

APPENDIX E

# 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

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# **2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory**

**National Aeronautics and Space Administration  
Huntsville, Alabama**

December 2011

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# Acronyms and Abbreviations

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Boeing	The Boeing Company
Cal-IPC	California Invasive Pest Plant Council
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Societies
EIS	Environmental Impact Statement
ENTS	Laboratory Engineered Natural Treatment Systems
ESA	Endangered Species Act
°F	Degree Fahrenheit
ft	Feet
GIS	Geographic information system
GPS	global positioning system
LOX	Liquid oxygen
NAD	North American Datum
NASA	National Aeronautics and Space Administration
NRCS	Natural Resources Conservation Service
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAIC	Science Applications International Corporation
SSFL	Santa Susana Field Laboratory
SSURGO	Soil Survey Geographic Database
USFWS	U.S. Fish and Wildlife Service
WRCC	Western Regional Climate Center

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## SECTION 1

# Introduction

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This report presents the findings of special-status plant species and wildlife surveys conducted in 2011 on the National Aeronautics and Space Administration (NASA)-administered property at Santa Susana Field Laboratory (SSFL) in southern California. SSFL was established shortly after World War II and has been used primarily as a site to develop and test nuclear reactors, rockets, and missiles. The 2,850-acre site is divided into four production and two buffer areas (Areas I, II, III, and IV, and the northern and southern buffer zones). A portion of SSFL is federally owned property that is administered by NASA. The remaining property at SSFL is owned by The Boeing Company (Boeing). The NASA-administered property at SSFL consists of 41.7 acres within Area I and all 409.5 acres of Area II. The Boeing Company owns the remainder of Area I, all of Areas III and IV, and the northern and southern buffer areas at the site.

## 1.1 Purpose

This report presents the results of protocol-level botanical surveys and opportunistic wildlife surveys of the NASA-administered property at SSFL. These biological surveys were conducted to support NASA's preparation of a Ecological Stewardship Plan for the property it administers at SSFL. The findings also will be used as the basis for the biological resources section of the Environmental Impact Statement (EIS) being prepared to assess the potential impacts of NASA's proposal to demolish structures and to remediate soil and groundwater on the NASA-administered property at SSFL. This report has been prepared as a supplement to the *Fall 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory* (NASA, 2011).

## 1.2 Background

In April 2008 and May 2009, ecological surveys were conducted on portions of the NASA-administered property at SSFL as part of Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs) (NASA, 2008; 2009a; 2009b). The fall 2010 habitat and listed species surveys (NASA, 2011) together with the 2011 botanical and wildlife surveys are intended to expand on the past ecological surveys through a survey of the entire NASA-administered property at SSFL, including some limited areas outside the RFI areas that had not been surveyed previously.

Several other ecological studies conducted at SSFL between 2005 and 2009 were reviewed for potential insight into the biological resources on the NASA-administered property:

- MWH Americas, Inc., and AMEC Earth & Environmental, Inc. (2005)
- MWH Americas, Inc., and ERM (2007)
- Ogden Environmental and Energy Services Co., Inc. (1998)
- Padre Associates, Inc. (2008)
- Science Applications International Corporation (SAIC) (2009)

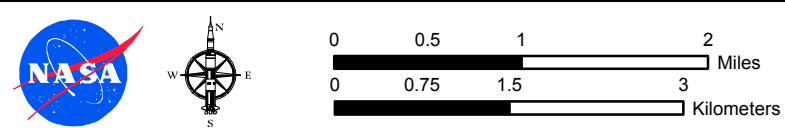
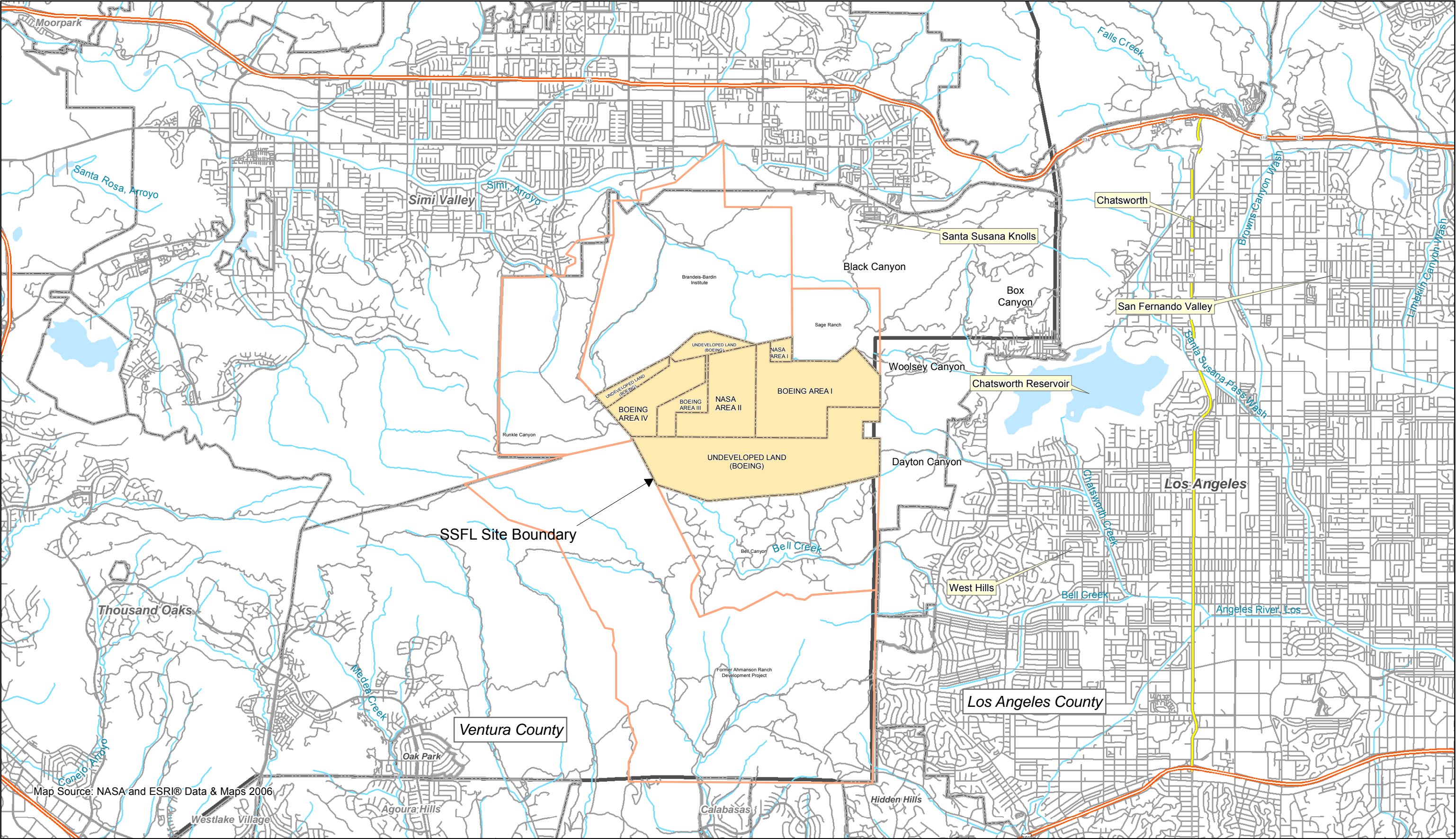
## 1.3 Location and Environmental Setting

Section 1.3 is summarized from a more detailed environmental setting description contained in the *Fall 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory* (NASA, 2011). Additional information regarding physiography, geology, and habitat types also is included in that report.

### 1.3.1 General

SSFL is approximately 29 miles northwest of downtown Los Angeles in the southeastern corner of Ventura County, California. SSFL is located mostly within an unincorporated part of Ventura County; its easternmost portion extends slightly into an unincorporated part of Los Angeles County (Figure 1-1). It encompasses 2,850 acres within a remote, mountainous area near the crest of the Simi Hills at the western border of the San Fernando Valley.

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18-Oct-2011  
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A. Cooley

Figure 1-1  
Regional Map  
NASA Supplemental Biological Survey – 2011  
Santa Susana Field Laboratory  
Ventura County, California

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Area I LOX Plant and Area II are in the central and north-central parts of SSFL, respectively (Figure 1-2). The 451.2 acres of the NASA-administered property at SSFL represents approximately 16 percent of the total site area.

SSFL's landscape is characterized by sandstone outcropping hills. Numerous industrial facilities, constructed drainage systems, and roadways have been developed within this hilly landscape. The site is within the central portion of the Southern California Coast ecological subregion in the Simi Valley–Santa Susana Mountains (261Be) ecological subsection. This subsection includes steep mountains; moderately steep to steep hills; and nearly level to gently sloping floodplains, terraces, and alluvial fans (Miles and Goudey, 1998).

### 1.3.2 Habitat Types

Habitat surveys of the NASA-administered property conducted during fall 2010 identified eight natural terrestrial habitat types, two aquatic habitat types, and ruderal and developed areas (NASA, 2011). These habitat types are described briefly in the following text. Table 1-1 cross-references the mapped habitat types and the current California vegetation classification system (Sawyer et al., 2009).

#### Chaparral

Chaparral is the most abundant and widespread natural community at the site. This habitat covers 172.6 acres (approximately 38 percent) of the NASA-administered property. Characteristic species include chamise (*Adenostoma fasciculatum*), hoaryleaf ceanothus (*Ceanothus crassifolius*), black sage (*Salvia mellifera*), laurel sumac (*Malosma laurina*), thicketleaf yerba santa (*Eriodictyon crassifolium*), Mendocino bushmallow (*Malacothamnus fasciculatus*), and chaparral yucca (*Yucca whipplei*). The abundance of these species is variable within this habitat type depending on soils, aspect, past disturbance, and other environmental factors.

#### Venturan Coastal Sage Scrub

Venturan coastal sage scrub covers 64.4 acres (approximately 15 percent) of the site. Characteristic species include coastal sagebrush (*Artemisia californica*), Eastern Mojave buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), black sage, chaparral yucca, thicketleaf yerba santa, and common deerweed (*Acmispon glaber*).

#### Non-native Grassland

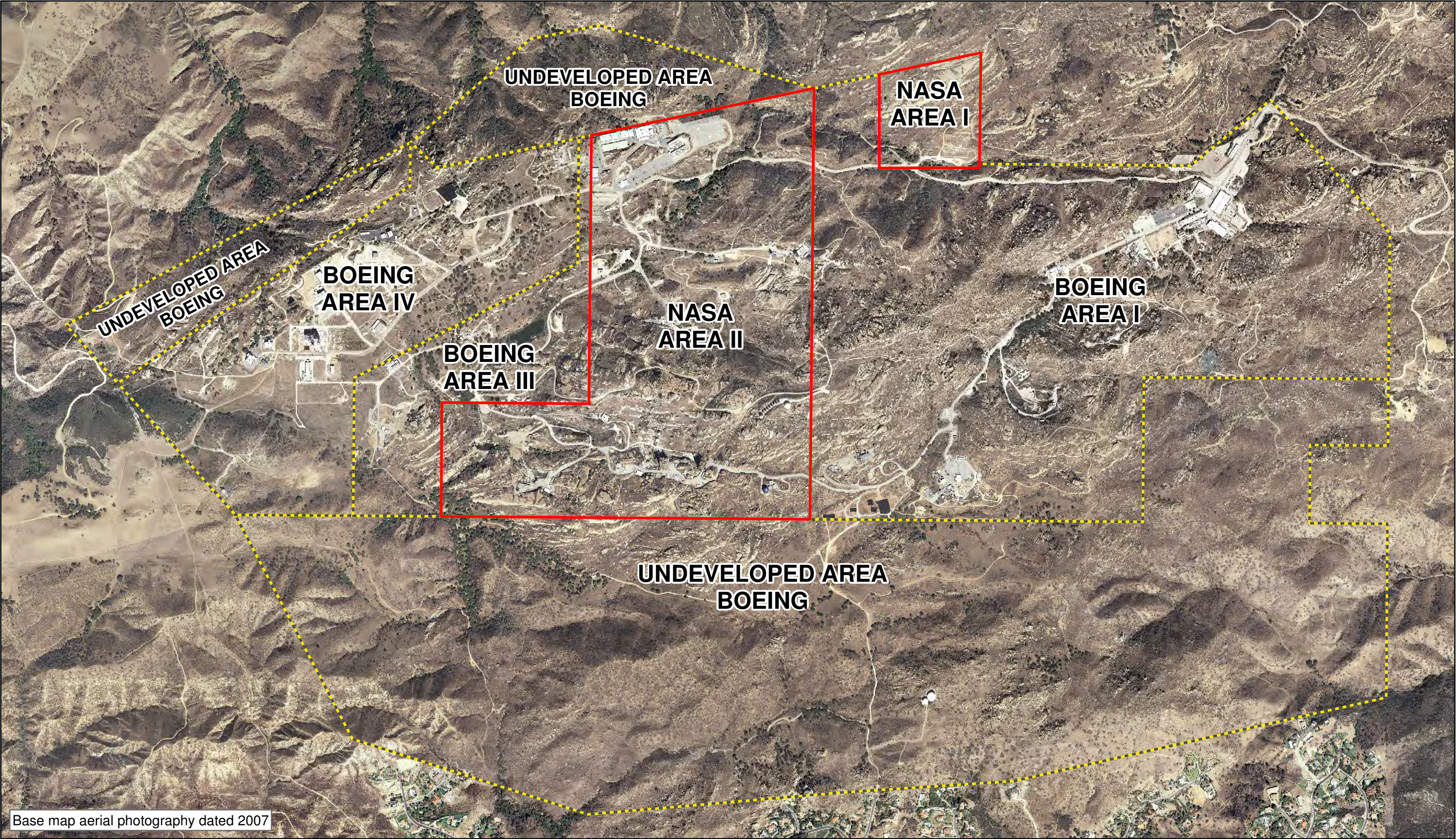
Grassland habitat covers 19.2 acres (approximately 4 percent) of the site and often occurs in a mosaic with other habitat types. Most of the grasslands are characterized by slender oat (*Avena barbata*), intermixed with other introduced annual grasses such as ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), and fescue (*Vulpia* spp). Native grasses including needlegrass (*Nassella* spp.), littleseed muhly (*Muhlenbergia microsperma*), and deergrass (*Muhlenbergia rigens*) are present in a few areas, but generally provide only minimal cover. Common herbaceous species include suncup (*Camissonia* spp.), winecup clarkia (*Clarkia purpurea*), longbeak stork's bill (*Erodium botrys*), and winter vetch (*Vicia villosa*).

#### Coast Live Oak Woodland

Coast live oak woodland is distributed widely across the site but only makes up 13.2 acres (approximately 3 percent) of the NASA-administered property. This habitat is characterized by mature coast live oak (*Quercus agrifolia*) trees. The understory generally consists of annual grasses such as ripgut brome and slender oat, with occasional native grasses including blue wildrye (*Elymus glaucus*) and California brome (*Bromus carinatus*). The understory shrub layer is poorly developed and, where present, generally consists of scattered Pacific poison oak (*Toxicodendron diversilobum*).

