

Biological Conditions Report Santa Susana Field Laboratory Ventura County, California

Prepared for
**Boeing North American,
Rocketdyne Propulsion and Power**

and

National Aeronautics and Space Administration

and

**U.S. Department of Energy
Energy Technology Engineering Center Division**

Prepared by
**Ogden Environmental and Energy Services Co., Inc.
5510 Morehouse Drive
San Diego, California 92121
(619) 458-9044**

**April 1998
Project No. 313150002**

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
1.0	INTRODUCTION	1-1
2.0	BIOLOGICAL SURVEY METHODS	2-1
2.1	Vegetation Surveys	2-1
2.2	Wildlife Surveys	2-1
3.0	EXISTING CONDITIONS OF SSFL	3-1
3.1	Physical Settings	3-1
3.2	Climate	3-2
3.3	Soils	3-2
3.4	Surface Water Hydrology	3-2
3.5	Ground-water Hydrology	3-3
3.6	Biological Features	3-3
3.6.1	Vegetation Communities and Habitat Types	3-4
3.6.2	Wildlife	3-8
3.6.3	Sensitive Plants	3-8
3.6.4	Sensitive Wildlife	3-9
3.6.5	Habitat Quality	3-17
3.6.6	Trophic Relationships	3-18
4.0	REFERENCES	4-1

LIST OF TABLES

<u>NUMBER</u>	<u>TITLE</u>	<u>PAGE</u>
3-1	Sensitive Plant Species Observed or Potentially Occurring at the SSFL Facility	3-20
3-2	Sensitive Reptile Species Observed or Potentially Occurring at the SSFL Facility	3-21
3-3	Sensitive Amphibian Species Potentially Occurring at the SSFL Facility	3-22
3-4	Sensitive Bird Species Observed or Potentially Occurring at the SSFL Facility	3-23

TABLE OF CONTENTS (Continued)

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
3-5	Sensitive Mammal Species Observed or Potentially Occurring at the SSFL Facility	3-25

LIST OF FIGURES

<u>NUMBER</u>	<u>TITLE</u>	<u>PAGE</u>
1-1	Project Location as Shown on the Ventura Regional Map	1-2
1-2	Santa Susana Field Laboratory Facility (SSFL)	1-3
1-3	RFI Site Santa Susana Field Laboratory	1-4
3-1	Vegetation Communities Occurring at the SSFL	map pocket
3-2	Sensitive Species Occurring at the SSFL	3-28
3-3	Trophic Model for the Rocketdyne Santa Susana Field Laboratory	3-29

LIST OF APPENDICES

<u>LETTER</u>	<u>TITLE</u>	<u>PAGE</u>
A	Vegetation Communities and Habitat Types	A-1
B	Floral Species Observed at the SSFL Facility	B-1
C	Bird Species Observed or Detected at the SSFL Facility	C-1
D	Bird Species Data for the SSFL, as Related by Onsite Rocketdyne Personnel	D-1
E	Non-Avian Wildlife Species Observed or Detected at the SSFL Facility	E-1

SECTION 1

INTRODUCTION

This Biological Conditions Report was prepared as part of the Standardized Risk Assessment Methodology (SRAM) being developed for risk assessments conducted at the Santa Susana Field Laboratory (SSFL) (Figures 1-1 and 1-2). The SSFL is jointly owned by Boeing North American, Inc. and the National Aeronautics and Space Administration (NASA), and it is operated by the Rocketdyne Division (Rocketdyne) of Boeing. A small portion of the SSFL owned by Boeing is leased to the U.S. Department of Energy (DOE). The SSFL is divided into four administrative areas (Areas I, II, III, and IV) and has a 2,000-foot-wide undeveloped area along its southern margin. The SRAM is being developed in support of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the SSFL. A RCRA Facility Assessment (RFA) was conducted in 1990 for U.S. Environmental Protection Agency (USEPA) and identified 122 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) within the four administrative areas of the SSFL (ICF 1993a-c). Selected SWMUs and AOCs were identified as requiring further investigation and have been grouped into 39 RFI sites (Figure 1-3). Information regarding materials used and wastes generated, and other environmental programs at the SSFL are summarized elsewhere (Ogden 1996). The Biological Conditions Report summarizes the results of field surveys conducted at the SSFL from 1995-1997, including the presence and distribution of vegetation communities, wildlife species detected, and locations of sensitive plant and animal species at the 39 RFI sites. Field surveys focused primarily on the RFI sites; however, the entire SSFL was surveyed during the 1995–1997 site visits. The information presented in this report will be utilized in developing ecological risk assessments conducted at the SSFL and any additional environmental documentation for actions conducted at the SSFL.

Figure 1-1

This Figure Intentionally Left Blank

Figure 1-2

This Figure Intentionally Left Blank

Figure 1-3

This Figure Intentionally Left Blank

SECTION 2 BIOLOGICAL SURVEY METHODS

2.1 VEGETATION SURVEYS

The SSFL was surveyed several times during the period from June 12, 1995 to February 6, 1997. Detailed surveys of each of the 36 RFI sites were conducted, while vegetation surveys of the open space and large areas between sites were performed using both field mapping and aerial photograph interpretation. The following is a list of the dates when botanical and vegetation surveys were performed at the SSFL:

Survey Periods

June 12-15, 1995	July 29-31, 1996
July 5, 1995	January 14-15, 1997
March 11-15, 1996	February 6, 1997
May 6-8, 1996	

All plant communities were visited and mapped, and all plant species were identified and recorded. Nomenclature for plant species conforms to Munz (1974), while vegetation communities and habitat types follow Holland (1986).

2.2 WILDLIFE SURVEYS

Wildlife surveys were conducted several times during the period from July 5, 1995 through February 6, 1997. The following is a list of the dates when wildlife surveys were performed at the SSFL:

Survey Periods

July 5-7, 1995	May 6-8, 1996
October 23-27, 1995	July 29-31, 1996
December 11-15, 1995	January 14-15, 1997
March 11-15, 1996	February 6, 1997

All habitats were visited, but no trapping or quantitative surveys were performed. All animal species observed were identified and recorded. Nomenclature for birds, mammals,

reptiles, and amphibians conforms to Laudenslayer et al. (1991) and for fish to the American Fisheries Society (AFS 1991).

SECTION 3

EXISTING CONDITIONS OF SSFL

3.1 PHYSICAL SETTING

The SSFL is located 29 miles northwest of downtown Los Angeles, California, in the southeast corner of Ventura County (Figure 1-1). The SSFL occupies approximately 2,700 acres of hilly terrain, with approximately 700 feet of topographic relief near the crest of the Simi Hills. The Simi Hills are bordered on the east by the San Fernando Valley and to the north by the Simi Valley. Most of the land adjacent to the site property is undeveloped and mountainous. About 73 percent of the area within a 5-mile radius of the site is undeveloped. Figure 1-2 shows the general geographic location, property lines, and topography of the facility.

The facility is divided into four administrative areas (Areas I, II, III, and IV) and an open space (Figure 1-3). The areas are owned and operated as follows (SAIC 1991):

- Area I (U.S. Environmental Protection Agency [USEPA] ID Number CAD 093365435) consists of 713 acres located in the northeast portion of the facility. Rocketdyne operates the entire area. Rocketdyne owns 671 acres, and the remaining 42 acres are owned by the National Aeronautics and Space Administration (NASA). The 42-acre NASA property in Area I was formerly owned by the U.S. Air Force.
- Area II (USEPA ID Number CAD 1800090010) consists of 410 acres located in the north-central portion of the site. Area II is owned by NASA and operated by Rocketdyne.
- Area III (USEPA ID Number CAD 093365435) consists of 114 acres and is owned and operated by Rocketdyne.
- Area IV (USEPA ID Number CAD 000629972 and CA 3890090001) consists of 290 acres located in the northwest section of the site. Rocketdyne owns and operates the entire area. A portion of Area IV (90 acres, which houses the Energy Technology Engineering Center [ETEC], a division of the Department of Energy [DOE]), is leased by the DOE and operated by Rocketdyne under

an option to buy contract with the DOE. Five National Pollutant Discharge Elimination System (NPDES) discharge points and drainage channels are located in Area IV.

- The open space consists of 1,200 acres of undeveloped land along the southern boundary of the facility. This naturally vegetated area is owned by Rocketdyne. Industrial activities have never been conducted in this area. Two NPDES discharge points and drainage channels are located in the open space.

