireo and willow flycatcher survey reports.

Monet (Bryn Glen) Wetland Mitigation and Revegetation Project, City of San Diego, California. Conducted habitat monitoring to assess the status of a mitigation project.

St. Jerome's Church Project, City of San Diego, California. Drafted permit applications for the US Army Corps of Engineers, California Department of Fish and Game, and California Regional Water Quality Control Board.

Simpson Farms Project, County of San Diego, California. Conducted census and mapping for *Rhamnus crocea* (redberry buckthorn). Library research for published literature documenting life history traits of the Hermes copper butterfly.

Environmental Consulting Services, Target Commercial Center Project, City of Vista, California. Drafted species survey reports for least Bell's vireo and willow flycatcher.

Fallbrook Ranch Project, County of San Diego, California. Drafted species survey report for the California gnatcatcher survey report.

Environmental Consulting Services for Proposed Dialysis Center, City of Vista, California. Drafted species survey reports for least Bell's vireo.

Environmental Consulting Services, Mitsuuchi Parcel, City of Carlsbad, California. Assisted with vegetation mapping and drafted a biological resources letter report for the client.

Hillhaven Ranch Biological Services Project, City of Laguna Beach, California. Assisted with vegetation mapping and drafted a biological resources letter report for the client.

Research Assistant, Natural Resources Defense Council, Santa Monica, California. Independent research of international naval sonar exercises and impacts to marine species. Investigated possible mitigation measures. Ms. Townsend's analysis was included in court filings and her policy recommendations are currently being used in arbitration. Determined if an Environmental Assessment prepared by the Minerals Management Service complied with NEPA and Section 7 ESA requirements. Updated portions of outreach publications. Acquired industry data to create the first worldwide map of seismic survey hotspots. October 2004 – August 2005.

Research Assistant, Heal the Bay, Santa Monica, California. Independent review and analysis of the California Performance Review Report. Investigated potential impacts to the California Resources Agency. Ms. Townsend's research revealed the many oversights and errors in the CPR. Primary author of formal submission. Volunteer certified public speaker on water quality issues. August–October 2004.

Lead Campaigner, International Fund for Animal Welfare, Yarmouth Port, Massachusetts. Implemented strategic plans for three campaigns spanning 13 country offices. Facilitated successful communication among campaign co-workers and ensured deadlines were met. Produced comment papers, reports, articles, press releases, and web content regarding elephants, sea turtles, and illegal wildlife trade. Created protocol and managed worldwide distribution of quarterly publication. March 2003 – February 2004.

Science and Policy Analyst, Marine Conservation Biology Institute, Washington, D.C. Tracked status of Pacific groundfish collapse and researched impacts from bottom trawls. Co-authored fact sheets for lobbying an amendment to the Magnuson-Stevens Act (HR 4003). Designed and wrote content for a poster session for the American Fisheries Society annual meeting. July–October 2002.

Fisheries Technician, National Marine Fisheries Service, Southeast Fisheries Science Center, Miami, Florida. Conducted laboratory work to prepare swordfish dorsal fin specimens for age and growth studies. Managed observer data from longline swordfish vessels in the northwestern Atlantic Ocean. Was selected for training to transition database from Access to Oracle. Assisted in training observers for a sea turtle mitigation experiment. April–June 2002.

Research Assistant, Monterey Bay Aquarium (MBA) and Center for Sustainable Fisheries, University of Miami, Miami, Florida. Ms. Townsend's Master's thesis in applied ecology combined fisheries management data and seafood marketing research to guide a consumer awareness program promoting sustainable seafood. Interviewed fishermen, seafood purveyors, managers, and scientists and built a network of contacts. Results were used in the Seafood Watch program of the MBA. June 2001 – April 2002.

Laboratory Technician, Holbrook Lab, Ecology Department, University of California, Santa Barbara, California. Sorted hundreds of samples of marine invertebrates to support research in determining impacts to the benthos from nearby effluent. Selected to use dichotomous keys for species identification. February–December 1996.

Research Assistant, Rocky Mountain Biological Laboratory, Gunnison, Colorado. Assisted in research of the evolutionary ecology of trait variation in tiger salamanders. Surveyed, captured, tagged, and released tiger salamanders and identified stomach contents. June–August 1996.

APPENDIX B

Vascular Plant Species Observed

At Newhall Ranch

(2002, 2003, 2004, 2005)

APPENDIX B
VASCULAR PLANT SPECIES – NEWHALL RANCH

LYCOPODIAE

SELAGINELLACEAE – SPIKE-MOSS FAMILY

Selaginella bigelovii – Bigelow's spike-moss

EQUISETAE

EQUISETACEAE – HORSETAIL FAMILY

Equisetum hyemale – common scouring-rush
Equisetum laevigatum – smooth scouring-rush
Equisetum telmateia – giant horsetail

FILACEAE

AZOLLACEAE – MOSQUITO FERN FAMILY

Azolla c.f. filiculoides – duckweed fern

DENNSTAEDTIACEAE – BRAKEN FAMILY

Adiantum jordani – California maiden-hair
Pellaea andromedifolia – coffee fern
Pellaea mucronata var. *mucronata* – bird's-foot fern
Pentagramma triangularis – goldenback fern

POLYPODIACEAE – POLYPODY FAMILY

Polypodium californicum – California polypody

CONIFERAE

CUPRESSACEAE – CYPRESS FAMILY

* *Cedrus deodara* – Deodar cedar
Juniperus californica – California juniper

PINACEAE – PINE FAMILY

* *Pinus halepensis* – Aleppo pine
* *Pinus pinea* – stone pine

ANGIOSPERMAE (DICOTYLEDONES)

AIZOACEAE – FIG-MARIGOLD FAMILY

* *Aptenia cordifolia* – baby sun-rose
* *Carpobrotus* sp. – sea-fig

AMARANTHACEAE – AMARANTH FAMILY

* *Amaranthus albus* – tumbleweed
Amaranthus blitoides – prostrate amaranth
* *Amaranthus hybridus* – amaranth
Amaranthus palmeri – Palmer's amaranth
Amaranthus powellii – Powell's amaranth
* *Amaranthus retroflexus* – rough pigweed

ANACARDIACEAE – SUMAC FAMILY

Malosma laurina – laurel sumac
Rhus ovata – sugar-bush
Rhus trilobata – squaw bush
* *Schinus molle* – Peruvian pepper-tree
Toxicodendron diversilobum – poison-oak

APIACEAE – CARROT FAMILY

* *Anethum graveolens* – dill
Apiastrum angustifolium – wild celery
* *Apium graveolens* – celery
Berula erecta – cutleaf water-parsnip
Bowlesia incana – American Bowlesia
* *Conium maculatum* – poison hemlock
* *Coriandrum sativum* – cilantro
* *Daucus carota* – Queen Anne's lace
Daucus pusillus – rattlesnake weed
Lomatium utriculatum – common lomatium
Sanicula bipinnata – poison sanicle

APOCYNACEAE – DOGBANE FAMILY

Apocynum cannabinum – Indian hemp
* *Vinca major* – periwinkle

ASCLEPIADACEAE – MILKWEED FAMILY

Asclepias californica – California milkweed
Asclepias fascicularis – narrow-leaf milkweed

ASTERACEAE – SUNFLOWER FAMILY

Achillea millefolium – yarrow
Achyrachaena mollis – blow-wives
Acourtia microcephala – sacapellote
Agoseris grandiflora – large-flowered agoseris
Ambrosia acanthicarpa – annual burweed
Ambrosia confertifolia – weak-leaved burweed
Ambrosia psilostachya – western ragweed
Artemisia californica – coastal sagebrush
Artemisia douglasiana – California mugwort
Artemisia dracunculus – tarragon
Artemisia tridentata – Great Basin sagebrush
Baccharis douglasii – marsh baccharis
Baccharis emoryi – Emory's baccharis
Baccharis pilularis – coyote brush
Baccharis salicifolia – mule fat
Baccharis sarothroides – chaparral broom
Brickellia californica – California brickellbush
Brickellia nevinii – Nevin's brickellbush
* *Carduus pycnocephalus* – Italian thistle
* *Centaurea melitensis* – star thistle
Chaenactis glabriuscula – yellow pincushion
* *Chrysothamnus nauseosus* – rubber rabbitbrush
Cirsium occidentale var. *californicum* – California thistle
Cirsium occidentale var. *occidentale* – cobwebby thistle
* *Cirsium vulgare* – bull thistle
* *Cnicus benedictus* – blessed thistle
Conyza canadensis – horseweed
Conyza coulteri – Coulter's conyza
Coreopsis bigelovii – Bigelow's coreopsis
* *Coreopsis tinctoria* – calliopsis
Corethrogyne filaginifolia – virgate cudweed aster
* *Cotula coronopifolia* – African brass-buttons
Encelia actoni – Acton's encelia

