

DRAFT

BIOLOGICAL RESOURCES STUDY

FOR THE BOEING COMPANY

SANTA SUSANA FIELD LABORATORY

SOILS AND GROUNDWATER REMEDIATION

PROJECT

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1.0 INTRODUCTION

The proposed project is located at the Santa Susana Field Laboratory (SSFL), which is located in southeastern Ventura County, near the crest of the Simi Hills at the western border of the San Fernando Valley (see Figure 1 below). The SSFL is divided into four administrative areas (Areas I, II, III, and IV). SSFL is bordered by the Bell Canyon residential development on the south, the Santa Monica Mountains Conservancy's Sage Ranch Park and the Brandeis-Bardin Institute on the north; several residential ranches and two mobile home parks on the east; and Meier and Runkle Canyons on the west.

The proposed project involves the remediation of affected soil and groundwater resulting from historical aerospace equipment development and experimentation within Boeing-owned SSFL Areas I and III. The California Environmental Protection Agency Department of Toxic Substances and Control (DTSC) is acting as lead agency under the California Environmental Quality Act (CEQA) to develop and prepare an Environmental Impact Report that addresses project alternatives and evaluates environmental impacts for the remediation activity. In support of the CEQA analysis for the proposed project, this Biological Resources Study (Study) has been prepared to document biological resources present or potentially present throughout the Project Study Area, which completely encompasses the Project Site.

1.1 BIOLOGICAL SUPPORT FOR PAST OR ONGOING ACTIVITIES

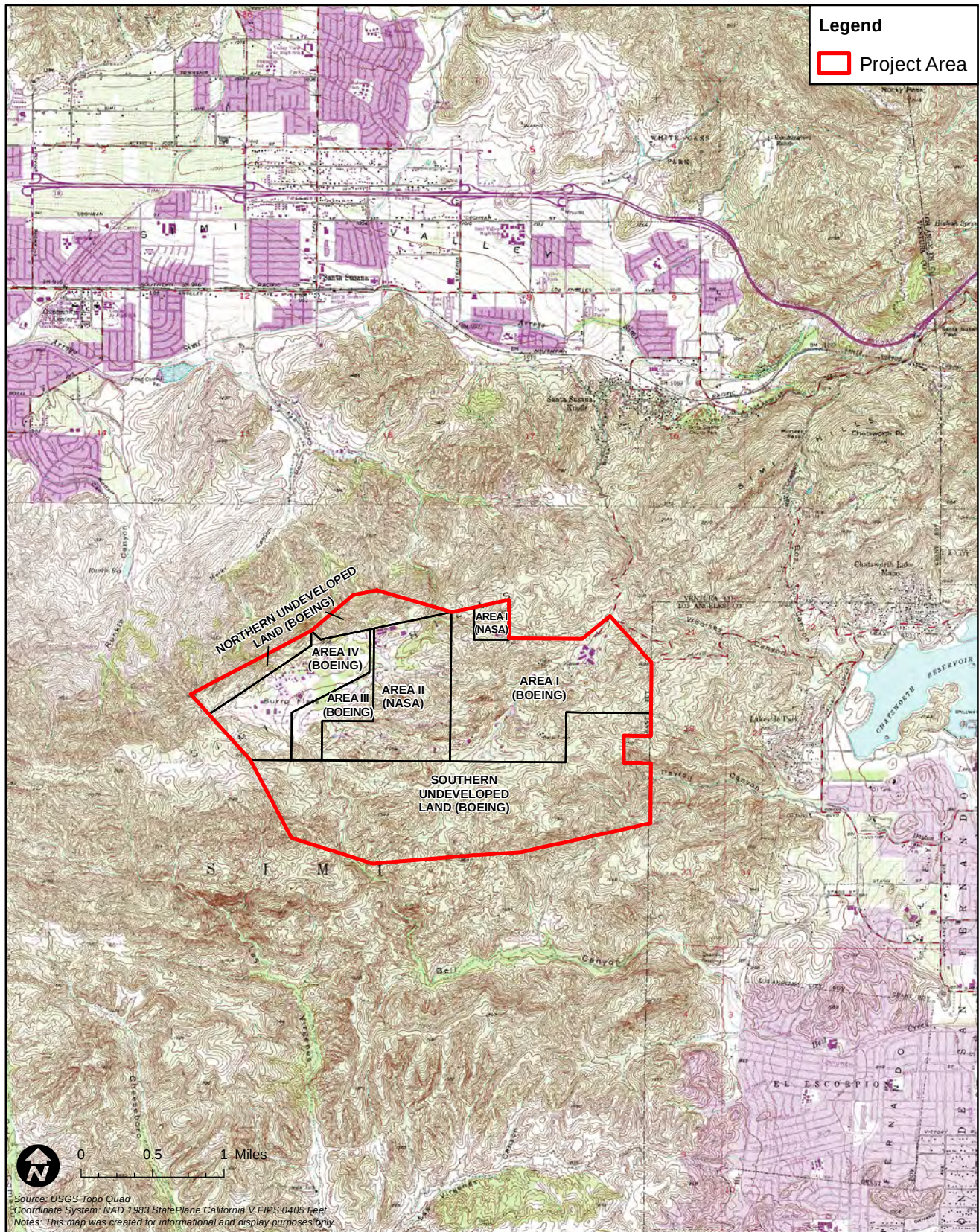
Activities including soil profiling, groundwater well installations, groundwater testing and treatment, interim source removal actions, installations of Best Management Practices (BMPs) for erosion control and surface water management, building demolitions and asphalt removal have been performed in recent years at SSFL. Depending on the specific location, scope, extent and regulatory constraints of each activity, biological surveys and monitoring were typically required based on the known presence of sensitive biological resources in the area.

Padre Associates, Inc. (Padre) Biologists were retained to conduct pre-activity biological surveys and part-time to full-time biological monitoring at SSFL dating back initially to 1999, with the most pronounced presence at SSFL during the years 2005 to the present. Biologists' activities also included environmental sensitivity training for field crews, vegetation and habitat mapping and assessment, sensitive plant mapping and flagging (for avoidance alerts), restoration oversight, long-term mitigation monitoring, a U.S. Fish and Wildlife Service-authorized vernal pool invertebrate survey, and participation in a field research study (in conjunction with Pollinator Partnership, a San Francisco-based non-profit conservationist organization) of hydroseeded versus relatively natural areas in regards to pollinator habitat. Padre Biologists have logged approximately 3,500 field hours at SSFL to date.

1.2 REPORT PURPOSE

The purpose of this Study is to document biological resources that are known, or have the potential to occur at SSFL and more specifically, at or near the proposed soil and groundwater remediation sites located within Areas I and III (herein collectively referred to as the Project Site). A narrow, linear portion of federally-owned (NASA-administered) Area II is also considered part of the Project Site for installation of an above-ground groundwater

conveyance pipeline. The Project Site is encompassed by a 25-foot potential disturbance buffer on all sides, and these areas combine to create the Project Study Area. The Study relies heavily on past survey data compiled by Padre Biologists at SSFL, and also provides a discussion on the need for any follow-up or focused surveys that may be required to adequately conduct the CEQA analysis for the proposed project. Recommendations to conserve sensitive biological resources in ways consistent with state and federal resource protection regulations and permitting constraints, and for the long-term goals of establishing a permanent natural preserve are also provided in this Study. Separate reports prepared by other professional biological firms exist for SSFL (e.g., in adjacent Areas II and IV) and can provide relevant data of biological resources that may also be expected to occur within the Project Study Area.



2.0 PROJECT DESCRIPTION

This Study specifically addresses the areas planned for soil and groundwater remedial actions located on Boeing-owned Areas I and III, and a small, linear portion of Area II (see Figure 2 below). The remedial action areas addressed in this Report are collectively termed the Project Site, and include a 25-foot potential disturbance buffer around each location. Table 1 below provides a list of the Project Site locations as they pertain to historical operational areas or other geographic signifiers within SSFL Areas I and III and the Southern Undeveloped Land:

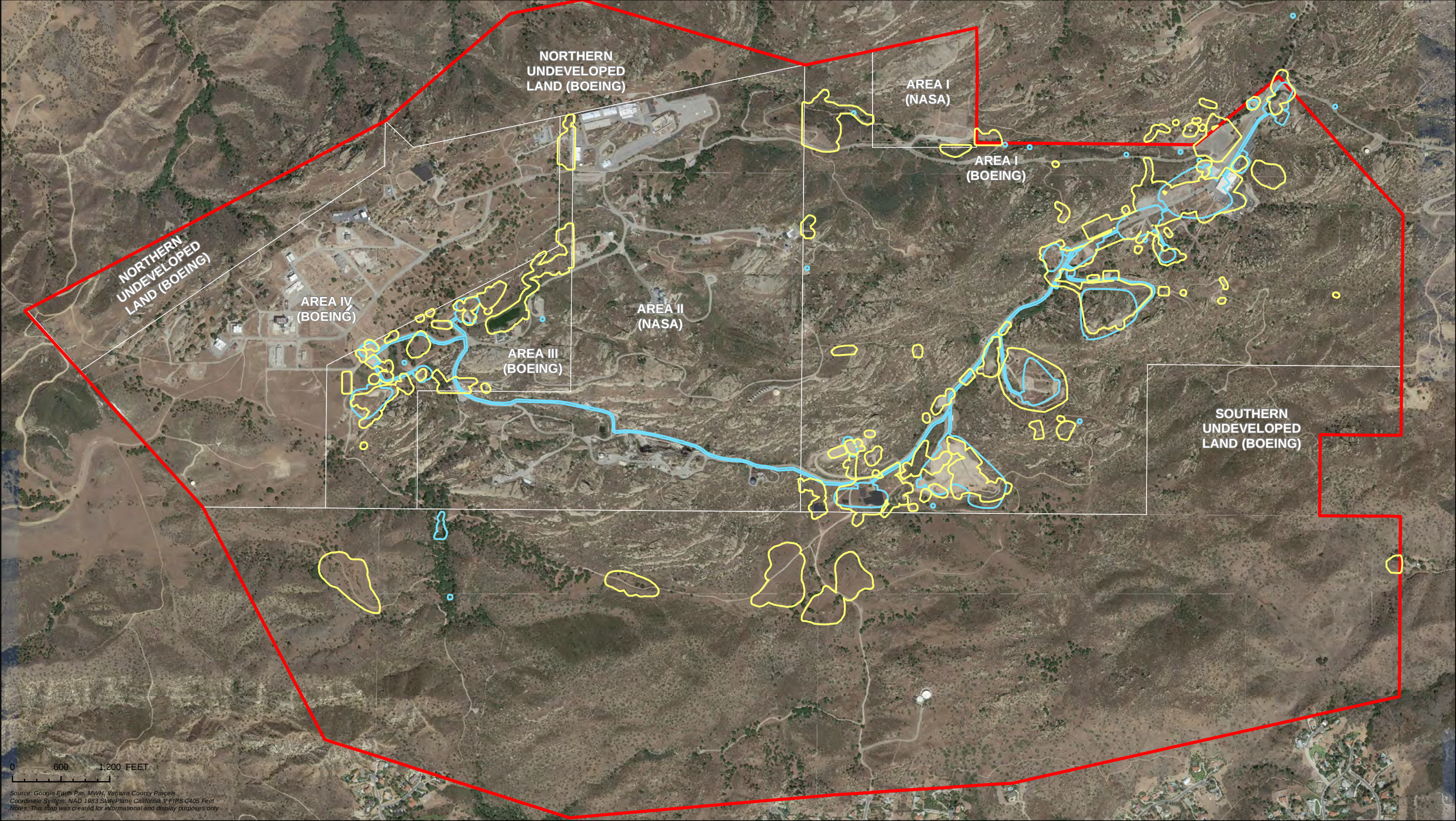
Table 1. Project Site Locations

Project Site Location	Outfall/Watershed	SSFL Area
B-1	009/Calleguas Creek	Area I
Former Rockwell Shooting Range	009/Calleguas Creek	Area I
IEL	009/Calleguas Creek	Area I
B436	009/Calleguas Creek	Area I
Area I Landfill	009/Calleguas Creek	Area I
B359	014/Bell Canyon	Area I
APTF	014/Bell Canyon	Area I
B315	014/Bell Canyon	Area I
CTL-I	015/Bell Canyon	Area I
Canyon	015/Bell Canyon	Area I
Bowl	015/Bell Canyon	Area I
R-1 Pond	015/Bell Canyon	Area I
Area I STP	015/Bell Canyon	Area I
Plummer's Road Water Spraying Areas	011/Bell Canyon	Area I
CTL-III	011/Bell Canyon	Area I
Perimeter Pond	011/Bell Canyon	Area I
Area I Burn Pit	001/Bell Canyon	Area I
CTL-V	001/Bell Canyon	Area I
LOX (Northern Drainage East)	009/Calleguas Creek	Area I
Northern Drainage West	009/Calleguas Creek	Area I
Area II Landfill	009/Calleguas Creek	Area I
Alfa	009/Calleguas Creek	Area I
B204	009/Calleguas Creek	Area III
SPA	018/Bell Canyon	Area III
Silvernale Pond	018/Bell Canyon	Area III
ECL	018/Bell Canyon	Area III

Table 1. Continued

Project Area	Outfall/Watershed	SSFL Area
Area III STP	017/Bell Canyon	Area III
Hydrogen Lab	017/Bell Canyon	Area III
STL-IV	018/Bell Canyon	Area III
Compound A	018/Bell Canyon	Area III
CDFF	018/Bell Canyon	Area III
Dayton Canyon	Los Angeles River	Southern Undeveloped Land
Soil Borrow Areas East	001/Bell Canyon	Southern Undeveloped Land
Soil Borrow Area Middle	002/Bell Canyon	Southern Undeveloped Land
Soil Borrow Area West	002/Bell Canyon	Southern Undeveloped Land
Seeps	002/Bell Canyon	Southern Undeveloped Land
Coca Road	011 & 018/Bell Canyon	NASA Area II

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3.0 STUDY METHODOLOGY

Biological resources of the Project Site were assessed based upon literature research, aerial photograph analysis, and field surveys. Field surveys have been performed by Padre Biologists on a multitude of occasions over the last 14 years (however, more frequently during the last nine years) throughout the entire Project Site as a support mechanism to protect biological resources during a variety of interim onsite activities. Many of the surveys repeatedly visited the same locations each year or in multiple years, providing qualitative, and sometimes quantitative characterizations of the landscape and biological resources contained therein over time.

Botanical surveys were conducted at various times throughout this time period and were compiled into one master list (provided in Appendix C). Wildlife surveys results contained herein are also largely a compilation of data collected in conjunction with various, recent onsite field activities. Survey methods for wildlife included walking transects of opportunity through all habitat types of a particular site, and included the use of 10x42 binoculars for the visual identification of bird or other wildlife species. Auditory cues for birds or other animals were also utilized for compiling a species list. Finally, indications of breeding/nesting bird activity (nest material collection, observation of active or abandoned nests, food collection and deliveries, etc.) were also noted, if observed. Wildlife surveys were largely opportunistic in design, and not necessarily performed to species-specific resource agency protocols. All wildlife observations were compiled into one master list (provided in Appendix D).

Documentation of these past biological surveys conducted at, or in close proximity to the Project Site from 2005 through December 2013 by Padre Staff including Chris Dunn (Project Biologist), Ken Gilliland (Project Biologist), Sarah Powell (Project Biologist), Zack Abbey (Staff Biologist), and Matt Ingamells (Senior Biologist) were catalogued and provide the basis for data presented in this Study.

The literature research also included reviewing the following documents:

- California Native Plant Society Inventory of Rare and Endangered Vascular Plants of California (6th Edition, 2001; online 8th Edition, 2010);
- Personal computer version (RAREFIND3) of the California Department of Fish and Wildlife (CDFW, formerly the California Department of Fish & Game, or CDFG) Natural Diversity Data Base (NDDB, 2013);
- Fall 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory (National Aeronautics & Space Administration, February 2011);
- Biological Assessment Santa Susana Field Laboratory Area IV Radiological Study Ventura County, California (HydroGeoLogic, Inc. & Envicom Corporation, December 2009); and,
- Biological Opinion for the Santa Susana Field Laboratory Area IV Radiological Study Project addressed to Craig Cooper of the U.S. Environmental Protection Agency, (U.S. Fish and Wildlife Service, May 25, 2010).

Vegetation communities were mapped by aerial photography analysis, review of catalogued data within the Project Site areas, and ground-truthing during follow-up field surveys conducted specifically for this Study. Plant communities specifically within the Project Site were characterized according to the California Vegetation Classification and Mapping Program's list of vegetation alliances (CDFG, 2010). Recent biological surveys were conducted within Area I and III on November 25, December 4 and December 6, 2013. A ground-truthing survey for the vegetation maps was conducted by Mr. Dunn on December 18, 2013. Vegetation maps are provided in Appendix A.