3.2 CLIMATE

The climate in the vicinity of the SSFL is classified as Mediterranean subtropical, with mean temperatures ranging from 50°F in the winter to 70°F in the summer. Precipitation on the property averages approximately 18 inches per year, based on meteorological data obtained from the weather station located at the SSFL (ICF 1993a-c).

3.3 SOILS

The soils at the SSFL consist primarily of Quaternary alluvium and the Chatsworth Formation (ICF 1993a-c). Quaternary alluvium is composed of unconsolidated sand, silt, and clay eroded primarily from the surrounding Chatsworth Formation. Depth of the alluvium ranges from a few feet to approximately 40 feet. The Chatsworth Formation is a very thick unit of sandstone bedrock, reaching up to 6,000 feet in thickness within the vicinity of the SSFL. This soil type forms the many sandstone cliffs and lenses that comprise the rock outcrop habitat located throughout the property.

3.4 SURFACE WATER HYDROLOGY

The majority of Areas I, II, III and IV and the open space drain offsite to the south and southwest, and the northern portion of Areas I, II, III, and IV drain to the north (Edelman 1991). Surface water also accumulates in several man-made ponds located throughout the facility, the largest of which is the Silvernale Reservoir (SWMU 6.8) located on the west side of the property. Figure 3-1 (map pocket) shows the known surface water drainages and impoundments on the SSFL (these features are designated as drainages and open water habitat in Figure 3-1). The surface water holding ponds also collect runoff from site-related activities, and recycled water is also pumped into Silvernale Reservoir. The

pond associated with the Building 56 Landfill (SWMU 7.1) site is man-made and reportedly the result of digging into the water table while attempting to construct the foundation of the building (Ueshiro 1995).

3.5 GROUND-WATER HYDROLOGY

Ground water is associated with the two geological formations that occur onsite. Shallow ground water is associated with the Quaternary alluvium layer and generally occurs within canyons and drainages on the facility. Deep ground water is associated with the Chatsworth Formation and is the dominant ground-water system on the property.

The amount of ground water associated with these systems varies with seasonal precipitation. Depth of the shallow ground water ranged from approximately ground surface to 39.3 feet below ground surface (bgs) during 1994 (GRC 1995). The shallow ground-water flow essentially follows the natural topography.

The deep ground water associated with the Chatsworth Formation has been pumped for use at the facility since the 1950's and has affected the depth of the local water table (ICF 1993a-c). The depth of ground water in the Chatsworth Formation ranged from near ground surface to 619.1 feet bgs during 1994 (GRC 1995). A ground-water divide occurs in Area IV, where ground water on the northwest half of Area IV flows to the northwest, and ground water southeast of the divide flows to the east-southeast. Ground-water contours also indicate that ground water in the southwest portion of Area III flows to the southwest. Historic pumping and operation of ground-water extraction and treatment systems since 1987 had created a cone of depression in the ground water in the center of the SSFL. Additional ground-water divides have been identified north and south of the cone of depression.

3.6 BIOLOGICAL FEATURES

Information on vegetation and wildlife was obtained through field reconnaissance surveys conducted in June, July, October, and December 1995, in March and May 1996, and in January and February 1997. The focus of the surveys was to provide information on the biological communities found at the SSFL facility and to identify sensitive biological resources present at the various sites at the SSFL.

3.6.1 Vegetation Communities and Habitat Types

Within the SSFL and open space, 16 different habitat types occur: freshwater marsh, open water, unvegetated drainage channels, coast live oak woodland, southern coast live oak riparian forest, southern willow scrub, mulefat scrub, baccharis scrub, Venturan coastal sage scrub, chaparral, native grassland, nonnative grassland, ruderal, rock outcrop, eucalyptus woodland, and developed. The 16 habitat types and their site-specific characteristics are discussed in the following sections. Rock outcrop occurs throughout the site and may be found within any of the habitat types. Figure 3-1 presents a vegetation map for the SSFL. Plant species observed onsite are presented in Appendix A.

Freshwater Marsh

Freshwater marsh habitat onsite is dominated by perennial, emergent monocots typically 4.2 to 6.5 feet tall. Freshwater marsh occurs in areas that are permanently flooded by standing freshwater. This habitat is characterized by a complex of cattails (*Typha* sp.), bulrush (*Scirpus* sp.), and toad rush (*Juncus bufonius*).

Open Water and Unvegetated Drainage Channels

Open water consists of ponded water with no emergent vegetation. Unvegetated drainages show obvious signs of channeling, have discernible banks and high water marks and show evidence of scouring. The majority of unvegetated drainage channel habitat occurs in the open space in Bell Canyon and can also be found sporadically across the SSFL.

Southern Coast Live Oak Riparian Forest

This habitat represents an open to locally dense evergreen community dominated by coast live oak, with arroyo willow (*Salix lasiolepis*) occurring to a lesser extent. This community type appears to be richer in herbs and poorer in understory shrubs than other riparian communities (Holland 1986). Southern coast live oak riparian forest is associated with bottomlands and outer floodplains along larger streams and occurs on fine-grained, rich alluvium (Holland 1986). At the SSFL facility, shrub species in this association include poison oak (*Toxicodendron diversilobum*) and broom baccharis (*Baccharis sarothroides*).

Southern Willow Scrub

Southern willow scrub is a riparian habitat consisting of dense, broad-leafed, winter-deciduous thickets. This habitat is dominated by willows (*Salix* sp.), with cottonwood (*Populus fremontii*) and sycamore (*Platanus racemosa*) scattered throughout. The dense canopy typically inhibits the development of an understory.

Mulefat Scrub

This habitat on the facility is represented by a herbaceous riparian community dominated by mulefat (*Baccharis salicifolia*) (Holland 1986). This early succession community is maintained by frequent flood disturbance. In the absence of disturbance, most stands could become cottonwood- or sycamore-dominated riparian forests or woodlands. Mulefat scrub is scattered throughout the SSFL.

Coast Live Oak Woodland

Coast live oak woodland typically occurs on north-facing slopes or in shaded ravines, and intergrades with coastal sage scrub or chaparral on drier sites. This habitat is dominated by coast live oak (*Quercus agrifolia*), which is evergreen and reaches a height of 30 to 80 feet. The shrub layer is poorly developed but includes white-flowered currant (*Ribes indecorum*) and Santa Susana tarplant (*Hemizonia minthornii*). The understory is continuous and dominated by nonnative weedy species. Coast live oak woodland occurs throughout the open space and on a majority of the SSFL.

Venturan Coastal Sage Scrub

This habitat is found from the coastal region south of Point Conception to northern Baja California, extending east to the vicinity of the Cajon and San Gorgonio Passes. Typical stands are fairly dense, with bare ground occurring between shrubs, and occur on dry, rocky slopes, usually below 9,800 feet. The coastal sage scrub habitat at the SSFL facility is dominated by California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), and laurel sumac (*Malosma laurina*). Venturan coastal sage scrub occurs mainly on the northwest corner of the open space and throughout the SSFL.

Chaparral

Chaparral is composed of broad-leafed sclerophyllous shrubs that grow about 5 to 10 feet tall and form dense, often nearly impenetrable stands. The plants of this association are typically deep rooted. There is usually little or no understory except in openings; considerable leaf litter accumulates, however. This habitat occurs on dry, rocky, often steep north-facing slopes with little soil. Characteristic shrub species include chamise (*Adenostoma fasciculatum*), sugarbush (*Rhus ovata*), and black sage. Chaparral occurs throughout the open space and the SSFL.

Baccharis Scrub

Baccharis scrub is most often found in recently disturbed areas, such as along roadsides, and is characterized by nearly monotypic stands of coyote bush (*Baccharis pilularis* ssp. *consanguinea*). Other associated species include California sagebrush (*Artemisia californica*), deerweed (*Lotus scoparius*), and weedy, nonnative herbs such as tocalote (*Centaurea melitensis*) and black mustard (*Brassica nigra*).

Native Grassland

Native grassland is characterized by a dense herbaceous cover of perennial, tussock-forming grass species, such as foothill stipa (*Stipa lepida*). Native and introduced annuals occur between the bunchgrasses, often exceeding them in cover (Holland 1986). This association generally occurs on fine-textured clay soils that are moist or wet in winter, but very dry in the summer. In addition to *Stipa*, other species present include blue-eyed grass (*Sisyrinchium bellum*), lilac mariposa (*Calochortus splendens*), and soap plant (*Chlorogalum pomeridianum*). At the SSFL, native grassland occurs primarily as small isolated patches within a matrix of nonnative grassland.