Encelia californica – California bush sunflower
Encelia farinosa – brittlebush, incensio
Ericameria palmeri var. *pachylepis* – goldenbush
Ericameria pinifolia – pine-bush
Erigeron foliosus – leafy daisy
Eriophyllum confertiflorum – long-stem golden yarrow
Euthamia occidentalis – western goldenrod
Filago californica – California fluffweed
* *Filago gallica* – narrow-leaf filago
* *Gazania linearis* – gazania
Gnaphalium bicolor – bicolor cudweed
Gnaphalium californicum – California everlasting
Gnaphalium canescens ssp. *microcephalum* – white everlasting
Gnaphalium leucocephalum – Sonora everlasting
Gnaphalium luteo-album – white cudweed
Gnaphalium sp. *nova* – everlasting
Gnaphalium palustre – lowland cudweed
Hazardia squarrosa ssp. *grindelioides* – saw-toothed goldenbush
Helianthus annuus – common sunflower
Helianthus nuttallii c.f. ssp. *parishii* – Los Angeles sunflower
Hemizonia fasciculata – fascicled tarweed
Hemizonia kelloggii – Kellogg's tarweed
Heterotheca grandiflora – telegraph weed
Heterotheca sessiliflora – golden aster
Isocoma menziesii – goldenbush
Iva axillaris – poverty weed
* *Lactuca saligna* – willowleaf lettuce
* *Lactuca serriola* – prickly lettuce
Lagophylla ramosissima – common hareleaf
Lasthenia californica – coast goldfields
Lepidospartum squamatum – scale-broom
Lessingia filaginifolia – California aster
Lessingia glandulifera – lessingia
Malacothrix saxatilis – cliff malacothrix
* *Matricaria matricarioides* – pineapple weed
Micropus californicus – slender cottonweed
Pluchea odorata – marsh-fleabane
Pluchea sericea – arrow weed

* *Pulicaria paludosa* – Spanish sunflower
Rafinesquia californica – California chicory
Senecio californicus – California butterweed
Senecio flaccidus var. *douglasii* – butterweed
* *Senecio vulgaris* – common groundsel
Silybum marianum – milk thistle
* *Sonchus asper* – prickly sow-thistle
* *Sonchus oleraceus* – common sow-thistle
Stebbinoseris heterocarpa [*Microseris heterocarpa*] – brown puffs
Stephanomeria exigua – small wreathplant
Stephanomeria pauciflora – wire-lettuce
Stephanomeria virgata – twiggy wreathplant
Stylocline gnaphaloides – everlasting nest-straw
Uropappus lindleyi [*Microseris lindleyi*] – silver puffs
Wyethia ovata – mule ears
Xanthium spinosum – spiny cocklebur
Xanthium strumarium – cocklebur

BETULACEAE – BIRCH FAMILY

Alnus rhombifolia – white alder

BORAGINACEAE – BORAGE FAMILY

Amsinckia menziesii var. *intermedia* – yellow fiddleneck
Amsinckia menziesii var. *menziesii* – yellow fiddleneck
Amsinckia tessellata – devil's lettuce
Cryptantha sp. – forget-me-not
Cryptantha intermedia – common forget-me-not
Cryptantha micrantha – redroot cryptantha
Cryptantha microstachys – tejon cryptantha
Cryptantha muricata – prickly cryptantha
Heliotropium curassavicum – wild heliotrope
Pectocarya linearis – slender pectocarya
Pectocarya penincillata – pectocarya
Pectocarya setosav – pectocarya
Plagiobothrys arizonicus – popcorn flower
Plagiobothrys canescens – rusty popcorn flower
Plagiobothrys collinus – California popcorn flower
Plagiobothrys fulvus – common popcorn flower

BRASSICACEAE – MUSTARD FAMILY

Athysanus pusillus – dwarf athysanus
* *Brassica nigra* – black mustard
* *Capsella bursa-pastoris* – shepard's purse
Caulanthus lasiophyllus – California mustard
Descurainia pinnata ssp. *halictorum* – tansy mustard
* *Hirschfeldia incana* – short-podded mustard
Lepidium lasiocarpum – peppergrass
* *Lepidium latifolium* – peppergrass
Lepidium virginicum – wild peppergrass
* *Lobularia maritime* – sweet-alyssum
* *Raphanus sativus* – wild radish
* *Rorippa nasturtium-aquaticum* – water cress
* *Sisymbrium altissimum* – tumble mustard
* *Sisymbrium irio* – London rocket
* *Sisymbrium officinale* – hedge mustard
* *Sisymbrium orientale* – Oriental mustard
Stanleya pinnata var. *pinnata* – Prince's plume
Thysanocarpus curvipes – fringepod
Tropidocarpum gracile – slender dobie-pod

CACTACEAE – CACTUS FAMILY

* *Cereus peruvianus* – Peruvian apple cactus
Opuntia basilaris var. *ramosa* – beaver-tail cactus
Opuntia californica var. *parkeri* – cane cholla
Opuntia littoralis – coastal prickly-pear
Opuntia X vaseyi – prickly-pear cactus
* *Trichocereus spachianus* – golden torch cactus

CAPPARACEAE – CAPER FAMILY

Isomeris arborea – bladderpod

CAPRIFOLIACEAE – HONEYSUCKLE FAMILY

Lonicera subspicata – southern honeysuckle
Sambucus mexicana – Mexican elderberry
Symphoricarpos sp. – snowberry
Symphoricarpos c.f. mollis – spreading snowberry

CARYOPHYLLACEAE – PINK FAMILY

* *Cerastium glomeratum* – sticky mouse-ear
* *Herniaria cinerea* – gray herniaria
Loeflingia squarrosa – no common name
* *Silene gallica* – common catchfly
Spergularia sp. – stickwort, starwort
* *Spergularia rubra* – sand-spurrey
* *Spergularia c.f. villosa* – villous sand-spurrey
* *Stellaria media* – common chickweed

CASURINACEAE – SHEET OAK FAMILY

* *Casuarina cunninghamiana* - Austrailian Pine

CHENOPODIACEAE – GOOSEFOOT FAMILY

Atriplex canescens – four-winged saltbush
* *Atriplex heterosperma* – weedy orache
Atriplex lentiformis – big saltbush, quail brush
* *Atriplex rosea* – tumbling oracle
* *Atriplex semibaccata* – Australian saltbush
Atriplex serenana var. *serenana* – bractscale
Atriplex suberecta – Australian saltbush
Atriplex triangularis – spearscale
* *Bassia hyssopifolia* – five-hooked bassia
* *Beta vulgaris* – garden beet
* *Chenopodium album* – lamb's-quarters
* *Chenopodium ambrosioides* – Mexican tea
Chenopodium berlandieri – pitseed goosefoot
* *Chenopodium botrys* – goosefoot
Chenopodium californicum – California goosefoot
* *Chenopodium murale* – nettle-leaved goosefoot
Chenopodium rubrum – red goosefoot
* *Salsola tragus* – Russian-thistle
* *Spinacia oleracea* – spinach

CONVOLVULACEAE – MORNING-GLORY FAMILY

Calystegia macrostegia ssp. *cyclostegia* – morning-glory
Calystegia peirsonii – Peirson's morning-glory
* *Convolvulus arvensis* – bindweed

CRASSULACEAE – STONECROP FAMILY

Crassula connata – dwarf stonecrop
Dudleya cymosa – unidentified dudleya
Dudleya lanceolata – lanceleaf dudleya

CUCURBITACEAE – GOURD FAMILY

Cucurbita foetidissima – coyote-melon, calabazilla
Marah macrocarpus – wild cucumber

CUSCUTACEAE – DODDER FAMILY

Cuscuta californica – California dodder
Cuscuta pentagona – five-angled dodder
Cuscuta subinclusa – canyon dodder

DATISCACEAE – DASTICA FAMILY

Dastica glomerata – Durango root

ERICACEAE – HEATH FAMILY

Arctostaphylos glauca – bigberry manzanita

EUPHORBIACEAE – SPURGE FAMILY

Chamaesyce albomarginata – rattlesnake spurge
* *Chamaesyce maculata* – spotted spurge
Chamaesyce polycarpa – small-seed sand mat
Chamaesyce serpyllifolia – thyme-leafed spurge
Croton californicus – California croton
Eremocarpus setigerus – doveweed
Euphorbia spathulata – reticulate-seed spurge
* *Ricinus communis* – castor-bean
Stillingia linearifolia – linear-leaved stillingia