4.0 ENVIRONMENTAL SETTING

SSFL is located in southeastern Ventura County, near the crest of the Simi Hills at the western border of the San Fernando Valley. SSFL is bordered by the Bell Canyon residential development on the south, the Santa Monica Mountains Conservancy's Sage Ranch Park and the Brandeis-Bardin Institute on the north; several residential ranches and two mobile home parks on the east; and Meier and Runkle Canyons on the west. SSFL includes approximately 2,850 acres of land, of which a majority is undeveloped. SSFL is divided into four administrative areas (Areas I through IV), in addition to three (3) undeveloped portions (two to the north, one to the south). The administrative areas that are considered part of the Project include the Boeing-owned Area I, Area III, and the Southern Undeveloped Land. The property boundaries are shown on Figure 1. A Project Site overview map is provided in Figure 2 showing the property boundaries and extent of project elements.

SSFL is composed of 17 sub-watersheds supporting 19 surface water monitoring outfalls (Outfalls 001 through 019). The Project Site is located within Outfalls 001 and 002 (Bell Canyon), Dayton Canyon (downstream of 008), 009 (Northern Drainage), 011 (Perimeter Pond), 014 (APTF in Area I), and 015 (STP-1 in Area I). Outfalls 001, 002, 008, 011, 014, and 015 are located within the Bell Canyon or Dayton Canyon watersheds, which eventually drain to the Los Angeles River and the Pacific Ocean. Outfall 009 is part of the Calleguas Creek Watershed (including the Northern Drainage, Meier Canyon, Arroyo Simi, Calleguas Creek, and Mugu Lagoon at its confluence with the Pacific Ocean). These watersheds are regulated by the Regional Water Quality Control Board (RWQCB), and their receiving waters have beneficial uses of wildlife habitat and as a wildlife movement/migration corridor, with Los Angeles River and Calleguas Creek also identified as rare, threatened, or endangered species habitats. Intermittent beneficial uses include groundwater recharge, contact and non-contact recreation, warm freshwater habitat, industrial process supply, and freshwater replenishment.

The Project Study Area consists of a combined approximately 181 acres of open space supporting chaparral, coastal sage scrub, riparian woodland and thickets, oak woodland, annual and perennial grasslands, and ephemeral streambeds, along with developed areas consisting of paved and unpaved roads, and numerous intact or recently decommissioned former test facility areas. No naturally permanent wet areas are present throughout the Project Site, but Silvernale Pond does contain open water for much of the year due to discharges of treated groundwater. During the winter months, three (3) other man-made basins within the Project Site (Perimeter Pond, R-1 Pond, and the Sedimentation Basin at the Lower Lot Biofilter near the entrance to SSFL) exhibit surface water ponding when sufficient rainfall has occurred. The

geology at SSFL consists mainly of shallow alluvium underlain by bedrock of sandstone and siltstone. The depth of alluvium varies with location throughout SSFL, with substantial portions exhibiting large sandstone outcrops.

5.0 DESCRIPTION OF BIOLOGICAL RESOURCES

5.1 VEGETATION

Vegetation throughout SSFL is composed of various coastal sage scrub and chaparral plant communities, oak woodland, mulefat scrub, and annual grassland or other disturbed areas. Substantial portions of the Project Site are located within previously developed areas with little or no vegetation; in particular, where paved and unpaved roads are maintained or various structures are present. Other portions of the Project Site have recently undergone demolition and interim reclamation (restoration) activities including hydroseeding, and in some locations, replanting with native species.

Where present, native vegetation types within the Project Study Area is predominantly composed of (in descending order) yerba santa (*Eriodictyon crassifolium*) scrub, deerweed (*Acmispon glaber*) scrub, chamise-black sage (*Adenostoma fasciculatum-Salvia mellifera*) scrub, upland and riparian coast live oak (*Quercus agrifolia*) woodland, laurel sumac (*Malosma laurina*) scrub, coyote brush (*Baccharis pilularis*) scrub, mulefat (*Baccharis salicifolia*) thicket, arroyo willow (*Salix lasiolepis*) thicket, birch-leaf mountain mahogany (*Cercocarpus betuloides*) chaparral, greenbark ceanothus (*Ceanothus spinosus*) chaparral, bush mallow (*Malacothamnus fasciculatus* ssp. *fasciculatus*) scrub, holly-leaved cherry (*Prunus ilicifolia* ssp. *ilicifolia*) chaparral, and to a lesser extent, California sagebrush (*Artemisia californica*) scrub, California bulrush (*Bolboschoenus maritimus*) marsh, and black sage (*Salvia mellifera*) scrub. Additional vegetation types are known to exist throughout SSFL, and many of the mapped areas exhibited intergrade conditions of more than one vegetation type (likely resulting, in many cases, from past disturbances followed by varying rates of recovery).

Evidence of recovery is present following the 2005 Topanga Fire, which affected nearly all of SSFL, with trees and shrubs exhibiting regeneration from individual stumps and shrubby vegetation recolonizing in dense thickets. However, droughty conditions in the last two years (2012 and 2013) have resulted in substantial senescence by perennial vegetation, as noted by substantial dieoff, low amounts of new vegetation and a very short blooming season in 2013.

In addition to native species comprising the vegetation types described above, stands of non-native annual brome (*Bromus* sp.) grassland and other undifferentiated exotic vegetation compose a substantial portion (nearly 28 acres or 15 percent) of the Project Study Area. Non-native species included summer mustard (*Hirschfeldia incana*), Italian thistle (*Carduus pycnocephalus*), tree tobacco (*Nicotiana glauca*), tocalote (*Centaurea melatensis*), redstem filaree (*Erodium cicutarium*), yellow sweet clover (*Melilotus officinalis*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), slender wild oats (*Avena barbata*), smilo grass (*Stipa miliacea* var. *miliacea*) and other annual grasses.

At least seven (7) acres (4 percent) of the Project Study Area is composed of bare to partially vegetated sandstone outcrops. Vegetation growing on the outcrops includes many of

the scrub or chaparral vegetation types listed above, individual oak trees, dipslope patches of mostly grasses and mosses (referred to by the California Native Plant Society as “moss gardens”), and of particular importance, individual Santa Susana tarplant (*Deinandra minthornii*), dudleya (*Dudleya* sp.), and other plant species that carry special-status designations. However, assessment of these areas is included mainly as a function of the 25-foot potential disturbance buffer around each Project Site location, and for the most part, may not actually be in harm’s way upon project implementation.

A total of 259 vascular plant species have been observed by Padre Biologists within the SSFL, including 198 native species; a vast majority of which (but not all) have been observed within the Project Study Area (see Appendix C). This list is likely not an exhaustive flora of all the species present within the Project Study Area as additional species may be expected to occur. Certain species of particular importance observed in other areas of SSFL (e.g., Braunton’s milk-vetch [*Astragalus brauntonii*]) have not been observed within the Project Study Area. Potential and known occurrences of special-status plant species are discussed further in Section 6 below.

Area calculations of plant communities and other landcover types located within the Project Study Area are provided in Table 2 below, and correspond with maps provided in Appendix A:

Table 2. Plant Community and Other Landcover Totals

Code	Description	Rarity Ranking	Acreage	Comments
DEV	Developed Areas	N/A	32.66	Includes paved and unpaved roads, former or existing building footprints, tarped areas, other concrete structures, etc.
DWS	Deerweed Scrub	G5S5	25.95	Includes natural areas, in addition to interim restoration areas located within the Project Study Area where hydroseeded areas are currently exhibiting high success of deerweed. California bush sunflower (<i>Encelia californica</i>) is commonly a co-dominant species in these hydroseeded areas.
YSS	Yerba Santa Scrub	G4S4*	25.50	*Species within Project Study Area is <i>E. crassifolium</i> var. <i>nigrescens</i> (Yerba Santa), not var. <i>crassifolium</i> (Thick-leaved Yerba Santa). Provisional alliance ranking of G3S3 for Thick-Leaved Yerba Santa is therefore not likely appropriate.
ABG	Annual Brome Grassland	Unranked	20.60	Codominants commonly include wildoats (<i>Avena</i> sp.).
CBC	Chamise-Black Sage Chaparral	G5S5	13.13	Common south-facing slope vegetation type at SSFL.
CLOU	Coast Live Oak Woodland (Upland)	G5S4	9.30	May include individual trees.
LSS	Laurel Sumac Scrub	G4S4	9.24	Frequently intergrades with other chaparral and scrub types.
CLOR	Coast Live Oak Woodland (Riparian)	G4S4	8.89	Includes vegetation otherwise known as Coast Live Oak Riparian Forest where sufficient cover is present to categorize it as forest. May include individual trees.

Table 2. Continued

Code	Description	Rarity Ranking	Acreage	Comments
SAST	Sandstone Vegetation	Varies	7.43	Bare to partially vegetated in cracks or crevices of rock outcrops, or on soil-covered mats of annual grass and moss gardens.
UEV	Undifferentiated Exotic Vegetation	N/A	6.84	Ruderal vegetation composed mainly of non-native summer mustard, tocalote, redstem filaree, yellow sweet clover and slender wild oats.
CBS	Coyote Brush Scrub	G5S5	4.89	Substantial portions of this type are in restored areas from replanting activities as part of interim erosion control BMPs.
MFT	Mulefat Thicket	G5S4	4.07	Substantial portions of this type are in restored areas from replanting activities as part of interim erosion control BMPs.
AWT	Arroyo Willow Thicket	G4S4	2.63	Found mainly in riparian corridors.
BMC	Birch-leaf Mountain Mahogany Chaparral	G5S4	2.41	Found mainly on north-facing slopes or mesic sites.
GCC	Greenbark Ceanothus Chaparral	G4S4	2.21	Found mainly on north-facing slopes or mesic sites.
BMS	Bush Mallow Scrub	G4S4	1.73	Found mainly on north-facing slopes or mesic sites.
HLC	Holly-leaf Cherry Chaparral	G3S3	1.04	Found mainly on north-facing slopes or mesic sites.
BARE/O W	Bare ground or open water	N/A	0.78	Open water was absent during Fall 2013 surveys.
CBM	California Bulrush Marsh	G5S4?	0.70	Limited to margins of Silvernale Pond.
CSS	California Sagebrush Scrub	G5S5	0.32	Small, recolonized patches of marginal quality.
BSS	Black Sage Scrub	G4S4	0.13	Commonly observed in other areas throughout SSFL.
EUC	Eucalyptus Windrows or Semi-Natural Stands	Unranked	0.06	Blue gum (<i>Eucalyptus globulus</i>) composes the dominant species for this vegetation type.
Total:			180.51	

5.2 WILDLIFE

The following section provides information on habitat suitability for wildlife and a compilation of wildlife species observations within the Project Study Area. Additional information on special-status species listed below and other special-status species that may be expected to occur at or near the Project Site are discussed further in Section 6. A complete list of wildlife species observed by Padre Biologists at SSFL is provided in Appendix D.

5.2.1 Habitat

Approximately 1,200 acres within SSFL are currently undeveloped, in addition to almost the entire 625-acre Sage Ranch Park, located immediately to the north, and approximately 2,000-acre open space area immediately south of the developed portion of SSFL. Many of the individual remediation areas comprising the Project Site are located within previously developed areas that have been actively or passively restored and revegetated subsequent to initial decommissioning activities. Much of the Project Site is located at the edges of, or is completely surrounded by mostly undisturbed areas supporting various wildlife habitat types.

Fish. Habitat for fish, including perennial surface flows or remnant pools, is absent from the Project Site, with exception to Silvernale Pond, which is typically wet in most years, and is known to support non-native mosquitofish (*Gambusia affinis*) according to surveys in previous years. However, Silvernale Pond was dry during the fall 2013 surveys, and no fish were observed. The nearest creek drainage that is known to support fish is likely Arroyo Simi (located approximately 3 miles downstream of Outfall 009), and is known to support arroyo chub (*Gila orcutti*), mosquitofish, brown bullhead (*Ameiurus nebulosus*), green sunfish (*Lepomis cyanellus*), and blunt-nosed minnow (*Pimephales notatus*).

Amphibians. Habitat quality for amphibians is considered moderate in areas where seasonal surface pools or flows are present during the winter months, along with adjacent upland dispersal areas, especially beneath woodland canopies. Breeding populations of amphibians including Baja California tree frog (*Pseudacris hypochondriaca hypochondriaca*), California tree frog (*Pseudacris cadaverina*) and western toad (*Bufo boreas*) have been frequently observed at winter or spring pools within the Northern Drainage, Perimeter Pond, R-1 Pond, Silvernale Pond, and the former CTL-III Catch Basin. Black-bellied salamander (*Batrachoseps nigriventris*) has also been observed at SSFL (however, not within the Project Site to date) beneath the canopy of coast live oak woodland.

Nearby (but offsite) observations of coast range newt (*Taricha torosa torosa*, a California species of special concern) have occurred in at least four (4) pools in the boulder-cascade portion of the Northern Drainage on the Brandeis Bardin Institute property (located approximately 1,500 feet downstream of Outfall 009), but is unlikely to occur onsite due to a lack of suitable habitat.

Western spadefoot (*Spea hammondi*, a California species of special concern) was recently discovered within the SSFL, breeding in a former detention basin at CTL-III. Moderately suitable dispersal habitat is present in the vicinity of CTL-III and several seasonal ponds or swales at CTL-III may provide suitable breeding habitat in wetter years with sufficient ponding duration. Western spadefoot may have a low to moderate potential to occur elsewhere throughout SSFL, but opportunistic herpetological surveys at various wetland and upland locations have yielded no other observations to date.

Reptiles. Habitat quality for reptiles is considered moderate to high due to the variety of scrub, chaparral, grassland and riparian vegetation types, a thick duff layer beneath oak trees (where present), rock outcrops and crevices, and the relatively undisturbed or recolonized condition of areas immediately adjacent to the developed portions of the Project Site. Reptiles commonly observed at SSFL include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), coastal western whiptail (*Aspidoscleis tigris stegnegeri*, a CDFG special animal), striped racer (or chaparral whipsnake [Stebbins, 2003], *Masticophis lateralis lateralis*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Other species occasionally observed at SSFL include racer (*Coluber constrictor*), coast horned lizard (*Phrynosoma coronatum* ssp. *frontale*, a California species of special concern), common king snake (*Lampropeltis getula*), gopher snake (*Pituophis catenifer*), ringneck snake (*Diadophis punctatus*), and common garter snake (*Thamnophis sirtalis*). Silvery legless lizard (*Anniella pulchra*, a California species of special concern) has also been observed on several occasions

to date and may have a moderate to high potential to occur in areas supporting oak woodlands (i.e., moist soils beneath oak tree duff). Two-striped garter snake (*Thamnophis hammondi*, a California species of special concern) has been observed on several occasions during the spring months where surface waters were temporarily present.

Birds. Habitat quality for birds is considered moderate to high due to the presence of native chaparral or other scrub-dominated hillsides, riparian and upland woodlands, and scattered grasslands. As indicated in Appendix D, 91 bird species have been observed during the field surveys and past surveys at SSFL or Sage Ranch Park. However, this is likely not an exhaustive list of every bird species that may be expected to occur during some portion of the year at SSFL. To date, the parasitic brown-headed cowbird (*Molothrus ater*) has not been observed at SSFL.

The U.S. Fish and Wildlife Service (USFWS) administer the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code [USC] 703-711). The purpose of the MBTA is the “establishment of a federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention for the protection of migratory birds, or any part, nest or egg of any such bird” (16 USC 703). Implementing regulations at 50 Code of Federal Regulations (CFR) 10 lists the migratory birds covered under the MBTA.

Eighty-eight (88) of the 91 bird species listed in Appendix D are protected by the MBTA when nesting (regardless of any special-status species protection), with exception to European starling (*Sturnus vulgaris*), orange bishop (*Euplectes franciscanus*) and rock pigeon (*Columba livia*). In addition, all special-status bird species (discussed in Section 6 below) are also protected by the MBTA when nesting. Additional bird species protected by the MBTA when nesting may also be expected to occur at the Project Study Area. CDFG Code (Sections 3503 and 3503.5) provides similar protection for most nesting birds, and defers to the MBTA list of protected birds. In addition, golden eagle (*Aquila chrysaetos*), is protected under the Bald Eagle and Golden Eagle Protection Act of 1940 (as amended 1990) and is known to nest in the vicinity of the Northern Undeveloped Land. Red-tailed hawk is known to regularly nest in at least one location near CTL-III in Area I, with numerous other potentially suitable nesting and perching sites present throughout the Project Study Area, especially on nearby rock outcrops.