Nonnative Grassland

This habitat is a dense to sparse cover of annual grasses often associated with numerous species of showy-flowered, native annual forbs, especially in years of high rainfall. This association occurs on fine-textured, usually clay soils, which are moist or even waterlogged during the winter rainy season and very dry during the summer and fall. Characteristic species on the facility include slender wild oat (*Avena barbata*), soft chess

(*Bromus mollis*), and red brome (*Bromus rubens*). Nonnative grassland occurs throughout the SSFL.

Ruderal Habitat

Ruderal habitat is comprised of many introduced species that can withstand frequent disturbance and/or has been disturbed by human activities. Many of the species in this community are similar to those found in nonnative grasslands; however, ruderal habitats also have a greater percentage of nongrass species and only sparse coverage of the area. Ruderal habitat on the facility is dominated by deerweed, black mustard, and tocalote. Ruderal habitat is widespread on the northern half of the SSFL.

Rock Outcrop

This habitat consists of rock formations where there is only a minor component, typically less than 15 percent ground cover, of vegetation within the area. Rock outcrop habitat can be important to birds of prey for roosting and nesting, while mammals may create dens in the caves formed by the rocks, and reptiles may potentially live in the cracks of boulders. This habitat occurs throughout the SSFL.

Eucalyptus Woodland

Eucalyptus woodland is often represented by a monotypic stand of eucalyptus trees (*Eucalyptus* sp.) with very little understory. These nonnative trees are usually planted for aesthetic reasons, wind breaks, or as shade trees. One large stand of eucalyptus woodland occurs north of the Instrument and Equipment Laboratories (SWMUs 4.3, 4.4, and AOCs).

Developed

Developed areas are associated with many of the sites. An area is considered developed when buildings, paved roads, or other structures are present with only a minimal amount of vegetation. Small areas of lawn and ornamental bushes are often planted in developed habitats. Although this vegetation does support some wildlife species, the habitat is considered very low quality and is primarily used by introduced, common urban species.

3.6.2 Wildlife

Sixty-nine bird species were detected during surveys of the sites at the SSFL facility. The most frequently observed bird species include scrub jay (*Aphelocoma coerulescens*), yellow-rumped warbler (*Dendroica coronata*), turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus elegans*), northern flicker (*Colaptes auratus*), California quail (*Callipepla californica*), and red-winged blackbird (*Agelaius phoeniceus*). A complete list of bird species observed during surveys of the facility is presented in Appendix C. An additional 19 bird species have been documented by SSFL personnel since 1983 and are presented in Appendix D.

Thirteen mammal species were detected on the property, including mule deer (*Odocoileus hemionus*), bobcat (*Felis rufus*), and San Diego black-tailed jackrabbit (*Lepus californica bennettii*). Ten reptile species, including western whiptail (*Cnemidophorus tigris multiscutatus*) and side-blotched lizard (*Uta stansburiana*), were observed on the facility. Three amphibian species, California slender salamander (*Batrachoseps attenuatus*), Pacific tree frog (*Hyla regilla*), and California toad (*Bufo boreas haliophilus*), were also detected. Two species of fish were observed in the ponds located on the SSFL property. Catfish (probably bullhead, *Ameirus* sp.) and goldfish (*Carassius auratus*) were observed. The catfish and goldfish were introduced to these ponds and are probably a source of food for piscivorous (fish-eating) bird species, such as the great blue heron. A complete list of the fish, amphibians, reptiles, and mammals detected at the SSFL facility is presented in Appendix E.

3.6.3 Sensitive Plants

Plant species are designated as sensitive because of their overall rarity, status, unique habitat requirements, and/or restricted distribution (USFWS 1990). In general, it is a combination of these factors that leads to a sensitivity designation. Sensitivity, as it is used herein, does not refer to an increased response to contaminant effects but refers to plant species listed by the USFWS and CDFG. In addition, the CDFG uses the California Native Plant Society (CNPS) listing to determine candidate species for threatened or endangered status. Two sensitive plant species were observed at the SSFL facility. Santa Susana tarplant is located throughout the facility, and southern California black walnut is primarily located in the Burro Flats area and the west end of the SSFL, with solitary individuals sparsely distributed across the SSFL. The locations of these sensitive plants

are shown in Figure 3-2. The sensitive plant species data described in the following sections are summarized in Table 3-1.

The Santa Susana tarplant is listed as rare by the State of California. This shrub typically grows from 2 to 3.5 feet in height on sandstone outcrops. Originally reported from the Santa Susana Pass area, the range of the Santa Susana tarplant is now known to include Castro Peak, Charmlee Park, the vicinity of the Chatsworth Reservoir, and the southwest slope of Calabasas Peak. The primary threat to this sensitive plant species is the continued encroachment of development into its habitat. Botanical surveys conducted for this project located Santa Susana tarplant throughout the SSFL.

Southern California black walnut (*Juglans californica* var. *californica*) is a List 4 CNPS sensitive species (Skinner and Pavlik 1994). List 4 species are defined as those plants that are of limited distribution and whose known populations need to be watched. This deciduous tree typically grows from 15 to 30 feet in height on slopes or canyons from 165 to 3,000 feet elevation. The southern California black walnut is known from the transverse mountain ranges in Ventura and Los Angeles Counties, including the Santa Monica, San Gabriel, and San Bernardino Mountains, and ranges as far south as San Diego County. The principal threat to this sensitive species is urbanization. A population of 23 southern California black walnut trees were located across the Burro Flats area. Four black walnut trees occur adjacent to the ESADA Storage Area (SWMU 7.9). Single California black walnut trees also occur at the Instrument and Equipment Laboratories (SWMUs 4.3, 4.4, and AOC) and in the open space.

3.6.4 Sensitive Wildlife

Fifteen wildlife species were detected on the SSFL property that are considered sensitive by the USFWS or CDFG, or are important indicators of wildlife corridor functions. Locations where sensitive wildlife species were either observed or sign (i.e., tracks, scat) was detected at the facility are shown in Figure 3-2. The following sensitive wildlife species data are summarized in Tables 3-2 through 3-5.

Reptiles

The two-striped garter snake (*Thamnophis hammondi*) is considered a "special animal" by the CDFG. Special animals are defined as biologically rare, very restricted in

distribution, or declining throughout their range; as populations in California that are threatened with extirpation; or as species that are closely associated with a habitat that is declining in the state (in this case, aquatic and riparian habitats). The two-striped garter snake is locally common in aquatic habitats from coastal central California to northwestern Baja California. It prefers rocky streams with protected pools, cattle ponds, marshes, vernal pools, and other shallow bodies of water lacking large aquatic predators (Stebbins 1966). Prey includes invertebrates, frogs, tadpoles, and small fish. The two-striped garter snake is active during the day and at dusk, from early spring to late fall. Individuals were observed in or adjacent to aquatic areas on the SSFL.

Birds

The great blue heron (*Ardea herodias herodias*) is considered a “special animal” by the CDFG. This species is the most widespread of all North American herons (Terres 1980) and is found throughout most of California (Zeiner et al. 1990a). The great blue heron commonly occurs throughout the year as a nonbreeder in open water and is less common along rivers, in croplands, pastures, and foothill ponds (Zeiner et al. 1990a). Nearly 75 percent of its diet is fish (Cogswell 1977), and it also eats small rodents, amphibians, snakes, lizards, insects, crustaceans, and small birds (Zeiner et al. 1990a). This species is considered sensitive at nesting colonies because human disturbance and human activity at a colony may cause nest desertion. This species was observed in or adjacent to aquatic areas on the SSFL. There is a moderate potential for this species to nest in any of the secluded tall trees or snags located at the SSFL facility.

Loggerhead shrike (*Lanius ludovicianus*) is considered a "species of special concern" by the CDFG. This is a fairly common breeding species in southern California. It utilizes a variety of habitats, occurring wherever bushes or trees are scattered on open ground. Loggerhead shrike was observed in nonnative grassland habitat. This species is a yearlong resident in southern California and likely nests at the SSFL.

The southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) is a CDFG “species of special concern.” This species is a resident in Ventura County, preferring grassy or rocky slopes with open scrub at elevations from sea level to 2,000 feet. It forages and nests on the ground, usually near vegetative cover, and maintains year-round territories. This species prefers coastal sage scrub habitats, and its

numbers have been reduced greatly by urban development. Rufous-crowned sparrows were observed at the SSFL.

Birds of Prey

Birds of prey (raptors) as a group are considered sensitive because of loss of foraging areas, their vulnerability to human disturbance, their low population densities, and their position at the top of the food chain. Several species were observed flying over the facility and presumably forage there. Impacts to nesting raptors are covered under specific CDFG permits for take of nesting raptors.