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Base map aerial photography dated 2007



02-Dec-2011  
Drawn By:  
A. Cooley

0 750 1,500 3,000  
Feet

**Legend**

- NASA-Administered Property Boundary
- SSFL Administrative Areas

**Figure 1-2**  
**Site Overview**  
**NASA Supplemental Biological Survey – 2011**  
**Santa Susana Field Laboratory**  
**Ventura County, California**



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TABLE 1-1

## Mapped Habitat Types and Current California Vegetation Classification System

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Mapped Natural Habitat Types	Current California Vegetation Classification System <sup>1</sup>
Chaparral	<i>Adenostoma fasciculatum</i> – <i>Salvia mellifera</i> Shrubland Alliance <i>Malosma laurina</i> Shrubland Alliance <i>Malacothamnus fasciculatus</i> Shrubland Alliance <i>Eriodictyon crassifolium</i> Provisional Shrubland Alliance
Venturan Coastal Sage Scrub	<i>Artemisia californica</i> – <i>Eriogonum fasciculatum</i> Shrubland Alliance
Non-Native Grassland	<i>Avena</i> ( <i>barbata</i> , <i>fatua</i> ) Semi-Natural Herbaceous Stands
Coast Live Oak Woodland	<i>Quercus agrifolia</i> Woodland Alliance
Coast Live Oak Riparian Forest	<i>Quercus agrifolia</i> Woodland Alliance
Baccharis Scrub	<i>Baccharis pilularis</i> Shrubland Alliance
Mule-fat Scrub	<i>Baccharis salicifolia</i> Shrubland Alliance
Southern Willow Scrub	<i>Salix lasiolepis</i> Shrubland Alliance

Note:

SSFL = Santa Susana Field Laboratory

<sup>1</sup> Sawyer et al.( 2009)**Coast Live Oak Riparian Forest**

Coast live oak riparian forest is found along the edges of the seasonal streams on the site. This habitat type covers 9.2 acres (approximately 2 percent) of the NASA-administered property. The composition of this community is generally similar to the coast live oak woodland habitat described previously, although the understory typically is more diverse in these areas and includes species such as Douglas' sagewort (*Artemisia douglasiana*), creeping snowberry (*Symphoricarpos mollis*), and American black elderberry (*Sambucus nigra*).

**Baccharis Scrub**

Baccharis scrub is limited, covering only 2.6 total acres (less than 1 percent) of the site. This community is characterized by generally pure stands of coyotebrush (*Baccharis pilularis*). In these areas, coyotebrush ranges from dense cover with a sparse herbaceous layer to more open stands with an understory composed of annual grasses and scattered forbs.

**Mule-fat Scrub**

Mule-fat scrub is limited, covering 2.1 acres (less than 1 percent) of the site. This habitat type is characterized by localized, dense stands of mule-fat (*Baccharis salicifolia*).

**Southern Willow Scrub**

Southern willow scrub habitat on the NASA-administered property is characterized by arroyo willow (*Salix lasiolepis*) intermixed with occasional red willow (*Salix laevigata*) and narrowleaf willow (*Salix exigua*). This habitat type is uncommon on the site, covering only 1 acre (less than 1 percent). Southern willow scrub occurs in localized patches around scattered ponds and detention basins and along portions of the seasonal drainages within the site.

**Aquatic Habitats**

Aquatic habitats identified on the NASA-administered property include 0.4 acre of open water and 0.2 acre of freshwater marsh habitat associated with various ponds and detention basins. Freshwater marsh is limited to the outer edges of ponds and detention basins and is characterized by southern cattail (*Typha domingensis*).

## Sandstone Rock Outcrops

Approximately 91 acres (20 percent) of the NASA-administered property is composed of sandstone outcrops. In many areas, the outcrops are devoid of vegetation, while in other areas, the rocks are covered with a diverse assemblage of lichens. In some areas, scattered vascular plants are present. Common plants associated with these rock outcrops include bushy spikemoss (*Selaginella bigelovii*), lanceleaf liveforever (*Dudleya lanceolata*), chalk dudleya (*Dudleya pulverulenta*), cliffbrake (*Pellaea* spp.), orange bush monkey flower (*Mimulus aurantiacus*), and Santa Susana tarweed (*Deinandra minthornii*).

## Ruderal

Ruderal habitat is common around developed areas and areas that have been subject to human disturbance. Ruderal habitats cover approximately 17 acres (4 percent) of the site. Common species observed in these areas include telegraphweed (*Heterotheca grandiflora*), black mustard (*Brassica nigra*), Maltese star-thistle (*Centaurea melitensis*), silver bird's-foot trefoil (*Acmispon argophyllus*), stork's bill (*Erodium* spp.), and common deerweed.

## Developed

Developed areas include paved roads, parking areas, buildings, test structures, and other developments. Approximately 58 acres, or 13 percent, of the NASA-administered property have been developed.

### 1.3.3 Soils

Three Natural Resources Conservation Service (NRCS) soil types occur within the NASA-administered property (NRCS, 2008). These soil types are described in the following text; Figure 1-3 shows their distribution on the property.

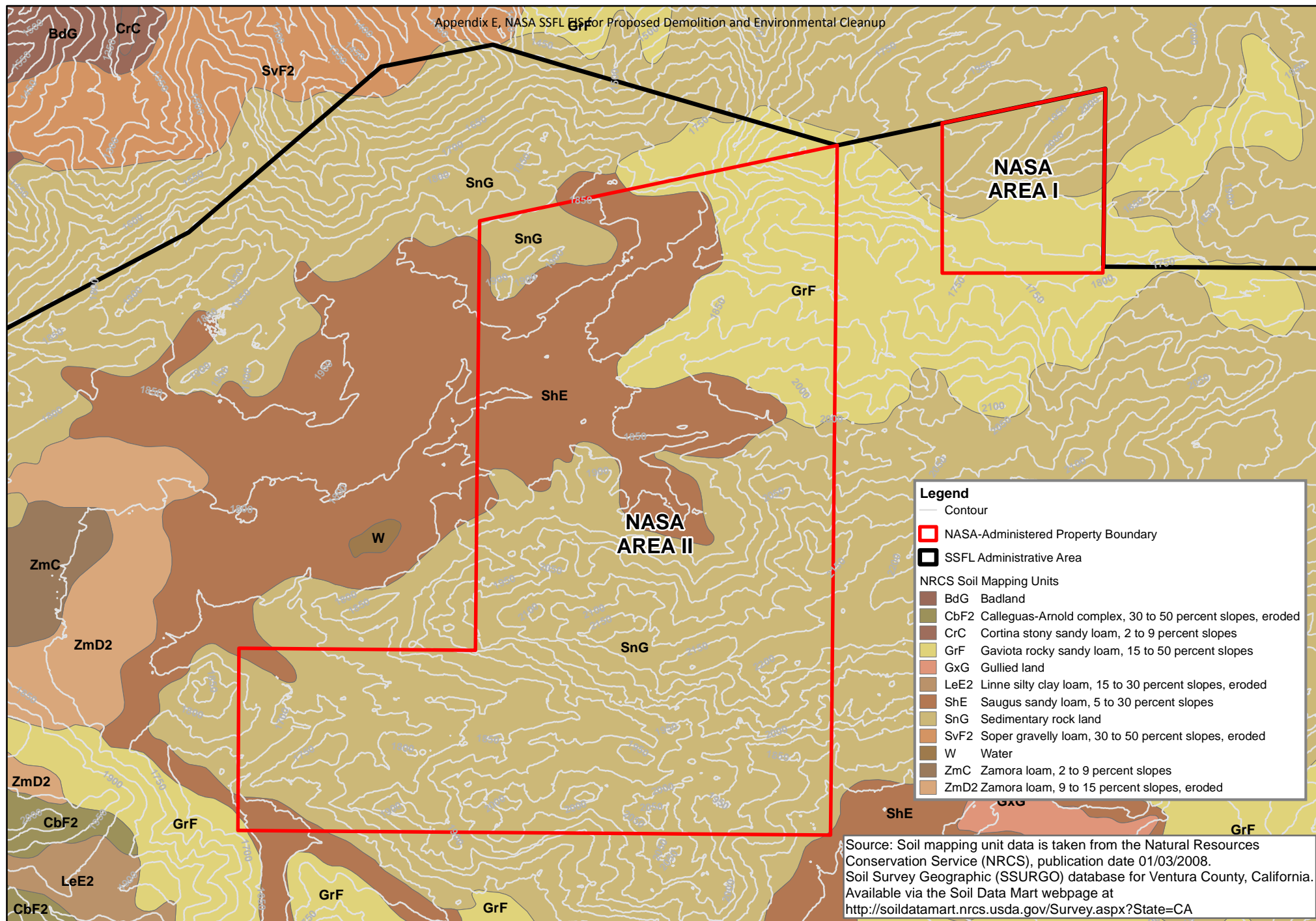
**GrF—Gaviota rocky sandy loam, 15- to 50-percent slopes.** This soil mapping unit occurs in the southern half of NASA Area I and in the northeastern corner of Area II. These soils are found on hills and mountains and have a very shallow or shallow to lithic (bedrock) contact. They are well to excessively well drained and are formed in material weathered from hard sandstone or meta-sandstone. These soils have very low to very high runoff and moderately rapid permeability.

**ShE—Saugus sandy loam, 5- to 30-percent slopes.** This soil mapping unit occurs in the northwestern and southwestern portions of Area II. This unit consists of deep, well-drained soils that formed from weakly consolidated sediments. They are found on dissected terraces and foothills. These soils have medium to rapid runoff and moderate permeability.

**SnG—Sedimentary rock land.** This soil mapping unit occurs in the northern half of NASA Area I and in the northwestern corner and southern half of Area II. This mapping unit consists mostly of exposed sedimentary rock with very thin, discontinuous areas of soil. There is little available information about this mapping unit; however, the potential for erosion is expected to be relatively low, based on the erosivity factors reported online and the relative lack of soil cover. It is expected that runoff is rapid and permeability is very low in these areas.

### 1.3.4 Climate Summary

Climate data from the Western Regional Climate Center (2011) Canoga Park area, which is approximately 7 miles southeast of SSFL, is considered generally representative of the regional climate for the site. Average temperatures range from a low of 39 degrees Fahrenheit (°F) in December and January to a high of 95°F in July and August. Average annual rainfall is 16.8 inches, most of which falls between November and March.



0 500 1,000 Feet  
0 150 300 Meters

06-Dec-2011  
Drawn By:  
A. Croley  
E-17

**Figure 1-3**  
**NRCS Soil Mapping Units**  
**NASA Supplemental Biological Survey - 2011**  
**Santa Susana Field Laboratory**  
**Ventura County, California**

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## SECTION 2

## Methods

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### 2.1 Botanical Surveys

#### 2.1.1 Pre-field Preparation

Preparation for the protocol-level special-status plant surveys included compiling a list of rare, threatened, or endangered plant species that have the potential to occur within the limits of the NASA-administered property at SSFL. For the purpose of this evaluation, a special-status plant is defined as any species that falls under one of the following classifications:

- Federally listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA)
- A candidate for federal listing under the ESA
- Listed threatened or endangered by the California Department of Fish and Game (CDFG) under the California Endangered Species Act
- Listed as rare under the California Native Plant Protection Act
- Considered rare, threatened, or endangered in California as determined by the California Native Plant Societies (CNPS) Rare Plant Inventory

The list of special-status plant species that potentially could occur on the NASA-administered property at SSFL was developed based on information from the California Natural Diversity Database (CNDDDB) (CDFW, 2011b); CNPS (2011) Rare Plant Inventory; USFWS list of threatened, endangered, and candidate species for Ventura County (USFWS, 2011); and information from herbarium collections from the Jepson Online Interchange for California Floristics (University of California, 2011). The CNDDDB and CNPS database searches included the following U.S. Geological Survey Quadrangles—Simi, Santa Susana, Oat Mountain, Thousand Oaks, Calabasas, Canoga Park, Point Dume, Malibu Beach, and Topanga.

The database searches and literature review identified 46 special-status plant species in the regional vicinity, 34 of which were considered to have the potential to occur on the NASA-administered property (Table 2-1). Appendix A contains a list of special-status plants identified in the data review that are considered unlikely to occur on the site.

Representative photographs of many of the special-status plant species were obtained from the Internet (CalPhotos, 2011) to facilitate field identification. Flowering periods provided by the CNPS Rare Plant Inventory (CNPS, 2011) were used to schedule field work to correspond with the appropriate blooming periods for the special-status plant species.

Ortho-rectified, 150-scale (1 inch = 150 feet [ft]) aerial photographs with overlain survey area boundaries were prepared as the base maps for the field surveys. These aerial photograph base maps were generated from the NASA geographic information system (GIS) database using the North American Datum (NAD) 1927 State Plane, California Zone V base datum coordinate system. Habitat mapping developed during the fall 2010 survey (NASA, 2011) also was overlain onto the base maps.

TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

***NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Asplenium vespertinum</i>	western spleenwort	4.2	Feb-June	Rocky areas in chaparral, cismontane woodland, and coastal scrub. Herbarium collection from Lake Sherwood area, approximately 10 miles southwest of the site.
<i>Astragalus brauntonii</i>	Braunton's milk-vetch	FE 1B.1	Jan-Aug	Chaparral, coastal scrub grassland, and closed-cone coniferous forest. Known to occur on Boeing-administered property at SSFL approximately 0.5 mile west of the site. Numerous reported occurrences in the regional vicinity.
<i>Atriplex parishii</i>	Parish's brittle-scale	1B.1	June-Oct	Alkali meadows, vernal pools, chenopod scrub, and playas; usually found on drying alkali playas with fine soils. Limited suitable habitat on the site. The nearest reported occurrence is around Santa Monica, approximately 18 miles southeast of the site.
<i>Baccharis malibuensis</i>	Malibu baccharis	1B.1	Aug	Coastal scrub, chaparral, and oak woodland habitats. Several reported occurrences approximately 8 to 10 miles south of the site.
<i>Calandrinia breweri</i>	Brewer's calandrinia	4.2	Mar-June	Sandy or loamy soils in chaparral and coastal scrub. Several herbarium collections from Ventura County including the Santa Monica Mountains.
<i>California macrophylla</i>	round-leaved filaree	1B.1	Mar-May	Cismontane woodland and grassland; generally associated with clay soils. Three reported occurrences between 5 and 9 miles south of the site.
<i>Calochortus catalinae</i>	Catalina mariposa lily	4.2	Feb-June	Openings in chaparral, coastal scrub, and cismontane woodland and on grassy slopes. Numerous herbarium collections from Ventura County, including the Santa Monica Mountains.
<i>Calochortus clavatus</i> var. <i>gracilis</i>	slender mariposa lily	1B.2	Mar-June	Chaparral and coastal scrub, often in grassy areas within other habitats. Known to occur on SSFL property. Several additional reported occurrences in the regional vicinity of the site.
<i>Calochortus fimbriatus</i>	late-flowered mariposa lily	1B.2	June-Aug	Chaparral and cismontane woodland; often on serpentine. Three reported occurrences approximately 8 miles north of the site, including one associated with open woodland on sandstone parent material.
<i>Calochortus plummerae</i>	Plummer's mariposa lily	1B.2	May-July	Coastal scrub, chaparral, grassland, cismontane woodland, and lower montane coniferous forests. Known to occur on SSFL property. Numerous reported occurrences in the regional vicinity of the site.
<i>Centromadia parryi</i> ssp. <i>australis</i>	southern tarweed	1B.1	May-Nov	Edges of marshes, vernal pools, and vernal mesic grasslands. Limited suitable habitat present on the site. The only reported occurrence in the vicinity is a historical (1930) herbarium collection from Santa Monica (18 miles to the southeast).

TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

***NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Chorizanthe parryi</i> var. <i>fernandina</i>	San Fernando Valley spineflower	FC/CE 1B.1	Apr-July	Sandy soils in coastal scrub and rocky outcrops. Large population reported approximately 3.6 miles south of the site.
<i>Chorizanthe parryi</i> var. <i>parryi</i>	Parry's spineflower	1B.1	Apr-June	Dry sandy soils in coastal scrub, chaparral, and grassland; often at interface with oak woodland habitat. Only document occurrence in the vicinity is a 1957 herbarium collection approximately 14 miles south of the site. This occurrence is possibly extirpated.
<i>Deinandra minthornii</i>	Santa Susana tarweed	CR 1B.2	July-Nov	On sandstone outcrops in chaparral and coastal scrub. This species is widespread throughout much of the site. Numerous reported occurrences in the regional vicinity.
<i>Delphinium parryi</i> ssp. <i>blochmaniae</i>	dune larkspur	1B.2	Apr-May	Coastal dunes and maritime chaparral in dry sandy soils. Only two reported occurrences in vicinity of the site, both are in the coastal hills to the southwest. Nearest reported occurrence is associated with oak woodland habitat approximately 10.5 miles to the southwest of the site.
<i>Dodecahema leptoceras</i>	Slender-horned spineflower	FE/SE 1B.1	Apr-June	Chaparral and coastal scrub. There are no CNDDDB occurrences or herbarium records for this species in Ventura County. Nearest reported occurrence is a historical collection (1893) from Newhall, approximately 13 miles northeast of the site. There is also an occurrence (possibly extirpated) approximately 17 miles east northeast of the site.
<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	Blochman's dudleya	1B.1	Apr-June	Coastal scrub, grassland, and open rocky slopes; often in clay soil over serpentine or in rocky areas with little soil. Known to occur on SSFL (Boeing property). Other reported occurrence in the vicinity of Chatsworth Reservoir approximately 3 miles east of the site.
<i>Dudleya cymosa</i> ssp. <i>agourensis</i>	Agoura Hills dudleya	FT 1B.2	May-June	Rocky areas and volcanic breccias in chaparral and cismontane woodland habitats. Several known occurrences between 6 and 10 miles southwest of the site.
<i>Dudleya cymosa</i> ssp. <i>marcescens</i>	marcescent dudleya	FT/CR 1B.2	Apr-July	Chaparral, sheer rock surfaces, and rocky volcanic cliffs. Four reported occurrences between 8 and 9 miles south of the site.
<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>	Santa Monica dudleya	FT 1B.2	Mar-June	Chaparral and coastal scrub; often on north facing slopes in canyons associated with sedimentary conglomerates. Three known occurrences between 10 and 12 miles south of the site.
<i>Dudleya multicaulis</i>	many-stemmed dudleya	1B.2	Apr-July	Chaparral, coastal scrub and grassy slopes; often in heavy clay soils. Known to occur at SSFL (Boeing property). One reported CNDDDB occurrence from a rocky outcrop approximately 3.5 miles east of the site.

TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

***NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Dudleya parva</i>	Conejo dudleya	FT 1B.2	May-June	Coastal scrub, grassland and rocky slopes; generally on clayey or volcanic soils. Two reported occurrences approximately 9 miles west of the site.
<i>Dudleya verityi</i>	Verity's dudleya	FT 1B.2	May-June	Volcanic and rocky outcrops in chaparral, coastal scrub, and cismontane woodland. Three reported occurrences between 15 and 19 miles west of the site.
<i>Eriogonum crocatum</i>	conejo buckwheat	CR 1B.2	Apr-July	Rocky areas in coastal scrub and grasslands. One reported occurrence approximately 10 miles southwest of the site.
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	4.2	Mar-May	Chaparral, coastal scrub, and grassland; often on clay soils. One reported occurrence approximately 13 miles northeast of the site.
<i>Horkelia cuneata</i> ssp. <i>puberula</i>	mesa horkelia	1B.1	Feb-Sept	Sandy or gravelly sites in chaparral, cismontane woodlands, and coastal scrub. Several herbarium collections from Ventura County. All CNDDDB occurrences are more than 30 miles to the west northwest of the site.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	1B.1	Feb-June	Coastal salt marshes, playas, grasslands, and vernal pools; usually associated with alkaline soils in playas, sinks, and grasslands. Limited suitable habitat on the site. Two reported occurrences in the vicinity of the site. One is a 1933 herbarium collection approximately 13 miles south, near the Malibu lagoon. The other is approximately 4.5 miles east of the site, but the habitat and taxonomy of this occurrence are questionable.
<i>Navarretia fossalis</i>	spreading navarretia	FT 1B.1	Apr-June	Vernal pools, shallow freshwater marshes, playas, and chenopod scrub. Limited habitat present on the site. No reported occurrences in Ventura County. Nearest reported occurrences are between 19 and 20 miles northeast of the site.
<i>Nolina cismontana</i>	chaparral nolina	1B.2	May-July	Chaparral and coastal scrub; primarily on sandstone and shale substrates. Three reported occurrences within 3 to 6 miles west to southwest of the site.
<i>Pentachaeta lyonii</i>	Lyon's pentachaeta	FE/CE 1B.1	Mar-Aug	Chaparral and grassland habitats. Numerous reported occurrences of this species in the regional vicinity of the site. Nearest CNDDDB occurrence is approximately 6.5 miles west of the site.
<i>Phacelia hubbyi</i>	Hubby's phacelia	4.2	Apr-June	Gravelly and rocky areas in coastal scrub, chaparral, and grassland habitats. Several herbarium collections from Ventura County, including the Santa Susana Mountains.
<i>Phacelia ramosissima</i> var. <i>austrolitoralis</i> <sup>1</sup>	south coast branching phacelia	3.2	Mar-Aug	Sandy or rocky sites in coastal scrub, chaparral, coastal dunes, and in coastal salt marshes. Herbarium records suggest that this variety is typically found in more coastal areas.



TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

***NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Pseudognaphalium leucocephalum</i>	white rabbit-tobacco	2.2	July-Dec	Sandy gravelly sites in coastal scrub, chaparral, riparian woodlands and cismontane woodland habitats. Known to occur on SSFL property.
<i>Thelypteris puberula</i> var. <i>sonorensis</i>	Sonoran maiden fern	2.2	Jan-Sept	Along streams, seeps, and in mesic meadows. One reported occurrence in a seepage area along a stream approximately 15 miles southwest of the site.

Notes:

CNDDDB = California Natural Diversity Database

SSFL = Santa Susana Field Laboratory

<sup>1</sup> *Phacelia ramosissima* var. *australitoralis*—This variety is no longer recognized and is now considered a synonym for *Phacelia ramosissima*, according to the Jepson Online Interchange for California Floristics (University of California, 2011).

Status Codes:

CE = State listed endangered species

CR = State listed rare species

FC = Candidate for federal listing as a threatened or endangered species

FE = Federally listed endangered species

FT = Federally listed threatened species

1B.1 = California Native Plant Society (CNPS) listed as rare, threatened, or endangered in California and elsewhere; considered seriously threatened in California.

1B.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; considered fairly threatened in California.

2.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; but more common elsewhere, considered fairly threatened in California.

3.2 – Plants about which more information is needed; a review list; considered fairly threatened in California.

4.2 – Plants of limited distribution; a watch list; considered fairly threatened in California.

Sources:

CNDDDB RareFind Version 3.1.0 (CDFG, 2011b).

Online CNPS Inventory of Rare and Endangered Plants (8th Edition) (CNPS, 2011)

Threatened and Endangered Plants of Ventura County (USFWS, 2011)

Berkeley Consortium of California Herbaria (University of California, 2011)

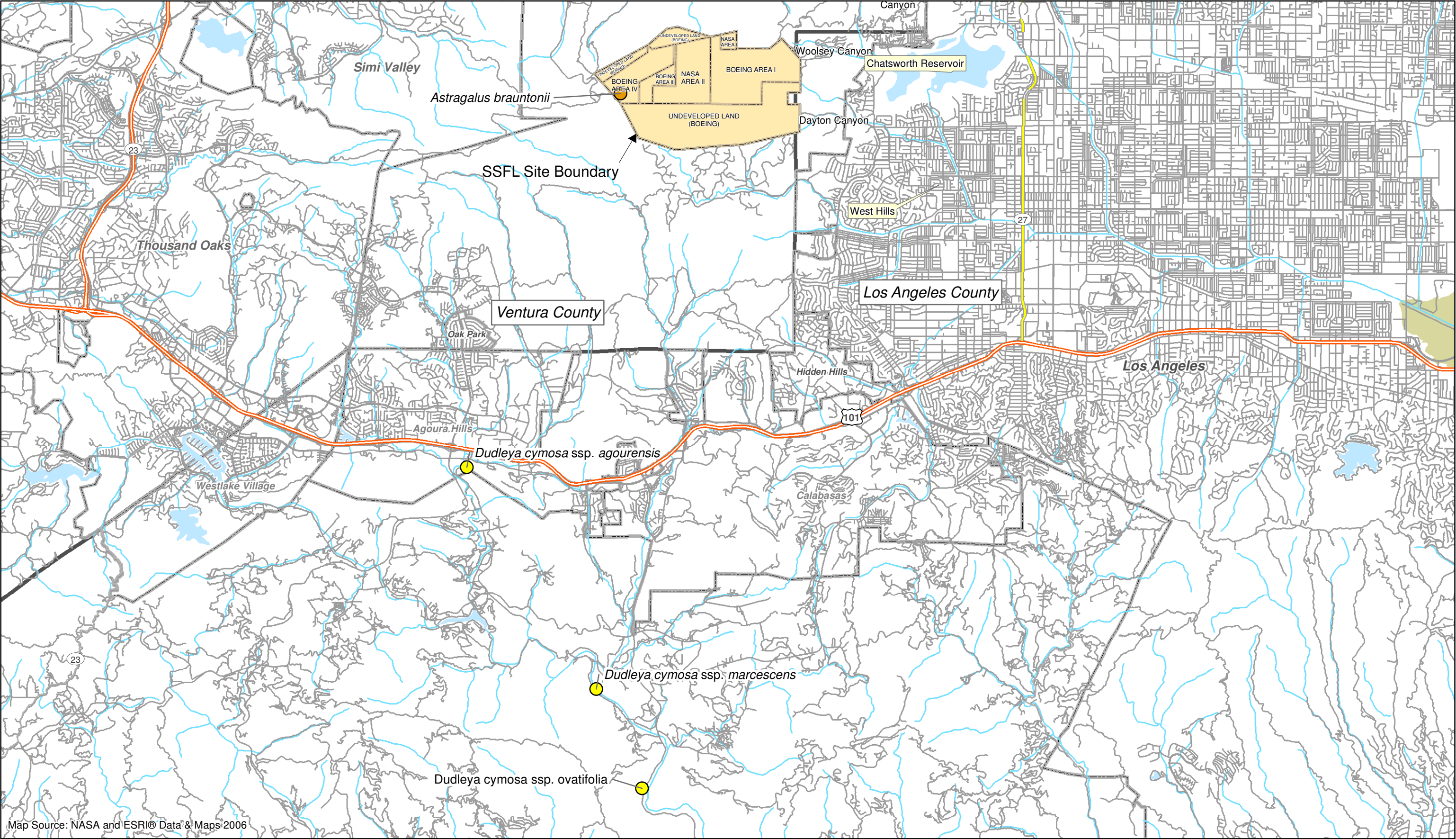
## 2.1.2 Reference Populations

Reference sites for four special-status plants were visited prior to or during the field surveys. Reference populations provide information about the current phenology, assist with proper identification of target species, and confirm that both the timing and environmental conditions are suitable for conducting the botanical surveys. Given the large number of potentially occurring plants, it was impractical to observe reference populations for all the target species. Imprecise location information, uncertainty of population status, distance from the site, and restricted access to private property also precluded visits to some reference locations.

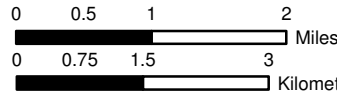
The following reference sites were visited on the dates indicated; Appendix B provides photographs of reference populations.

**Braunton's milk-vetch (*Astragalus brauntonii*):** A large number of individuals on a previously burned, north-facing hillside were observed on April 18, June 6, and August 15, 2011. This population is within the southern portion of Boeing Area IV (coordinates 34° 13' 34.58788" N; -118° 43' 00.34798" W), as shown in Figure 2-1. Plants were viewed in different development stages (budding, flowering, and fruiting) over the course of the three site visits.

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Map Source: NASA and ESRI® Data & Maps 2006



02-Dec-2011  
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A. Cooley

Figure 2-1  
Special Status Plant Reference Locations  
NASA Supplemental Biological Survey – 2011  
Santa Susana Field Laboratory  
Ventura County, California

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**Agoura Hills Dudleya (*Dudleya cymosa* ssp. *agourensis*):** A large number of individuals were viewed on a north-facing rock slope on Cornell Road south of Agoura Hills on June 7, 2011 (coordinates 34° 08' 29.33165" N; -118° 45' 28.64898" W), as shown in Figure 2-1. The sandy-rocky slope was a road cut that exposed a former volcanic mud flow. Plants were viewed in flowering condition.

**Marcescent Dudleya (*Dudleya cymosa* ssp. *marcescens*):** Approximately 12 individuals were observed on an east-facing rock slope within Malibu Creek State Park approximately 2.9 miles south of State Highway 101 off Coastal Highway N1 (Malibu Canyon Road) on June 7, 2011 (coordinates 34° 05' 29.36678" N; -118° 43' 19.91690" W), as shown in Figure 2-1. The rock slope is adjacent to a dirt roadway and hiking trail and partially covered with moss and lichens. Plants were viewed in flowering condition.

**Santa Monica Mountains Dudleya (*Dudleya cymosa* spp. *ovatifolia*):** Numerous individuals were observed on a northeast-facing rocky slope along a small creek 5.4 miles south of State Highway 101 off Coastal Highway N1 (Malibu Canyon Road) on June 7, 2011 (coordinates 34° 04' 08.80759" N; -118° 42' 34.32287" W), as shown in Figure 2-1. The rock slope is a volcanic mud flow covered with mosses and lichens. Plants were viewed in flowering condition.

In addition to these rare plant reference locations, a site that had Palmer's Dudleya (*Dudleya palmeri*) was viewed on June 7, 2011, to observe the diversity of characteristics of this genus.

### 2.1.3 Field Surveys

The 2011 botanical field surveys were completed by Russell Huddleston, Steve Long, Gary Santolo, and Laurel Karren. The surveys were conducted in accordance with the USFWS botanical survey guidelines (1996), CDFG (2009), and CNPS (2001).

Field surveys were scheduled to capture the temporal variations in the occurrence of special-status plants. Surveys were conducted during the following periods: April 18 to 22, June 6 to 10, and August 15 to 20, 2011. Tarja Sagar, a botanist with the National Park Service's Santa Monica Mountains National Recreation Area, provided local expertise on plant identification and assisted with the botanical surveys on June 7, 2011. Surveys of the NASA-administered property involved more than 488 person hours.