Mammals. Habitat quality for mammals is considered moderate to high due the presence of native woodland and chaparral-dominated plant communities, and significant expanses of adjacent open space areas (see Section 5.2.2 Wildlife Corridors below). Mammals commonly observed during the field surveys and past surveys at SSFL included Audubon’s cottontail (*Sylvilagus audubonii*), brush rabbit (*Sylvilagus bachmani*), black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), woodrat (*Neotoma* sp.), gray fox (*Urocyon cinereoargenteus*), California ground squirrel (*Spermophilus beecheyi*), western gray squirrel (*Sciurus griseus*), California vole (*Microtus californicus*), deer mouse (*Peromyscus*

maniculatus), and introduced eastern fox squirrel (*Sciurus niger*). In addition, the following wildlife sightings were reported by Padre Biologists, or on-site personnel:

- A cougar (*Puma concolor*) sighting in NASA/Area II on April 5, 2010;
- Cougar tracks observed near monitoring well PZ-003 (Boeing Area 1) on May 26, 2010;
- Several bobcat (*Lynx rufus*) and cougar sightings were reported by work crew personnel in 2008 and 2009 at various locations throughout SSFL and Sage Ranch Park; and,

Suitable habitat for a variety of bat species is present at SSFL, especially in rock outcrop areas near CTL-V and Canyon. Numerous caves in cliff faces show evidence of bat occupancy, and unidentified bat species sightings have been recorded in Happy Valley, near Canyon.

Invertebrates. Habitat quality for invertebrates is considered variable depending on the species. A variety of species in the phylum Arthropoda (including, but not limited to bugs, beetles, flies, moths, butterflies, bees, wasps, bristletails, spiders, ticks, centipedes, and water fleas) have been observed, but not necessarily identified to species at SSFL. Of note was the observation of versatile fairy shrimp (*Branchinecta lindahli*) in several seasonal sandstone pools located in Areas I and IV. A mid-season survey of each pool was conducted by Sarah Powell, Padre Project Biologist, on March 19, 2010 upon receiving authorization from USFWS to collect and identify fairy shrimp. Data including GPS location, pool size, depth, water temperature, pH, and electrical conductivity were collected at each pool location. Each pool was photographed to depict pool conditions at the time of sampling. Voucher specimens were fixed with preservative and taken back to the laboratory for observation under a microscope and identification to species. All specimens collected during these surveys were determined to be the versatile fairy shrimp, which is not a special-status species. The report documenting these survey findings anticipated that many more of these pool complexes are present in sandstone rock outcrop areas throughout SSFL.

Additionally, there may be other types of vernal pools present within the SSFL (Padre, 2010b), but a comprehensive focused survey for vernal pools has not been conducted to date. Several earthen swales or depressional areas are present within the Project Study Area including within Canyon, Bowl, and CTL-III, but they may not be expected to hold water for sufficient duration to support vernal pool species. All four ponds (R-1, Perimeter, Silvernale and the Biofilter Sedimentation Basin) are periodically filled and emptied depending on ongoing groundwater remediation or surface water BMP activities. When left to natural conditions, the moisture regime of these ponds in most years is likely of insufficient duration to be considered vernal pool habitat.

A three (3) year study was also completed in 2013 by the non-profit organization, the Pollinator Partnership, assisted by Padre Biologists to assess the success of large-scale restoration projects using native seedmixes designed for pollinators. The goal of the Study was to develop outreach programs and Best Management Practices in the promotion of improving or restoring pollinator habitat. The Study measured the occurrence of insect pollinators and their use of new habitat (colonization) in restored areas compared to unrestored or otherwise natural landscapes at SSFL. The Study also included a rare plant reproduction study focused

on Santa Susana tarplant and Braunton's milk-vetch. Results will be published in a peer-reviewed scientific journal, but preliminary data analysis indicates that there was a 40 percent increase in bee types at the restored (pollinator seeded) areas compared to the unrestored landscape, and a 7 percent (smaller, but still significant) increase in bee abundance in the restored areas. The Study also found a 10 percent increase in Santa Susana tarplant seed viability in plants nearer to restored sites, driven by a 50 percent increase in bee visitation to these plants. Finally, the Study found through the use of exclusionary netting on individual stalks that Santa Susana tarplant is nearly 100 percent pollinator dependent in the production of viable seeds. Both plant species are considered generalist host plants, providing foraging habitat for numerous bee genera. Voucher specimens were also collected and sent to the University of Arizona Center for Insect Science to identify each specimen to the genus or species level and compile a representative list of pollinator species that occur at SSFL. Bee genera recorded in the Study included the following: Mellittidae (*Hesperapis*), Colletidae (*Hylaeus*), Andrenidae (*Andrena*), Megachilidae (*Anthidium*, *Hoplitis*, *Megachile*, and *Osmia*), Halictidae (*Dialictus*, *Agapostemon*, *Dieunomia*, *Dufourea*, *Halictus ligatus*, and *Lasioglossum*), and Apidae (*Anthophora hirtagalea* [rare and uncommon], *Apis mellifera*, *Bombus*, *Centris*, *Ceratina*, *Diadasia*, *Ericrocis*, *Habropoda*, *Melissodes*, *Tetraloniella*, *Triepeolus*, and *Xylocopa*).

5.2.2 Wildlife Corridors

Wildlife migration corridors are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Migration corridors may be local, such as between foraging and nesting or denning areas, or they may be regional in nature. Migration corridors are not unidirectional access routes; however, reference is usually made to source and receiver areas in discussions of wildlife movement networks. "Habitat linkages" are migration corridors that contain contiguous strips of native vegetation between source and receiver areas. Habitat linkages provide cover and forage sufficient for temporary inhabitation by a variety of ground-dwelling animal species. Wildlife migration corridors are essential to the regional ecology of an area as they provide avenues of genetic exchange and allow animals to access alternative territories as fluctuating dispersal pressures dictate.

Native habitat areas within or in close proximity to the Project Study Area may play an important role as a wildlife migration corridor, connecting habitat areas throughout the Simi Hills. These habitat areas may be especially critical where human activities would otherwise prohibit or impair the movement of species between habitat areas. Of notable importance was the frequent observation of wildlife tracks on unpaved access roads throughout SSFL and at Sage Ranch Park. In addition, according to the South Coast Wildlands Missing Linkages Project (2008)¹, the Santa Monica-Sierra Madre Landscape Linkage connects the Santa Monica Mountains to the south along the ocean and the Sierra Madre Ranges of the Los Padres National Forest to the north, and includes the Simi Hills. The Project Study Area is located within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage. Developed portions of SSFL exhibit some barriers to wildlife movement such as fencing or other structures,

¹ The South Coast Wildlands Missing Linkages Project is a collaborative inter-agency effort to identify and conserve the highest priority linkages in the South Coast Ecoregion, from Santa Barbara County to Baja California.

and large, exposed asphalt areas absent of suitable cover. Therefore, wildlife movement is likely focused mainly in undeveloped portions of SSFL or adjacent properties.

5.3 LEVEL OF DISTURBANCE

The level of disturbance at the Project Study Area varies from low to high based on historical and current disturbances of the SSFL property, which includes former aerospace development activities, large expanses of pavement or buildings throughout Areas I and III, and water quality monitoring stations and groundwater well installations. Portions of the Project Study Area is completely paved over or otherwise disturbed, while others support mostly undisturbed or recolonized native vegetation exhibiting a moderate to high level of disturbance. Adjacent areas are typically relatively undisturbed, supporting intact native plant communities and wildlife habitats.

6.0 IMPORTANT BIOLOGICAL RESOURCES

No plant or animal species listed as threatened or endangered were observed, and no critical habitats for any threatened or endangered species are located within the Project Study Area. Special-status plants of lesser designations observed within the Project Study Area included Santa Susana tarplant (*Deinandra minthornii*, a state rare plant and California Native Plant Society [CNPS] list 1B.2 species), Plummer's mariposa lily (*Calochortus plummerae*, a CNPS list 4.2 species), ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*, a CNPS list 4.2 species), coast live oak (*Quercus agrifolia*) and scrub oak (*Quercus berberidifolia*), two species covered under the Ventura County Oak Tree Protection Ordinance.

Special-status wildlife species observed during field surveys throughout SSFL that are known or have the potential to occur within the Project Study Area included Cooper's hawk (*Accipiter cooperi*, a CDFW Watch List species), southern California rufous-crowned sparrow (*Aimophila ruficeps* ssp. *canescens*, a CDFW Watch List species), white-tailed kite (*Elanus caerulus*, a CDFW fully protected species), golden eagle (*Aquila chrysaetos*, a CDFW fully protected species), yellow warbler (*Dendroica petechia* ssp. *brewsteri*, a CDFW species of special concern where nesting), coast horned lizard (*Phrynosoma blainvillii*, a CDFW species of special concern), silvery legless lizard (*Anniella pulchra* ssp. *pulchra*, a CDFW species of special concern), coastal western whiptail (*Aspidoscleis tigris* ssp. *stejnegeri*, a CDFW special animal), two-striped garter snake (*Thamnophis hammondi*, a CDFW species of special concern), coast patch-nosed snake (*Salvadora hexalepis virgultea*, a CDFW species of special concern), and San Bernardino ring-neck snake (*Diadophis punctatus* ssp. *modustus*, a U.S. Forest Service sensitive species). Special-status plant and wildlife sighting locations at SSFL are presented in Appendix B. Habitats for additional special-status plants and wildlife species are present within the Project Study Area, and are described below.

6.1 SPECIAL-STATUS PLANT SPECIES

Special-status plant species are either listed as endangered or threatened under the Federal or California Endangered Special Acts, or rare under the California Native Plant Protection Act, or considered to be rare or of scientific interest (but not formally listed) by Ventura County, resource agencies, professional organizations (e.g., Audubon Society, CNPS,

The Wildlife Society), and the scientific community. Species listed as threatened or endangered under the Federal or California Endangered Species Acts may require permits for take of one or more of these species, in addition to consideration under CEQA. All other (non-listed) special-status species are also given consideration under CEQA.

For the purposes of this project, special-status plant species are defined in Table 3. The literature search and field surveys conducted for this impact analysis indicates that 26 special-status plant species have the potential to occur in the project region. Table 4 lists these species, their current status, and the nearest known location relative to the Project Study Area.

Table 3. Definitions of Special-Status Plant Species

Special-Status Plant Species
➤ Plants listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species). ➤ Plants that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register, November 9, 2009). ➤ Plants that meet the definitions of rare or endangered species under the CEQA (<i>State CEQA Guidelines</i>, Section 15380). ➤ Plants considered by the CNPS to be "rare, threatened, or endangered" in California (Lists 1B and 2 in CNPS, 2001). ➤ Plants listed by CNPS as plants about which we need more information and plants of limited distribution (Lists 3 and 4 in CNPS, 2001). ➤ Plants listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 California Code of Regulations [CCR] 670.5). ➤ Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.). ➤ Plants considered sensitive by other Federal agencies (i.e., U.S. Forest Service, Bureau of Land Management), state and local agencies or jurisdictions. ➤ Plants on the Special Vascular Plants, Bryophytes, and Lichens List (California Department of Fish and Wildlife, Natural Diversity Database, October 2013 Quarterly publication). ➤ Trees protected under Ventura County Ordinance no. 4092 (Zoning Ordinance Section 8107-25).

Table 4. Special Status Plant Species of the Project Region

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Slender-horned Spineflower	<i>Dodecahema leptoceras</i>	Chaparral, coastal scrub, flood deposited terraces	FE, SE, List 1B.2	Ahmanson Ranch, 4.5 miles to the south
San Fernando Valley spineflower	<i>Chorizanthe parryi</i> var. <i>fernandina</i>	Coastal scrub	FC, SE, List 1B.1	Ahmanson Ranch, 4.5 miles to the south
Spreading navarretia	<i>Navarretia fossalis</i>	Vernal pools	FT, List 1B.1	Ventura County, unspecified
Round-leaved filaree	<i>Erodium</i> (= <i>California</i>) <i>macrophyllum</i>	Valley and foothill grassland	List 1B.1	Vicinity of Reagan Library, 9 miles to the west
Santa Susana tarplant	<i>Deinandra minthornii</i>	Chaparral, coastal scrub	SR, List 1B.2	Onsite at numerous locations.
Southern California black walnut	<i>Juglans californica</i> var. <i>californica</i>	Riparian corridors, mesic hillsides	List 4.2	Various locations throughout SSFL
Lyon's pentachaeta	<i>Pentachaeta lyonii</i>	Chaparral, valley and foothill grassland	SE, FE, List 1B.1	North of Wood Ranch Reservoir, 7 miles to the west

Table 4. Continued

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Coast live oak	<i>Quercus agrifolia</i>	Riparian corridors, mesic hillsides	TPO	Onsite at numerous locations.
Scrub oak	<i>Quercus berberidifolia</i>	Riparian corridors, mesic hillsides	TPO	Onsite at limited locations.
Chaparral nolina	<i>Nolina cismontane</i>	Chaparral, coastal scrub	List 1B.2	Palo Comado Canyon, 4 miles to the southwest
Dune larkspur	<i>Delphinium parryi</i> ssp. <i>blochmaniae</i>	Chaparral, coastal dunes	List 1B.2	Lake Eleanor, 11 miles to the southwest
Conejo buckwheat	<i>Eriogonum crocatum</i>	Chaparral, coastal scrub, valley and foothill grassland	List 1B.2	Lake Eleanor, 11 miles to the southwest
Conejo dudleya	<i>Dudleya parva</i>	Coastal scrub, valley and foothill grassland in clayey or volcanic soils and rocky hillsides	FT, List 1B.2	Norwegian Grade, 10 miles to the west
Many-stemmed dudleya	<i>Dudleya multicaulis</i>	Chaparral, coastal scrub, valley and foothill grassland	List 1B.2	Chatsworth Reservoir, 2 miles to the east
Santa Monica Mountains dudleya (inclusive of Agoura Hills dudleya)	<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i> (inclusive of <i>Dudleya cymosa</i> ssp. <i>agourensis</i>)	Chaparral	FT, List 1B.2	Cornell Corners, 7 miles to the southwest
Marcescent dudleya	<i>Dudleya cymosa</i> ssp. <i>marcescens</i>	Chaparral	FT, SR, List 1B.2	Cornell Road, 8.5 miles to the southwest
Blochman's dudleya	<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	Coastal scrub, coastal bluff scrub, and valley and foothill grassland	List 1B.2	Near Chatsworth Reservoir, 1.5 miles to the east
Braunton's milkvetch	<i>Astragalus brauntonii</i>	Closed cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland, carbonate soils	FE, List 1B.1	Southern portion of SSFL Area IV, 0.2 miles to the west
Ocellated Humboldt lily	<i>Lilium humboldtii</i> ssp. <i>ocellatum</i>	Oak canyons	List 4.2	Tributaries to Northern Drainage, and Bell Canyon, 0.1 miles or less (Padre obs. 2009 et seq.).
Slender mariposa lily	<i>Calochortus clavatus</i> var. <i>gracilis</i>	Chaparral, coastal scrub	List 1B.2	Santa Monica Mountains, south of Woolsey Canyon Road, approximately 0.5 miles to the east
Catalina mariposa lily	<i>Calochortus catalinae</i>	Chaparral	List 4.2	Long Canyon, 5.9 miles to the west (Padre obs., 2010)
Plummer's mariposa lily	<i>Calochortus plummerae</i>	Chaparral	List 4.2	Onsite at numerous locations.
Crowned forget-me-not	<i>Cryptantha corollata</i>	Oak woodland, foothill woodland, valley grassland	LC	Santa Susana Mountains (exact distance unspecified)
Tiny poppy	<i>Meconella denticulata</i>	Chaparral, coastal sage scrub, shaded canyons	LC	Ventura County, unspecified
Trask yerba santa	<i>Eriodictyon traskiae</i>	Chaparral	LC	Ventura County, unspecified
California Orcutt grass	<i>Orcuttia californica</i>	Vernal pools	SE, FE, List 1B.1	Thousand Oaks, 8 miles to the southwest
Malibu baccharis	<i>Baccharis malibuensis</i>	Chaparral, coastal scrub	List 1B.1	Southern portion of SSFL Area IV, 0.2 miles to the west

Status Codes: FC Federal Candidate (USFWS) FE Federal Endangered SE State Endangered
FT Federal Threatened LC Species of Local Concern (Ventura Co.) SR State Rare
List 1B Plants considered rare or endangered in California and elsewhere (CNPS, 2001)
List 2 Plants considered rare or endangered in California, more common elsewhere (CNPS, 2001)
List 3 Plants for which more information is needed, review list (CNPS, 2001)
List 4 Limited distribution, watch list (CNPS, 2001)
TPO Ventura County Tree Protection Ordinance

6.1.1 Braunton's Milkvetch

Braunton's milkvetch (*Astragalus brauntonii*) is a federally endangered species known to occur in limited distribution at SSFL, and particularly where carbonate soils (a Primary Constituent Element, or PCE for this species) and low competitive cover are present. As indicated in Section 3, numerous biological surveys and monitoring have been conducted for various activities at SSFL and Sage Ranch Park. These surveys have resulted in no observations of Braunton's milkvetch within the Project Study Area. Based on the unlikelihood of occurrence carbonate soils within the Project Study Area, Braunton's milk-vetch has a low likelihood to occur at the Project Site.