FABACEAE – PEA FAMILY

* *Acacia baileyana* – golden wattle
Astragalus didymocarpus – white dwarf locoweed
Astragalus gambelianus – Gambel's locoweed
Astragalus trichopodus – Santa Barbara locoweed
Glycyrrhiza lepidota – wild licorice
Lathyrus laetiflorus – wild sweet pea

Lathyrus vestitus – wild pea
Lotus corniculatus – bird's-foot lotus
Lotus hamatus – grab lotus
Lotus humistratus – lotus
Lotus purshianus – Spanish-clover
Lotus salsuginosus – coastal lotus
Lotus scoparius var. *scoparius* – deerweed
Lotus strigosus – strigose deerweed
Lupinus bicolor – Lindley's annual lupine
Lupinus excubitus – Mountain Springs bush lupine
Lupinus excubitus var. *hallii* – grape soda lupine
Lupinus hirsutissimus – stinging lupine
Lupinus microcarpus var. *densiflorus* – chick lupine
Lupinus microcarpus var. *microcarpus* – chick lupine
Lupinus sparsiflorus – Coulter's lupine
Lupinus succulentis – arroyo lupine
Lupinus truncatus – collar lupine
* *Medicago polymorpha* – California burclover
* *Medicago polymorpha* var. *brevispina* – short-spined California burclover
* *Medicago sativa* – alfalfa
* *Melilotus alba* – white sweet-clover
* *Melilotus indica* – yellow sweet-clover
* *Robinia pseudoacacia* – black locust
Trifolium sp. – clover
Trifolium albopurpureum – rancheria clover
Trifolium ciliolatum – tree clover
* *Trifolium fragiferum* – strawberry clover
Trifolium gracilentum – pin-point clover
* *Trifolium hirtum* – rose clover
Trifolium microcephalum – maiden clover
* *Trifolium repens* – white clover
Trifolium willdenovii – valley clover
Vicia hassei – Hesse’s vetch
* *Vicia villosa* ssp. *villosa* – winter vetch

FAGACEAE – BEECH FAMILY

Quercus agrifolia – coast live oak
Quercus berberidifolia – scrub oak

Quercus douglasii – blue oak
Quercus lobata – valley oak

GERANIACEAE – GERANIUM FAMILY

* *Erodium brachycarpum* – shortfruit stork's bill
* *Erodium botrys* – long-beaked filaree
* *Erodium cicutarium* – red-stemmed filaree
* *Erodium moschatum* – white-stemmed filaree

GROSSULARIACEAE – CURRANT FAMILY

Ribes aureum – golden currant
Ribes malvaceum – chaparral currant

HYDROPHYLLACEAE – WATERLEAF FAMILY

Emmenanthe penduliflora – whispering bells
Eriodictyon crassifolium var. *nigrescens* – yerba santa
Eucrypta chrysanthemifolia – common eucrypta
Nemophila menziesii – baby blue-eyes
Nemophila parviflora var. *quercifolia* – oak-leaved nemophila
Phacelia cicutaria – caterpillar phacelia
Phacelia cicutaria var. *hispida* – caterpillar phacelia
Phacelia distans – blue fiddleneck
Phacelia imbricata ssp. *imbricata* – imbricate phacelia
Phacelia minor – wild canterbury-bell
Phacelia ramosissima – shrubby phacelia

JUGLANDACEAE – WALNUT FAMILY

Juglans californica – southern California black walnut

LAMIACEAE – MINT FAMILY

* *Marrubium vulgare* – horehound
Mentha citrata – orange mint
Salvia apiana – white sage
Salvia columbariae – chia
Salvia leucophylla – purple sage
Salvia mellifera – black sage
Stachys ajugoides – bugle hedge-nettle
Stachys ajugoides var. *rigida* – rigid hedge-nettle

Stachys albens – white hedge-nettle
Trichostema lanceolatum – vinegar weed

LAURACEAE – LAUREL FAMILY
Umbellularia californica – California laurel

LOASACEAE – STICK-LEAF FAMILY
Mentzelia sp. – blazing star
Mentzelia laevicaulis – blazing star
Mentzelia micrantha – small-flowered stick-leaf

LYTHRACEAE – LOOSESTRIFE FAMILY
Lythrum californicum – California loosestrife

MALVACEAE – MALLOW FAMILY
Malacothamnus fasciculatus ssp. *laxiflorus* – chaparral bush mallow
Malacothamnus fremontii – bush mallow
Malacothamnus marrubioides – bush mallow
* *Malva neglecta* – common mallow
* *Malva parviflora* – cheeseweed

MELIACEAE – MAHOGANY FAMILY
* *Melia azedarach* – China berry

MORACEAE – FIG FAMILY
* *Ficus carica* – edible fig

MYRTACEAE – MYRTLE FAMILY
* *Eucalyptus* sp. – eucalyptus
* *Eucalyptus camaldulensis* – red gum
* *Eucalyptus globulus* – blue gum
* *Eucalyptus leucoxylon* – white ironbark
* *Eucalyptus polyanthemos* – silver dollar gum
* *Eucalyptus sideroxylon* – red ironbark

NYCTAGINACEAE – FOUR O'CLOCK FAMILY
Mirabilis laevis var. *crassifolia* [*M. californica*] – California wishbone-bush

OLEACEAE – OLIVE FAMILY

Fraxinus dipetala – California ash
* *Fraxinus uhdei* – tropical ash
Fraxinus velutina – velvet ash
* *Ligustrum lucidum* – glossy privet
* *Olea europaea* – mission olive

ONAGRACEAE – EVENING-PRIMROSE FAMILY

Camissonia bistorta – southern sun cup
Camissonia boothii – sun cup
Camissonia boothii ssp. *decorticans* – shredding evening primrose
Camissonia californica – mustard primrose
Camissonia hirtella – sun cup
Camissonia micrantha – miniature sun cup
Camissonia strigulosa – sun cup
Clarkia purpurea – winecup clarkia
Clarkia speciosa – clarkia
Clarkia unguiculata – elegant clarkia
Epilobium brachycarpum – willow herb
Epilobium canum ssp. *canum* – California fuchsia
Epilobium ciliatum – California cottonweed
Ludwigia peploides – yellow waterweed
Ludwigia repens – water primrose
Oenothera elata – evening primrose
* *Oenothera laciniata* – evening primrose

OROBANCHACEAE – BROOM-RAPE FAMILY

Orobanche parishii ssp. *parishii* – broom-rape
Orobanche sp. – broom-rape

PAEONIACEAE – PEONY FAMILY

Paeonia californica – California peony

PAPAVERACEAE – POPPY FAMILY

Argemone corymbosa – prickly poppy
Eschscholzia californica – California poppy
Platystemon californicus – California creamcups

PLANTAGINACEAE – PLANTAIN FAMILY

Plantago erecta – dot-seed plantain
* *Plantago indica* – plantain
* *Plantago lanceolata* – English plantain
* *Plantago major* – common plantain

PLATANACEAE – SYCAMORE FAMILY

Platanus racemosa – western sycamore

POLEMONIACEAE – PHLOX FAMILY

Allophyllum divaricatum – purple false gillyflower
Allophyllum glutinosum – sticky false gillyflower
Eriastrum densifolium – woollystar
Eriastrum densifolium ssp. *elongatum* – elongate eriastrum
Eriastrum densifolium ssp. *mohavense* – Mohave eriastrum
Eriastrum sapphirinum – sapphire eriastrum
Gilia angelensis – angel gilia
Gilia capitata – globe gilia
Leptodactylon californicum – prickly phlox
Linanthus androsaceus – common linanthus*Linanthus pygmaeus* - linanthus
Navarretia atractyloides – holly-leaf skunkweed
Phlox gracilis – slender phlox

POLYGONACEAE – BUCKWHEAT FAMILY

Chorizanthe fimbriata – fringed spineflower
Chorizanthe parryi var. *fernandina* – San Fernando Valley spineflower
Chorizanthe staticoides – turkish rugging
Eriogonum angulosum – angle-stem buckwheat
Eriogonum baileyi – Bailey's buckwheat
Eriogonum brachyanthum – short-flowered buckwheat
Eriogonum elongatum – long-stemmed buckwheat
Eriogonum fasciculatum ssp. *foliolosum* – California buckwheat
Eriogonum fasciculatum ssp. *polifolium* – California buckwheat
Eriogonum gracile var. gracile – slender woolly buckwheat
Eriogonum gracillimum – rose and white buckwheat
Eriogonum maculatum – spotted buckwheat
Eriogonum c.f. viridescens – buckwheat