The survey area included the entire NASA-administered property at SSFL. The field surveys were conducted via systematic walking. Because of the steep rugged terrain and impenetrable dense vegetation in some areas, transects were not used for all areas of the site. In areas where terrain, slope, or dense vegetation constrained access, observations were made from adjacent, safely accessible locations. The surveys were floristic in nature and the plant species observed were identified to the taxonomic level necessary to assess their conservation status. Appendix C includes the list of observed plant species observed. Samples of plants that could not be identified readily in the field were collected for later identification using taxonomic keys. Taxonomic keys and the following local flora and field guides were used to identify plant species in the field and from collected samples: the *Jepson Manual* (Hickman, 1993); *Flora of the Santa Ana River and Environs* (Clarke, et al., 2006); *Wildflowers of the Santa Monica Mountains* (McAuley, 1996); and *Flowering Plants: The Santa Monica Mountains, Coastal and Chaparral Regions of Southern California* (Dale, 1986). Appendix D contains representative photographs of special-status plants, sensitive habitat, and selected wildlife species observed during the survey. Special-status plant occurrences were recorded in the field using a Trimble Geo-XT global positioning system (GPS) device.

### 2.1.4 Sensitive Habitat Types

Sensitive habitats on the NASA-administered property at SSFL were evaluated based on the 2010 fall habitat mapping and descriptions (NASA, 2011). The status of the natural habitat types identified on the site was determined based on the current list of natural communities from the Vegetation Classification and Mapping Program (CDFG, 2011a). Habitat types assigned a rank of S1, S2, or S3 were considered high-priority conservation habitats. Habitat types ranked as S4 and S5 were not considered priority conservation types (CDFG, 2011a).

### 2.1.5 Noxious and Invasive Weeds

The 2011 surveys did not include detailed assessments or mapping of noxious and invasive weeds on the site; however, noxious and invasive weed species and their general locations were recorded as part of the floristic surveys. A noxious weed is a plant that has been defined as a pest plant by law or regulation, and for the purpose of this report, included any species listed by the California Department of Food and Agriculture (CDFA) as a noxious weed (2011). Invasive weeds include species that present an economic or ecological threat, but that are not subject to legal regulations. Invasive species include any plant with a high or moderate threat level, as identified by the California Invasive Pest Plant Council (CAL-IPC) (2011).

## 2.2 Wildlife Surveys

Opportunistic wildlife surveys were conducted concurrently with the special-status plant surveys. Direct observations, calls, and signs of wildlife (butterflies, amphibians, reptiles, birds, and mammals) were recorded during the field surveys. Searches under logs, rocks, and debris were conducted in limited cases where circumstances permitted. Binoculars were used to search for raptor nests on steep rocky cliffs, test stands, and other constructed structures. No protocol-level surveys were conducted, and wildlife observations were opportunistic rather than systematic, although the timing of the surveys presented the best opportunity for multiple seasonal observations. The locations of significant wildlife observations such as nest sites and special-status species sighted during the surveys were recorded by GPS (where accessible) or on aerial photographs (inaccessible locations). Potential habitat for aquatic species such as vernal pool crustaceans and amphibians also was recorded during the surveys. Features such as potential seasonal wetlands and sandstone basins that have adequate size and structure to potentially hold enough water during the wet season to support aquatic biota were mapped with GPS. Appendix E contains a list of the wildlife species observed.

## SECTION 3

## Results

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This section presents the findings of the 2011 surveys. Pertinent findings of the fall 2010 survey also are presented for context.

### 3.1 Special-Status Plant Species

No federal- or state-listed threatened or endangered plant species were observed on the NASA-administered property during the 2011 surveys. Santa Susana tarweed (*Deinandra minthornii*), which is listed as rare under the California Native Plant Protection Act, is widespread and abundant throughout much of the site. Two other plants included in the CNPS Rare Plant Inventory—slender mariposa lily (*Calochortus clavatus* var. *gracilis*) and Plummer’s mariposa lily (*Calochortus plummerae*)—also were observed on the site. Additional information about these occurrences is provided in this section. None of the special-status species of *Dudleya* was observed on the NASA-administered property area during the 2011 surveys.

#### 3.1.1 Santa Susana tarweed (*Deinandra minthornii*)

Santa Susana tarweed is a small leafy shrub in the sunflower family (Asteraceae). This species is listed as rare under the California Native Plant Protection Act as a CNPS 1B.2 (rare, threatened, or endangered in California and elsewhere and considered fairly endangered in California). Shrubs typically range from 1.5 to 3 ft tall and have numerous stiff stems ascending from the base. This plant produces a fragrant resin that makes the stems and leaves sticky. The yellow flower heads occur singly at the ends of the long stems. Blooming generally occurs from July through early November.

During the fall 2010 survey, more than 3,600 Santa Susana tarweeds were identified and mapped on the NASA-administered property (NASA, 2011). The majority of the plants were observed in Area II, where they were widespread throughout the area in association with sandstone outcrops. A total of 324 plants were mapped in Area I; most were found on a sandstone outcrop north of the Liquid Oxygen (LOX) Plant site. The areas containing Santa Susana tarweeds were visited during the 2011 surveys; no changes to the overall distribution were noted.

#### 3.1.2 Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)

Slender mariposa lily is a perennial herb in the lily (Liliaceae) family. Stems are slender and typically between 7 and 12 inches tall with withering basal leaf. The yellow flowers are sparsely hairy with a reddish-brown line above small, shallow nectary. Several plants were observed in small sand pockets associated with dense patches of bushy spikemoss on a sandstone outcrop on the southern side of Skyline Road in Area II (Figure 3-1).

#### 3.1.3 Plummer’s mariposa lily (*Calochortus plummerae*)

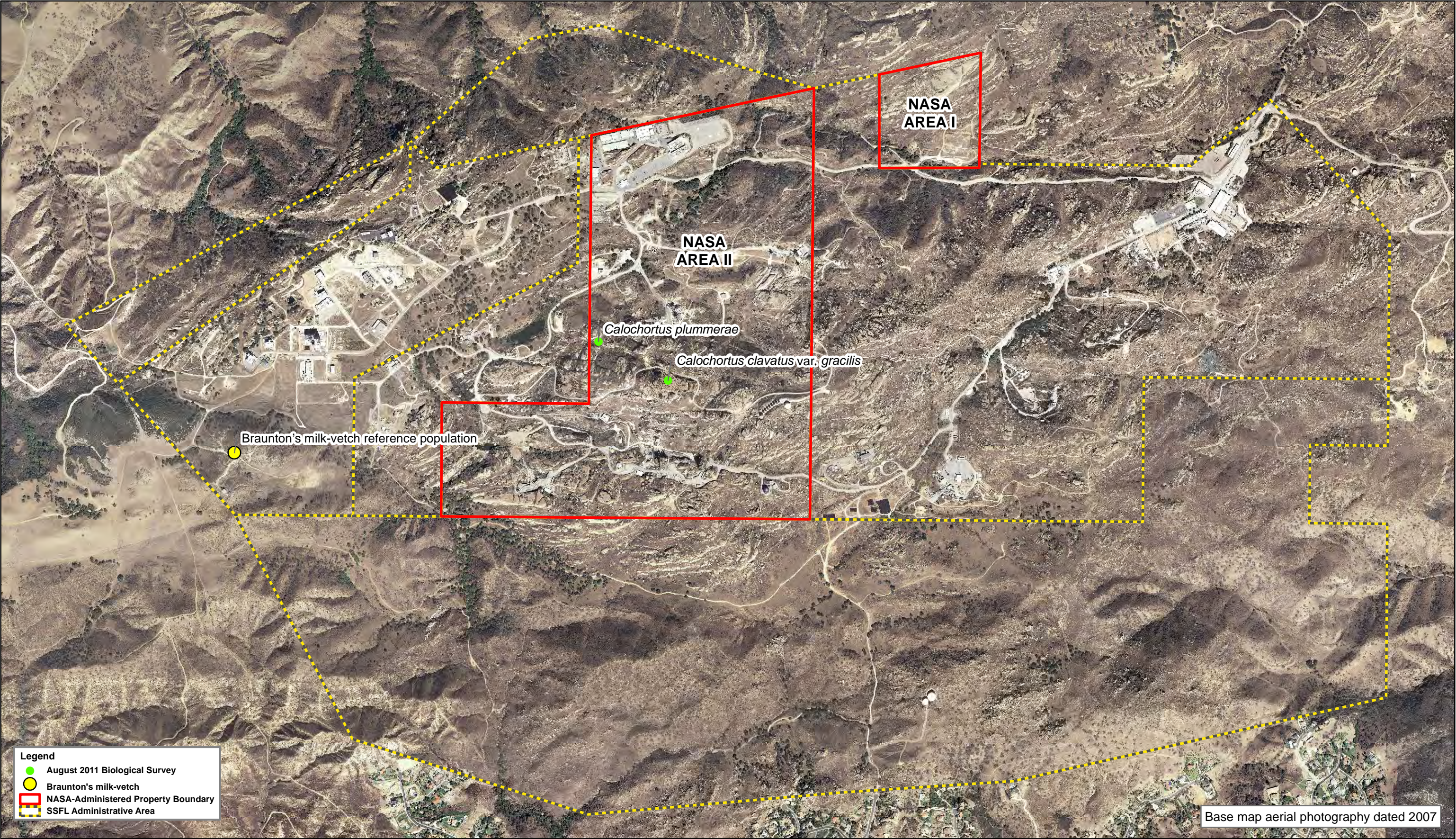
Plummer’s mariposa lily is a perennial herb in the lily (Liliaceae) family. The stem generally ranges from 1 to 2 ft tall and is often branched. Basal leaves are generally 8 to 16 inches long, withering later in the season. Leaves along the stem range from 1.5 to 7 inches long and are inrolled toward the ends. The pink to purple flowers are finely toothed with a central ring of long, yellow to orange hairs above the nectary. Two plants were observed in a sandy opening in the chaparral habitat on the western side of the Bravo test stand in Area II (Figure 3-1).

### 3.2 Sensitive Habitats

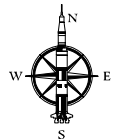
Two high-priority conservation natural habitats, as defined by the CDFG (2011a), were identified and mapped on the NASA-administered property during the fall 2010 survey—southern willow scrub and Venturan coastal sage scrub (NASA, 2011). These habitats have been assigned a state ranking of either S2 (community is considered imperiled

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**Figure 3-1**  
**Special-Status Plant Locations**  
**NASA Supplemental Biological Survey – 2011**  
**Santa Susana Field Laboratory**  
**Ventura County, California**



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due to a restricted range, steep declines, or other factors that make it vulnerable to extirpation from the state), or S3 (the habitat is considered vulnerable with a moderate risk of extirpation due to a restricted range, recent declines, or other factors). Figure 3-2 shows the distribution of sensitive habitat types identified on the NASA-administered property at SSFL.

### 3.2.1.1 Southern Willow Scrub (S2)

Southern willow scrub, which is relatively limited on the site (1.04 total acres), is associated with seasonal drainages, as well as with more permanent water sources. Small areas of this habitat type were identified in Area II along the drainages north of the Area II landfill and the Coca test stand site, and around the R-2 Ponds and the Coca detention pond. The largest area of southern willow scrub on the NASA-administered property occurs along the drainage on the southern side of the Alfa test stand site (Figure 3-2).

### 3.2.1.2 Venturan Coastal Sage Scrub (S3)

Venturan coastal sage scrub is widespread throughout the site, covering a total of 64.44 acres. The largest areas of this habitat occur in the southwestern part of Area II. This habitat generally is intermixed with chaparral and rock outcrops (Figure 3-2).

## 3.3 Noxious and Invasive Weeds

A total of 14 invasive plant species were identified on the NASA-administered property during the 2011 surveys. Five of the species identified are classified by the state as noxious weeds. Table 3-1 lists the noxious and invasive weeds that were identified and the general locations in which they were observed.

## 3.4 Special-status Animal Species

Five CDFG Species of Special Concern occurrences have been documented by CNDDB (CDFS, 2011b) within the general vicinity of SSFL—western spadefoot toad (*Spea hammondi*), arroyo toad (*Anaxyrus californicus*), San Diego desert woodrat (*Neotoma lepida intermedia*), tricolored blackbird (*Agelaius tricolor*), and western mastiff bat (*Eumops perotis californicus*). The arroyo toad also is federally listed as endangered.

No evidence was found during the 2010 or 2011 surveys indicating the potential occurrence of any of these species, except for the San Diego desert woodrat. Evidence of potential occurrence of woodrat species (woodrat nests and scat) was found during the surveys; however, the species of woodrat on the site was not identified. No species-specific surveys have been conducted.

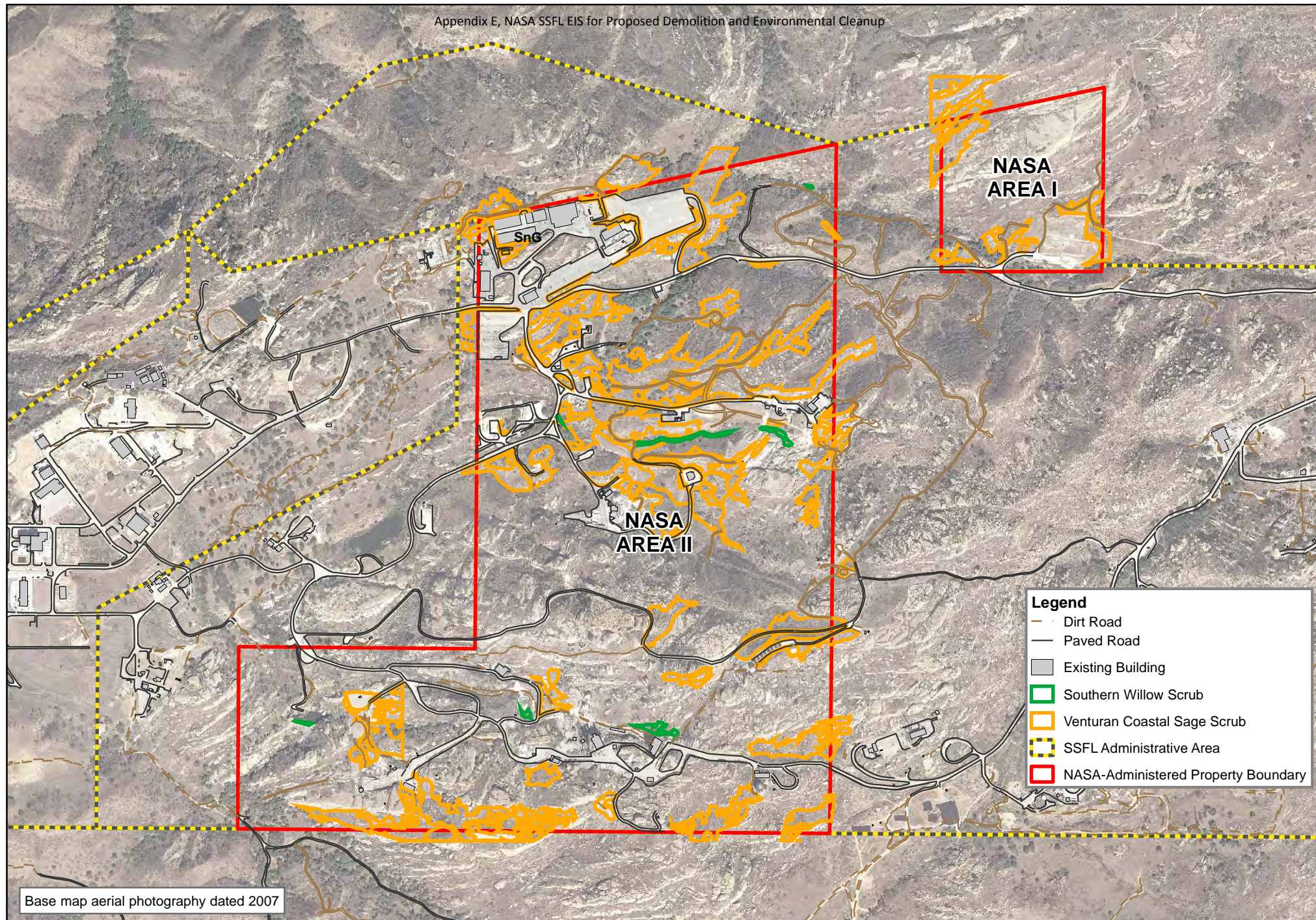
During the recent EIS public scoping period, USFWS commented that the following federally listed animal species have the potential to occur on the site:

- Quino checkerspot butterfly (*Euphydryas editha ssp. quino*)—Endangered
- Riverside fairy shrimp (*Streptocephalus woottoni*)—Endangered
- Vernal pool fairy shrimp (*Branchinecta lynchi*)—Threatened
- California red-legged frog (*Rana aurora ssp. draytonii*)—Threatened
- Least Bell's vireo (*Vireo bellii ssp. pusillus*)—Endangered
- Coastal California gnatcatcher (*Polioptila californica ssp. californica*)—Threatened

In addition to these species, the federally endangered longhorn fairy shrimp (*Branchinecta longiantenna*) was identified during the 2010 fall survey as having the potential to occur in seasonally inundated pools on rock outcrops on the NASA-administered property (NASA, 2011).