The nearest known population of this species at SSFL is in USFWS-designated Critical Habitat Unit 1d in the southern portion of Area IV, approximately 0.2 miles to the west of the nearest Project Site location at the former STL-IV facility in Area III, and 0.2 miles to the north of the proposed westernmost Soil Borrow Area in the Southern Undeveloped Land. A small portion of Critical Habitat Unit 2f is also located at the southeast corner of the Southern Undeveloped Land, approximately 1,200 feet south of one (1) isolated Project Site location within Dayton Canyon.

An initial estimate of the population within or just outside Unit 1d in 2009 was approximately 18,500 individuals, with a majority of the plants being in the species' largest class size (>70 cm), or fully mature (HydroGeoLogic, Inc. & Envicom Corporation, 2009). Subsequent to USFWS-approved vegetation clearing activities within Area IV associated with a U.S. EPA Radiological Study in 2010, an additional stand of Braunton's milk-vetch plants in the 1,000s was discovered to the west, bringing the possible total population at this general location to 30,000 individuals or more. As of summer 2013, substantial dieoff of Braunton's milk-vetch was noted by Padre and Pollinator Partnership Biologists during the monthly aforementioned pollinator surveys, with the remaining plants being fully mature, commonly senescent, and likely totaling less than 2,000 live individuals. Nonetheless, the entire aerial extent of known Braunton's milk-vetch occurrences at this location can be assumed to support a substantial seed bank that would likely be regenerated subsequent to the next major disturbance.

6.1.2 Santa Susana Tarplant

Santa Susana tarplant (*Deinandra minthornii*) is categorized as a State rare species by CDFW that commonly occurs throughout SSFL and Sage Ranch Park, especially in areas of low competition. It has been observed mainly in rock outcrop areas or disturbed areas (e.g., abandoned parking lots). Padre conducted a Santa Susana tarplant study in 2008 throughout Area I and the eastern portion of the Southern Undeveloped Land (with follow-up surveys through 2010, as presented on Figures in Appendices A and B). The survey estimated that 4,635 to 8,000 individuals were located throughout Area I and approximately 110 acres of the Southern Undeveloped Land, and an additional 4,000 individuals were likely present throughout the remainder of SSFL (Padre, 2010). This total estimate of approximately 12,000 individuals SSFL-wide is roughly consistent with data compiled by others in NASA Area I, Area II, and Area IV. NASA (2010) estimates that NASA Area I supports 324 locations of individual plants or clumps of plants, and Area II supports 3,333 locations of individual plants or clumps of plants. HydroGeoLogic/Envicom (2009) estimates that Area IV and the Northern Undeveloped Lands

support roughly 850 individuals. Estimates for Area III have not been completed to date, but based on the relatively small size of Area III, and predominance of vegetation types unsuitable for Santa Susana tarplant (e.g., oak savannah), less than approximately 500 individuals are likely to be present within Area III.

More recent observations in 2013 of Santa Susana tarplant throughout SSFL indicate that the population is stable, if not increasing. For example, many formerly developed areas that have undergone removal of facility appurtenances and subsequent restoration in recent years, have proliferated with Santa Susana tarplant where at least a few mature individuals were already locally present and were protected in place, providing a seed source for the species to colonize bare areas.

Santa Susana tarplant is present in variable densities within or immediately adjacent to several of the Project Site locations. Some notable Project Site locations with approximations of a total of 1,865 Santa Susana tarplants potentially in harm's way include:

- B-1 (200 individuals)
- Former Shooting Range (75 individuals)
- APTF (300 individuals)
- Canyon (1,200 individuals)

This includes a CDFW-approved tarplant mitigation site exhibiting high success from seeding several areas by hand, and by natural recolonization of asphalt-removed areas. As of September 2013, a total of 1,061 individuals were tallied in formerly disturbed and subsequently restored areas within Canyon (Padre, 2013). Additional individual Santa Susana tarplants are also present within Canyon; some of which may be in harm's way upon project implementation.

- Bowl (50 individuals)
- Area I Burn Pit (20 individuals)
- CTL-V (20 individuals)

6.1.3 Ocellated Humboldt Lily

Ocellated Humboldt lily is a CNPS List 4.2 species that occurs in canyon bottoms. Dating back to 2009, observations of ocellated Humboldt lily at SSFL included several individuals in the Northern Drainage near the Outfall 009 flume, several individuals in an adjacent unnamed tributary to the south (approximately 200 feet upstream of Outfall 009), and approximately 100 individuals in the tributary to Bell Canyon, approximately 0.1 miles or less from the in situ Seep Treatment Area (Padre obs., 2009 and 2010).

6.1.4 Plummer's Mariposa Lily

Plummer's mariposa lily (*Calochortus plummerae*) is a CNPS List 4.2 (recently downgraded from 1B.2) species that typically occurs in chaparral. Past biological surveys at SSFL and Sage Ranch Park resulted in observations of Plummer's mariposa lily at multiple locations including at or near the B-1, former Shooting Range, and CTL-I Hilltop Project Site

locations. Plummer's mariposa lily has also been observed in other areas at SSFL, including at Delta area (Padre obs., 2007), and at the lower end of Happy Valley, approximately 1.6 miles to the southeast (observed by MWH in 2004). All observations of Plummer's mariposa lily were in low concentrations (individuals or groups of less than 10). Additional *Calochortus* species may be expected to occur within the Project Study Area, as indicated by CNDDDB records at SSFL including slender mariposa lily (*Calochortus clavatus* var. *gracilis*, a CNPS List 1B.2 species).

6.1.5 Oak Species

Coast live oak (*Quercus agrifolia*) commonly occurs, and scrub oak (*Quercus berberidifolia*) less commonly occurs throughout SSFL, mainly either as individual trees in and around bedrock outcrops or as woodlands or forests along creek drainages and north-facing slopes. As presented in Table 2 above and on the Vegetation Maps in Appendix A, 9.3 acres of Upland Coast Live Oak Woodland and 8.9 acres of Riparian Coast Live Oak Woodlands are present within the Project Study Area. These calculations include individual trees, as the minimum mapping unit of approximately 200 square feet (21 square meters) accommodates the delineation of individual trees of sufficient canopy size. Based on this mapping unit, no distinction is made between coast live oak and scrub oak, as scrub oak may be associated with a variety of woodland and chaparral vegetation types. According to CDFW, the Global and State Rarity Ranking (which measure the imperilment status of a vegetation type both on a global scale and within the geographic boundaries of the state of California) are G4S5 and G4S4, respectively. These designations state that the Upland Riparian Coast Live Oak Woodland community is globally "Apparently Secure (uncommon but not rare; some cause for long-term concern due to declines or other factors)" and state-wide "Demonstrably Secure (common; widespread and abundant)", and the Riparian community is globally "Apparently Secure" and state-wide "Apparently Secure".

Locally, the Ventura County Zoning Ordinance no. 8107-25 (Tree Protection Regulations) considers oak trees (including coast live oak and scrub oak) at least 9.5 inches (single trunk) or 6.25 inches (multi-trunk) in circumference (3 or 2 inches in diameter, respectively) as County protected trees. In addition, trees with a circumference of 90 inches (29 inches in diameter) or greater are considered to be "heritage" trees. Oak tree protection regulations extends not only to the removal of oak trees, but invasion (encroachment) of the tree's protected zone by activities including trenching, digging, or placement of heavy equipment, vehicles, or materials within the protected zone. The protected zone is defined as the surface and subsurface area within the dripline and extending a minimum of five (5) feet outside the dripline, or 15 feet from the trunk of the tree, whichever is greater. The County Tree Protection Ordinance also protects western sycamore (*Platanus racemosa*), which are present in limited distribution at SSFL, but are absent from the Project Study Area. The Ordinance protects additional tree species within Scenic Resource and Scenic Highway Overlay Zones, but the Project Study Area is outside these zones.

By brief tally of mapped oak woodlands and individual trees, encroachment, limb and root pruning, and possibly complete removal of approximately 195 coast live oak (possibly including a small fraction of scrub oak) trees of "protected" size may occur as a result of the project. A small fraction of these trees may also be considered "heritage" trees. A separate

Oak Tree Assessment may require preparation for submittal to the County of Ventura as part of a tree permit application packet for the subject project.

Valley oak (*Quercus lobata*) is historically known to occur in low concentrations at SSFL, with only one (1) known individual tree, located in the northern portion of Area IV. However, this tree was completely burned in the 2005 Topanga Fire and is currently a dead snag. A brief inspection of the area around this tree was conducted in summer 2013 to identify any valley oak seedlings, of which none were found. Therefore, no live valley oak trees are known to occur at SSFL, but could potentially be discovered upon more intensive survey.

6.1.6 Southern California Black Walnut

Southern California black walnut (*Juglans californica*), a CNPS List 4.2 species, occurs as individuals or composes the dominant tree species in small stands of California Walnut Woodland (Rarity Ranking of G2, S2.1, or “Imperiled because of rarity due to very restricted range, very few populations [often 20 or fewer], steep declines, or other factors making it very vulnerable to extirpation”) in scattered locations and throughout SSFL. Southern California black walnut is not known to occur within the Project Study Area, but could potentially be discovered within the Project Study Area upon more intensive survey.

6.1.7 Malibu Baccharis

Malibu baccharis (*Baccharis malibuensis*), a CNPS List 1B.1 species has been observed in abundant concentration in chaparral-covered hillsides in Area IV (e.g., cohabitating within portions of Braunton’s milk-vetch sighting locations). This species is not known to occur within the Project Study Area, but could potentially be discovered within the Project Study Area due to the abundance of chaparral and coastal scrub habitats.

6.1.8 Other Special-Status Plant Species

Special-status plants including state and federal listed species are known in the project region, but have not been observed during numerous botanical surveys. Slender-horned spineflower (*Dodecahema leptocerus*), San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), round-leaved filaree (*Erodium* [=California] *macrophyllum*), Lyon’s pentachaeta (*Pentachaeta lyonii*), chaparral nolina (*Nolina cismontane*), dune larkspur (*Delphinium parryi* ssp. *blochmaniae*), Conejo buckwheat (*Eriogonum crocatum*), crowned forget-me-not (*Cryptantha corollata*), tiny poppy (*Meconella denticulata*), Trask yerba santa (*Eriodictyon traskiae*), and Catalina mariposa lily (*Calochortus catalinae*) may all have the potential to occur in the Project Study Area.

Certain special-status dudleya species including many-stemmed dudleya (*Dudleya multicaulis*), Agoura Hills dudleya (*Dudleya cymosa* ssp. *agouensis*), Marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*), and Blochman’s dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*) may also have the potential to occur at SSFL, especially on sedimentary rock outcrops where the non-special-status lanced-leaved dudleya (*Dudleya lanceolata*) is commonly observed. Droughty conditions in recent years have likely reduced the likelihood for many of these species to proliferate and be observed; therefore, additional spring botanical surveys within the Project Study Area may be warranted.

Conejo dudleya (*Dudleya parva*), is unlikely to occur in the Project Study Area due to the absence of volcanic rock outcrops. Spreading navarretia (*Navarettia fossalis*) and California Orcutt grass (*Orcuttia californica*), both of which are known to occur mainly in vernal pools, are not expected to occur within the Project Study Area due to the absence of suitable vernal pool habitat.

6.2 SENSITIVE HABITATS OR LOCALLY IMPORTANT COMMUNITIES

The CDFG Vegetation Classification and Mapping Program (CDFG, 2010) provides a list of all California vegetation alliances, and ranks each alliance from 1 through 5 (Global and State). If an alliance is marked with a G1 through a G3 code, this means that all of the associations within it will also be considered of high inventory priority. If marked as G4 or G5, these alliances are generally considered common enough to not be of concern (i.e., this habitat is apparently secure); however, it does not mean that certain associations contained within them are not rare, particularly within the State (CDFG, 2010).

Table 2 above provides quantities of all vegetation alliances present within the Project Study Area, and are predominantly assigned G4S4 or G5S5 ranks. Holly-leaf cherry chaparral measures approximately 1.04 acres within the Project Study Area and is ranked as G3S3 (vulnerable). According to CDFG (2010), yerba santa scrub may tentatively be assigned a G3S3 rank, but only if it were included as the Thick Leaf Yerba Santa Provisional Alliance (a provisional alliance ranking applies to vegetation types that CDFW has only sampled 10 or fewer stands, but are expected to prove to be more widespread). The species present within Project Study Area was keyed out to be *Eriodictyon crassifolium* var. *nigrescens* (yerba santa), a common species that is widespread throughout the region, not *E. crassifolium* var. *crassifolium* (thick-leaved yerba santa). Therefore, a G4S4 ranking is likely more appropriate for the yerba santa scrub present onsite, and is not considered sensitive. No vegetation alliances within the Project Study Area are ranked G1 and G2, or S1 and S2 (critically imperiled or imperiled). All other vegetation types are unranked, and are not considered sensitive.

6.3 SPECIAL-STATUS WILDLIFE SPECIES

Special-status wildlife species are defined in Table 5. The potential for these species to occur in the project area was determined by completion of various biological surveys throughout SSFL, review of sight records from other environmental documents and range maps including Zeiner et al. (1988, 1990a, 1990b). Table 6 lists special-status wildlife species that have the potential to occur in the project region for at least a portion of their life cycle.

Table 5. Definitions of Special-Status Wildlife Species

Special-Status Wildlife Species	
➤	Animals listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.11 for listed animals and various notices in the Federal Register for proposed species).
➤	Animals protected by the Bald Eagle and Golden Eagle Protection Act (16 USC 668-688), prohibiting the taking or possession of bald and golden eagles, their eggs, or their nests without a permit from the USFWS.
➤	Animals that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register, November 9, 2009).
➤	Animals that meet the definitions of rare or endangered species under the CEQA (<i>State CEQA Guidelines</i> , Section 15380).
➤	Animals listed or proposed for listing by the State of California as threatened and endangered under the California Endangered Species Act (14 CCR 670.5).
➤	Animal species of special concern to the CDFW (Shuford and Gardali, 2008 for birds; Williams, 1986 for mammals; Moyle et al. 1989 for fish; and Jennings and Hayes; 1994 for amphibians and reptiles).
➤	Animal species that are fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).
➤	Animals listed on the CDFG Special Animals List (CDFG Biogeographic Data Branch, Natural Diversity Database, January 2011).