The sharp-shinned hawk (*Accipiter striatus velox*) is considered a “species of special concern” by the CDFG and is distributed throughout North America, Central America, and South America. In California, it is a fairly common migrant and winter resident, although its breeding distribution is poorly documented (Zeiner et al. 1990a). The San Jacinto Mountains north of San Diego County are the documented southern breeding range of this species. During winter, it occupies a variety of habitats and requires a certain amount of dense vegetative cover, but this can be localized and scattered through relatively open country. The sharp-shinned hawk often darts out from a perch to capture unsuspecting avian prey and also hunts in low gliding flights (Zeiner et al. 1990a). One individual of this species was observed flying over the Expendable Launch Vehicle (ELV) Final Assembly Building 206 (SWMU 5.2) during surveys of the property; additionally, SSFL personnel have documented a sighting of this species in the vicinity of the STL-IV Area (SWMU 6.5) in June 1987.

The Cooper's hawk (*Accipiter cooperii*) is considered a "species of special concern" by the CDFG and nests primarily in oak woodlands but occasionally in willows or eucalyptus. This species breeds from late March through June and nests primarily in oak woodlands and occasionally in willows or eucalyptus. Outside of the breeding season, it disperses widely from southern Canada to northern Mexico. It has declined as a breeding species in California primarily because of destruction of oak and riparian woodland. A male and female Cooper's hawk were observed roosting in the oak woodland habitat in the open space and are likely to nest there.

The red-shouldered hawk (*Buteo lineatus elegans*) is common in southern California, occurring in wooded areas on the coastal plain. This species does not have any sensitivity

status at the federal level, although the state regulates the removal of any active nesting locations. The red-shouldered hawk, a carnivore at the top of the food web, is an important indicator of wildlife habitat quality. It readily adapts to wooded urban settings such as parks, rural residential areas, and wooded business parks. Breeding season for these tree-nesting hawks is midwinter through midspring. A single, recently fledged red-shouldered hawk was observed perched on top of a tall test stand at the STL-IV Area (SWMU 6.5), suggesting that nesting occurs on the SSFL property.

The red-tailed hawk (*Buteo jamaicensis*) is probably the most common hawk in urban fringe areas. Similar to the red-shouldered hawk, removal of this species' nest are regulated by the state. In addition, as a carnivore at the top of the food web, the red-tailed hawk is an important indicator of wildlife habitat quality. Several red-tailed hawks were observed flying over the SSFL property.

The turkey vulture (*Cathartes aura*) is considered a declining species in the region, having been eliminated from all coastal sites where it formerly nested. This raptor species is considered sensitive by the CDFG at nesting locations. This species is a fairly common spring and fall migrant in southern California, an uncommon to locally common winter visitor, and a rare to uncommon summer resident. Several turkey vultures were observed roosting on several rock ledges and circling over all portions of the SSFL facility. Based on these observations, there is a moderate potential that they nest onsite, and the species presumably forages throughout the property.

The great horned owl (*Bubo virginianus*) is a fairly common species, occurring in woodlands and forests, often adjacent to open hunting areas. It can also be found foraging and nesting in urban fringe areas. This species does not have any sensitivity status at the state and federal levels other than the regulations covering impacts to raptor nests. The great horned owl is a carnivore at the top of the food chain, and as such it is an important indicator of wildlife habitat quality. Two great horned owls were observed roosting at the top of a power pole northeast of Building 901 at the west end of the Bowl Area and Building 901 Leach Field (SWMU 4.15 and AOC), and were observed nesting adjacent to the Bowl Area.

Mammals

The bobcat (*Felis rufus*) is considered a “harvest species” by the CDFG. A "harvest species" is a CDFG wildlife management term defined as a commercially valuable fur-bearing or trophy animal whose population size or distribution may be influenced by trapping and hunting pressure, as well as habitat loss, and whose relative abundance within a region is a good indicator of the diversity of the ecosystem. The bobcat's position at the top of the food chain makes it an important indicator of the wildlife habitat quality and wildlife corridor functions. Home range studies conducted by Zezulak and Schwab (1980) in Riverside County indicated home ranges of 1.8 to 20.7 square miles (1,152 to 13,248 acres) with a mean of 10.3 square miles (6,592 acres). Bobcats are, for the most part, nocturnal and require cover and den sites such as rock caves, hollow logs, or very dense brush. Prey includes rabbits, rodents, birds, and occasionally deer. Bobcats also require access to a water source. Bobcat and their sign (e.g., scat and tracks) have been observed throughout the SSFL and open space.

The mule deer (*Odocoileus hemionus*) is considered a “harvest species” by the CDFG. In California, mule deer occur throughout the state with the exception of the San Joaquin Valley and some southeastern desert areas. Locally, mule deer inhabit a variety of habitats, including riparian and oak woodlands, coniferous forest, coastal sage scrub, and chaparral. Suitable habitat is a mosaic of vegetation, providing clearings interspersed with dense brush or tree thickets. Brushy areas and thickets are important for escape cover and thermal regulation. Deer also require a permanent source of water. Mule deer browse and graze, preferring tender new growth of various shrubs such as ceanothus, mountain mahogany, and bitterbrush. Forbs and grasses are important in spring, and mule deer feed heavily on acorns when available, primarily in autumn. They also dig out subterranean mushrooms and commonly frequent salt or mineral licks.

Local populations of mule deer are dispersed and seldom form herds. The usual groups consist of a doe with her fawn or a doe with twin fawns and a pair of yearlings. Bucks usually are solitary. Mule deer establish home ranges to which they restrict their movements. Natural predators of deer include mountain lions, coyotes, and bobcats. Deer populations can decline in response to fragmentation, degradation, or destruction of habitat. Movement corridors may be instrumental in maintaining population continuity and allowing the dispersal of juveniles. Several individuals and sign (i.e., tracks, scat) were observed throughout the SSFL.

The San Diego black-tailed jackrabbit (*Lepus californica bennettii*) is considered a “species of special concern” by the CDFG. This species is found from the coast to the western slope of the coastal mountains up to 6,000 feet. It inhabits open land but requires some shrubs for cover. Typical habitats include early stages of chaparral, open coastal sage scrub, and grasslands near the edges of brush. Grasses and forbs are the rabbit's preferred foods. Chew and Chew (1970) reported a diet of 65 percent shrub browse and 35 percent herbage. Breeding occurs throughout the year, and young are born under shrubs with no special nest structure. Home ranges averaging 45 acres have been recorded in California (Lechleitner 1958). One San Diego black-tailed jackrabbit was observed at the STL-IV Area (SWMU 6.5), and another was observed north of the FSDF (SWMU 7.3).

Species Potentially Occurring at the SSFL

A number of other sensitive wildlife species are either known from the area or have the potential to occur at the facility. Species that are considered to have a high potential to occur at the facility are described in the following paragraphs. These species are known from the surrounding area, and suitable habitats are available at the SSFL. Species that are considered to have a low to moderate potential to occur at the facility are described in Appendix E. The potential for these species to occur is typically low to moderate if the study area is at the edge of the known species range or if adequate amounts of suitable habitat are lacking at the SSFL.

Reptiles

The San Diego horned lizard (*Phrynosoma coronatum blainvillei*) is considered a “species of special concern” by the State of California. This subspecies is endemic to extreme southwestern California, occurring from sea level to elevations of over 8,000 feet, and frequents a variety of habitats from sage scrub and chaparral to coniferous and broadleaf woodlands (Stebbins 1966). It is most often found on sandy or friable soils with open scrub. Habitat requirements include open areas for sunning, bushes for cover, and fine loose soil for rapid burial. Harvester ants are the primary food item of the horned lizard and indicate the potential for the lizard to occur in an area. This taxon is primarily active in late spring (April through May) and early summer (June through July) after which individuals typically estivate. Threats to this species include urban development,

conversion of habitat to agriculture, and collection of individuals for the pet trade (SDHS 1980). Although no San Diego horned lizards were detected at the facility, suitable habitat and prey items for this subspecies occur at the facility, and the San Diego horned lizard is known to occur within the Santa Susana Mountains. There is a high to moderate probability that the San Diego horned lizard occurs onsite in low numbers.

The coastal rosy boa (*Lichanura trivirgata roseofusca*) is considered a fully protected species by the CDFG. This boa is widely but sparsely distributed throughout desert and chaparral habitats in southern California, ranging from western Los Angeles County to eastern San Bernardino County (Zeiner et al. 1988). It occurs in dry rocky brushlands and arid habitats, usually near intermittent streams, but does not require permanent water. It is secretive and chiefly nocturnal and best surveyed for at night. It is declining as a result of habitat alteration and collection for the pet trade. Habitat requirements include vegetation or rock outcrops for shelter and small mammals or birds for prey. There is a high probability that this species occurs at the facility.