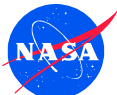
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- Legend**
- Dirt Road
  - Paved Road
  - Existing Building
  - Southern Willow Scrub
  - Venturan Coastal Sage Scrub
  - SSFL Administrative Area
  - NASA-Administered Property Boundary

Base map aerial photography dated 2007



0 500 1,000 Feet  
0 150 300 Meters

06-Dec-2011  
Drawn By:  
A. Cooley

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**Figure 3-2**  
**Sensitive Natural Communities**  
**NASA Supplemental Biological Survey - 2011**  
**Santa Susana Field Laboratory**  
**Ventura County, California**



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TABLE 3-1

Noxious and Invasive Weeds Identified On the NASA-administered Property at SSFL

***NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name	Common Name	CDFA	CAL-IPC	Areas Observed
<i>Ailanthus altissima</i>	tree of heaven	C	Moderate	Area II–SPA, Delta and Coca
<i>Brassica nigra</i>	black mustard	--	Moderate	Widespread in grassland habitats, chaparral openings, and disturbed areas throughout the site
<i>Bromus diandrus</i>	ripgut brome	--	Moderate	Common in grasslands and in the understory of oak woodland habitat
<i>Bromus madritensis</i> ssp. <i>rubens</i>	red brome	--	High	Widespread in grasslands and on sandstone outcrops
<i>Carduus pycnocephalus</i>	Italian plumeless thistle	C	Moderate	Locally abundant in grasslands and in the understory of oak woodland habitat
<i>Centaurea melitensis</i>	Maltese star-thistle	C	Moderate	Widespread in grasslands, openings in chaparral, and in disturbed areas
<i>Cirsium vulgare</i>	bull thistle	C	Moderate	Area II–WTC, SPA, Coca, and R9 Pond
<i>Cynodon dactylon</i>	Bermudagrass	--	Moderate	Area II–Coca
<i>Foeniculum vulgare</i>	sweet fennel	--	High	Area II–R9 Pond
<i>Gazania linearis</i>	treasureflower	--	Moderate	Observed in one location south of Skyline road
<i>Mesembryanthemum crystallinum</i>	Common iceplant	--	Moderate	Alfa and Bravo—around developed areas including test stands and buildings.
<i>Pennisetum setaceum</i>	crimson fountaingrass	--	Moderate	Common and widespread, often around developed areas.
<i>Salsola tragus</i>	prickly Russian thistle	C	Limited	Area II–Alfa
<i>Vulpia myuros</i> ssp. <i>myuros</i>	rat-tail fescue	--	Moderate	Common in grassland habitats

Notes:

CDFA = California Department of Food and Agriculture

Cal-IPC = California Invasive Pest Plant Council

SSFL = Santa Susana Field Laboratory

**CDFA – List C Noxious weeds**

List C includes noxious weeds that are of known economic or environmental detriment and are usually widespread. They are subject to regulations designed to retard spread or to suppress at the discretion of the individual county agricultural commissioner. There is no state enforced action other than providing for pest cleanliness.

**CAL\_IPC Ratings**

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

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

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

Sources:

California Department of Food and Agriculture, 2011. State List of Noxious Weeds.

California Invasive Pest Plant Council, 2011. Invasive Plant Inventory.

Species-specific surveys were not conducted during the 2010 or 2011 surveys for these federally listed wildlife species; however, the potential occurrence of these species on the site was evaluated during the opportunistic wildlife surveys that were conducted.

One least Bell's vireo was sighted during the August 2011 survey in coyotebrush adjacent to coast live oak woodland habitat west of the Ash Pile in Area II (Figure 3-3). This sighting occurred outside the typical breeding period of this species (April 10 to July 31); therefore, one explanation for the presence of the bird sighted is that it might have been a transient moving through the area. Mule-fat, a favored plant of the least Bell's vireo, exists on the site; however, the coverage of mule-fat scrub habitat is relatively limited (2.1 total acres) and fragmented. No least Bell's vireos were observed or heard during surveys conducted during their breeding period.

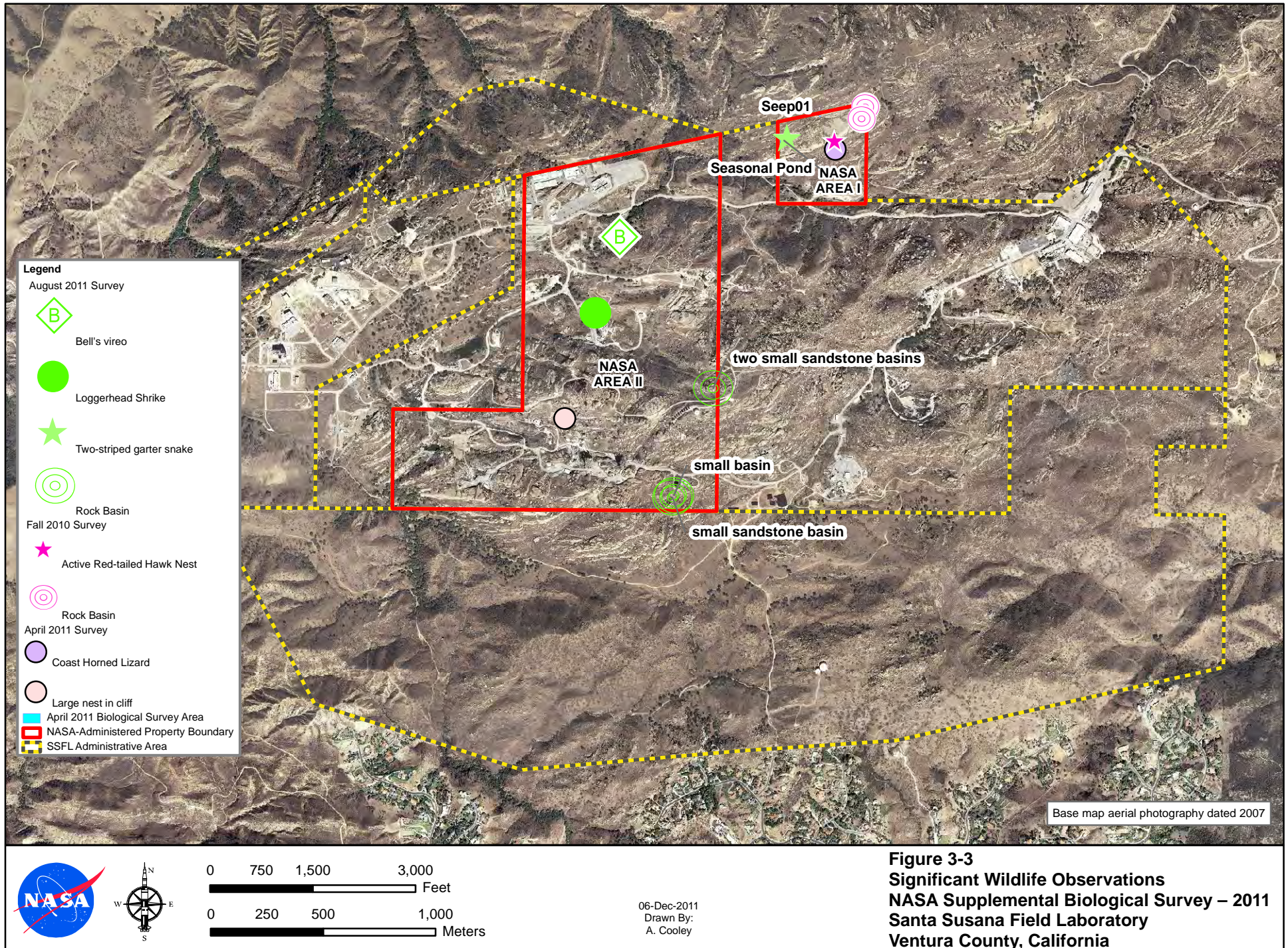
The Quino checkerspot butterfly potentially was sighted on the NASA-administered property during the fall 2010 survey. One individual butterfly that might have been this species was sighted southwest of the Bravo test stand site in mosaic habitat consisting of rock outcrop, non-native grassland, and Venturan coastal sage scrub. The butterfly was observed in flight, and a positive identification was not possible; however, its color, markings, and flight pattern were observed to be similar to those of the Quino checkerspot butterfly. Potential suitable habitat for this species was observed onsite during the 2010 and 2011 surveys. Dotseed plantain (*Plantago erecta*), a potential host plant for this species, was found during surveys conducted in 2011. Other potential food (nectar) plants for the butterfly, including Coulter's snapdragon (*Antirrhinum coulterianum*); California goldfields (*Lasthenia gracilis*); *Cryptantha* spp.; and pinebush (*Ericameria pinifolia*) were also observed during the 2011 surveys. A site assessment for Quino checkerspot butterfly completed by Forensic Entomology Services (2010) in Area IV concluded that the potential for occurrence was very low because the butterfly has not been sighted in Ventura County for more than 70 years and overall habitat at SSFL was considered marginal. A habitat survey for this species is planned within the NASA-administered properties for spring 2012.

One ring-tailed cat (*Bassariscus astutus*) was sighted on a rock outcrop near a riparian drainage northwest of the SPA site during the fall 2010 field surveys. The ring-tailed cat is a California "fully protected" species, which means it cannot be taken or possessed at any time.

The findings of the 2010 and 2011 surveys indicate that potential suitable habitat for the Riverside, vernal pool, and longhorn fairy shrimps exist on the NASA-administered property. Potential habitat includes small rock basins in sandstone outcrops and two seasonally ponded wetland areas. Opportunistic surveys for these species will be done in conjunction with planned wetland delineation fieldwork scheduled for January 2012.

No evidence of California red-legged frog occurrence was found during the 2010 or 2011 surveys. There is limited potential suitable habitat for this frog species on the NASA-administered property, primarily around the R-2 Ponds and the detention basin north of the Coca test stand site. A habitat assessment for California red-legged frog conducted by SAIC (2010) at several locations within SSFL (including the R2-A pond and Outfall 18 on the NASA property) determined that the presence of this species is unlikely. The coastal California gnatcatcher was not observed during the 2010 or 2011 surveys. Small, fragmented populations of gnatcatcher occur in Ventura County in habitat near where sage scrub-grassland interfaces; this species is less likely to be found in habitat where sage scrub grades into chaparral, such as was observed on the site. Dense sage scrub is occupied less frequently than more open sites.







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The following Species of Special Concern were sighted during the 2010 and 2011 surveys—coast horned lizard (*Phrynosoma coronatum* [blainvillii population]), two-striped garter snake (*Thamnophis hammondi*), and loggerhead shrike (*Lanius ludovicianus*) (Figure 3-3):

- A coast horned lizard was sighted during the spring 2011 survey. Approximately 3 inches long, it was sighted on the LOX Plant site beneath a cliff. Two individuals of this species also were observed during the fall 2010 surveys near the Area II landfill and north of the LOX Plant site in Area I.
- A two-striped garter snake was observed under debris in the seasonal pond northwest of the LOX Plant site during the August 2011 survey.
- A loggerhead shrike was sighted foraging on a hill above the viewing stand at the Bravo test stand site during the August 2011 survey. One individual also was observed during the fall 2010 surveys on the eastern side of the SPA site in Area II.

### 3.5 Wildlife Observations

Observations of wildlife on the NASA-administered property at SSFL were recorded during the 2010 and 2011 surveys. Appendix E lists the animal species identified on the site via sightings, calls, and other evidence of occurrence. A total of 11 butterfly species, 12 herpetile (reptiles and amphibians) species, 60 bird species, and at least 15 mammal species were identified during the surveys. Numerous common invertebrate species also were observed besides butterflies such as dragonflies and milkweed bugs.

A total of three inactive raptor stick nests were sighted during the fall 2010 survey. During the 2011 surveys, two of these nests were observed to be occupied by red-tailed hawks (*Buteo jamaicensis*) and successfully fledged young. A pair of ravens (*Corvus corax*) successfully fledged young from a nest on a test stand at the Alfa test stand site. An adult barn owl (*Tyto alba*) was observed in a test stand at the Coca test stand site; it is likely that owls use these structures for nesting. In addition, several California towhee nests were observed on the ground in the chaparral and coastal sage scrub areas.

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## SECTION 4

## Conclusions and Recommendations

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### 4.1 Conclusions

No federal- or state-listed threatened or endangered plant species were identified within the NASA-administered property at SSFL during the 2011 surveys. Santa Susana tarweed, which is listed as rare under the California Native Plant Protection Act, is widespread and abundant throughout much of the site. Two other plants included in the CNPS Rare Plant Inventory—slender mariposa lily and Plummer’s mariposa lily—also were observed on the site.

Two sensitive habitat types are present on the NASA-administered property. These included 1.04 acres of southern willow scrub habitat and 64.44 acres of Venturan coastal sage scrub habitat.

A total of 14 invasive plant species were identified during the 2011 surveys. Five of the identified species are classified by the state as noxious weeds.

Species-specific surveys for special-status animal species were not conducted during the 2011 surveys; however, opportunistic wildlife observations were recorded during both the 2010 and 2011 field surveys. A total of 10 butterfly species, 13 herpetile (reptiles and amphibians) species, 60 bird species, and at least 15 mammal species were identified during the surveys. The least Bell’s vireo was the only federally listed animal species sighted during the 2011 surveys. One individual was sighted during the August 2011 survey. This sighting occurred outside the typical breeding period of this species (April 10 to July 31); therefore, the bird sighted might have been a transient moving through the area.