Lastarriaea coriacea – lastarriaea
* *Polygonum arenastrum* – common knotweed
* *Polygonum argyrocoleon* – smartweed
Polygonum lapathifolium – willow weed
Polygonum punctatum – perennial smartweed
Pterostegia drymarioides – pterostegia
* *Rumex conglomeratus* – whorled dock
* *Rumex crispus* – curly dock
Rumex hymenosepalus – wild rhubarb
Rumex maritimus – golden dock
Rumex obtusifolius – dock
Rumex salicifolius – willow dock

PORTULACACEAE – PURSLANE FAMILY
Calandrinia ciliata – redmaids
Calyptridium sp. – pussypaws
Claytonia parviflora – small-leaved montia
Claytonia perfoliata – miner's lettuce
* *Portulaca oleracea* – common purslane

RANUNUCULACEAE – BUTTERCUP FAMILY
Clematis ligusticifolia – yerba de chiva
Delphinium parryi ssp. *parryi* – Parry's larkspur

RHAMNACEAE – BUCKTHORN FAMILY
Ceanothus crassifolius – hoary-leaved ceanothus
Ceanothus tomentosus – woolyleaf ceanothus
Rhamnus crocea – redberry
Rhamnus ilicifolia – holly-leaf redberry

ROSACEAE – ROSE FAMILY
Adenostoma fasciculatum – chamise
Cercocarpus betuloides – mountain-mahogany
Cercocarpus betuloides var. *betuloides* – birch-leaf mountain-mahogany
Cercocarpus betuloides var. *blancheae* – island mountain-mahogany
Heteromeles arbutifolia – toyon
Prunus ilicifolia – holly-leaf cherry
Rosa californica – California rose

Rubus ursinus – California blackberry
* *Sangwisorba minor* – garden burnet

RUBIACEAE – MADDER FAMILY

Galium angustifolium – narrow-leaved bedstraw
* *Galium aparine* – goose grass
Galium nuttallii ssp. *nuttallii* – San Diego bedstraw
Galium porrigens – climbing bedstraw

SALICACEAE – WILLOW FAMILY

Populus fremontii – Fremont's cottonwood
Populus tremuloides – Quaking aspen
Salix exigua – narrow-leaved willow
Salix gooddingii – black willow
Salix laevigata – red willow
Salix lasiolepis – arroyo willow
Salix lucida ssp. *lasiandra* – golden willow

SAURURACEAE – LIZARD'S-TAIL FAMILY

Anemopsis californica – yerba mansa

SCROPHULARIACEAE – FIGWORT FAMILY

Antirrhinum coulterianum – white snapdragon
Antirrhinum multiflorum – withered snapdragon
Castilleja affinis – coast paintbrush
Castilleja densiflora – dense-flowered owl's-clover
Castilleja exserta – common owl's-clover
Castilleja foliolosa – woolly Indian paintbrush
Collinsia heterophylla – purple Chinese houses
Cordylanthus rigidus – bird’s beak
Keckiella cordifolia – heart-leaf penstemon
Linaria canadensis – toadflax
Mimulus aurantiacus – bush monkeyflower
Mimulus aurantiacus var. *pubescens* – bush monkeyflower
Mimulus guttatus – seep monkeyflower
Mimulus pilosus – downy monkeyflower
Penstemon centranthifolius – scarlet bugler
* *Verbascum thapsus* – woolly mullein

* *Verbascum virgatum* – wand mullein
* *Veronica anagallis-aquatica* – water speedwell

SIMAROUBACEAE – QUASSIA FAMILY
* *Ailanthus altissima* – tree of heaven

SOLANACEAE – NIGHTSHADE FAMILY
Datura wrightii – western jimsonweed
* *Nicotiana glauca* – tree tobacco
Nicotiana quadrivalvis – Indian tobacco
* *Solanum americanum* – small-flowered nightshade
Solanum douglasii – white nightshade
* *Solanum eleagnifolium* – silver leaf horse-nettle
* *Solanum sarrachoides* – hairy nightshade
Solanum xanti – chaparral nightshade

TAMARICACEAE – TAMARISK FAMILY
* *Tamarix* sp. – tamarisk
* *Tamarix ramoissima* – tamarisk

ULMACEAE – ELM FAMILY
* *Ulmus pumila* – Siberian elm

URTICACEAE – NETTLE FAMILY
Hesperocnide tenella – western nettle
Parietaria hespera – western pellitory
Urtica dioica – giant creek nettle
* *Urtica urens* – dwarf nettle

VERBENACEAE – VERVAIN FAMILY
Verbena lasiostachys – western verbena

VIOLACEAE – VIOLET FAMILY
Viola pedunculata – Johnny jump-ups

VISCACEAE – MISTLETOE FAMILY
Phoradendron macrophyllum – big leaf mistletoe
Phoradendron villosum – oak mistletoe

VITACEAE – GRAPE FAMILY

Parthenocissus vitacea – woodbine, Virginia creeper
Vitis girdiana – desert wild grape

ZYGOPHYLLACEAE – CALTROP FAMILY

* *Tribulus terrestris* – puncture vine

ANGIOSPERMAE (MONOCOTYLEDONES)

ARECACEAE – PALM FAMILY

* *Washingtonia robusta* – Mexican fan palm

CYPERACEAE – SEDGE FAMILY

Carex alma – sturdy sedge
Carex praegracilis – clustered field sedge
Carex sp. – sedge
Cyperus eragrostis – tall cyperus
Cyperus esculentus – yellow nut-grass
* *Cyperus involucratus* – nutsedge
Cyperus odoratus – coarse cyperus
Eleocharis montevidensis – slender creeping spike-rush
Eleocharis parishii – Parish's spikerush
Eleocharis rostellata – beaked spikerush
Scirpus acutus – hard-stemmed bulrush
Scirpus americanus – winged three-square
Scirpus maritimus – alkali bulrush
Scirpus microcarpus – bulrush
Scirpus robustus – Pacific coast bulrush

JUNCACEAE – RUSH FAMILY

Juncus sp. – rush
Juncus acutus ssp. *leopoldii* – southwestern spiny rush
Juncus balticus – wire rush
Juncus bufonius – toad rush
Juncus longistylis – rush
Juncus mexicanus – Mexican rush
Juncus rugulosus – wrinkled rush
Juncus textilis – Indian rush

Juncus torreyi – rush
Juncus triformis – Yosemite dwarf rush
Juncus xiphioides – iris-leaved rush

LEMNACEAE – DUCKWEED FAMILY

Lemna miniscula – duckweed
Lemna valdiviana – duckweed

LILIACEAE – LILY FAMILY

* *Allium cepa* – onion
Allium porrum – onion
* *Amaryllis bella-donna* – naked lady
* *Asparagus officinalis* – asparagus
Bloomeria crocea – common goldenstar
Brodiaea terrestris ssp. *kernensis* – dwarf brodiaea
Calochortus clavatus var. *gracilis* – slender mariposa lily
Calochortus venustus – mariposa lily
Dichelostemma capitatum – blue dicks
Muilla maritima – common muilla
Yucca whipplei – Our Lord's candle
Yucca schidigera – Mojave Yucca

POACEAE – GRASS FAMILY

Achnatherum coronatum – giant needlegrass
* *Agrostis* sp. – bentgrass
* *Agrostis viridis* – water bent
* *Arundo donax* – giant reed
* *Avena barbata* – slender oat
* *Avena fatua* – wild oat
Avena sativa – cultivated oat
Bromus catharticus – California brome
Bromus catharticus var. *catharticus* – California brome
* *Bromus diandrus* – ripgut grass
* *Bromus hordeaceus* – soft chess
* *Bromus madritensis* ssp. *rubens* – foxtail chess
* *Bromus sterilis* – sterile brome
* *Bromus tectorum* – cheat grass
* *Cortaderia jubata* – pampas grass