Table 6. Special-Status Wildlife Species of the Project Region

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Fish				
Arroyo chub	<i>Gila orcutti</i>	Slow water streams with mud or sand bottoms	CSC	Arroyo Simi, 10 miles to the northwest (NDDDB, 2013)
Amphibians				
California red-legged frog	<i>Rana draytonii</i>	Stream pools, vegetated ponds	FT, CSC	East Las Virgenes Creek (Ahmanson Ranch), 3 miles to the south (NDDDB, 2013)
Arroyo toad	<i>Anaxyrus californicus</i>	Semi-arid regions near intermittent streams	FE, CSC	Chatsworth Creek, 4 miles to the east (historical sighting, NDDDB, 2013)
Western spadefoot	<i>Spea hammondi</i>	Vernal pools	CSC	Onsite at CTL-III detention basin (Padre obs., 2010)
Coast range newt	<i>Taricha torosa torosa</i>	Riverine, riparian, riparian scrub, grassland, and coastal scrub (overwintering and dispersal)	CSC	Northern Drainage, 0.3 miles to the northwest (Padre obs., 2008)
Reptiles				
Silvery legless lizard	<i>Anniella pulchra</i> ssp. <i>pulchra</i>	Woodlands under leaf litter	CSC	Various locations at SSFL, including within 100 feet of CTL-I (Padre obs., 2008, 2009, 2010).
Pacific pond turtle	<i>Actinemys marmorata</i>	Stream pools, vegetated ponds	USFSS, CSC	Box Canyon, 1.3 miles to the northeast (NDDDB, 2013)

Table 6. Continued

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Two-striped garter snake	<i>Thamnophis hammondi</i>	Streams	CSC	Onsite at CTL-I, CTL-III, and Perimeter Pond (Padre obs., 2010-2012)
Coastal western whiptail	<i>Aspidoscleis tigris</i> ssp. <i>stejnegeri</i>	Scrubland, grassland, or woodlands	SA	Various locations onsite (Padre obs., 2005-2013)
Coast horned lizard	<i>Phrynosoma blainvillii</i>	Scrubland, grassland, or woodlands	CSC	Various locations onsite (Padre obs., 2008-2012)
San Bernardino ring-neck snake	<i>Diadophis punctatus</i> ssp. <i>modestus</i>	Woodlands, streambanks	USFSS	Onsite at Area II Landfill and Northern Drainage, and in Area IV (Padre obs. 2004, 2010)
Coast patch-nosed snake	<i>Salvadora hexalepis</i> ssp. <i>virgultea</i>	Grasslands, chaparral	CSC	Onsite at former Shooting Range and Southern Undeveloped Area (Padre obs. 2013)
Birds				
Least Bell's vireo	<i>Vireo belli</i> ssp. <i>pusillus</i>	Willow and other riparian habitats	FE, SE	Arroyo Simi, 9 miles to the northwest (NDDDB, 2013)
Southwestern willow flycatcher	<i>Empidonax trailii</i> <i>extimus</i>	Willow and other riparian habitats	FE, SE	Fillmore Fish Hatchery, 16 miles to the northwest (Greaves, 2003)
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Willow and other riparian habitats	FC, SE	Santa Clara River, 12 miles to the northwest (NDDDB, 2013)
White-tailed kite	<i>Elanus caeruleus</i>	Grasslands, meadows, farmlands	FP	Various locations throughout SSFL (Padre obs. 2009)
Cooper's hawk	<i>Accipiter cooperi</i>	Woodlands near riparian zones	WL (nesting)	Nesting at NASA Area II (AP/STP), 0.2 miles southeast of B204 in Area III (Padre obs. 2013)
Sharp-shinned hawk	<i>Accipiter striatus</i>	Woodlands near riparian zones	WL (nesting)	Rarely observed at various locations throughout SSFL (Padre obs. 2012)
Golden eagle	<i>Aquila chrysaetos</i>	Rolling foothill mountain areas	FP, WL (nesting & wintering), BEPA	Rarely observed in the SSFL Northern Undeveloped Land, 0.1 miles northwest of B204 in Area III (Padre obs. 2013)
Yellow warbler	<i>Dendroica petechia</i> ssp. <i>brewsteri</i>	Riparian woodlands	CSC (nesting)	Non-nesting individual observed in Northern Drainage, 400 feet northwest of Area I Landfill (Padre obs., 2010)
Yellow-breasted chat	<i>Icteria virens</i>	Riparian woodlands	CSC (nesting)	Ventura County (Padre obs., 2013)
Loggerhead shrike	<i>Lanius ludovicianus</i>	Woodlands, shrublands	CSC	Various locations throughout SSFL (Padre obs. 2008-2012)

Table 6. Continued

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Coastal California gnatcatcher	<i>Poliophtila californica</i> ssp. <i>californica</i>	Coastal sage scrub	FT, CSC	SSFL (unspecified location) (USFWS, 2010). North end of Las Virgenes Road, 5 miles to the south; Little Simi Valley, 6.5 miles to the northwest (NDDDB, 2013)
Tri-colored blackbird	<i>Agelaius tricolor</i>	Cattail and bulrush thickets, open water	CSC	Chatsworth Reservoir, 2 miles to the east (NDDDB, 2013)
Southern California rufous-crowned sparrow	<i>Aimophila ruficeps</i> ssp. <i>canescens</i>	Chaparral, coastal sage scrub	WL	Non-nesting individuals at various locations throughout SSFL (Padre obs., 2008-2013)
Bank swallow	<i>Riparia riparia</i>	Vertical streambanks	ST (nesting)	Simi Valley, 4 miles to the northwest (NDDDB, 2013)
Bell's sage sparrow	<i>Artemisiospiza belli</i>	Chaparral, coastal sage scrub	WL (nesting)	Tierra Rejada Road, 7 miles to the northwest (MWD, 1994)
Burrowing owl	<i>Athene cunicularia</i>	Open, dry annual or perennial grasslands, deserts or scrublands	CSC (burrow sites and some wintering sites)	Laskey Mesa, 3.8 miles to the south (NDDDB, 2013)
Mammals				
California mastiff bat	<i>Eumops perotis</i> ssp. <i>californicus</i>	Roosting: Crevices in cliff faces, caves, buildings, etc. Foraging: Woodlands, coastal scrub, grasslands, chaparral	CSC	China Flat, 2.3 miles to the west (NDDDB, 2013)
Western small-footed myotis	<i>Myotis ciliolabrum</i>	Roosting: Crevices in cliff faces, caves, buildings, etc. Foraging: Woodlands, water sources	WBWG	China Flat, 2.3 miles to the west (NDDDB, 2013)
Pallid bat	<i>Antrozous pallidus</i>	Roosting: Crevices in cliff faces, caves, buildings, etc. Foraging: Woodlands, coastal scrub, grasslands, chaparral	CSC	China Flat, 2.3 miles to the west (NDDDB, 2013)
California leaf-nosed bat	<i>Macrotus californicus</i>	Roosting: Crevices in cliff faces, caves, buildings, mines, etc. Foraging: Woodlands, coastal scrub, grasslands, chaparral	CSC, WBWG	Canoga Park, 1.9 miles to the south (NDDDB, 2013)
San Diego desert woodrat	<i>Neotoma lepida</i> ssp. <i>intermedia</i>	Chaparral and other habitats, building houses at base of tree or cliffs	CSC	Immediately adjacent to IEL, likely numerous other locations at SSFL (Padre, 2013)

Table 6. Continued

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
San Diego black-tailed jackrabbit	<i>Lepus californicus</i> ssp. <i>bennettii</i>	Chaparral or other early-stage forest habitats	CSC	Oak Park, 8 miles to the northwest (Scott & Wier, 1982)
American badger	<i>Taxidea taxus</i>	Open shrubby, forest or herbaceous habitats with friable soils	CSC	West Simi Valley, 6 miles to the west (Marsh, 1981)
Ringtail	<i>Bassariscus astutus</i>	Riparian and other shrubby habitats	FP	SSFL Area III 100 feet northwest of SPA (NASA, 2011)
Invertebrates				
Quino checkerspot	<i>Euphydryas editha quino</i>	Coastal sage scrub, chaparral, meadows	FE	Historically known to occur in the Santa Monica Mountains
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Vernal pools	FT	Ventura County (NDDDB, 2013)
Riverside fairy shrimp	<i>Streptocephalus woottoni</i>	Vernal pools	FE	Northwest of Tierra Rejada Road & Moorpark Road intersection, 6.5 miles to the northwest (NDDDB, 2013)

Status Codes:

ABC	American Bird Conservancy
AWL	Audubon Watch List
BEPA	Bald Eagle and Golden Eagle Protection Act (USFWS)
CSC	California Species of Special Concern (CDFW)
FP	Fully protected (Fish and Game Code)
WL	Watch List (CDFW)
FE	Federal Endangered (USFWS)
FT	Federal Threatened (USFWS)
FT-PD	Federal Threatened, proposed for de-listing (USFWS)
FC	Federal Endangered Species Act Candidate (USFWS)
SA	Special Animal (CDFW)
SE	State Endangered (CDFW)
ST	State Threatened (CDFW)
USBC	U.S. Bird Conservation Watch List
WBWG	Western Bat Watch Group List
USFSS	Sensitive (U.S. Forest Service)

6.3.1 Fish

Habitat for fish (permanent surface flow, pools and runs) is absent from the Project Study Area. Therefore, special-status fish species including arroyo chub (*Gila orcutti*) are not expected to occur at the Project Study Area.

6.3.2 Amphibians

Habitat quality for California red-legged frog (*Rana draytonii*, a federally threatened species and California species of special concern) is low from the Project Study Area due to the absence of relatively permanent surface waters or pools, but presence of marginal, isolated wetland areas and substantial upland dispersal habitats. Numerous aquatic herpetological surveys have opportunistically been conducted by Padre Biologists and others at SSFL resulting in no observations of California red-legged frog (including at least one nighttime survey, but not any protocol-level surveys). California red-legged frog has been observed in Las Virgenes Creek (NDDDB, 2013) in a separate watershed approximately 3 miles to the south,

which is the only known population in eastern Ventura County. According to the Revised Critical Habitat for the California Red-Legged Frog; Final Rule (50 CFR Part 17) (USFWS, 2010a), Upper Las Virgenes Canyon is included as Critical Habitat Unit VEN-3, which at its nearest point is approximately 0.2 miles to the west of the Project Study Area (in the eastern portion of the Southern Undeveloped Land). California red-legged frog is known to occupy upland habitats for a portion of their life cycle, and make substantial overland movements (mostly at night) over variable upland terrain rather than using riparian corridors for movement between habitats (USFWS, 2010b). USFWS (2010b) believes that it is possible that California red-legged frog could occur within Area IV based on nearby records, conditions onsite, and information contained in the revised critical habitat designation. Due to the adjacency of Area IV to the Project Study Area (i.e., project locations within Area III and the Southern Undeveloped Land), a similar determination may be made for the subject project, and California red-legged frog may have a low likelihood to occur at the Project Site.

Habitat quality for coast range newt (*Taricha torosa torosa*, a California species of special concern) is low from the Project Study Area due to the presence of geographic barriers, absence of permanent surface water or pools, but presence of marginal, isolated wetland areas providing ephemeral surface waters and substantial upland dispersal habitats. Coast range newt has been observed in pools within the Northern Drainage on the Brandeis-Bardin Institute property to the north (Padre, 2008).

Western spadefoot (*Spea hammondi*, a California species of special concern) was discovered breeding onsite in May 2010 in a former concrete detention basin at CTL-III. Approximately 200 metamorph and 100 tadpole spadefoots were observed in shallow, warm water, but it is not known if they lived long enough to mature and disperse from the basin. A variety of predators are known to occur at SSFL, including the observation of two-striped garter snake at this same location, and no western spadefoots have been observed subsequent to the 2010 sightings. The sighting location now consists of several earthen swales (constructed following the removal of the detention basin) that are yet to be determined whether they may provide suitable breeding habitat in wetter years. Sufficient dispersal habitat is also present adjacent to these swales. Therefore, western spadefoot may be expected to occur at the Project Site.

Arroyo toad (*Anaxyrus californicus*, a federally endangered species and California species of special concern) has historically been documented in Chatsworth Creek below Chatsworth Reservoir (NDDDB, 2013). However, suitable habitat for arroyo toad (large, widespread, intermittent streambeds with sandbars) is absent from SSFL and Sage Ranch Park, and geographic or manmade barriers exist between SSFL and Chatsworth Reservoir. Therefore, arroyo toad is not expected to occur at the Project Site.

6.3.3 Reptiles

Habitat quality for special-status reptiles is moderate to high at the Project Study Area, including scrub or woodland areas, rock outcrops, and pockets of vegetative litter (duff). Coastal western whiptail (*Aspidoscleis tigris* ssp. *stejnegeri*, a California special animal) have been frequently observed, and coast horned lizard (*Phrynosoma blainvillii*, a California species

of special concern) have been less frequently observed during past surveys at SSFL and Sage Ranch Park and may be expected to occur at the Project Site.

San Bernardino ring-neck snake (*Diadophis punctatus* ssp. *modestus*, a U.S. Forest Service sensitive species) has been observed on at least three occasions at SSFL, including at the Northern Drainage (Padre obs. 2010), Area II Landfill and in Area IV (Padre obs. 2004). Therefore, this species may be expected to occur at the Project Site.

Silvery legless lizard (*Anniella pulchra* ssp. *pulchra*) has been observed on several occasions in the Northern Drainage near southern tributary originating from the Area I Landfill area, at a northern tributary to the Northern Drainage on Sage Ranch Park, and in the Northern Drainage adjacent to the Outfall 009 flume, and in an upland oak woodland immediately south of CTL-I (Padre obs., 2008, 2009, and 2010). Therefore, silvery legless lizard may be expected to occur at the Project Site in areas of suitable habitat (typically moist soils beneath oak tree duff).

Coast patch-nosed snake (*Salvadora hexalepis* ssp. *virgultea*, a California species of special concern) was recently observed on two (2) occasions at SSFL, including near the former Shooting Range and in the Southern Undeveloped Land (Padre obs., 2013). Therefore, coast patch-nosed snake may be expected to occur at the Project Site in areas of suitable scrubland habitat.

No sight records for Pacific pond turtle (*Actinemys marmorata*, a California species of special concern) exist at SSFL, including from numerous surveys conducted by Padre Biologists at any of the aquatic habitats (streams, pools, and vegetated ponds) throughout SSFL in recent years. The nearest sight record is in Box Canyon, approximately 1.3 miles to the northeast (NDDb, 2013), with substantial geographic or manmade barriers existing between this location and SSFL. Although this species is known to migrate over upland areas to adjacent aquatic habitats, the lack of sight records onsite, difficult terrain surrounding the Project Site, and substantial distances from suitable habitats in the region, Pacific pond turtle is not expected to occur at the Project Site.

Two-striped garter snake (*Thamnophis hammondi*, a California species of special concern) is a predominantly aquatic snake that has been observed at several locations within SSFL, including within the Project Site at the former CTL-III detention basin and Perimeter Pond in summer 2010, following a wetter than average 2009-2010 winter season where surface water ponding was persistent into at least July. One adult two-striped garter snake was also observed on a roadside in Area I in June 2011. Several sub-adult two-striped garter snakes were then observed in May 2012 in a temporarily wet, gravel-lined swale at CTL-I. Droughty conditions in subsequent years have resulted in no further sightings of two-striped garter snake. Nonetheless, two-striped garter snake is known to utilize upland habitats, burrows and can travel substantial distances between aquatic habitats. Therefore, two-striped garter snake may have a moderate likelihood to occur at the Project Site, especially during wetter months when surface waters are present or recently present.

6.3.4 Birds

A variety of habitats, predominantly for shrub/scrub, woodland and open grassland-dependent bird species, and to a lesser degree riparian-dependent species are present within the Project Study Area. Several special-status raptors (birds-of-prey) have been observed during field surveys at SSFL. Cooper's hawk (*Accipiter cooperii*, a California watch list species protected while nesting), was observed nesting in Area II (outside the Project Study Area) in spring 2013 and has been frequently observed in the Northern Drainage near Area II Landfill. White-tailed kite (*Elanus leucurus*, a California fully protected species) has been observed foraging mainly within woodland areas and open grassland areas, along with sharp-shinned hawk (*Accipiter striatus*, a California watch list species protected while nesting). No sight records for burrowing owl (*Athene cunicularia*, a California species of special concern at burrow sites and some wintering sites) exist at SSFL. However, due to the presence of substantial grassland habitats, especially in the Southern Undeveloped Land, burrowing owl may have a moderate likelihood to occur at or near the Project Site.

Golden eagle (*Aquila chrysaetos*, a California fully protected species, and also protected under the Bald Eagle and Golden Eagle Protection Act of 1940 [as amended 1990]), which is dependent on mountainous areas and rolling foothills with an ability to forage over large areas (many square miles), has been observed by Padre Biologists foraging mainly in the Northern Undeveloped Land north of Area III in 2013, and nesting in this vicinity further to the northwest in 2009 (HydroGeologic/Envicom, 2009). Sight records from Palo Comado Canyon two miles to the south also exist (NDDDB, 2013); therefore, golden eagle may be expected to forage, and has a low likelihood to nest at or near the Project Site based on the presence of nearby rocky cliffs or ledges.

Other special-status chaparral-dependent species observed at various locations throughout SSFL include rufous-crowned sparrow (*Aimophila ruficeps*, of which the southern California race is a California watch list species) and loggerhead shrike (*Lanius ludovicianus*, a California species of special concern), both of which may be expected to forage or nest within chaparral areas at the Project Site. No sight records for Bell's sage sparrow (*Artemisiospiza belli*, a California watch list species) exist at SSFL. However, due to the prevalence of chaparral habitats and known sight records within 7 miles of the Project Site, Bell's sage sparrow may be expected to forage or nest at or adjacent to the Project Site.

Coastal California gnatcatcher (*Poliophtila californica* ssp. *californica*, a federally threatened species and California species of special concern) is a year-round resident of coastal southern California and Baja California. Coastal California gnatcatcher prefers open coastal sage scrub with California sagebrush as a dominant or co-dominant species at elevations from sea level to 1650 feet, but mostly below 990 feet (Mock, 2004).

According to the Revised Designation of Critical Habitat for the Coastal California Gnatcatcher; Final Rule (50 CFR Part 17) (USFWS, 2007), Critical Habitat Unit 13 encompasses approximately 57,737 acres in eastern Ventura and western Los Angeles Counties along the southern and eastern slopes of the Santa Susana Mountains and a portion of the interior foothills of the San Gabriel Mountains. Unit 13 has been designated because it is currently occupied by this species, contains the Primary Constituent Elements (PCEs,) required

by this species and serves as an essential linkage between the two isolated populations: the core population in the Moorpark area in Ventura County and the pairs documented in the foothills of the San Gabriel Mountains in Los Angeles County (USFWS, 2007). These PCEs include [1] Venturan coastal sage scrub and coastal sage-chaparral scrub providing space for individual and population growth, normal behavior, breeding, reproduction, nesting, dispersal and foraging; and [2] Non-sage scrub habitats such as chaparral, grassland, riparian areas, in proximity to sage scrub habitats that provide space for dispersal, foraging, and nesting. At its closest point, Unit 13 (in the Simi Hills, north of SR118) is located approximately 2.7 miles to the northeast of SSFL.