One potential Quino checkerspot butterfly was observed during the fall 2010 surveys, but no similar looking individuals were observed during the 2011 field surveys.

One California state fully protected species, the ring-tailed cat, was observed during the fall 2010 surveys. This species was not seen during the 2011 field surveys.

Three Species of Special Concern were sighted during the 2011 surveys—coast horned lizard, two-striped garter snake, and loggerhead shrike. Two coast horned lizards and one loggerhead shrike were observed during the fall 2010 surveys.

### 4.2 Recommendations

Pre-construction surveys by a qualified wildlife biologist are recommended before any proposed demolition, remediation, or other activities involving potential disturbance to wildlife or natural communities are initiated. This approach is especially important if the activities will occur during the breeding season for birds or wildlife. A breeding season schedule will be developed as part of the EIS and used in evaluating potential impacts to listed and protected species.

Because the rock basins and seasonal wetlands are found in areas that are unlikely to be affected by remediation or other onsite activities, protocol-level surveys for special-status invertebrates in these areas are not considered necessary. However, if it is later determined that the basins could be affected, it will be necessary to coordinate with resource agencies to evaluate what additional data might be needed or how mitigation of the impacts should occur.

A delineation of wetlands and waters of the United States and the State of California will be completed during the winter of 2011. These results will be documented in a separate wetland delineation report that will be submitted as in a separate report that will be submitted to the US Army Corps of Engineers for verification.

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## SECTION 5

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## **Appendix A**

### **Special-Status Plants Identified in the Database Review Not Expected to Occur on the Site**

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## APPENDIX A

# Special-status Plants Identified in the Database Review Not Expected to Occur on the Site

## APPENDIX A

Special-status Plants Identified in the Database Review Not Expected to Occur on the Site

*NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory*

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Arenaria paludicola</i>	marsh sandwort	FE/CE 1B.1	May-Aug	Sandy openings in marshes and swamps. Only known from two extant occurrences; no herbarium records or California Natural Diversity Data Base (NDDDB) occurrences in Ventura County and the occurrence in Los Angeles County has been extirpated.
<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>	Ventura marsh milk-vetch	FE/CE 1B.1	June-Oct	Coastal salt marshes, coastal scrub and coastal dunes. No suitable habitat in the study area.
<i>Astragalus tener</i> var. <i>titi</i>	coastal dunes milk-vetch	FE/CE 1B.1	Mar-May	Coastal scrub, coastal prairie and coastal dunes; vernal mesic areas. No suitable habitat in the study area.
<i>Atriplex coulteri</i>	Coulter's saltbush	1B.2	Mar-Oct	Coastal bluff scrub, coastal dunes and coastal grasslands. No suitable habitat in the study area.
<i>Berberis pinnata</i> ssp. <i>insularis</i>	island barberry	FE/CE 1B.2	Feb-May	Endemic to the Channel Islands. Rocky areas in chaparral, coastal scrub, cismontane woodland, and closed cone coniferous forest.
<i>Camissonia lewisii</i>	Lewis' evening-primrose	3	Mar-June	Coastal dunes, coastal scrub, cismontane woodland, and grassland; generally on sandy or clay soils. No herbarium collections from Ventura County; Los Angeles County collections largely occur in coastal plains and basin areas.
<i>Caulanthus californicus</i>	California jewelflower	FE 1B.1	Feb-May	Chenopod scrub, grassland and pinyon-juniper woodland. No CNDDDB records of this species in Ventura or Los Angeles Counties. Several herbarium collections from 1935 from the Cuyama Valley near the northwestern part of the County, more than 50 miles from the study area.
<i>Chloropyron maritimum</i> ssp. <i>maritimum</i>	salt marsh bird's-beak	FE/CE 1B.2	May-Oct	Coastal salt marshes and dunes. No suitable habitat in the study area.
<i>Dithyrea maritima</i>	beach spectaclepod	CT 1B.1	Mar-May	Coastal dunes and coastal scrub and other sandy habitat near the shore. No suitable habitat in the study area.

## APPENDIX A

Special-status Plants Identified in the Database Review Not Expected to Occur on the Site

***NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Malacothrix squalida</i>	island malacothrix	FE 1B.1	Apr-July	Endemic to the Channel Islands. Coastal bluff scrub, chaparral and cismontane woodland. Endemic to the Channel Islands.
<i>Orcuttia californica</i>	California Orcutt grass	FE/CE 1B.1	Apr-Aug	Vernal pools and playas; typically in heavy clay soils. No suitable habitat in the study area.
<i>Sidalcea neomexicana</i>	Salt Spring checkerbloom	2.2	Mar-June	Alkali playas, brackish marshes, alkali springs also found in mesic alkaline areas in coastal scrub, chaparral, Mojave desert scrub and lower montane coniferous forests. No suitable habitat in study area.

## Status Codes

FE = Federally listed endangered species

CE = State-listed endangered species

CT = State-listed threatened species

1B.1 = California Native Plant Society (CNPS) listed as rare, threatened, or endangered in California and elsewhere; considered seriously threatened in California

1B.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; considered fairly threatened in California

2.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; but more common elsewhere, considered fairly threatened in California

3 = Plants for which more information is needed; a review list

## Sources:

CNDDB Rarefind Version 3.1.0 (CDFG, 2011).

Online CNPS Inventory of Rare and Endangered Plants (8th Edition) (CNPS, 2011)

List of Threatened and Endangered Plants of Ventura County (USFWS, 2011)

Berkeley Consortium of California Herbaria (University of California, 2011)

## Appendix B Rare Plant Reference Site Photographs

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APPENDIX B

## Rare Plant Reference Site Photographs

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**A-1. Reference Site: *Astragalus brauntonii*.**  
Vegetative; no flowers or buds April 17, 2011.



**A-2. Reference Site: *Astragalus brauntonii*.**  
Flowering June 8, 2011.



**A-3. Reference Site: *Dudleya cymosa* spp. *agourensis***  
Flowers. June 7, 2011.



**A-4. Reference Site: *Dudleya cymosa* spp. *agourensis***  
Basal leaves. June 7, 2011.





**A-5. Reference Site: *Dudleya cymosa* spp. *marcescens*** Flowering. June 7, 2011.



**A-6. Reference Site: *Dudleya cymosa* spp. *marcescens***  
Basal leaves. June 7, 2011.



**A-7. Reference Site: *Dudleya cymosa* spp. *ovatifolia***  
Flowering. June 7, 2011.



**A-8. Reference Site: *Dudleya cymosa* spp. *ovatifolia***  
Flowering. June 7, 2011.



## Appendix C

### List of Plant Species Observed

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## APPENDIX C

# List of Plant Species Observed

## APPENDIX C

## List of Plant Species Observed

*NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory*

Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<b>BLECHNACEAE</b>			
<i>Woodwardia fimbriata</i>	giant chainfern	N	Herb (P)
<b>DENNSTAEDTIACEAE</b>			
<i>Pteridium aquilinum</i>	Western brackenfern	N	Herb (P)
<b>DRYOPTERIDACEAE</b>			
<i>Dryopteris arguta</i>	coastal woodfern	N	Herb (P)
<b>POLYPODIACEAE</b>			
<i>Polypodium californicum</i>	California polypody	N	Herb (P)
<b>PTERIDACEAE</b>			
<i>Adiantum jordanii</i>	California maidenhair	N	Herb (P)
<i>Aspidotis californica</i>	California lacefern	N	Herb (P)
<i>Pellaea andromedifolia</i>	coffee cliffbrake	N	Herb (P)
<i>Pellaea mucronata</i> var. <i>mucronata</i>	birdfoot cliffbrake	N	Herb (P)
<i>Pentagramma triangularis</i> ssp. <i>triangularis</i>	goldenback fern	N	Herb (P)
<b>SELAGINELLACEAE</b>			
<i>Selaginella bigelovii</i>	bushy spikemoss	N	Herb (P)
<b>PINACEAE</b>			
<i>Pinus muricata</i> <sup>3</sup>	Bishop pine	N	Tree
<b>AIZOACEAE</b>			
<i>Mesembryanthemum crystallinum</i> <sup>4</sup>	common iceplant	I	Herb (A/P)
<b>ADOXACEAE</b>			
<i>Sambucus nigra</i> ssp. <i>caerulea</i> ( <i>Sambucus mexicana</i> ) <sup>5</sup>	American black elderberry	N	Shrub/Tree
<b>AMARANTHACEAE</b>			
<i>Amaranthus albus</i>	tumbleweed	I	Herb (A)
<i>Amaranthus blitoides</i>	mat amaranth	I	Herb (A)
<b>ANACARDIACEAE</b>			
<i>Malosma laurina</i>	laurel sumac	N	Shrub
<i>Rhus ovata</i>	sugar sumac	N	Shrub

## APPENDIX C

## List of Plant Species Observed

***NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<i>Schinus molle</i>	Peruvian peppertree	I	Tree
<i>Toxicodendron diversilobum</i>	Pacific poison oak	N	Shrub
<b>APIACEAE</b>			
<i>Anthriscus caucalis</i>	bur chervil	I	Herb (A)
<i>Bowlesia incana</i>	hairy bowlesia	N	Herb (A)
<i>Daucus pusillus</i>	American wild carrot	N	Herb (A)
<i>Foeniculum vulgare</i> <sup>4</sup>	sweet fennel	I	Herb (B/P)
<i>Lomatium lucidum</i>	shiny biscuitroot	N	Herb (P)
<i>Sanicula bipinnata</i> <sup>6</sup>	poison sanicle	N	Herb (P)
<i>Sanicula crassicaulis</i>	Pacific blacksnakeroot	N	Herb (P)
<i>Torilis arvensis</i>	spreading hedgeparsley	I	Herb (A)
<i>Yabea microcarpa</i>	false carrot	N	Herb (A)
<b>APOCYNACEAE</b>			
<i>Vinca major</i>	bigleaf periwinkle	I	Vine
<b>ARACEAE</b>			
<i>Lemna</i> sp.	duckweed	N	Herb (P)
<b>ASCLEPIADACEAE</b>			
<i>Asclepias eriocarpa</i>	woollypod milkweed	N	Herb (P)
<i>Asclepias fascicularis</i>	Mexican whorled milkweed	N	Herb (P)
<b>ASTERACEAE</b>			
<i>Acourtia microcephala</i>	sacapellote	N	Herb (P/SS)
<i>Agoseris grandiflora</i>	bigflower agoseris	N	Herb (P)
<i>Artemisia californica</i>	coastal sagebrush	N	Shrub
<i>Artemisia douglasiana</i>	Douglas' sagewort	N	Herb (P)
<i>Baccharis pilularis</i>	coyotebrush	N	Shrub
<i>Baccharis salicifolia</i>	mule-fat	N	Shrub
<i>Carduus pycnocephalus</i> <sup>4</sup>	Italian plumeless thistle	I	Herb (A)
<i>Centaurea melitensis</i> <sup>4</sup>	Maltese star-thistle	I	Herb (A/B)
<i>Cirsium occidentale</i> var. <i>occidentale</i>	cobwebby thistle	N	Herb (B)
<i>Cirsium vulgare</i> <sup>4</sup>	bull thistle	I	Herb (B)
<i>Conyza bonariensis</i>	asthmaweed	I	Herb (A/B)



## APPENDIX C

## List of Plant Species Observed

***NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<i>Conyza canadensis</i>	Canadian horeseweed	N	Herb (A/B)
<i>Corethrogyne filaginifolia</i>	common sandaster	N	Herb (P/SS)
<i>Deinandra fasciculata</i>	clustered tarweed	N	Herb (A)
<i>Deinandra minthornii</i> <sup>7</sup>	Santa Susanna tarweed	N	Shrub
<i>Encelia californica</i>	California brittlebush	N	SS/Shrub
<i>Ericameria pinifolia</i>	pinebush	N	Shrub
<i>Erigeron foliosus</i>	leafy fleabane	N	Herb (P)
<i>Eriophyllum confertiflorum</i>	golden-yarrow	N	SS/Shrub
<i>Gazania linearis</i> <sup>4</sup>	treasureflower	I	Herb (P)
<i>Hazardia squarrosa</i> var. <i>grindelioides</i>	sawtooth goldenbush	N	SS/Shrub
<i>Heterotheca grandiflora</i>	telegraphweed	N	Herb (A/P)
<i>Hypochaeris glabra</i>	smooth cat's ear	I	Herb (A)
<i>Lactuca serriola</i>	prickly lettuce	I	Herb (A/B)
<i>Lactuca virosa</i>	bitter lettuce	I	Herb (A/B)
<i>Lasthenia californica</i>	California goldfields	N	Herb (A/P)
<i>Logfia filaginoides</i> (syn. <i>Filago californica</i> )	California cottonrose	N	Herb (A)
<i>Logfia gallica</i> (syn. <i>Filago gallica</i> )	narrowleaf cottonrose	I	Herb (A)
<i>Madia gracilis</i>	grassy tarweed	N	Herb (A)
<i>Malacothrix saxatilis</i>	cliff desertdandelion	N	SS/Shrub
<i>Micropus californicus</i>	q-tips	N	Herb (A)
<i>Microseris douglasii</i>	Douglas' silverpuffs	N	Herb (A)
<i>Pseudognaphalium biolettii</i> ( <i>Gnaphalium bicolor</i> ) <sup>5</sup>	two-color rabbit-tobacco	N	Herb/SS (B)
<i>Pseudognaphalium californicum</i>	ladies' tobacco	N	Herb/SS (B)
<i>Pseudognaphalium canescens</i>	Wright's cudweed	N	Herb (A/P)
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	I	Herb (A)
<i>Psilocarphus tenellus</i>	slender woollyheads	N	Herb (A)
<i>Rafinesquia californica</i>	California plumeseed	N	Herb (A)
<i>Senecio vulgaris</i>	old-man-in-the-Spring	I	Herb (A/B)
<i>Silybum marianum</i>	blessed milkthistle	I	Herb (A/B)
<i>Sonchus asper</i>	spiny sowthistle	I	Herb (A)
<i>Sonchus oleraceus</i>	common sowthistle	I	Herb (A)