*	*Crypsis schoenoides* – prickle grass
*	*Cynodon dactylon* – Bermuda grass
*	*Digitaria sanguinalis* – hairy crabgrass
	Distichlis spicata – salt grass
*	*Echinochloa colonum* – jungle-rice
	Echinochloa crus-galli – barnyard grass
*	*Eleusine indica* – goose grass
	Elymus glaucus – western wild-rye
	Elymus multisetus – big squirreltail
	Eragrostis mexicana – lovegrass
*	*Festuca arundinacea* – tall fescue
*	*Hordeum marinum* – Mediterranean barley
*	*Hordeum murinum* – glaucous foxtail barley
*	*Lamarckia aurea* – goldentop
*	*Leptochloa uninerva* – Mexican sprangletop
	Leymus condensatus – giant ryegrass
	Leymus triticoides – beardless wild rye
*	*Lolium multiflorum* – Italian ryegrass
*	*Lolium perenne* – perennial ryegrass
	Melica imperfecta – California melic
	Muhlenbergia asperifolia – scratch-grass
	Muhlenbergia microsperma – littleseed muhly
	Nassella cernua – nodding needlegrass
	Nassella lepida – foothill needlegrass
	Nassella pulchra – purple needlegrass
	Panicum capillare – western witchgrass
*	*Panicum miliaceum* – broom corn millet
*	*Parapholis incurve* – sickle grass
	Paspalum distichum – knotgrass
*	*Phalaris aquatica* – Harding grass
*	*Phalaris minor* – Mediterranean canary grass
*	*Piptatherum miliaceum* – smilo grass
*	*Poa annua* – annual bluegrass
	Poa secunda – Malpais bluegrass
*	*Polypogon interruptus* – ditch beard grass
*	*Polypogon monspeliensis* – rabbit's-foot grass
	Schismus barbatus – abumashi
	Sorghum bicolor – sorghum

Sorghum halepense – Johnsongrass
Sporobolus airoides – alkali scation
* *Triticum aestivum* – cultivated wheat
Vulpia microstachys – fescue
* *Vulpia myuros* – rattail fescue
Vulpia octoflora – six-weeks fescue

POTAMOGETONACEAE – PONDWEED FAMILY

Potamogeton foliosus – leafy pondweed

TYPHACEAE – CATTAIL FAMILY

Typha domingensis – slender cattail
Typha latifolia – broad-leaved cattail

* signifies introduced (non-native) species

APPENDIX C

California Natural Diversity Database Forms

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
IndexCode _____ Occurrence # _____
copy Sent To _____

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU.
PLEASE USE THE BACK FOR COMMENTS IF NECESSARY.
ATTACH OR DRAW A MAP ON BACK.

Scientific name (no codes): *Chorizanthe parryi* var. *fernandina*

Reporter: Anuja Parikh, Nathan Gale, and others **Phone: (760) 942.5147**

Address: Dudek & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: May 21-June 8, Aug 3-4, 2006 County: Los Angeles **Collection: no** **If yes,** # **Mus./Herb:**

Location: Northern Santa Susana Mountains/Santa Clarita Valley, Newhall Ranch, southeast of confluence of the Santa Clara River and Castaic Creek, east, south, and west edges of Airport Mesa and adjacent mesas.

Quad Name: **Newhall** T 4N **R 16W** W % **of W%Sec3**
X 7½' 15' **Elevation: 1075-1250'** **T 4N** **R 17W** **E** **¼ of E ¼**
Sec3

Landowner/Manager: Newhall Land, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ____ **No** **If not, reason:**

Is this a new location record? _____ **Yes X No** ____ **Unknown**

Total# of Individuals = ~1,216,626 Is this a subsequent visit? X Yes ___ **No Compared to your last visit: _more _ same X fewer**

Phenology (plants): ____ % **vegetative** _____ **% flowering** _____ **% fruiting**

Population Age Structure (animals): ____ **# adults** ____ **#juveniles** ____ **# others**

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ **other**

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Most occurred in California grassland series, with some plants in California sagebrush communities (purple sage and California buckwheat series). Dominant plants include, *Bromus madritensis rubens, Erodium cicutarium, Schismus barbatus, Artemisia californica,* and *Eriogonum fasciculat*
Most plants were on up to 50% slopes with southwest, south, or southeast aspects. Vegetative cover commonly between 75 and 90 percent.

Current Land Use Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle

Overall Site Quality: ____ Excellent _____ Good X____ Fair ____ Poor

Comments: This report summarizes 181 discrete locations, each with from 1 to an estimated 450,000 individuals observed.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

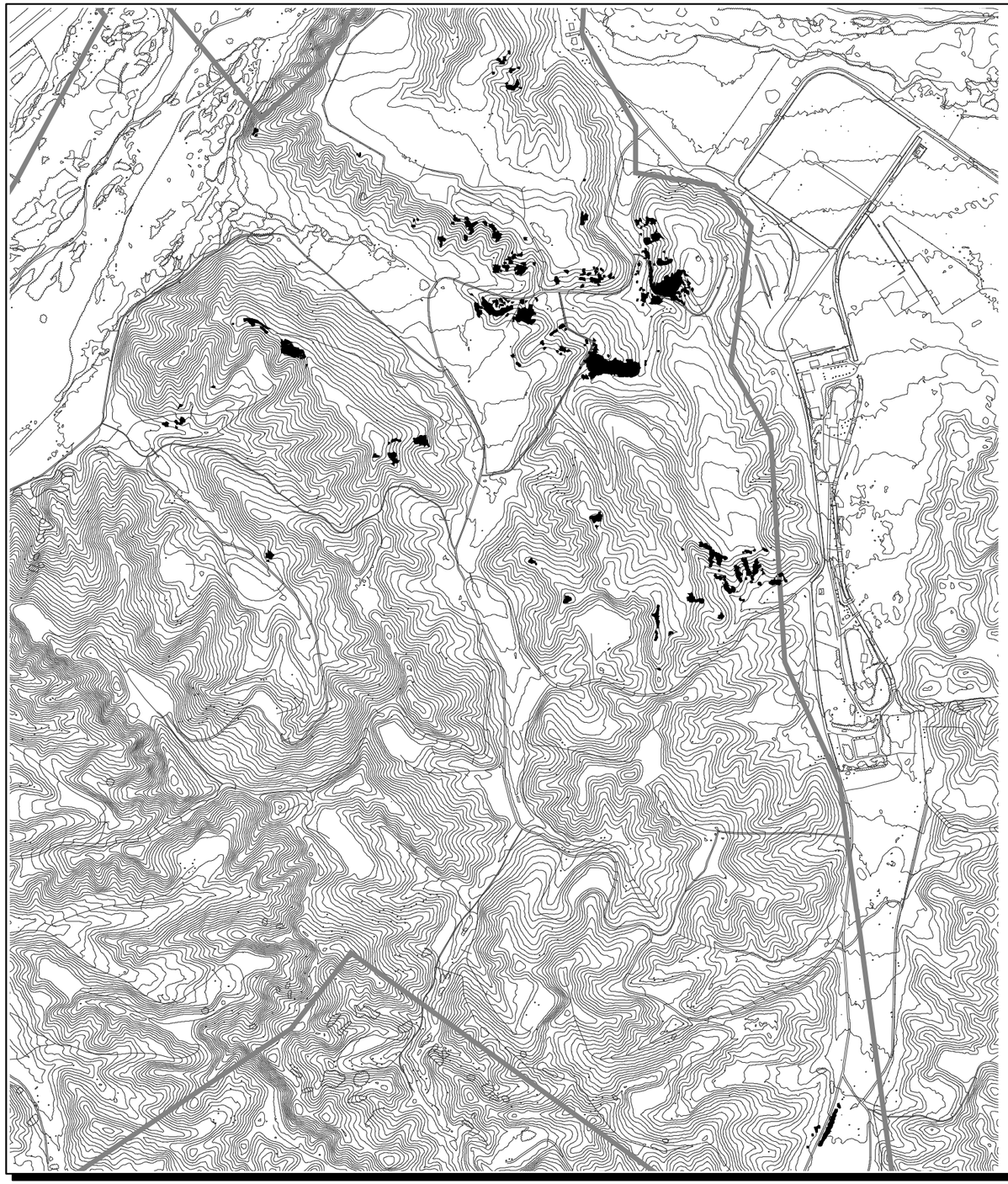
____Keyed in a site reference:
____ Compared with specimen housed at:
____Compared with photo/drawing in:
____ By another person (name):
_X_Other: Personal knowledge

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
____ Plant/Animal	____Slide
__ Habitat	_____Print
____Diagnostic Feature	
_____Other	

May we obtain duplicates **at our cost?**
____Yes X No



San Fernando Valley spineflower - *Chorizanthe parryi var. fernandina*

N

Feet

900 0

TOPO SOURCE: Psomas Engineering, 2002

Newhall Ranch - Airport Mesa

2006 Sensitive Plant Survey Results

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICIAL USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Submitted to: _____

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU.
USE THE BACK FOR COMMENTS IF NECESSARY.
PLEASE ATTACH OR DRAW A MAP ON BACK.

Scientific Name (no codes): *Calochortus clavatus* var. *gracilis*

Reporter: Chris Oesch, Saudamini Sindhar, Colin Khoury and Makela Mangrich **Phone:** 760.942.5147

Address: Dudek & Associates, 605 Third Street, Encinitas, California 92024

Date of Field Work: May 25; 2006

County: Los Angeles **Collection:** no **If yes, #** **Mus/Herb:**

Location: Northern Santa Susana Mountains/Santa Clarita Valley, Newhall Ranch, south of confluence of the Santa Clara River and Castaic Creek of Grapevine Mesa and scattered ridges in the area.