The coast patch-nosed snake (*Salvadora hexalepis virgultea*) is considered a “species of special concern” by the CDFG. The distribution of the coast patch-nosed snake includes the coastal slope of southern California and northern Baja California (Stebbins 1966). The species is found in a variety of habitats from sea level to 7,000 feet, including coastal sage scrub, chaparral, riparian, grasslands, and agricultural fields (Zeiner et al. 1988). Its activity patterns are diurnal and it is active most of the year in southern California. It prefers open habitats with friable or sandy soils and enough cover to escape predation. Burrowing rodents are a preferred food source. This uncommon snake is threatened by intensive agricultural practices and urbanization of its habitat. There is a high probability that the coast patch-nosed snake occurs at the SSFL facility.

Birds

The golden eagle (*Aquila chrysaetos canadensis*) enjoys full federal protection under the Bald Eagle Act and is considered a "species of special concern" by the CDFG. Golden eagles are distributed throughout North America, Eurasia, and North Africa (Johnsgard 1990). Golden eagles occur as breeding residents in the western half of the United States and formerly nested in the northeast (Terres 1980; Johnsgard 1990). This species is an uncommon resident throughout California (Zeiner et al. 1990a). Golden eagles forage in grassy and open shrubby habitats and nest primarily on cliffs, with secondary use of large

trees (e.g., oaks and sycamores). Breeding pairs may occupy territories of several square miles, within which they may often use several nest sites, shifting nest sites from year to year. This species has declined regionally because of loss of foraging and nesting habitat to urban and agricultural development, illegal shooting, incidental poisoning of prey species (e.g., ground squirrels and prairie dogs), egg collecting, power line electrocution, and human disturbance at the nest (Snow 1973; Johnsgard 1990; Scott 1985). Facility personnel at the STL-IV Area (SWMU 6.5) documented a golden eagle sighting in November 1989.

Mammals

The ringtail cat (*Bassariscus astutus*) has been given fully protected status by the CDFG. The ringtail cat was previously classified with raccoons in the Procyonidae family but are now placed in their own family, the Bassaricadae. This nocturnal species is seldom observed but is normally associated with steep rocky slopes adjacent to streams. It is also associated with caves and abandoned mines. Home ranges of this species have been estimated at 100 to 1,200 acres (Grinnel et al. 1937). Ringtails require rocky areas not more than 0.6 mile from water. Rocketdyne personnel have reported observation of this species in the Instrument and Equipment Laboratories area in December 1996.

The mountain lion (*Felis concolor*) is considered a “harvest species” by the CDFG, and there is presently a moratorium on mountain lion hunting. Mountain lions typically occur in remote, hilly, or mountainous areas. They require open water sources, such as streams or rock pools, large foraging areas, and rocky shelters or caves for denning. The home range of mountain lions can cover areas as large as 25 to 96 square miles (16,000 to 61,440 acres) for males and 3 to 12 square miles (1,920 to 7,680 acres) for females, with a typical minimum home range of 15 square miles (9,600 acres) per individual (Russell 1978; Hornocker 1970). Mountain lions are chiefly nocturnal but may also be active during the day if undisturbed. This cat is active year-round and may travel up to 25 miles per night in search of food. Prey includes mule deer (up to 60 to 80 percent of diet), rabbits, rodents, coyotes, snakes, and occasionally livestock. Because of its large home range size, this species is susceptible to increased human pressures. No mountain lions were detected at the facility during project surveys, although SSFL personnel have reported sightings. There is a high potential for mountain lions to occur onsite.

The American badger (*Taxidea taxus jeffersoni*) is considered a “species of special concern” and “harvest species” by the CDFG. It is an uncommon resident of level, open areas in grasslands, agricultural areas, and open shrub habitats. It digs large burrows in dry, friable soils and feeds mainly on fossorial mammals: ground squirrels, gophers, rats, mice, etc. Badgers are primarily active during the day but may become more nocturnal when in proximity to humans. The home range of badgers has been measured at 1,327 to 1,549 acres for males and 338 to 751 acres for females in Utah (Lindzey 1978), and 400 to 600 acres in Idaho (Messick and Hornocker 1981). Mating occurs in late summer or early fall, and two to three young are born 183 to 265 days later in March or April (Long 1973). Badgers are known to live at least 11 to 15 years (Messick and Hornocker 1981). Threats to badgers include urban and agricultural development of habitat and possibly excessive trapping and persistent poisons in prey in some areas (Zeiner et al. 1990b). The American badger has been reported by SSFL personnel to have occurred historically onsite; due to its large home range size, it is very difficult to observe. There is a high probability that the American badger occurs at the SSFL facility.

The San Diego desert woodrat (*Neotoma lepida intermedia*) is a “species of special concern” in the state of California. Like other woodrats, it constructs large middens, usually of small twigs, cactus pads, and other plant material. Middens are often constructed under patches of prickly pear or cholla (*Opuntia* spp.), in rock outcrops, or under low trees. Although the middens are easily detectable and several were observed on the SSFL property, trapping is usually necessary to distinguish between the middens of the dusky-footed woodrat (*Neotoma fuscipes*) and those of the desert woodrat. The primary threat to this species is urbanization and habitat degradation. There is a high probability that the San Diego desert woodrat occurs at the SSFL facility.

3.6.5 Habitat Quality

The wildlife and vegetative habitats at the SSFL facility are generally considered to be of high quality. Habitat quality is positively influenced by the availability of several sources of water at the site, relative size of the open space on the property, biological and physical diversity, and connections to larger areas of open space.

Water can play an important role in determining the habitat quality of a site. Areas that have a readily available source of water typically support those vegetative habitats that in turn are able to support a wide variety of wildlife species. Sources of water at the facility

include areas of open water such as Silvernale Reservoir and several ponds, perennial springs, and streams scattered across the facility. These permanent sources of water are high quality resources that may attract wildlife from adjacent open space areas.

The undeveloped areas within the SSFL facility, both in the open space and the natural areas surrounding the developed site areas, consists of a large area of diverse habitats. This diversity is reflected in a wide variety of floral and faunal species occurring at the site. The habitat and species diversity associated with the SSFL property, the physical attributes of the facility, and its geographic location makes the area a potentially important route for effective movement from floral and faunal source units (large habitat areas from which species can migrate to repopulate or maintain current populations in more restricted areas). According to recent studies of wildlife movement within the Santa Susana Mountains, the open space associated with the site may play an important role as a habitat linkage between the Santa Susana Mountains, the Simi Hills, and possibly the San Gabriel Mountains (Edelman 1991; Envicom 1993).

3.6.6 Trophic Relationships

Trophic relationships refer to the interaction of one organism with another on a predator/prey basis; this relationship is often shown as a food web or chain. Positions within the web may include:

- Primary producer – a photosynthetic plant
- Herbivore or primary consumer – the first animal which feeds on a plant
- Secondary consumer – an animal feeding on an herbivore
- Tertiary consumer – an animal feeding on a secondary consumer

Trophic relationships are useful for determining the flow of energy and matter within an ecosystem and for modeling potential chemical exposure through the food web. The food web model developed for the SSFL illustrates trophic relationships among species found on the SSFL (Figure 3-3).

In the trophic model developed for the SSFL, aquatic and terrestrial plants are identified as primary producers. That is, they rely on solar energy and nutrients in the soil, sediment, and/or water for growth and reproduction. Mammals, reptiles, amphibians, fish, birds, and invertebrates are considered herbivores if they eat plants. Some of these

animals, such as birds or fish, are also considered secondary consumers; birds and fish may eat portions of a plant as well as consume species such as invertebrates. Tertiary consumers include carnivorous species such as bobcats, raptors, snakes, toads, and fish.

A complete food chain for the SSFL may include plants, rabbits that eat the plants, and bobcats that eat the rabbits. Another example is that of a piscivorous bird that feeds on fish, which feeds on other fish, invertebrates, and plant matter.