## APPENDIX C

## List of Plant Species Observed

***NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<i>Stephanomeria virgata</i>	rod wirelettuce	N	Herb (A)
<i>Uropappus lindleyi</i>	Lindley's silverpuffs	N	Herb (A)
<i>Venegasia carpesioides</i>	canyon sunflower	N	SS/Shrub
<i>Xanthium strumarium</i>	rough cocklebur	N	Herb (A)
<b>BORAGINACEAE</b>			
<i>Amsinckia intermedia</i>	common fiddleneck	N	Herb (A)
<i>Amsinckia menziesii</i>	Menzies' fiddleneck	N	Herb (A)
<i>Cryptantha</i> sp. (cf <i>C. barbiger</i> )	cryptantha	N	Herb (A)
<i>Cryptantha muricata</i>	Clokey's cryptantha	N	Herb (A)
<i>Cryptantha micromeres</i>	pygmyflower cryptantha	N	Herb (A)
<i>Emmenanthe penduliflora</i>	whisperingbells	N	Herb (A)
<i>Eriodictyon crassifolium</i>	thickleaf yerba santa	N	Shrub
<i>Eucrypta chrysanthemifolia</i>	spotted hideseed	N	Herb (A)
<i>Pectocarya linearis</i>	sagebrush combseed	N	Herb (A)
<i>Phacelia cicutaria</i>	caterpillar phacelia	N	Herb (A)
<i>Phacelia minor</i>	wild Canterbury bells	N	Herb (A)
<i>Phacelia ramosissima</i>	branching phacelia	N	Herb/SS (P)
<i>Phacelia tanacetifolia</i>	lacy phacelia	N	Herb (A)
<i>Plagiobothrys nothofulvus</i>	rusty popcornflower	N	Herb (A)
<b>BRASSICACEAE</b>			
<i>Arabis sparsiflora</i>	sicklepod rockcress	N	Herb/SS (P)
<i>Brassica nigra</i> <sup>4</sup>	black mustard	I	Herb (A)
<i>Draba cuneifolia</i>	wedgeleaf draba	N	Herb (A)
<i>Lepidium nitidum</i> var. <i>nitidum</i>	shining pepperweed	N	Herb (A)
<i>Sisymbrium orientale</i>	Indian hedgemustard	I	Herb (A)
<i>Thysanocarpus laciniatus</i>	mountain fringedpod	N	Herb (A)
<b>CACTACEAE</b>			
<i>Opuntia ficus-indica</i> <sup>3</sup>	Barbary fig	I	Shrub
<b>CALLITRICHACEAE</b>			
<i>Callitriche marginata</i>	winged water-starwort	N	Herb (A)

## APPENDIX C

## List of Plant Species Observed

***NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<b>CAMPANULACEAE</b>			
<i>Triodanis perfoliata</i>	clasping Venus' looking-glass	N	Herb (A)
<b>CAPRIFOLIACEAE</b>			
<i>Lonicera subspicata</i>	southern honeysuckle	N	Shrub/Vine
<i>Symphoricarpos mollis</i>	creeping snowberry	N	SS/Shrub
<b>CARYOPHYLLACEAE</b>			
<i>Cerastium glomeratum</i>	sticky chickweed	I	Herb (A)
<i>Minuartia douglasii</i>	Douglas' stitchwort	H	Herb (A)
<i>Polycarpon tetraphyllum</i>	fourleaf manyseed	I	Herb (A/P)
<i>Silene antirrhina</i>	sleepy silene	N	Herb (A)
<i>Silene gallica</i>	common catchfly	I	Herb (A/B)
<i>Silene laciniata</i>	cardinal catchfly	N	Herb (P)
<i>Stellaria media</i>	common chickweed	N	Herb (A/P)
<b>CHENOPODIACEAE</b>			
<i>Chenopodium californicum</i>	California goosefoot	N	Herb (P)
<i>Dysphania ambrosioides</i>	Mexican tea	I	Herb (A/P)
<i>Salsola tragus</i> <sup>4</sup>	prickly Russian thistle	I	Herb (A)
<b>CISTACEAE</b>			
<i>Helianthemum scoparium</i>	Bisbee Peak rushrose	N	SS/Shrub
<b>CONVOLVULACEAE</b>			
<i>Calystegia macrostegia</i> ssp. <i>cyclostegia</i>	island false bindweed	N	Herb/Vine
<i>Convolvulus arvensis</i>	field bindweed	I	Herb/Vine
<i>Cuscuta californica</i>	chaparral dodder	N	Herb/Vine
<b>CRASSULACEAE</b>			
<i>Crassula aquatica</i>	water pygmyweed	N	Herb (A)
<i>Crassula connata</i>	sand pygmyweed	N	Herb (A)
<i>Dudleya lanceolata</i>	lanceleaf liveforever	N	Herb (P)
<i>Dudleya pulverulenta</i>	chalk dudleya	N	Herb (P)
<b>CUCURBITACEAE</b>			
<i>Marah macrocarpus</i>	Cucamonga manroot	N	Herb/Vine

## APPENDIX C

## List of Plant Species Observed

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Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<b>ERICACEAE</b>			
<i>Arctostaphylos glauca</i>	bigberry manzanita	N	Shrub
<b>EUPHORBIACEAE</b>			
<i>Chamaesyce maculata</i>	spotted sandmat	I <sup>8</sup>	Herb (A)
<i>Chamaesyce polycarpa</i>	smallseed sandmat	N	Herb (A/P)
<i>Croton setigerus</i>	dove weed	N	Herb (A)
<b>FABACEAE</b>			
<i>Acmispon americanus</i> (syn. <i>Lotus purshianus</i> )	birds-foot trefoil	N	Herb (A)
<i>Acmispon argophyllus</i> (syn. <i>Lotus argophyllus</i> )	silver bird's-foot trefoil	N	Herb/SS (P)
<i>Acmispon glaber</i> (syn. <i>Lotus scoparius</i> )	common deerweed	N	SS (P)
<i>Acmispon strigosus</i> (syn. <i>Lotus strigosus</i> )	strigose bird's-foot trefoil	N	Herb (A)
<i>Lupinus bicolor</i>	miniature lupine	N	Herb (A)
<i>Lupinus hirsutissimus</i>	stinging annual lupine	N	Herb (A)
<i>Lupinus truncatus</i>	collared annual lupine	N	Herb (A)
<i>Medicago polymorpha</i>	burclover	I	Herb (A/P)
<i>Melilotus indicus</i>	annual yellow sweetclover	I	Herb (A)
<i>Trifolium gracilentum</i>	pinpoint clover	N	Herb (A)
<i>Trifolium willdenovii</i>	tomcat clover	N	Herb (A)
<i>Vicia hassei</i>	Hasse's vetch	N	Herb (A)
<i>Vicia villosa</i>	winter vetch	I	Herb (A/P)
<b>FAGACEAE</b>			
<i>Quercus agrifolia</i>	California live oak	N	Tree/Shrub
<i>Quercus berberidifolia</i>	scrub oak	N	Tree/Shrub
<b>GENTIANACEAE</b>			
<i>Zeltnera venusta</i> (syn. <i>Centaurium venustum</i> )	charming centaury	H	Herb (A)
<b>GERANIACEAE</b>			
<i>Erodium botrys</i>	longbeak stork's bill	I	Herb (A/B)
<i>Erodium cicutarium</i>	redstem stork's bill	I	Herb (A/B)
<i>Geranium</i> sp. <sup>3</sup>	cultivated geranium	I	Herb (P)



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<b>GROSSULARIACEAE</b>			
<i>Ribes malvaceum</i>	chaparral current	N	Shrub
<i>Ribes speciosum</i>	fuchsiaflower gooseberry	N	Shrub
<b>JUGLANDACEAE</b>			
<i>Juglans californica</i>	Southern California walnut	N	Tree/Shrub
<b>LAMIACEAE</b>			
<i>Marrubium vulgare</i>	horehound	I	Herb/SS (P)
<i>Salvia columbariae</i>	chia	N	Herb (A)
<i>Salvia leucophylla</i>	San Luis purple sage	N	SS/Shrub
<i>Salvia mellifera</i>	black sage	N	SS/Shrub
<i>Salvia spathacea</i>	hummingbird sage	N	Herb (P)
<i>Scutellaria tuberosa</i>	Danny's skullcap	N	Herb (P)
<i>Stachys bullata</i>	California hedgenettle	N	Herb (P)
<i>Trichostema lanatum</i>	woolly bluecurls	N	SS/Shrub
<i>Trichostema lanceolatum</i>	vinegarweed	N	Herb (A)
<b>LAURACEAE</b>			
<i>Umbellularia californica</i>	California laurel	N	Tree/Shrub
<b>LYTHRACEAE</b>			
<i>Lythrum hyssopifolia</i>	hyssop loosestrife	I	Herb (A/B)
<b>MALVACEAE</b>			
<i>Malacothamnus fasciculatus</i>	Mendocino bushmallow	N	SS/Shrub
<i>Sidalcea malviflora</i>	dwarf checkerbloom	N	Herb/SS (P)
<b>MONTIACEAE</b>			
<i>Claytonia perfoliata</i>	miner's lettuce	N	Herb (A/P)
<b>MYRSINACEAE</b>			
<i>Anagallis arvensis</i>	scarlet pimpernel	I	Herb (A/B)
<b>NYCTAGINACEAE</b>			
<i>Mirabilis laevis</i> var. <i>crassifolia</i> (syn. <i>Mirabilis californica</i> )	California four o'clock	N	SS (P)
<b>OLEACEAE</b>			
<i>Fraxinus velutina</i> <sup>3</sup>	velvet ash	N	Tree

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Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<b>ONAGRACEAE</b>			
<i>Camissonia bistorta</i>	southern suncup	N	Herb (A/P)
<i>Camissonia californica</i>	California suncup	N	Herb (A/P)
<i>Camissonia hirtella</i>	Santa Cruz Island suncup	N	Herb (A)
<i>Camissonia micrantha</i>	miniature suncup	N	Herb (A)
<i>Clarkia purpurea</i>	winecup clarkia	N	Herb (A)
<i>Clarkia unguiculata</i>	elegant clarkia	N	Herb (A)
<i>Epilobium</i> sp.	willowherb	N	Herb (A)
<b>PAEONIACEAE</b>			
<i>Paeonia californica</i>	California peony	N	Herb (P)
<b>PAPAVERACEAE</b>			
<i>Dendromecon rigida</i>	tree poppy	N	Shrub/Tree
<i>Eschscholzia californica</i>	California poppy	N	Herb (A/P)
<i>Platystemon californicus</i>	creamcups	N	Herb (A)
<b>PHRYMACEAE</b>			
<i>Mimulus aurantiacus</i>	orange bush monkeyflower	N	Shrub/SS
<i>Mimulus brevipes</i>	widethroat yellow monkeyflower	N	Herb (A)
<i>Mimulus floribundus</i>	manyflowered monkeyflower	N	Herb (A)
<i>Mimulus guttatus</i>	seep monkeyflower	N	Herb (A/P)
<i>Mimulus pilosus</i>	false monkeyflower	H	Herb (A)
<b>PLANTAGINACEAE</b>			
<i>Antirrhinum coulterianum</i>	Coulter's snapdragon	N	Herb (A)
<i>Antirrhinum kelloggii</i>	Kellogg snapdragon	N	Herb (A)
<i>Antirrhinum multiflorum</i>	Sierra snapdragon	N	Herb/SS (A)
<i>Collinsia parryi</i>	Parry's blue eyed Mary	N	Herb (A)
<i>Keckiella cordifolia</i>	heartleaf Keckiella	N	Shrub/SS
<i>Penstemon centranthifolius</i>	scarlet bugler	N	H/SS (P)
<i>Penstemon spectabilis</i>	showy penstemon	N	H/SS (P)
<i>Plantago erecta</i>	dotseed plantain	N	Herb (A)
<i>Veronica peregrina</i>	neckweed	N	Herb (A)

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Scientific Name <sup>1</sup>	Common Name <sup>2</sup>	Origin <sup>2</sup>	Habit <sup>2</sup>
<b>PLATANACEAE</b>			
<i>Platanus racemosa</i>	California sycamore	N	Tree
<b>POLEMONIACEAE</b>			
<i>Allophyllum divaricatum</i>	purple false gilyflower	N	Herb (A)
<i>Allophyllum glutinosum</i>	sticky false gilyflower	N	Herb (A)
<i>Eriastrum sapphirinum</i>	sapphire woollystar	N	Herb (A)
<i>Linanthus californicus</i> (syn. <i>Leptodactylon californicum</i> )	California prickly phlox	N	Herb/SS (P)
<i>Linanthus dianthiflorus</i>	fringed linanthus	N	Herb (A)
<i>Navarretia hamata</i>	hooked pincushionplant	N	Herb (A)
<b>POLYGONACEAE</b>			
<i>Chorizanthe staticoides</i>	Turkish rugging	N	Herb (A)
<i>Eriogonum elongatum</i>	longstem buckwheat	N	SS/Herb (P)
<i>Eriogonum fasciculatum</i> var. <i>fasciculatum</i>	Eastern Mojave buckwheat	N	SS/Shrub
<i>Eriogonum wrightii</i> var. <i>membranaceum</i>	bastardsage	N	SS/Shrub
<i>Persicaria</i> cf <i>hydropiperoides</i> (syn. <i>Polygonum hydropiperoides</i> )	swamp smartweed	N	Herb (P)
<i>Pterostegia drymarioides</i>	woodland pterostegia	N	Herb (A)
<i>Rumex crispus</i>	curly dock	I	Herb (P)
<i>Rumex salicifolius</i>	willow dock	N	Herb (P)
<b>PRIMULACEAE</b>			
<i>Dodecatheon clevelandii</i>	padre's shootingstar	N	Herb (P)
<b>RANUNCULACEAE</b>			
<i>Delphinium cardinale</i>	scarlet larkspur	N	Herb (P)
<i>Delphinium parryi</i>	San Bernardino larkspur	N	Herb (P)
<b>RHAMNACEAE</b>			
<i>Ceanothus crassifolius</i>	hoaryleaf ceanothus	N	Shrub
<i>Ceanothus oliganthus</i>	hairy ceanothus	N	Shrub
<i>Ceanothus spinosus</i>	redheart	N	Shrub
<i>Rhamnus ilicifolia</i>	hollyleaf redberry	N	Shrub

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<b>ROSACEAE</b>			
<i>Adenostoma fasciculatum</i>	chamise	N	Shrub
<i>Cercocarpus betuloides</i>	birchleaf mountain mahogany	N	Shrub/Tree
<i>Hertermeles arbutifolia</i>	toyon	N	Shrub
<i>Drymocallis glandulosa</i> (syn. <i>Potentilla glandulosa</i> )	sticky cinquefoil	N	SS/Herb (P)
<i>Prunus dulcis</i> <sup>3</sup>	sweet almond	I	Tree
<i>Prunus ilicifolia</i>	hollyleaf cherry	N	Tree/Shrub
<i>Rosa californica</i>	California wildrose	N	Shrub
<i>Rubus ursinus</i>	California blackberry	N	SS (P)
<b>RUBIACEAE</b>			
<i>Galium angustifolium</i>	narrowleaf bedstraw	N	Herb/SS (P)
<i>Galium aparine</i>	stickywilly	N	Herb (A)
<i>Galium cliftonsmithii</i>	Santa Barbara bedstraw	N	Shrub
<i>Galium nuttallii</i>	climbing bedstraw	N	SS/Shrub
<i>Galium parisiense</i>	wall bedstraw	I	Herb (A)
<b>SALICACEAE</b>			
<i>Populus fremontii</i>	Fremont cottonwood	N	Tree
<i>Salix exigua</i>	narrowleaf willow	N	Shrub/Tree
<i>Salix laevigata</i>	red willow	N	Tree
<i>Salix lasiolepis</i>	arroyo willow	N	Tree/Shrub
<b>SAXIFRAGACEAE</b>			
<i>Lithophragma affine</i>	San Francisco woodland-star	N	Herb (P)
<b>SCROPHULARIACEAE</b>			
<i>Scrophularia californica</i>	California figwort	N	Herb (P)
<b>SIMAROUBACEAE</b>			
<i>Ailanthus altissima</i> <sup>4</sup>	tree of heaven	I	Tree
<b>SOLANACEAE</b>			
<i>Datura wrightii</i>	sacred thorn-apple	N	Herb (A/P)
<i>Nicotiana glauca</i>	tree tobacco	I	Shrub/Tree
<i>Solanum douglasii</i>	greenspot nightshade	N	Herb (P)
<i>Solanum xanti</i>	chaparral nightshade	N	Herb (P)