Approximately 90 acres (50 percent) of the Project Study Area may provide habitat that at least marginally meets the PCEs for coastal California gnatcatcher. However, other factors including habitat fragmentation and elevation may discount much of the the Project Study Area. Accordingly, no gnatcatcher observations have been recorded by Padre Biologists during past opportunistic surveys in recent years.

Of particular note, however, is sighting information at SSFL of two (2) coastal California gnatcatchers heard calling by a USFWS Biologist in December 2009. USFWS (2010) stated the following: "Based on the amount of suitable habitat onsite (*within the adjacent Area IV*), the number of coastal California gnatcatchers currently known to occur in Ventura County, and recent observations of coastal California gnatcatchers onsite (*in Area IV*), USFWS believes that Area IV likely contains 1 to 10 coastal California gnatcatcher individuals." Other sighting information for coastal California gnatcatcher include small, disjunct populations have been documented in Ventura and Los Angeles Counties (Mock, 2004), including Las Virgenes Canyon, approximately 5 miles to the south, and in Little Simi Valley, approximately 6.5 miles to the northwest (NDDb, 2013). In addition, coastal California gnatcatcher was recently observed in 2010 along the western boundary of the Santa Monica Mountains; an area in Ventura County in which the species was previously not known to occur (Rincon, 2010). Therefore, coastal California gnatcatchers may have a moderate likelihood to occur at the Project Site.

Special-status species dependent on riparian habitats that have been observed at SSFL are limited to yellow warbler (*Setophaga petechia*, a California species of special concern when nesting), foraging in the Northern Drainage (Padre obs., 2010), and may have the potential to nest in riparian corridors within the Project Study Area. Based on similar habitat requirements, yellow-breasted chat (*Icteria virens*, a California species of special concern while nesting) may also be expected to forage, and possibly nest within these same areas within the Project Study Area.

Willow riparian-dependent species such as least Bell's vireo (*Vireo belli* ssp. *pusillus*, a federal and California endangered species), southwestern willow flycatcher (*Empidonax traillii extimus*, a federal and California endangered species), and western yellow-billed cuckoo (*Coccyzus americanus occidentalis*, a federal candidate and California endangered species) have not been recorded at SSFL, and may have a low likelihood to occur within the Project Study Area. Within Area IV, HydroGeoLogic/Envicom (2009) identified a riparian corridor (named the 17th Street Drainage by onsite personnel) that was considered potential habitat for least Bell's vireo. This riparian corridor extends into Area III and the Project Study Area, immediately east of the former Hydrogen Lab, and may be considered potential habitat for least

Bell's vireo, and to a lesser degree, southwestern willow flycatcher and western yellow-billed cuckoo. Bank swallow (*Riparia riparia*, a California threatened species while nesting) is unlikely to occur at within the Project Study Area based on absence of vertical streambanks and local sight records.

As stated above in Section 5, all special-status bird species are also afforded separate protection under the MBTA when nesting. A variety of MBTA-protected bird species have been observed nesting in various habitats at SSFL including, but not limited to Anna's hummingbird (*Calypte anna*), cliff swallow (*Petrochelidon pyrrhonota*), mallard (*Anas platyrhynchos*), bushtit (*Psaltirparus minimus*), western scrub jay (*Aphelocoma californica*), black phoebe (*Sayornis nigricans*), house finch (*Carpodacus mexicanus*), California towhee (*Melospiza crissalis*), white-throated swift (*Aeronautes saxatalis*), killdeer (*Charadrius vociferus*), and great horned owl (*Bubo virginianus*). Of note is the repeated annual use of a red-tailed hawk (*Buteo jamaicensis*) nesting site atop the rock outcrop near CTL-I and observation of successful fledglings during the last three (3) seasons. Various stick nests likely of American crow (*Corvus brachyrhynchos*) and common raven (*Corvus corax*) have also been observed, especially on rock outcrop ledges or tree canopies.

6.3.5 Mammals

Observations of special-status mammals during field surveys within the Project Study Area are limited to San Diego desert woodrat (*Neotoma lepida* ssp. *intermedia*, a California species of special concern) nesting in a sandstone cave adjacent to the Project Site at IEL. Numerous other nesting sites for San Diego desert woodrat are likely present in similar habitat areas, along with an abundance of non-special-status dusky footed woodrat (*Neotoma fuscipes*) commonly found onsite at the base of laurel sumac shrubs. NASA (2011) recorded ringtail (*Bassariscus astutus*, a California fully protected species) in Area III, approximately 100 feet northwest of SPA, and therefore may be expected to occur at the Project Site. San Diego black-tailed jackrabbit (*Lepus californicus* ssp. *bennettii*, a California species of special concern) may also be expected to occur in grassland or open scrub areas. Habitat for American badger (*Taxidea taxus*, a California species of special concern) is moderately suitable based on the presence of shrub or woodland habitats with friable soils. However, based on the lack of local sight records or observations of dens during past surveys, this species is not likely to occur at the Project Study Area.

Foraging habitat (woodlands and chaparral) for bat species including California mastiff bat (*Eumops perotis* spp. *californicus*, a California species of special concern), western small-footed myotis (*Myotis ciliolabrum*, a Western Bat Watch Group species), pallid bat (*Antrozus pallidus*, a California species of special concern), and California leaf-nosed bat (*Macrotus californicus*, a California species of special concern and Western Bat Watch Group species) is present at the Project Study Area. Suitable roosting habitat (cliff faces, caves, buildings, and to a lesser degree, tree hollows or other crevices) is present mainly at the margins or outside of the Project Study Area. Therefore, bat species may be expected to forage and roost in close proximity to the Project Site.

No California or federally threatened or endangered mammals are anticipated to occur at the Project Site.

6.3.6 Invertebrates

As stated above in Section 5.2.1, an USFWS-authorized mid-season fairy shrimp survey was conducted at several selected sandstone pools on March 19, 2010. All specimens collected during this survey were determined to be the versatile fairy shrimp, which is not a special-status species, but the report concluded that the potential exists for listed vernal pool branchiopods (including, but not limited to vernal pool fairy shrimp [*Branchinecta lynchi*], a federally threatened species, or Riverside fairy shrimp [*Streptocephalus woottoni*], a federally endangered species) to occur in these and other vernal pool habitats potentially present at SSFL (Padre, 2010b). As stated in the discussion above, several earthen swales or depressional areas are present within the Project Study Area including within Canyon, Bowl, and CTL-III, but they may not be expected to hold water for sufficient duration to support vernal pool species. In addition, all four man-made ponds (R-1, Perimeter, Silvernale and the Biofilter Sedimentation Basin) are periodically filled and emptied depending on ongoing groundwater remediation or surface water BMP activities. When left to natural conditions, the moisture regime of these ponds in most years is likely of insufficient duration to be considered vernal pool habitat. Therefore, special-status fairy shrimp have a low likelihood to occur within the Project Study Area, depending mainly on the extent of the Project into sandstone rock outcrop areas containing pools.

Quino checkerspot (*Euphydryas editha quino*, a federally endangered species), is a medium sized butterfly in the Nymphalidae (brush-foot) butterfly family, with a wingspread of about 3 cm. The dorsal surface of the wings is a checkerboard of brown, red and yellow spots. The Quino checkerspot once thrived in the entire area from the Santa Monica Mountains south to the northern parts of Baja California. There are now only six known U.S. populations in southwestern Riverside and San Diego counties, and one population near Tecate, Mexico (Xerces Society, undated). The larvae may use either dwarf plantain (*Plantago erecta*) or exserted Indian paintbrush (*Castilleja exserta*), both of which may be common in meadows and upland sage scrub/chaparral habitat. No known focused surveys for Quino checkerspots have been conducted at or near SSFL, but based on the absence site records and the absence of these host plants, Quino checkerspot is not anticipated to occur at the Project Study Area.

7.0 WETLAND ASSESSMENT

The U.S. Army Corps of Engineers (USACE) has jurisdiction over waters of the United States (U.S.). The limit of jurisdiction in non-tidal waters extends to the ordinary high water mark (OHWM) and includes all adjacent wetlands. Waters of the U.S. are defined as:

"All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; including all interstate waters including interstate wetlands, all other waters such as intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce."

In the arid west, the Corps describes some commonly used physical characteristics to indicate the OHWM, including a clear, natural scour line impressed on the bank, recent bank erosion, destruction of native terrestrial vegetation, and the presence of litter and debris (Lichvar & McColley, 2008).

The Corps also implements jurisdictional determinations under revised guidance according to two Supreme Court cases collectively referred to as *Rapanos*, which includes the application of a "significant nexus" analysis (December, 2008). The Corps will apply the significant nexus standard as follows:

"A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream navigable waters" and,

"Significant nexus includes consideration of hydrologic and ecologic factors."

However, the *Rapanos* guidance also states that the following geographic features generally are not jurisdictional waters:

"Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short-duration flow)", and

"Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water."

The USACE and U.S. Environmental Protection Agency define wetlands as:

"those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

USACE' jurisdictional wetlands are determined to be present if evidence of all three Federal criteria are observed (hydrophytic vegetation, hydric soils, and wetland hydrology). Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas

where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (USACE, 1987). The definition of a hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. The wetland hydrology criterion applies to an area that is inundated or saturated to the surface for at least 5 percent of the growing season in most years. The USFWS and CDFW wetland definition requires that only one of the wetland criteria be present to define a wetland.

The County of Ventura defines wetlands as lands that are transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is periodically covered with shallow water. The frequency of occurrence of water is sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands include marshes, bogs, sloughs, vernal pools, wet meadows, river and stream overflows, mudflats, ponds, springs and seeps (County of Ventura, 2005).

7.1 USACE JURISDICTION

A formal wetland delineation or jurisdictional determination has not been performed for the Project; however, based on numerous field surveys at SSFL by Padre Biologists trained to perform wetland delineations, potential USACE jurisdictional areas are anticipated to be present at the Project Site locations that are within the OHWM of the Northern Drainage (Outfall 009), R-1 Pond, Perimeter Pond and the ephemeral drainage feeding into it from the north, Silvernale Pond and the ephemeral drainage that feeds into it (immediately west of SPA), the ephemeral 17th Street Drainage (a tributary to Bell Canyon from near Hydrogen Lab downstream to Compound A), the Southern Undeveloped Land Seeps in Bell Canyon, and at the Southern Undeveloped Land eastern property boundary in Dayton Canyon.

In total, a distance of approximately 3,500 linear feet of potential USACE jurisdictional areas may be temporarily impacted in some form by project activities, with little or no anticipated permanent impacts (subsequent to restoration). Based on visual indicators such as a natural line on the bank, shelving, changes in soil, destruction of terrestrial vegetation by past storm flows, and debris deposited on the banks of each channel or canyon, the average estimated OHWM width of the subject drainages is 6 feet. Therefore, based on this OHWM width, in addition to coverage of the aforementioned ponds, total potential USACE jurisdictional area may be approximately 2 acres. USACE-defined wetlands are likely present within or adjacent to several of the areas listed above, including at R-1 Pond, Silvernale Pond, Silvernale Pond, and the Seeps in Bell Canyon.

7.2 CDFW JURISDICTION

CDFW jurisdiction under Section 1602 of the Fish and Game Code includes the bed, bank and channel of streams and lakes. CDFW staff generally interpret the jurisdictional area to include any riparian vegetation on or immediately adjacent to the bank, and therefore typically overlap with USACE jurisdictional, commonly extending past the OHWM. CDFW jurisdictional areas are present where established streambeds or banks, and riparian woodland (oak or willow) corridors are present within the Project Site. These include locations within or adjacent to

the Northern Drainage (Outfall 009), riparian areas within Canyon, R-1 Pond, Perimeter Pond and the ephemeral drainage feeding into it from the north, Silvernale Pond and the ephemeral drainage that feeds into it (immediately west of SPA), the ephemeral 17th Street Drainage (a tributary to Bell Canyon from near Hydrogen Lab downstream to Compound A), the Southern Undeveloped Land Seeps in Bell Canyon, and at the Southern Undeveloped Land eastern property boundary in Dayton Canyon.

In total, a distance of approximately 3,800 linear feet of CDFW jurisdictional areas may be temporarily impacted in some form by project activities, with little or no anticipated permanent impacts (subsequent to restoration). Based on visual indicators during past surveys of the typical extent of riparian vegetation at these locations, the average estimated width of these areas is 25 feet. Therefore, based on this width, in addition to coverage of the aforementioned ponds, total potential USACE jurisdictional area may be approximately 4 acres. CDFW-defined wetlands are likely present within or adjacent to several of the areas listed above, including at R-1 Pond, Silvernale Pond, Silvernale Pond, and the Seeps in Bell Canyon.

7.3 COUNTY OF VENTURA WETLANDS

Some areas within the Project Site likely exhibit evidence of seasonal saturation and vegetation requiring saturated conditions for at least a portion of their life cycle. Therefore, County-defined wetlands are likely present within or adjacent to R-1 Pond, Silvernale Pond, Silvernale Pond, and the Seeps in Bell Canyon.

8.0 DISCUSSION FOR ADDITIONAL STUDY

8.1 SPECIAL-STATUS PLANTS

Mapping and an accurate population count for Santa Susana tarplant has not been completed to date within Area III; therefore, additional study on this species is recommended to determine potential impacts to this species.

Upon certification of the Project's CEQA document, an Oak Tree Assessment for any and all proposed oak tree impacts may be required for submittal to the County of Ventura as part of a tree permit application packet for the subject project.

Special-status plants including state and federal listed species are known in the project region, but have not been observed during numerous botanical surveys. Focused spring botanical surveys may be warranted for Slender-horned spineflower, San Fernando Valley spineflower, round-leaved filaree, Lyon's pentachaeta, chaparral nolina, dune larkspur, Conejo buckwheat, crowned forget-me-not, tiny poppy, Trask yerba santa, Catalina mariposa lily, many-stemmed dudleya, Agoura Hills dudleya, Marcescent dudleya, and Blochman's dudleya.

8.2 SPECIAL-STATUS WILDLIFE

Based on the 2009 sighting of coastal California gnatcatcher (USFWS, 2010), focused surveys for coastal California gnatcatcher throughout the Project Study Area are recommended.

Based on observations, but no confirmed species identifications, and presence of suitable habitat onsite, focused surveys for bat species including California mastiff bat, western small-footed myotis, pallid bat, and California leaf-nosed bat are recommended.

Focused surveys, particularly in sandstone rock outcrop areas located within the Project Site, for vernal pool fairy shrimp and Riverside fairy shrimp are recommended. Should other types of vernal pool habitats be identified within the Project Site, these areas should also be surveyed.

Focused surveys for Quino checkerspot may be warranted based on suitable habitat onsite and the location of the Project Site within this species historic range.

Focused surveys for all other special-status species discussed in this Study are not recommended at this time, but project-incorporated measures may require development and implementation upon Project approval.

8.3 WETLANDS

Upon certification of the Project's CEQA document, a formal wetland delineation and jurisdictional determination may be required as part of permit application packages to the USACE, CDFW and RWQCB.

8.4 POTENTIAL ONSITE MITIGATION AREAS

Potential onsite mitigation areas for post-project restoration are likely best sighted directly within the proposed soil remediation impact areas, where soil backfill and in-kind replacement of native plant species may be required as project-incorporated mitigation measures. Upon Project completion, a majority of the approximately 180-acre Project Site may be available to support mitigation activities in varying capacities. A more definitive proposed mitigation plan may be warranted at this early phase of the Project design to better determine the extent of Project impacts.