Quad Name: Val Verde ☒ 7½' ☐ 15' **Elevation:** 1040–1290' T 17W R 4N N ¼ Sec 3

Landowner/Manager: Newhall Land, 23823 Valencia Boulevard, Valencia, California 91355

Species Found: ☒ Yes ☐ No If not, reason:

Is this a new location record? ☐ Yes ☒ No ☐ Unknown

Total # of individuals = ~322 Is this a subsequent visit? ☒ Yes ☐ No Compared to your last visit: ☐ more ☐ same ☒ fewer

Phenology (plants): ____% vegetative ____% flowering ____% fruiting (not reported)

Population Age Structure (animals): ____ # of adults ____ # of juveniles ____ # others

Site Function for Species (animals): ☐ breeding ☐ foraging ☐ wintering ☐ roosting ☐ denning ☐ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Disturbed coastal sage scrub and California annual grassland communities predominate, including California buckwheat (Eriogonum *fasciculatum*), California sagebrush (*Artemisia californica*) and non natives like *Bromus madritensis* ssp. *rubens, Avena barbata* and *Brassica nigra* with 0-10% native cover, 20-30% bare ground and 65-70% non-native cover. Aspect ranges from east to northeast, with a 20% slope. Soil texture is sandy loam.

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: cattle grazing, farming; **Visible Disturbances:** cattle grazing, farming; **Possible Threats:** proposed residential/commercial development.

Overall Site Quality: ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Comments: This report summarizes two discrete locations, with two and 320 individuals observed respectively.

Should/Could this site be protected? How?

Other Comments:

DETERMINATION (Check one or more, fill in blanks)

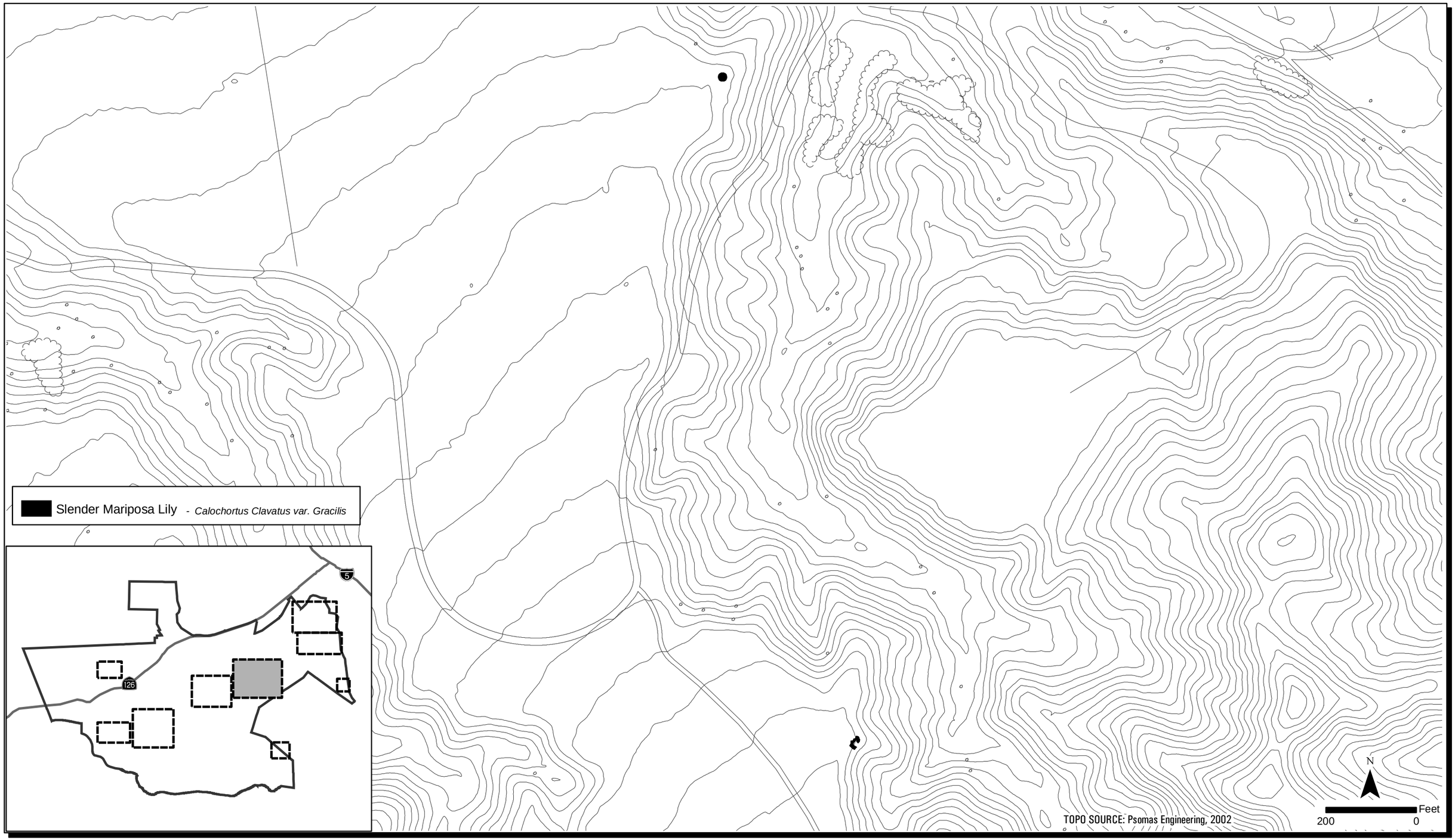
☐ Keyed in a site reference:
☐ Compared with specimen housed at:
☐ Compared with photo/drawing in:
☐ By another person (name):
☒ Other: personal knowledge

PHOTOGRAPHS (Check one or more)

Subject	**Type**
☐ Plant/Animal	☐ Slide
☐ Habitat	☐ Print
☐ Diagnostic Feature	
☐ Other	

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

May we obtain duplicates at our cost?
☐ Yes ☒ No



Newhall Ranch - Grapevine Mesa

2006 Sensitive Plant Survey Results

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
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PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU.
USE THE BACK FOR COMMENTS IF NECESSARY.
PLEASE ATTACH OR DRAW A MAP ON BACK.

Scientific name (no codes): *Chorizanthe parryi* var. *fernandina*

Reporter: Colin Khoury, Chris Oesch, Saudamini Sindhar, Makela Mangrich, Vipul Joshi, Phone: (760) 942-5147

Clint Emerson, Sara Townsend, Callie Ford, Kam Muri others

Address: Dudek & Associates, 605 Third Street, Encinitas, CA 92024 County: Los Angeles Collection: no **If yes, # Mus./Herb:**

Location: Northern Santa Susana Mountains/Santa Clarita Valley, Newhall Ranch, south of confluence of the Santa Clara River and Castaic Creek, eastern, southern, and western edges of Grapevine Mesa and scattered ridges in the area.

Quad Name: Val Verde X 7½' 15' **Elevation:** 1040-1290' T 17W R 4N N ¼ Sec 3

Landowner/Manager: Newhall Land, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ____ **No If not, reason:**

Is this a new location record? ___ Yes X **No** ____ **Unknown**

Total# of Individuals = ~33,596 Is this a subsequent visit? X Yes No Compared to your last visit: _ more _ same X **fewer**

Phenology (plants): ____ % **vegetative** ____ **% flowering** ____ **% fruiting**

Population Age Structure (animals): ____ **# adults** ____ **#juveniles** ____ **# others**

Site Function for Species (animals): ____ **breeding** ____ **foraging** ____ **wintering** ____ **roosting** ____ **denning** ____ **other**

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Open California sagebrush, California buckwheat, ecotonal California sagebrush/California buckwheat and California annual grassland series, and at the edge of agricultural fields on mesas. cover generally 40 - 70%. Dominant plants include Bromus spp., Avena fatua, Erodium cicutarium, and Salsola tragus. Associated native species include Adenostoma fasciculatum, Ericameria sp and Artemisia californica. Slopes were generally south, south-west facing and less than 30%. Soil texture is predominantly clay loam.

Current Land Use/Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, farming; Possible Threats: proposed residential/commercial development.