Vegetation Map with Sensitive Species

Santa Susana Field Laboratory

- VENTURIAN COASTAL SAGE SCRUB
- VENTURIAN COASTAL SAGE SCRUB/CHAPARRAL
- BACCHARIS SCRUB
- CHAPARRAL
- CHAPARRAL/COAST LIVE OAK WOODLAND
- NONNATIVE GRASSLAND
- NATIVE GRASSLAND
- COAST LIVE OAK RIPARIAN FOREST
- COAST LIVE OAK WOODLAND
- FRESHWATER MARSH
- MULEFAT SCRUB
- SOUTHERN WILLOW SCRUB/MULEFAT SCRUB
- SOUTHERN WILLOW SCRUB
- OPEN WATER
- RUDERAL HABITAT
- ROCK OUTCROP
- DEVELOPED
- DISTURBED VEGETATION OVERLAY
- VEGETATION WITH ROCK OUTCROPS OVERLAY

Drainages

Legend

Sensitive Wildlife

- MD MULE DEER
- BC BOBCAT
- TU/TU TURKEY VULTURE
- ASHA RED-SHOULDERED HAWK
- BTJ S.D. BLACK-TAILED JACKRABBIT
- RTHA RED-TAILED HAWK
- GBH GREAT BLUE HERON
- GHOW GREAT HORNED OWL
- SSHA SHARP-SHINNED HAWK
- RCSP RUFOUS-CROWNED SPARROW
- DCCO DOUBLE-CRESTED CORMORANT
- TSGS TWO-STRIPED GARTER SNAKE
- COHA COOPER'S HAWK
- LOSH LOGGERHEAD SHRIKE

Sensitive Plants

- HM SANTA SUSANA MOUNTAIN TARPLANT
- BW SOUTHERN CAL. BLACK WALNUT
- QA VALLEY OAK
- OL COAST LIVE OAK

DATE: 05/04/04
 FILE: spspmapshp\spmapshp.mxd
 1. MDC (Land and Environmental) 2003. Standardized Bird Abundance Methodology for the Santa Susana Field Laboratory. Santa Susana Field Laboratory, Ventura County, California.
 2. Map coordinates in StatePlane, NAD 27, Zone 10.
 3. Species occurrence data from Santa Susana Field Laboratory.

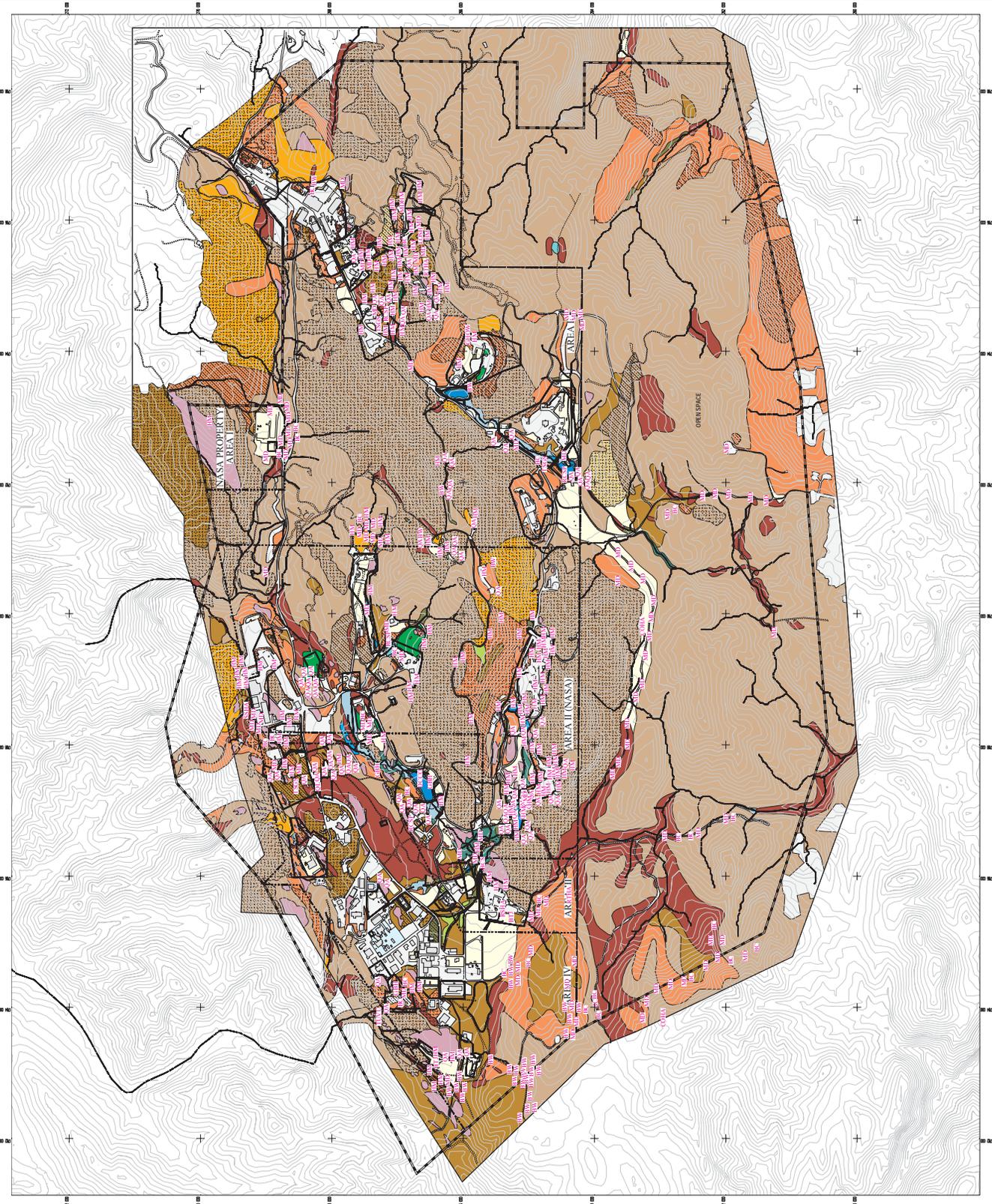
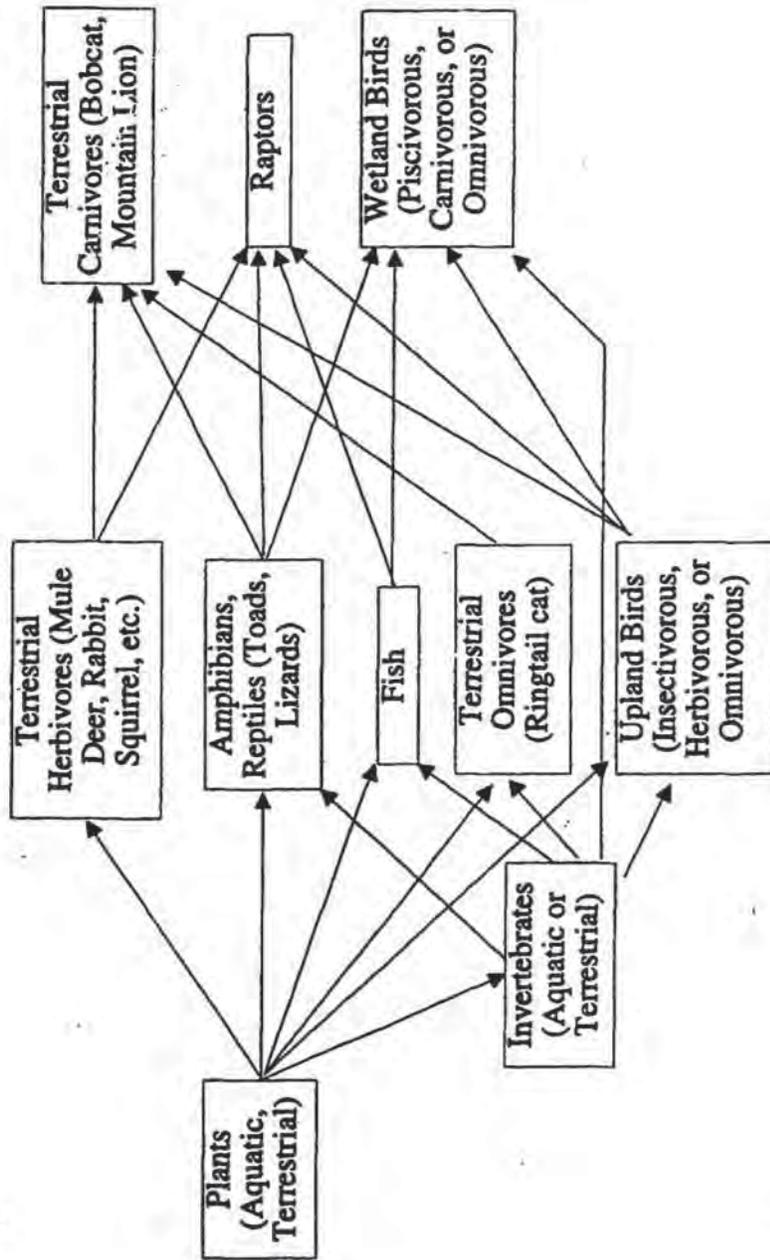