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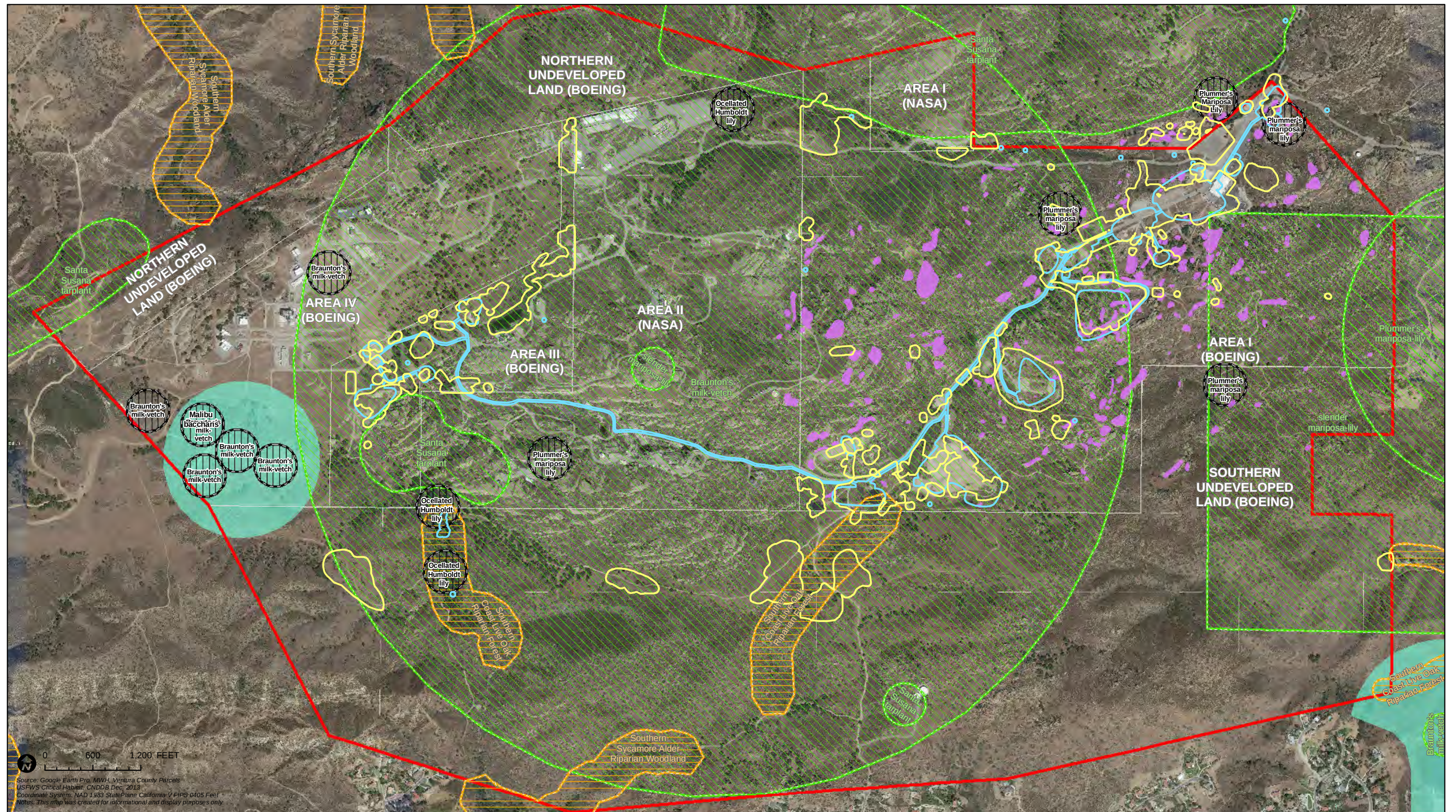
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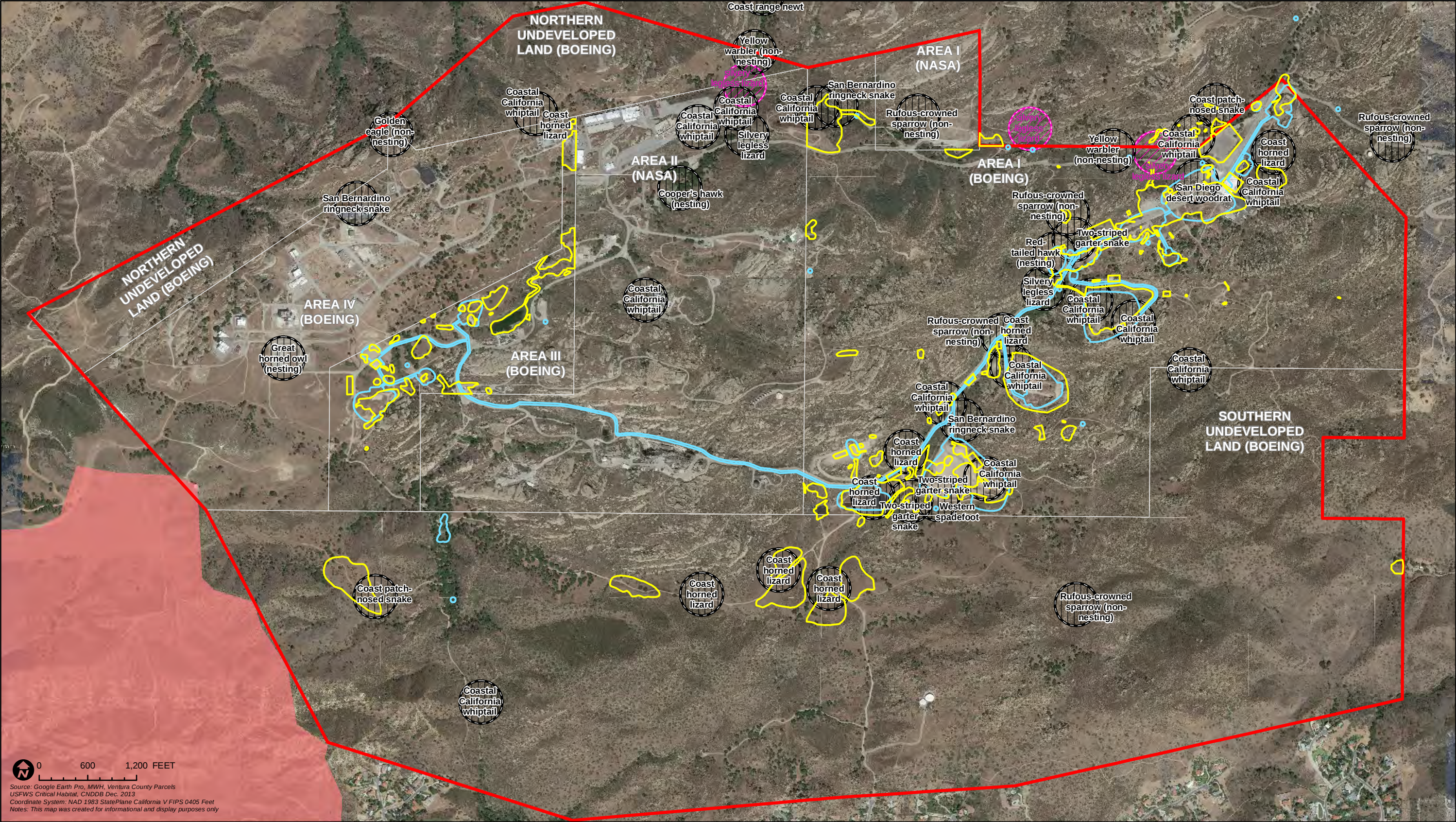
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APPENDIX A. VEGETATION MAPS

APPENDIX B. SPECIAL-STATUS SPECIES MAPS





Santa Susana Field Laboratory Soils & Groundwater Remediation Project

- Project Area
- Proposed Groundwater Impact Area
- CNDDB Occurrence
- Padre Observation
- Proposed Soil Impact Area
- California Red-Legged Frog Critical Habitat
- Animal

SPECIAL-STATUS WILDLIFE SPECIES MAP
FIGURE B-2

APPENDIX C. VASCULAR PLANT FLORA OBSERVED AT AREAS I AND III, SANTA SUSANA FIELD LABORATORY VENTURA COUNTY, CALIFORNIA

Appendix C

Vascular Plant Flora Observed within Santa Susana Field Laboratory , Ventura County, California

Scientific Name	Common Name	Habit	Family
<i>Achillea millefolium</i>	Yarrow	PH	Asteraceae
<i>Acmispon americanus</i>	Spanish clover	AH	Fabaceae
<i>Acmispon argophyllus</i> var. <i>argophyllus</i>	Silver lotus	PH	Fabaceae
<i>Acmispon glaber</i>	Deerweed, California broom	PH	Fabaceae
<i>Acmispon strigosus</i>	Strigose lotus	AH	Fabaceae
<i>Acourtia microcephala</i>	Sacapolote	PH	Asteraceae
<i>Adenostoma fasciculatum</i>	Chamise	S	Rosaceae
<i>Aesculus californica</i>	California Buckeye	T	Sapindaceae
<i>Ailanthus altissima</i> *	Tree of heaven	T	Simaroubaceae
<i>Alnus rhombifolia</i> **	White alder	T	Betulaceae
<i>Amaranthus blitoides</i>	Amaranth	AH	Amaranthaceae
<i>Ambrosia acanthicarpa</i>	Annual bursage	AH	Asteraceae
<i>Ambrosia psilostachya</i>	Western ragweed	PH	Asteraceae
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Fiddleneck	AH	Boraginaceae
<i>Anagallis arvensis</i> *	Scarlet pimpernel	AH	Myrsinaceae
<i>Antirrhinum coulterianum</i>	White snapdragon	AH	Plantaginaceae
<i>Antirrhinum multiflorum</i>	Rose snapdragon	PH	Plantaginaceae
<i>Arctostaphylos glauca</i>	Manzanita	S	Ericaceae
<i>Artemisia californica</i>	California sagebrush	S	Asteraceae
<i>Artemisia douglasiana</i>	Mugwort	PH	Asteraceae
<i>Asclepias eriocarpa</i>	Indian milkweed	PH	Asclepiadaceae
<i>Asclepias fascicularis</i>	Narrow-leaf milkweed	AH	Asclepiadaceae
<i>Aspidotis californica</i>	California lace fern	PF	Pteridaceae
<i>Astragalus brauntonii</i>	Braunton's milkvetch	S	Fabaceae
<i>Avena barbata</i> *	Slender wild oats	AG	Poaceae
<i>Avena fatua</i> *	Wild oats	AG	Poaceae
<i>Baccharis malibuensis</i>	Malibu baccharis	S	Asteraceae
<i>Baccharis pilularis</i>	Coyote brush	S	Asteraceae
<i>Baccharis salicifolia</i>	Mule fat, seep-willow	S	Asteraceae
<i>Bloomeria crocea</i> var. <i>crocea</i>	Common goldenstar	AH	Themidaceae
<i>Brassica nigra</i> *	Black mustard	AH	Brassicaceae
<i>Brickellia californica</i>	California brickellbush	S	Asteraceae
<i>Bromus carinatus</i>	California brome	PG	Poaceae
<i>Bromus diandrus</i> *	Ripgut grass	AG	Poaceae
<i>Bromus hordeaceus</i> *	Soft chess	AG	Poaceae
<i>Bromus madritensis</i> ssp. <i>rubens</i> *	Red brome	AG	Poaceae
<i>Bromus tectorum</i> *	Cheat grass	AG	Poaceae
<i>Calochortus clavatus</i> var. <i>pallidus</i>	Yellow mariposa lily	AH	Liliaceae
<i>Calochortus plummerae</i>	Plummer's mariposa lily	AH	Liliaceae
<i>Calystegia macrostegia</i> ssp. <i>cyclostegia</i>	Chaparral morning glory	PV	Convolvulaceae
<i>Camissoniopsis micrantha</i>	Small evening primrose	AH	Onagraceae
<i>Capsella bursa-pastoris</i> *	Shepherd's purse	AH	Brassicaceae
<i>Cardamine californica</i>	Milk maids	AH	Brassicaceae
<i>Carduus pycnocephalus</i> *	Italian thistle	AH	Asteraceae
<i>Carex praegracilis</i>	Clustered field sedge	PH	Cyperaceae
<i>Carpobrotus edulis</i> *	Hottentot fig	PH	Aizoaceae
<i>Castilleja affinis</i> ssp. <i>affinis</i>	Indian paintbrush	PH	Scrophulariaceae
<i>Ceanothus crassifolius</i>	Hoary-leaf ceanothus	S	Rhamnaceae
<i>Ceanothus cuneatus</i>	Buckbrush	S	Rhamnaceae
<i>Ceanothus oliganthus</i> var. <i>oliganthus</i>	Hairy ceanothus	S	Rhamnaceae
<i>Ceanothus spinosus</i>	Greenbark ceanothus	S	Rhamnaceae
<i>Centaurea calcitrapa</i> *	Purple starthistle	AH	Asteraceae
<i>Centaurea melitensis</i> *	Tocalote	AH	Asteraceae
<i>Cercocarpus betuloides</i> var. <i>betuloides</i>	Birch-leaf mountain mahogany	S	Rosaceae
<i>Chenopodium californicum</i>	Soap plant	AH	Chenopodiaceae
<i>Chlorogalum pomeridianum</i>	Soap plant	PH	Liliaceae
<i>Chorizanthe stachyoides</i>	Turkish rugging	AH	Polygonaceae
<i>Cirsium occidentale</i>	Cobweb thistle	BH	Asteraceae
<i>Clarkia botata</i>	Farewell-to-spring	AH	Onagraceae
<i>Clarkia epilobioides</i>	White clarkia	AH	Onagraceae
<i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>	Four spot	AH	Onagraceae
<i>Clarkia unguiculata</i>	Elegant clarkia	AH	Onagraceae
<i>Claytonia perfoliata</i>	Miner's lettuce	AH	Portulacaceae
<i>Collinsia heterophylla</i>	Chinese houses	AH	Scrophulariaceae
<i>Collinsia parryi</i>	Blue-eyed Mary	AH	Scrophulariaceae
<i>Cordylanthus rigidus</i> ssp. <i>setigerus</i>	Bird's beak	AH	Scrophulariaceae
<i>Corethrogyne filaginifolia</i>	California aster	PH	Asteraceae
<i>Cortaderia selloana</i> *	Pampas grass	PG	Poaceae
<i>Cotula australis</i> *	Cotula	AH	Asteraceae
<i>Crassula connata</i>	Pygmy weed	AH	Crassulaceae
<i>Croton setigerus</i>	Turkey mullein	AH	Euphorbiaceae
<i>Cryptantha intermedia</i>	Large-flowered Cryptantha	AH	Boraginaceae
<i>Cryptantha micromeres</i>	Small-flowered Cryptantha	AH	Boraginaceae
<i>Cuscuta</i> sp.	Dodder	PV	Convolvulaceae
<i>Cynodon dactylon</i> *	Bermuda grass	PG	Poaceae
<i>Cyperus eragrostis</i>	Nutsedge	PH	Cyperaceae
<i>Datura wrightii</i>	Jimsonweed	PH	Solanaceae
<i>Deinandra fasciculata</i>	Fascicled tarplant	AH	Asteraceae
<i>Deinandra minthornii</i>	Santa Susana tarplant	S	Asteraceae
<i>Delphinium cardinale</i>	Scarlet Larkspur	PH	Ranunculaceae
<i>Delphinium parryi</i>	Parry's larkspur	PH	Ranunculaceae
<i>Dichelostemma capitatum</i>	Blue dicks	PH	Liliaceae
<i>Dimorphotheca sinuata</i> *	Cape-marigold	AH	Asteraceae
<i>Distichlis spicata</i>	Salt grass	PG	Poaceae
<i>Dittrichia graveolens</i> *	Stinkwort	AH	Asteraceae
<i>Dodecatheon clevelandii</i> ssp. <i>clevelandii</i>	Shooting star	PH	Primulaceae
<i>Dudleya lanceolata</i>	Lanceleaf dudleya	PH	Crassulaceae
<i>Dudleya pulverulenta</i>	Chalk dudleya	PH	Crassulaceae
<i>Elymus condensatus</i>	Giant wild rye	PG	Poaceae
<i>Elymus triticoides</i>	Creeping wild rye	PG	Poaceae
<i>Emmenanthe penduliflora</i>	Whispering bells	AH	Hydrophyllaceae
<i>Encelia californica</i>	California bush sunflower	S	Asteraceae

Appendix C

Vascular Plant Flora Observed within Santa Susana Field Laboratory , Ventura County, California