Overall Site Quality: ____ Excellent X Good ____ Fair ____ Poor

Comments: This report summarizes 87 discrete locations, each with from 1 to an estimated 20,000 individuals observed.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

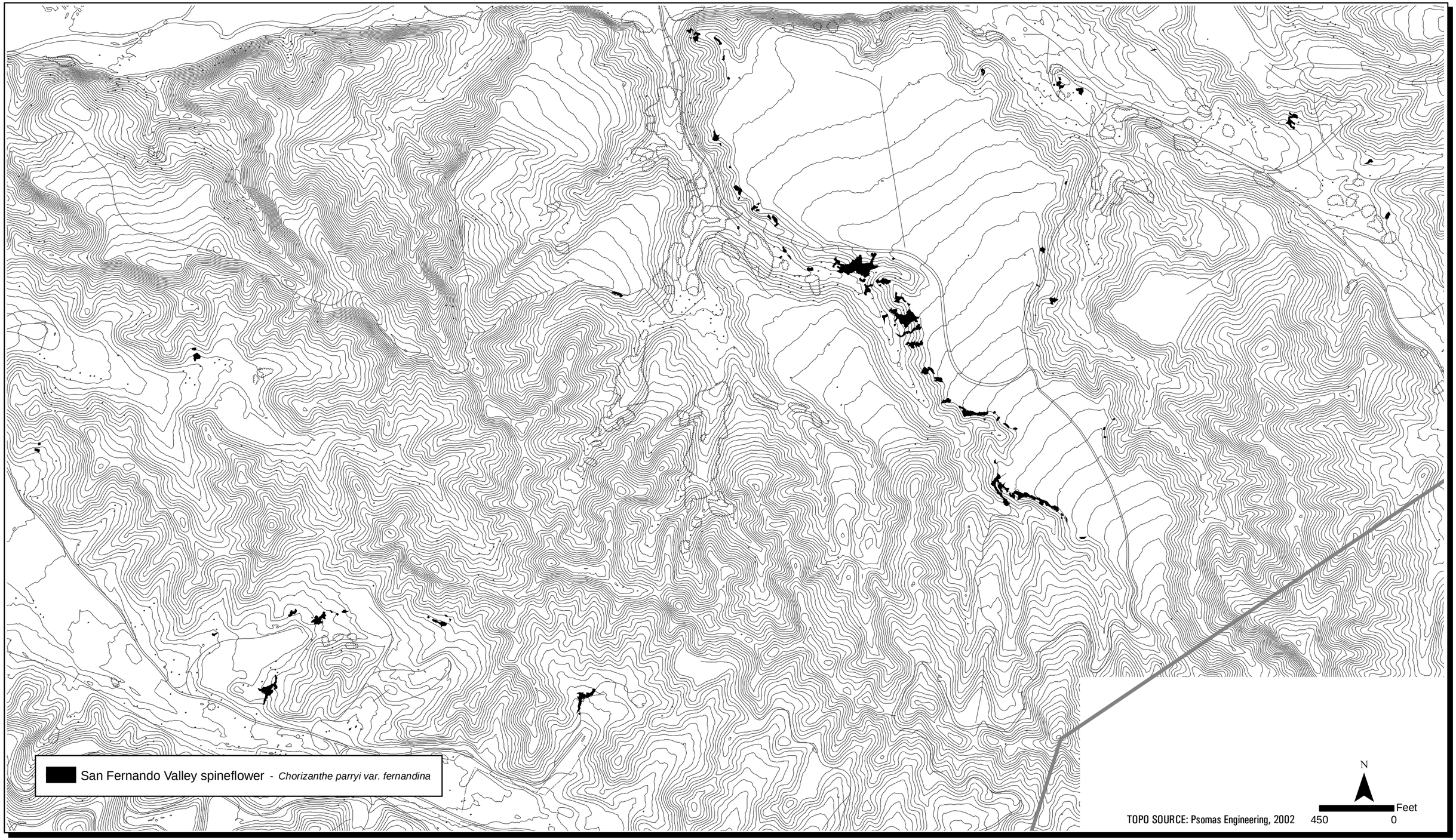
____ Keyed in a site reference:
____ Compared with specimen housed at:
____ Compared with photo/drawing in:
____ By another person (name):
____
X Other: Personal

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
____ Plant/Animal	____ Slide
____ Habitat	____ Print
____ Diagnostic Feature	
____ Other	

May we obtain duplicates at our cost?
____ Yes X No



Newhall Ranch - Grapevine Mesa

2006 Sensitive Plant Survey Results

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
IndexCode _____ Occurrence # _____
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PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU.
USE THE BACK FOR COMMENTS IF NECESSARY.
ATTACH OR DRAW A MAP ON BACK.

Scientific name (no codes): *Chorizanthe parryi* var. *fernandina*

Reporter: Anuja Parikh, Nathan Gale, Doug Gettinger and others Phone: (760) 942.5147

Address: Dudek & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: June 9-14; July 10, 2006 County: Los Angeles Collection: no If yes, # Mus./Herb:

Location: Northern Santa Susana Mountains/Santa Clarita Valley, Newhall Ranch: south of State Route 126 just east of the Ventura County line, on ridges and north facing slopes throughout Potrero Canyon.

Quad Name: Val Verde and Newhall X 7½' 15' Elevation: 1100-1400' 4N R 17W NW ¼ Sec 3

Landowner/Manager: Newhall Land, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ____ No If not, reason:

Is this a new location record? ___ Yes X No ____ Unknown

Total # of Individuals= ~88,659 plants Is this a subsequent visit? X Yes _ No Compared to your last visit _more_ same X fewer

Phenology (plants): ____ % vegetative __ % flowering ____% fruiting

Population Age Structure (animals): ____ # adults ____ #juveniles ____ # others

Site Function for Species (animals): ____ breeding ____ foraging ____ wintering ____ roosting ____ denning ____ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

California sagebrush - black sage series, California grassland series, and California sagebrush - purple sage series, typically with 20 and 100 percent cover. Dominant plants associated with the populations include *Artemisia californica, Salvia leucophyla, Centaurea melitensis, Erodium cicutarium, Bromus spp.* and *Eriogonum fasciculatum.* Soil texture is generally silty clay loam and clay loam. Most plants are on south-east to south facing slopes, with some on southwestern aspects. Slopes were generally between 10% and 17%.

Current Land Use Visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, fire in recent past (5-1 0 years); Possible Threats: Proposed for estate residential development.

Overall Site Quality: ____ Excellent ____ Good _____ Fair X Poor (based on non-native plant cover)

Comments: This report summarizes 32 discrete locations, each with from 1 to an estimated 20,000 individuals observed.

Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

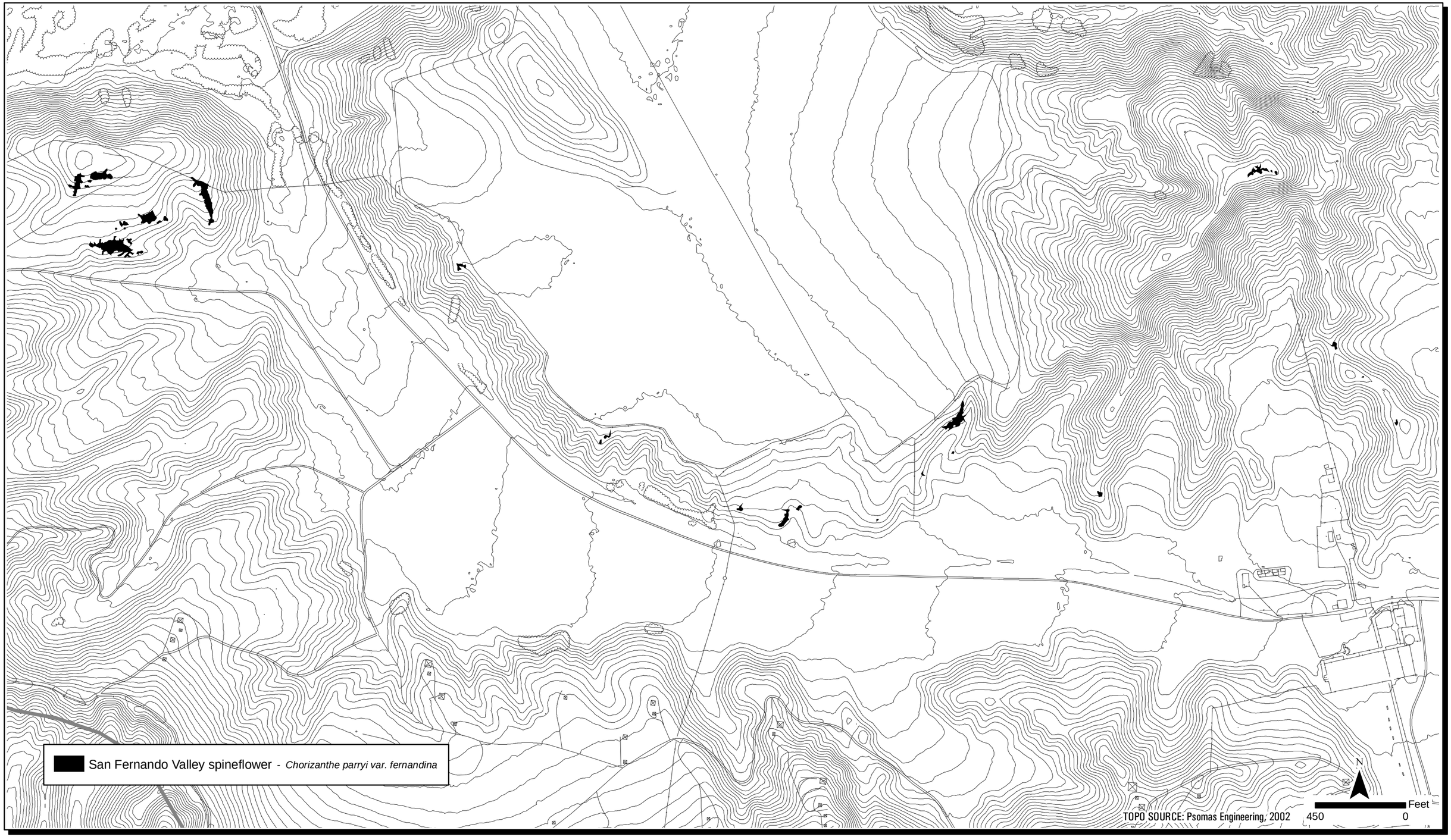
____ Keyed in a site reference:
____ Compared with specimen housed at:
____ Compared with photo/drawing in:
____ By another person (name):
X Other: personal