Figure 3-2

This Figure Intentionally Left Blank



Trophic Model for the Rocketdyne Santa Susana Field Laboratory Facility

Table 3-1

**SENSITIVE PLANT SPECIES OBSERVED OR POTENTIALLY OCCURRING
AT THE SSFL FACILITY**

Species Name	State Status	Federal Status	Likelihood of Occurrence*
Santa Susana tarplant (<i>Hemizonia minthornii</i>)	Rare	--	Observed throughout the SSFL primarily on rock outcrops.
Southern California black walnut (<i>Juglans californica</i> var. <i>californica</i>)	Candidate (CNPS List 4)	--	Observed 23 trees in the vicinity of Burro Flats and west of the STL-IV Area (SWMU 6.5). Four individuals adjacent to the ESADA Storage Area (SWMU 7.9), and individual trees observed across the SSFL.
Braunton's milkvetch (<i>Astragalus brauntonii</i>)	Candidate (CNPS List 1B)	Endangered	Not observed. Suitable habitat present onsite but low potential to occur. Known from fewer than ten extant occurrences, none of which are at or adjacent to the SSFL.
Plummer's mariposa lily (<i>Calochortus plummerae</i>)	Candidate (CNPS List 1B)	--	Not observed. Low potential to occur in chaparral habitat onsite. Less common at higher elevations. Has been reported in area of the SSFL but not on or immediately adjacent to the SSFL.
San Fernando Valley spineflower (<i>Chorizanthe parryi</i> var. <i>fernandina</i>)	Candidate (CNPS List 1A)	Candidate	Not observed. Extremely low potential to occur onsite. Presumed to be extinct.
Santa Monica Mountains dudleya (<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>)	Candidate (CNPS List 1B)	Threatened	Not observed. Low potential to occur onsite. Known from fewer than ten occurrences, none of which are at or adjacent to the SSFL.
Many-stemmed dudleya (<i>Dudleya multicaulis</i>)	Candidate (CNPS List 1B)	--	Not observed. Low potential to occur in the coastal sage scrub and chaparral habitats onsite. Not reported to occur at or adjacent to the SSFL.

*Likelihood of occurrence is based on known species range and the presence and quality of suitable habitat.

Table 3-2

**SENSITIVE REPTILE SPECIES OBSERVED OR POTENTIALLY OCCURRING
AT THE SSFL FACILITY**

Species Name	State Status	Federal Status	Likelihood of Occurrence*
San Diego horned lizard (<i>Phrynosoma coronatum blainvillei</i>)	Species of Special Concern	--	Not observed. High potential to occur in appropriate habitat at the SSFL. Known to occur within the Santa Susana Mountains.
Silvery legless lizard (<i>Anniella pulchra pulchra</i>)	Species of Special Concern	--	Not observed. Moderate potential to occur in appropriate habitat (chaparral and coastal scrub) at the SSFL.
Coastal rosy boa (<i>Lichanura trivirgata roseofusca</i>)	Protected	--	Not observed. High potential to occur in appropriate habitat (rocky chaparral-covered hillsides and canyons) at the SSFL.
Coast patch-nosed snake (<i>Salvadora hexalepis virgultea</i>)	Species of Special Concern	--	Not observed. High potential to occur in appropriate habitat (coastal chaparral) at the SSFL. Widely distributed throughout California.
Two-striped garter snake (<i>Thamnophis hammondi</i>)	Special Animal	--	Observed at the Old Conservation Yard (SWMU 7.4), the LETF (SWMU 4.12), the Bravo Area (SWMUs 5.13, 5.14, and 5.15), and at the Perimeter Pond (SWMU 4.17). Expected to occur throughout appropriate habitat at the SSFL.
San Diego mountain king snake (<i>Lampropeltis zonata pulchra</i>)	Protected	--	Not observed. Low to moderate potential to occur in the rock outcrop habitat at the SSFL. May be at edge of range.

*Likelihood of occurrence is based on known species range and the presence and quality of suitable habitat.

Table 3-3
SENSITIVE AMPHIBIAN SPECIES POTENTIALLY OCCURRING AT THE SSFL FACILITY

Species Name	State Status	Federal Status	Likelihood of Occurrence*
Western spadefoot toad (<i>Scaphiopus hammondi</i>)	Species of Special Concern	--	Not observed. Low to moderate potential to occur at the SSFL. Occurs primarily in native grasslands at lower elevations. Few small patches of native grassland occurs at the SSFL and may not be sufficient to support toad populations.
Southwestern pond turtle (<i>Clemmys marmorata pallida</i>)	Species of Special Concern (under review for Protected status)	--	Not observed. Low to moderate potential to occur in the aquatic habitat at the SSFL.
California red-legged frog (<i>Rana aurora draytoni</i>)	Species of Special Concern	Threatened	Not observed. Low potential to occur in the aquatic habitat at the SSFL. Uncommon throughout southern California.

*Likelihood of occurrence is based on known species range and the presence and quality of suitable habitat.

Table 3-4

**SENSITIVE BIRD SPECIES OBSERVED OR POTENTIALLY OCCURRING
AT THE SSFL FACILITY**

Species Name	State Status	Federal Status	Likelihood of Occurrence*
Double-crested cormorant (<i>Phalacrocorax auritus</i>)	Species of Special Concern	--	Observed on Silvernale Reservoir. There is only a low to moderate probability that this species nests onsite.
Great blue heron (<i>Ardea herodias herodias</i>)	Special Animal	--	Observed in freshwater marsh and aquatic habitat at the Silvernale Reservoir adjacent to the SPA (Area II AOC), the Building 56 Landfill (SWMU 7.1), the Bowl Area and Building 901 Leach Field (SWMU 4.15 and AOC), and the CTL-III area (SWMU 4.7). Moderate potential to nest in the large trees at the SSFL.
California gnatcatcher (<i>Poliopitila californica</i>)	Species of Special Concern	Threatened	Not observed. Low potential to occur in the sage scrub habitat onsite. May be at edge of known range. Focused surveys did not detect gnatcatchers.
Southern California rufous-crowned sparrow (<i>Aimophila ruficeps canescens</i>)	Species of Special Concern	--	Observed north of the ECL area (SWMU 6.1, 6.3 and AOC), and between the Alfa Area (SWMUs 5.9, 5.10, and 5.11) and the SPA (Area II AOC).
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Species of Special Concern	--	Observed south of the Happy Valley Site (Area II AOC). This species probably nests at the SSFL.
Sharp-shinned hawk (<i>Accipiter striatus velox</i>)	Species of Special Concern	--	Observed flying over the ELV Final Assembly Building 206 (SWMU 5.2). Historically documented at the SSFL by Rocketdyne personnel.

**SENSITIVE BIRD SPECIES OBSERVED OR POTENTIALLY OCCURRING
AT THE SSFL FACILITY**

Species Name	State Status	Federal Status	Likelihood of Occurrence*
Red-shouldered hawk (<i>Buteo lineatus elegans</i>) ¹	--	--	Observed evidence of nesting at the SSFL in the vicinity of the STL-IV area.
Red-tailed hawk (<i>Buteo jamaicensis</i>) ¹	--	--	Observed roosting in the vicinity of Happy Valley (Area I AOC), and flying over the CTL-III Area (SWMU 4.7), the SPA (Area II AOC), and the Building 56 Landfill (SWMU 7.1).
Turkey vulture (<i>Cathartes aura</i>) ¹	--	--	Observed roosting and flying over the entire SSFL and are expected to forage on the property.
Great horned owl (<i>Bubo virginianus</i>) ¹	--	--	Observed two owls roosting at the Bowl Area and Building 901 Leach Field (SWMU 4.15 and AOC).
Cooper's hawk (<i>Accipiter cooperii</i>)	Species of Special Concern	--	Observed a male and female roosting in the buffer zone. This species has a high probability of nesting onsite.
Golden eagle (<i>Aquila chrysaetos canadensis</i>)	Species of Special Concern	Protected	Not observed during biological surveys; however, this species has been historically documented by Rocketdyne personnel.

¹ Although no official status is given for these raptors, raptor nests are protected to varying degrees by separate state regulations. Additionally, raptors are considered important to the ecosystem due to their position at the top of the food chain.

* Likelihood of occurrence is based on known species range and the presence and quality of suitable habitat.