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<b>URTICACEAE</b>			
<i>Hesperocnide tenella</i>	western stingingnettle	N	Herb (A)
<i>Parietaria hespera</i>	rillita pellitory	N	Herb (A/P)
<i>Urtica urens</i>	dwarf nettle	I	Herb (A)
<b>VERBENACEAE</b>			
<i>Verbena lasiostachys</i>	western vervain	N	Herb (P)
<b>AGAVACEAE</b>			
<i>Chlorogalum pomeridianum</i>	wavyleaf soap plant	N	Herb (P)
<i>Yucca gloriosa</i> <sup>3</sup>	moundlily yucca	I	Tree/Shrub
<i>Yucca whipplei</i>	chaparral yucca	N	SS/Shrub
<b>ARECACEAE</b>			
<i>Phoenix</i> sp. <sup>3</sup>	date palm	I	Tree
<i>Washingtonia robusta</i>	Washington fan palm	I	Tree
<b>CYPERACEAE</b>			
<i>Cyperus eragrostis</i>	tall flatsedge	N	Graminoid (P)
<i>Eleocharis macrostachya</i>	pale spikerush	N	Graminoid (P)
<b>IRIDACEAE</b>			
<i>Sisyrinchium bellum</i>	western blue-eyed grass	N	Herb (P)
<b>JUNCACEAE</b>			
<i>Juncus balticus</i>	mountain rush	N	Graminoid (P)
<i>Juncus bufonius</i>	toad rush	N	Graminoid (A)
<i>Juncus phaeocephalus</i>	brownhead rush	N	Graminoid (P)
<i>Juncus xiphioides</i>	irisleaf rush	N	Graminoid (P)
<b>LILIACEAE</b>			
<i>Calochortus plummerae</i> <sup>7</sup>	Plummer's mariposa lily	N	Herb (P)
<i>Calochortus clavatus</i> var. <i>gracilis</i> <sup>7</sup>	slender mariposa lily	N	Herb (P)
<b>MELANTHIACEAE</b>			
<i>Toxicoscordion fremontii</i> (syn. <i>Zigadenus fremontii</i> )	Fremont's deathcamas	N	Herb (P)
<b>POACEAE</b>			
<i>Agrostis pallens</i>	seashore bentgrass	N	Graminoid (P)
<i>Avena barbata</i>	slender oat	I	Graminoid (A)

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<i>Avena fatua</i>	wild oat	I	Graminoid (A)
<i>Bromus carinatus</i>	California brome	N	Graminoid (A/P)
<i>Bromus diandrus</i> <sup>4</sup>	ripgut brome	I	Graminoid (A)
<i>Bromus hordeaceus</i>	soft brome	I	Graminoid (A)
<i>Bromus madritensis</i> ssp. <i>rubens</i> <sup>4</sup>	red brome	I	Graminoid (A)
<i>Bromus sterilis</i>	poverty brome	I	Graminoid (A)
<i>Chloris virgata</i>	feather fingergrass	I <sup>8</sup>	Graminoid (A)
<i>Cynodon dactylon</i>	Bermudagrass	I	Graminoid (P)
<i>Elymus glaucus</i>	blue wildrye	N	Graminoid (P)
<i>Gastridium ventricosum</i>	nit grass	I	Graminoid (A)
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	hare barley	I	Graminoid (A)
<i>Lamarckia aurea</i>	goldentop grass	I	Graminoid (A)
<i>Leymus condensatus</i>	giant ryegrass	N	Graminoid (P)
<i>Melica imperfecta</i>	smallflower melicgrass	N	Graminoid (P)
<i>Muhlenbergia microsperma</i>	littleseed muhly	N	Graminoid (A)
<i>Muhlenbergia rigens</i>	deergrass	N	Graminoid (P)
<i>Nassella lepida</i>	foothill needlegrass	N	Graminoid (P)
<i>Nassella pulchra</i>	purple needlegrass	N	Graminoid (P)
<i>Pennisetum setaceum</i> <sup>4</sup>	crimson fountaingrass	I	Graminoid (P)
<i>Piptatherum miliaceum</i>	smilgrass	I	Graminoid (P)
<i>Poa annua</i>	annual bluegrass	I	Graminoid (A)
<i>Poa pratensis</i>	Kentucky bluegrass	I	Graminoid (P)
<i>Poa secunda</i>	Sandberg bluegrass	N	Graminoid (P)
<i>Polypogon monspeliensis</i>	annual rabbitsfoot grass	I	Graminoid (A)
<i>Schismus arabicus</i>	Arabian schismus	I	Graminoid (A)
<i>Vulpia bromoides</i>	brome fescue	I	Graminoid (A)
<i>Vulpia microstachys</i>	small fescue	N	Graminoid (A)
<i>Vulpia myuros</i> ssp. <i>myuros</i> <sup>4</sup>	rat-tail fescue	I	Graminoid (A)

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<b>THEMIDACEAE</b>			
<i>Dichelostemma capitatum</i>	bluedicks	N	Herb (P)
<b>TYPHACEAE</b>			
<i>Typha domingensis</i>	southern cattail	N	Herb (P)

## Notes:

N = Native

I = Introduced (non-native species that have become naturalized)

(A) = Annual

(B) = Biennial

(P) = Perennial

SS = Sub-Shrub

<sup>1</sup>Taxonomy follows the currently accepted nomenclature for plant species occurring in California as indicated on the Jepson On-Line Interchange for California Floristics (University of California, 2011).

<sup>2</sup>Species common name, origin and grow habitat from the U.S. Department of Agriculture's Plants Database (2011).

<sup>3</sup> Horticultural or landscape planting

<sup>4</sup>Noxious or invasive weed

<sup>5</sup>Taxonomic or nomenclatural synonym for taxon not occurring in California.

<sup>6</sup>Species was observed just outside of the NASA-administered property by Tarja Sagar.

<sup>7</sup>Special-status plant species

<sup>8</sup>Considered Native in the USDA Plants Databases, but is considered an introduced (naturalized) species in California, per the Jepson On-Line Interchange.

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## **Appendix D**

# **Representative Photographs of the Site, Special-status Plants, and Wildlife Species**

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APPENDIX D

## Representative Photographs of the Site, Special-status Plants, and Wildlife Species

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B-1 Santa Susana tarplant (*Deinandra minthornii*)—August 18, 2011



B-2 Santa Susana tarplant (*Deinandra minthornii*)—August 18, 2011



B-3 Plummer's mariposa lily (*Calochortus plummerae*)—  
June 27, 2011



B-4 Plummer's mariposa lily (*Calochortus plummerae*)—  
June 27, 2011





**B-5 View northeast of southern willow scrub in Alfa Area—April 2011**



**B-6 Woodrat (*Neotoma* sp.) nest—  
April 2011**



**B-7 Coast horned lizard (*Phrynosoma blainvillii*),  
Area I—April 2011**



**B-8 Two striped garter snake (*Thamnophis hammondi*),  
Area 1—April 2011**





**B-9 Stick nest in sandstone cliff—April 2011**



**B-10 Red-tailed hawk (*Buteo jamaicensis*) nest—  
April 2011**



**B-10 Dead canyon bat (*Parastrellus hesperus*),  
Area II Alfa Site—August 2011**



**B-11 Western side-blotched lizard (*Uta stansburiana elegans*)—  
April 2011**





**B-12 Western rattlesnake (*Crotalus oreganus helleri*), on roadway near the SPA Area—June 2011**



**B-13 California Striped Racer (*Masticophis lateralis lateralis*)—August 2011**



**B-14 Square-spotted blue (*Euphilotes battoides*)—June 2011**



**B-15 Lorquin's admiral (*Limenitis lorquini*)—April 2011**

## Appendix E Wildlife Species Observed in 2010 and 2011

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## APPENDIX E

# Wildlife Species Observed in 2010 and 2011

## APPENDIX E

## Wildlife Species Observed in 2010 and 2011

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Common Name	Scientific Name	2010	2011
<b>Butterflies</b>			
Quino Checkerspot <sup>1,2</sup>	<i>Euphydryas editha quino</i>	X	
Anise Swallowtail	<i>Papilio zelacaon</i>		X
Western Tiger Swallowtail	<i>Papilio rutulus</i>		X
Checkered White	<i>Pontia protodice</i>		X
Cabbage White	<i>Pieris rapae</i>		X
Orange Sulphur	<i>Colius carythene</i>		X
Square-spotted Blue	<i>Euphilotes battoides</i>		X
American Lady	<i>Vanessa virginiensis</i>		X
Lorquin's Admiral	<i>Limenitis lorquini</i>		X
Funereal Duskywing	<i>Erynnis funeralis</i>		X
Northern White-skipper	<i>Heliopetes ericetorum</i>		X
<b>Herpetiles</b>			
Northern Pacific Treefrog	<i>Pseudacris regilla</i>		X
Western Toad	<i>Anaxyrus [Bufo] boreas</i>	X	
Coast Horned Lizard <sup>3</sup>	<i>Phrynosoma blainvillii</i>	X	X
Western Fence Lizard	<i>Sceloporus occidentalis</i>	X	X
California Whiptail	<i>Aspidoscelis tigris munda</i>	X	X
Mountain Garter Snake	<i>Thamnophis elegans elegans</i>	X	
Two-striped Garter Snake <sup>3</sup>	<i>Thamnophis hammondi</i>		X
Ring-necked Snake	<i>Diadophis punctatus</i>	X	X
California Striped Racer	<i>Coluber [=Masticophis] lateralis lateralis</i>		X
Gopher Snake	<i>Pituophis catenifer</i>		X
Western Rattlesnake	<i>Crotalus oreganus helleri</i>	X	X
<b>Birds</b>			
Mallard	<i>Anas platyrhynchos</i>	X	X
California Quail	<i>Callipepla californica</i>	X	X

## APPENDIX E

## Wildlife Species Observed in 2010 and 2011

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Common Name	Scientific Name	2010	2011
Great Blue Heron	<i>Ardea herodias</i>	X	X
Green Heron	<i>Butorides virescens</i>	X	X
Turkey Vulture	<i>Cathartes aura</i>	X	X
Cooper's Hawk	<i>Accipiter cooperii</i>	X	X
Red-shouldered Hawk	<i>Buteo lineatus</i>	X	X
Red-tailed Hawk	<i>Buteo jamaicensis</i>	X	X
Ferruginous Hawk	<i>Buteo regalis</i>		X
American Kestrel	<i>Falco sparverius</i>	X	X
Rock Pigeon	<i>Columba livia</i>	X	X
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	X	X
Mourning Dove	<i>Zenaida macroura</i>	X	X
Greater Roadrunner	<i>Geococcyx californianus</i>		X
Barn Owl	<i>Tyto alba</i>		X
Great Horned Owl	<i>Bubo virginianus</i>		X
White-throated Swift	<i>Aeronautes saxatalis</i>	X	X
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	X	X
Anna's Hummingbird	<i>Calypte anna</i>	X	X
Rufous/Allen's Hummingbird	<i>Selasphorus rufus/sasin</i>	X	X
Belted Kingfisher	<i>Megaceryle alcyon</i>	X	X
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	X	X
Nuttall's Woodpecker	<i>Picoides nuttallii</i>	X	X
Northern Flicker	<i>Colaptes auratus</i>	X	X
Black Phoebe	<i>Sayornis nigricans</i>	X	X
Say's Phoebe	<i>Sayornis saya</i>	X	X
Western Kingbird	<i>Tyrannus verticalis</i>		X
Loggerhead Shrike <sup>3</sup>	<i>Lanius ludovicianus</i>	X	X
Least Bell's Vireo <sup>2</sup>	<i>Vireo bellii pusillus</i>		X
Cassin's Vireo	<i>Vireo cassinii</i>	X	X
Western Scrub-Jay	<i>Aphelocoma californica</i>	X	X
American Crow	<i>Corvus brachyrhynchos</i>	X	X
Common Raven	<i>Corvus corax</i>	X	X



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<b>Common Name</b>	<b>Scientific Name</b>	<b>2010</b>	<b>2011</b>
Oak Titmouse	<i>Baeolophus inornatus</i>	X	X
Red-winged Blackbird	<i>Agelaius phoeniceus</i>		X
Bushtit	<i>Psaltiriparus minimus</i>	X	X
White-breasted Nuthatch	<i>Sitta carolinensis</i>	X	X
Pygmy Nuthatch	<i>Sitta pygmaea</i>	X	X
Rock Wren	<i>Salpinctes obsoletus</i>	X	X
Canyon Wren	<i>Catherpes mexicanus</i>	X	X
Bewick's Wren	<i>Thryomanes bewickii</i>	X	X
House Wren	<i>Troglodytes aedon</i>	X	X
Wrentit	<i>Chamaea fasciata</i>	X	X
Northern Mockingbird	<i>Mimus polyglottos</i>	X	X
California Thrasher	<i>Toxostoma redivivum</i>	X	X
Orange-crowned Warbler	<i>Vermivora celata</i>	X	X
Yellow-rumped Warbler	<i>Dendroica coronata</i>	X	X
MacGillivray's Warbler	<i>Oporornis tolmiei</i>	X	X
Wilson's Warbler	<i>Wilsonia pusilla</i>	X	X
Spotted Towhee	<i>Pipilo maculatus</i>	X	X
California Towhee	<i>Melospiza crissalis</i>	X	X
Song Sparrow	<i>Melospiza melodia</i>		X
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	X	X
Lark Sparrow	<i>Chondestes grammacus</i>	X	X
Fox Sparrow	<i>Passerella iliaca</i>	X	X
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	X	X
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	X	X
Blue Grosbeak	<i>Passerina caerulea</i>		X
House Finch	<i>Carpodacus mexicanus</i>	X	X
American Goldfinch	<i>Spinus tristis</i>	X	X
<b>Mammals</b>			
Canyon Bat	<i>Parastrellus hesperus</i>		X
Botta's Pocket Gopher	<i>Thomomys bottae</i>		X
Desert Cottontail	<i>Sylvilagus audubonii</i>	X	X

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Common Name	Scientific Name	2010	2011
Woodrat	<i>Neotoma sp.</i>		X
California Ground Squirrel	<i>Spermophilus beecheyi</i>	X	X
Ring-tailed cat <sup>4</sup>	<i>Bassariscus astutus</i>	X	
Raccoon	<i>Procyon lotor</i>	X	X
Coyote	<i>Canis latrans</i>	X	X
Bobcat	<i>Felis rufus</i>	X	X
Mountain Lion	<i>Felis concolor</i>	X	X
California Mule Deer	<i>Odocoileus hemionus californicus</i>	X	X
Wild Pig	<i>Sus scrofa</i>	X	X
Gray fox	<i>Urocyon cinereoargenteus</i>		X
Vole species	<i>Microtus sp.</i>	X	X
Mouse species	Rodentia		X

## Notes:

<sup>1</sup> Tentative species identification<sup>2</sup> Federally listed endangered species<sup>3</sup> California Species of Concern<sup>4</sup> California Fully Protected Species

**End of Appendix E**

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