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
____ Plant/Animal	____ Slide
__ Habitat	____ Print
____ Diagnostic Feature	
____ Other	

May we obtain duplicates **at our cost?**
____ Yes X No



Newhall Ranch - Potrero Canyon

2006 Sensitive Plant Survey Results

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
IndexCode _____ Occurrence # _____
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PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU.
USE THE BACK FOR COMMENTS IF NECESSARY.
ATTACH OR DRAW A MAP ON BACK.

Scientific name (no codes): *Chorizanthe parryi* var. *fernandina*

Reporter: Colin Khoury, Callie Ford, Kam Muri Phone: (760) 942.5147

Address: Dudek & Associates, 605 Third Street, Encinitas, CA 92024

Date of Field Work: July13; Aug 8, 2006 County: Los Angeles Collection: no If yes, # Mus./Herb:

Location: Santa Clarita Valley, Newhall Ranch: north of State Route 126, west of San Martinez Grande Canyon Road

Quad Name: Val Verde X 7½'_15' Elevation: 1000-1700' T4N R 17W ____ ¼ Sec 15,16,22

Landowner/Manager: Newhall Land, 23823 Valencia Boulevard, Valencia, CA 91355

Species Found? X Yes ___ No If not, reason:

Is this a new location record? _ Yes X No ___ Unknown

Total # of Individuals = ~ 1050 Is this a subsequent visit X Yes No Compared to your last visit: _ more _ same X fewer

Phenology (plants): ___ % vegetative ___ % flowering ___% fruiting

Population Age Structure (animals): ___ # adults ___ #juveniles ___ # others

Site Function for Species (animals): ___ breeding ___ foraging ___ wintering ___ roosting ___ denning ___ other

Habitat Description (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope):

Locations are predominantly within disturbed or ruderal habitat. Ruderal habitat is dominated by *Bromus hordeaceus, Avena fatua, Centaurea melitensis, Vulpia myuros, and Hirschfeldia incana.* Clay soils predominate, with some loam. Most plants are on south or southwest slopes from 0-40%.

Current Land Use visible Disturbances/Possible Threats: Current Land Use: Cattle grazing, farming; Visible Disturbances: cattle grazing, fire in recent past (5-1 0 years); Possible Threats: Currently proposed for estate residential development.

Overall Site Quality: ___ Excellent ___ Good X Fair ___ Poor

Comments: This report summarizes 13 discrete locations, each with from 1 to an estimated 807 individuals observed.
Should/Could this site be protected? How?

Other comments:

DETERMINATION (Check one or more, fill in blanks)

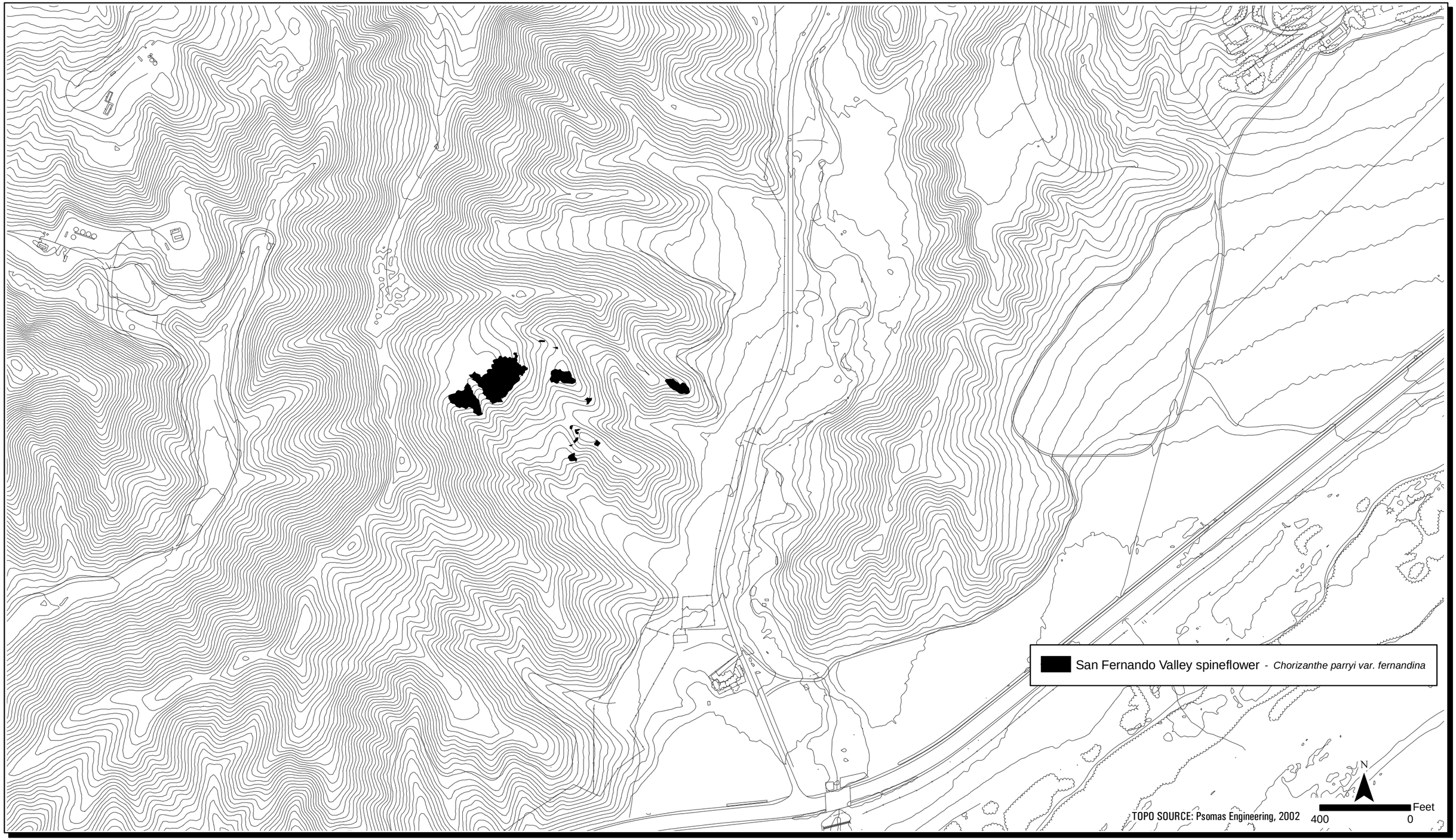
_____ Keyed in a site reference:
_____ Compared with specimen housed at:
_____ Compared with photo/drawing in:
_____ By another person (name):
____
X Other: Personal knowledge

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
_____ Plant/Animal	_____ Slide
_____ Habitat	_____ Print
_____ Diagnostic Feature	
_____ Other	

May we obtain duplicates at our cost?
___ Yes X No



Newhall Ranch - San Martinez Grande

2006 Sensitive Plant Survey Results