Table 3-5

**SENSITIVE MAMMAL SPECIES OBSERVED OR POTENTIALLY OCCURRING
AT THE SSFL FACILITY**

Species Name	State Status	Federal Status	Likelihood of Occurrence*
Bobcat (<i>Felis rufus</i>)	Harvest Species	--	Observed bobcat sign, including scat and tracks, throughout the Buffer Zone and at all the RFI sites except the Bowl Area and Building 901 Leach Field (SWMU 4.15 and AOC). One bobcat was observed foraging in the scrub habitat west of the Perimeter Pond (SWMU 4.17).
Mule deer (<i>Odocoileus hemionus</i>)	Harvest Species	--	Observed mule deer or sign, including scat and tracks, throughout the Buffer Zone and at all the RFI sites except the Bowl Area and Building 901 Leach Field (SWMU 4.15 and AOC), the RIHL (SWMU 7.7), and the Former Coal Gasification PDU (SWMU 7.10).
San Diego black-tailed jackrabbit (<i>Lepus californica bennettii</i>)	Species of Special Concern	--	Observed one individual at the STL-IV area (SWMU 6.5) and another at the FSDF (SWMU 7.3).
Los Angeles little pocket mouse (<i>Perognathus longimembris brevinasus</i>)	Species of Special Concern	(Under review for Endangered or Threatened status)	Not observed. Low to moderate potential to occur in appropriate habitat at the SSFL. A live-trapping study would need to be performed to determine if this subspecies is present at the SSFL.

**SENSITIVE MAMMAL SPECIES OBSERVED OR POTENTIALLY OCCURRING
AT THE SSFL FACILITY**

Species Name	State Status	Federal Status	Likelihood of Occurrence*
Ringtail (<i>Bassariscus astutus</i>)	Protected	--	Reported from Instrument and Equipment Laboratories area in December 1996. Moderate to high potential to occur elsewhere at the SSFL in areas of rock outcrops.
Mountain lion (<i>Felis concolor</i>)	Harvest Species	--	Not observed. High potential to occur at the SSFL. Known to occur in the area.
American badger (<i>Taxidea taxus jeffersoni</i>)	Species of Special Concern, Harvest Species	--	Not observed. High potential to occur at the SSFL. Known to occur in the area.
San Diego desert woodrat (<i>Neotoma lepida intermedia</i>)	Species of Special Concern	--	Not observed during biological surveys; however, this species has been historically documented by SSFL personnel.

*Likelihood of occurrence is based on known species range and the presence and quality of suitable habitat.

SECTION 4 REFERENCES

- American Fisheries Society (AFS). 1991. A List of Common and Scientific Names of Fishes from the United States and Canada. Special Publication. American Fisheries Society, Bethesda, Maryland.
- Chew, R.M., and A.E. Chew. 1970. Energy relationships of the mammals of a desert shrub (*Larrea tridentata*) community. Ecol. Monogr. 40: pp. 1-21.
- Cogswell, H.L. 1977. Water birds of California. University of California Press, Berkeley. 399 pp.
- Edelman, P. 1991. Critical wildlife corridor/habitat linkage areas between the Santa Susana Mountains, the Simi Hills and the Santa Monica Mountains. Prepared for The Nature Conservancy. 103 pp.
- Envicom Corporation. 1993. A consideration of wildlife movements in the Santa Susana Mountains. Prepared for HMDI, Incorporated. February.
- Grinnell, J., J.S. Dixon, and J.M. Linsdale. 1937. Fur-bearing mammals of California. 2 vols. University of California Press, Berkeley. 752 pp.
- Ground Water Resources Consultants (GRC). 1993. Annual ground water monitoring report, Santa Susana Field Laboratory, 1992, Volumes I and II. February.
- Ground Water Resources Consultants (GRC). 1995. Annual Ground Water Monitoring Report, Santa Susana Field Laboratory. 1994. Volume II.
- Hall, E. Raymond. 1981. Mammals of North America. 2 vols. John Wiley and Sons. New York. 1181 pp.
- Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency.
- Hornocker, M.G. 1970. An analysis of mountain lion predation upon mule deer and elk in the Idaho Primitive Area. Wildlife Monographs. No 21. 39 pp.
- ICF Kaiser Engineers. 1993a. Current conditions report and draft RCRA facility investigation work plan, Areas I and III, Santa Susana Field Laboratory. Ventura County, California. October.
- ICF Kaiser Engineers. 1993b. Current conditions report and draft RCRA facility investigation work plan, Area II and Area I LOX plant, Santa Susana Field Laboratory. Ventura County, California. October.

- ICF Kaiser Engineers. 1993c. Current conditions report and draft RCRA facility investigation work plan, Area IV, Santa Susana Field Laboratory. Ventura County, California. October.
- Johnsgard, P.A. 1990. *North American Owls: Biology and Natural History*. Washington D. C.: Smithsonian Institution Press.
- Laudenslayer, W.F., Jr., W.E. Grenfell, Jr. and D. Zeiner. 1991. A check-list of the amphibians, reptiles, birds, and mammals of California. *The Resources Agency*: 77(3): 109-141.
- Lechleitner, R.R. 1958. Movements, destiny, and mortality in a black-tailed jackrabbit population. *J. Wildlife Manage.* 22: pp. 371-384.
- Lindzey, F.G. 1978. Movement patterns in badgers in northwest Utah. *Journal of Wildlife Management.* 42:418-422.
- Long, C.A. 1973. *Taxidea taxus*. Mammal. Species No. 26. 4 pp.
- Messick, J.P. and M.G. Hornocker. 1981. Ecology of the badger in southwestern Idaho. *Wildlife Monograph No. 76.* 53 pp.
- Munz, P.A. 1974. *A flora of southern California*. University of California Press, Berkeley. 1086 pp.
- Ogden Environmental and Energy Services Co., Inc. (Ogden). 1996. RCRA facility investigation work plan addendum, Santa Susana field laboratory, Ventura County, California - Volumes I and II. Prepared for Rockwell International Corporation, Rocketdyne Division. September.
- Russell, K.R. 1978. Mountain lion. Pages 207-225 in J. L. Schmidt and D. L. Gilbert, eds. *Big Game of North America*. Stackpole Books, Harrisburg, PA. 494 pp.
- San Diego Herpetological Society (SDHS). 1980. Survey and status of endangered and threatened species of reptiles natively occurring in San Diego County. Prepared for Fish and Wildlife Committee, San Diego Department of Agriculture, 33 pp.
- Science Applications International Corporation (SAIC). 1991. Interim final RCRA facility assessment report for Rockwell International Corporation, Rocketdyne Division, Santa Susana Field Laboratory, Ventura County, California. Prepared for U.S. EPA, Region IX. July.
- Scott, T.A. 1985. Human impacts on the golden eagle population of San Diego County from 1928-1981. Master's thesis, San Diego State University, California. 100 pp.

- Skinner, M. W. and B. M. Pavlik. 1994. Inventory of rare and endangered vascular plants of California. California Native Plant Society, Special Publication No. 1, 5th edition.
- Snow, C. 1973. Technical note: habitat management series for unique or endangered species: Report no. 7 golden eagle (*Aquila chrysaetos*). Bureau of Land Management, U.S. Department of the Interior. Denver Service Center, Denver, CO. 52 pp.
- Stebbins, R.C. 1966. *A field guide to western reptiles and amphibians*. Houghton-Mifflin Co. 279 pp.
- Terres, J.K. 1980. The Audubon Society encyclopedia of North American birds. A.A. Knopf Publishing Company. New York, New York.
- Ueshiro, R.Y. 1995. Personal communication of surface water hydrology data for the Building 56 Landfill site (SWMU 7.1).
- Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer and M. White. 1988. California Statewide Wildlife Habitat Relationships System. Volume 1: Amphibians and Reptiles. David Zeiner, W. Laudenslayer and K. Mayer eds. The Resource Agency. Sacramento. 269 pp.
- Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer and M. White. 1990a. California Statewide Wildlife Habitat Relationships System. Volume 2: Birds. David Zeiner, W. Laudenslayer K. Mayer, and Marshal White eds. The Resource Agency. Sacramento. 732 pp.
- Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer and M. White. 1990b. California Statewide Wildlife Habitat Relationships System. Volume 3: Mammals. David Zeiner, W. Laudenslayer and K. Mayer eds. The Resource Agency. Sacramento. 407 pp.
- Zezulak, D. S. and R. G. Schwab. 1980. Bobcat biology in a Mojave Desert community. California Department of fish and Game, Sacramento. Federal Aid to Wildlife Restoration Project. W-54-R-12, job IV-4. 25 pp.