Scientific Name	Common Name	Habit	Family
<i>Encelia farinosa</i>	Brittlebush	S	Asteraceae
<i>Epilobium canum</i> ssp. <i>latifolium</i>	California fuschia	PH	Onagraceae
<i>Eriastrum sapphirinum</i>	Eriastrum	AH	Polemoniaceae
<i>Ericameria palmeri</i> var. <i>pachylepis</i>	Palmer's goldenbush	S	Asteraceae
<i>Erigeron canadensis</i>	Horseweed	AH	Asteraceae
<i>Erigeron foliosus</i> var. <i>foliosus</i>	Flea-bane	PH	Asteraceae
<i>Eriodictyon crassifolium</i>	Yerba santa	S	Hydrophyllaceae
<i>Eriogonum elongatum</i> var. <i>elongatum</i>	Wand buckwheat	S	Polygonaceae
<i>Eriogonum fasciculatum</i> var. <i>fasciculatum</i>	California buckwheat	S	Polygonaceae
<i>Eriogonum gracile</i> var. <i>gracile</i>	Slender buckwheat	AH	Polygonaceae
<i>Eriogonum wrightii</i> ssp. <i>membranaceum</i>	Wright's buckwheat	S	Polygonaceae
<i>Eriophyllum confertiflorum</i>	Golden yarrow	S	Asteraceae
<i>Erodium botrys</i> *	Storks-bill	AH	Geraniaceae
<i>Erodium cicutarium</i> *	Redstem filaree	AH	Geraniaceae
<i>Erysimum capitatum</i> var. <i>capitatum</i>	Western wallflower	PH	Brassicaceae
<i>Eschscholzia californica</i>	California poppy	AH	Papaveraceae
<i>Eucrypta chrysanthemifolia</i>	Eucrypta	AH	Hydrophyllaceae
<i>Eulobus californicus</i>	Mustard evening primrose	AH	Onagraceae
<i>Euthamia occidentalis</i>	Western goldenrod	PH	Asteraceae
<i>Festuca arundinacea</i> *	Tall fescue	PG	Poaceae
<i>Festuca microstachys</i>	Vulpia	AG	Poaceae
<i>Festuca myuros</i> *	Rat-tail fescue	AG	Poaceae
<i>Festuca perennis</i> *	Italian rye-grass	AG	Poaceae
<i>Fraxinus</i> sp.	Ash	T	Oleaceae
<i>Galium angustifolium</i>	Bedstraw	AH	Rubiaceae
<i>Geranium dissectum</i> *	Cutleaf geranium	AH	Geraniaceae
<i>Gilia achilleifolia</i>	Gilia	AH	Polemoniaceae
<i>Gnaphalium palustre</i>	Cud-weed	AH	Asteraceae
<i>Hazardia squarrosa</i> var. <i>grindelioides</i>	Sawtooth goldenbush	S	Asteraceae
<i>Helianthemum scoparium</i>	Peak rush-rose	PH	Cistaceae
<i>Helianthus annuus</i>	Common sunflower	AH	Asteraceae
<i>Hesperoyucca whipplei</i>	Our lord's candle	S	Agavaceae
<i>Heteromeles arbutifolia</i>	Toyon	T	Rosaceae
<i>Heterotheca grandiflora</i>	Telegraph weed	PH	Asteraceae
<i>Hirschfeldia incana</i> *	Summer mustard	BH	Brassicaceae
<i>Hordeum murinum</i> *	Barley	AG	Poaceae
<i>Hypochaeris glabra</i> *	Smooth cat's ear	AH	Asteraceae
<i>Juglans californica</i>	Southern California black walnut	T	Juglandaceae
<i>Juncus macrophyllus</i>	Rush	PH	Juncaceae
<i>Juncus patens</i>	Spreading rush	PH	Juncaceae
<i>Keckiella cordifolia</i>	Heart-leaved penstemon	S	Scrophulariaceae
<i>Lactuca serriola</i> *	Prickly lettuce	AH	Asteraceae
<i>Lamarckia aurea</i> *	Goldentop	AG	Poaceae
<i>Lasthenia californica</i>	Goldfields	AH	Asteraceae
<i>Lepidospartum squamatum</i>	Scalebroom	PH	Asteraceae
<i>Lilium humboldtii</i> ssp. <i>ocellatum</i>	Humboldt lily	PH	Liliaceae
<i>Linanthus californicus</i>	Prickly phlox	S	Polemoniaceae
<i>Lithophragma affine</i>	Woodland star	AH	Saxifragaceae
<i>Logfia californica</i>	Filago	AH	Asteraceae
<i>Logfia gallica</i> *	Narrow-leaf cottonrose	AH	Asteraceae
<i>Lomatium</i> sp.	Lomatium	PH	Apiaceae
<i>Lonicera subspicata</i> var. <i>denudata</i>	Chaparral honeysuckle	S	Caprifoliaceae
<i>Lupinus bicolor</i>	Miniature lupine	AH	Fabaceae
<i>Lupinus hirsutissimus</i>	Stinging lupine	AH	Fabaceae
<i>Lupinus truncatus</i>	Collar lupine	AH	Fabaceae
<i>Madia sativa</i>	Coast tarweed	AH	Asteraceae
<i>Malacothamnus fasciculatus</i> ssp. <i>fasciculatus</i>	Chaparral bush mallow	S	Malvaceae
<i>Malacothrix saxatilis</i> var. <i>tenuifolia</i>	Cliff aster	PH	Asteraceae
<i>Malosma laurina</i>	Laurel sumac	S	Anacardiaceae
<i>Marah macrocarpa</i>	Wild cucumber	PV	Cucurbitaceae
<i>Marrubium vulgare</i> *	Horehound	PH	Lamiaceae
<i>Matricaria discoidea</i> *	Pineapple weed	AH	Asteraceae
<i>Medicago lupulina</i> *	Black medic	AH	Fabaceae
<i>Medicago polymorpha</i> *	Bur clover	AH	Fabaceae
<i>Melica imperfecta</i>	Melic	PG	Poaceae
<i>Melilotus indicus</i> *	Yellow sweet clover	BH	Fabaceae
<i>Mimulus aurantiacus</i>	Bush monkeyflower	S	Scrophulariaceae
<i>Mimulus guttatus</i>	Creek monkeyflower	PH	Scrophulariaceae
<i>Mirabilis laevis</i> var. <i>crassifolia</i>	Wishbone bush	PH	Nyctaginaceae
<i>Muhlenbergia microsperma</i>	Littleseed Muhly	AG	Poaceae
<i>Muhlenbergia rigens</i>	Deergrass	PG	Poaceae
<i>Navarretia atractylodes</i>	Navarretia	AH	Polemoniaceae
<i>Nicotiana glauca</i> *	Tree tobacco	S	Solanaceae
<i>Opuntia ficus-indica</i> *	Mission Prickly Pear	S	Cactaceae
<i>Orobanche fasciculata</i>	Clustered broom-rape	PH	Orobanchaceae
<i>Paeonia californica</i>	Wild peony	PH	Paeoniaceae
<i>Parietaria hespera</i> var. <i>californica</i>	Pellitory	AH	Urticaceae
<i>Pectocarya linearis</i> ssp. <i>ferocula</i>	Sagebrush combseed	AH	Boraginaceae
<i>Pellaea andromedifolia</i>	Coffee fern	PF	Pteridaceae
<i>Pellaea mucronata</i> var. <i>mucronata</i>	Bird's-foot fern	PF	Pteridaceae
<i>Pennisetum setaceum</i> *	Fountain grass	PG	Poaceae
<i>Pentagramma triangularis</i> ssp. <i>triangularis</i>	Goldback fern	PH	Pteridaceae
<i>Persea americana</i> **	Avocado	T	Lauraceae
<i>Phacelia cicutaria</i> var. <i>hispida</i>	Caterpillar phacelia	AH	Hydrophyllaceae
<i>Phacelia grandiflora</i>	Large-flowered phacelia	AH	Hydrophyllaceae
<i>Phacelia ramosissima</i> var. <i>ramosissima</i>	Branching phacelia	PH	Hydrophyllaceae
<i>Pholistoma auritum</i> var. <i>auritum</i>	Fiesta flower	AH	Boraginaceae
<i>Plagiobothrys</i> sp.	Popcorn flower	AH	Boraginaceae
<i>Platanus racemosa</i>	Western sycamore	T	Plantanaceae
<i>Pluchea odorata</i> var. <i>odorata</i>	Salt marsh fleabane	AH/PH	Asteraceae
<i>Poa secunda</i>	Bluegrass	PG	Poaceae
<i>Polypodium californicum</i>	California polypody	PF	Polypodiaceae

Appendix C

Vascular Plant Flora Observed within Santa Susana Field Laboratory , Ventura County, California

Scientific Name	Common Name	Habit	Family
<i>Polypogon monspeliensis</i> *	Annual beard grass	AG	Poaceae
<i>Populus fremontii</i>	Fremont cottonwood	T	Salicaceae
<i>Prunus ilicifolia</i> ssp. <i>ilicifolia</i>	Holly-leaved cherry	S/T	Rosaceae
<i>Pseudognaphalium biolettii</i>	Two-tone everlasting	AH	Asteraceae
<i>Pseudognaphalium californicum</i>	Green everlasting	AH	Asteraceae
<i>Pseudognaphalium luteoalbum</i> *	Weedy cudweed	BH	Asteraceae
<i>Pseudognaphalium microcephalum</i>	White everlasting	BH	Asteraceae
<i>Pterostegia drymarioides</i>	Thread-stem	AH	Polygonaceae
<i>Quercus agrifolia</i> var. <i>agrifolia</i>	Coast live oak	T	Fagaceae
<i>Quercus berberidifolia</i>	Scrub oak	S	Fagaceae
<i>Quercus lobata</i> (1 known individual - deceased)	Valley Oak	T	Fagaceae
<i>Rafinesquia californica</i>	Rafinesquia	AH	Asteraceae
<i>Ranunculus californicus</i>	Buttercup	PH	Ranunculaceae
<i>Rhamnus ilicifolia</i>	Holly-leaved redberry	S	Rhamnaceae
<i>Rhus integrifolia</i>	Lemonade berry	S	Anacardiaceae
<i>Rhus ovata</i>	Sugar bush	S	Anacardiaceae
<i>Ribes indecorum</i>	White chaparral currant	S	Grossulariaceae
<i>Ribes malvaceum</i>	Chaparral currant	S	Grossulariaceae
<i>Ribes</i> sp.	Gooseberry	S	Grossulariaceae
<i>Rubus ursinus</i>	California blackberry	PV	Rosaceae
<i>Rumex californicus</i>	California willow dock	PH	Polygonaceae
<i>Rumex crispus</i> *	Curly dock	PH	Polygonaceae
<i>Salix exigua</i>	Sandbar willow	S	Salicaceae
<i>Salix laevigata</i>	Red willow	T	Salicaceae
<i>Salix lasiolepis</i>	Arroyo willow	T	Salicaceae
<i>Salsola tragus</i> *	Russian thistle	AH	Chenopodiaceae
<i>Salvia apiana</i>	White sage	S	Lamiaceae
<i>Salvia columbariae</i>	Chia	S	Lamiaceae
<i>Salvia leucophylla</i>	Purple sage	S	Lamiaceae
<i>Salvia mellifera</i>	Black sage	S	Lamiaceae
<i>Salvia spathacea</i>	Crimson pitcher sage	PH	Lamiaceae
<i>Sambucus nigra</i> ssp. <i>caerulea</i>	Blue elderberry	T	Caprifoliaceae
<i>Sanicula bipinnata</i>	Poison sanicle	BH	Apiaceae
<i>Sanicula crassicaulis</i>	Pacific sanicle	PH	Apiaceae
<i>Schinus molle</i> *	Pepper tree	T	Anacardiaceae
<i>Schismus barbatus</i> *	Mediterranean grass	AG	Poaceae
<i>Schoenoplectus californicus</i>	California bulrush	PH	Cyperaceae
<i>Senecio flaccidus</i>	Shrubby ragwort	S	Asteraceae
<i>Senecio vulgaris</i> *	Common groundsel	AH	Asteraceae
<i>Sidalcea sparsifolia</i>	Few-leaved checkerbloom	PH	Malvaceae
<i>Silene gallica</i> *	Windmill pink	AH	Caryophyllaceae
<i>Silene laciniata</i> ssp. <i>laciniata</i>	Indian pink	PH	Caryophyllaceae
<i>Silybum marianum</i> *	Milk thistle	AH	Asteraceae
<i>Sisymbrium altissimum</i> *	Tumble mustard	AH	Brassicaceae
<i>Sisyrinchium bellum</i>	Blue-eyed grass	PH	Iridaceae
<i>Solanum xanti</i>	Purple nightshade	PH	Solanaceae
<i>Sonchus asper</i> *	Prickly sow thistle	AH	Asteraceae
<i>Sonchus oleraceus</i> *	Common sow thistle	AH	Asteraceae
<i>Stephanomeria virgata</i> ssp. <i>virgata</i>	Twiggy wreath plant	AH	Asteraceae
<i>Stipa miliacea</i> var. <i>miliacea</i> *	Smilo grass	PG	Poaceae
<i>Stipa pulchra</i>	Purple needlegrass	PG	Poaceae
<i>Stylocline gnaphaloides</i>	Everlasting nest straw	AH	Asteraceae
<i>Symphoricarpos mollis</i>	Snowberry	S	Caprifoliaceae
<i>Tamarix ramosissima</i> *	Salt cedar	T	Tamaricaceae
<i>Taraxacum officinale</i> *	Dandelion	PH	Asteraceae
<i>Thysanocarpus curvipes</i>	Lace pod	AH	Brassicaceae
<i>Thysanocarpus laciniatus</i>	Lace pod	AH	Brassicaceae
<i>Toxicodendron diversilobum</i>	Poison oak	S	Anacardiaceae
<i>Toxicoscordion fremontii</i>	Death camas	PH	Liliaceae
<i>Trichostema lanatum</i>	Wooly blue curls	S	Lamiaceae
<i>Trichostema lanceolatum</i>	Vinegar weed	AH	Lamiaceae
<i>Trifolium ciliclatum</i>	Hairy clover	AH	Fabaceae
<i>Trifolium hirtum</i> *	Rose clover	AH	Fabaceae
<i>Trifolium willdenovii</i>	Tomcat clover	AH	Fabaceae
<i>Ulmus parvifolia</i> *	Chinese elm	T	Ulmaceae
<i>Umbellularia californica</i>	California bay	T	Lauraceae
<i>Uropappus lindleyi</i>	Silver puffs	AH	Asteraceae
<i>Venegasia carpesioides</i>	Canyon sunflower	PH	Asteraceae
<i>Verbena lasiostachys</i>	Verbena	PH	Verbenaceae
<i>Vicia benghalensis</i> *	Mediterranean vetch	AV	Fabaceae
<i>Vicia hassei</i> (possibly <i>ludoviciana</i>)	Hasse's vetch	AV	Fabaceae
<i>Vicia sativa</i> *	Common vetch	AV	Fabaceae
<i>Viola pedunculata</i>	Johnny-jump-up	AH	Violaceae
<i>Washingtonia robusta</i> *	Mexican fan palm	T	Arecaceae
<i>Zeltnera venusta</i>	Charming Centaury	AH	Gentianaceae

Notes:

Scientific nomenclature follows Baldwin et al. (2012).

An *** indicates non-native species which have become naturalized or persist without cultivation.

An **** indicates species which have been planted and may not persist without cultivation.

Habit Definitions:

- AF = annual fern or fern ally.
- AG = annual grass.
- AH = annual herb.
- BH = biennial herb.
- PF = perennial fern or fern ally.
- PG = perennial grass.
- PH = perennial herb.
- PV = perennial vine.
- S = shrub.
- T = tree.

**APPENDIX D. WILDLIFE SPECIES OBSERVED AT SANTA
SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA**

WILDLIFE OF BOEING SANTA SUSANA FIELD LABORATORY

November 11, 2013

The following lists represent wildlife species observed at The Boeing Company Santa Susana Field Laboratory (SSFL), Ventura County, California by Padre Associates, Inc. biologists from the period 2003 through 2013, with contributions by Mark Osokow (of the National Audubon Society) in 2011 through 2013. It is not an exhaustive list of all wildlife species potentially occurring at the site. This list will be updated periodically with all credible sighting information.

REPTILES

Table 1. Reptile Species Observed at SSFL

Western fence lizard (<i>Sceloporus occidentalis</i>)
Striped racer (or chaparral whipsnake [Stebbins, 2003], <i>Masticophis lateralis lateralis</i>)
Coastal western whiptail (<i>Aspidoscleis tigris stegnegeri</i> , a CDFW* Special Animal)
Side-blotched lizard (<i>Uta stansburiana</i>)
Southern Pacific rattlesnake (<i>Crotalus viridis helleri</i>)
Racer (<i>Coluber constrictor</i>)
Coast horned lizard (<i>Phrynosoma coronatum</i> ssp. <i>frontale</i> , a California Species of Special Concern)
Common king snake (<i>Lampropeltis getula</i>)
Gopher snake (<i>Pituophis catenifer</i>)
San Bernardino ringneck snake (<i>Diadophis punctatus modestus</i> , a CDFW Special Animal)
Common garter snake (<i>Thamnophis sirtalis</i>)
Silvery legless lizard (<i>Anniella pulchra</i> , a California Species of Special Concern)
Two-striped garter snake (<i>Thamnophis hammondi</i> , a California Species of Special Concern)
Southern alligator lizard (<i>Elgaria multicarinata</i>)
Western skink (<i>Plestiodon skiltonianus</i>)
Coast patch-nosed snake (<i>Salvadora hexalepis virgultea</i> , a California Species of Special Concern)

*California Department of Fish and Wildlife

AMPHIBIANS

Table 2. Amphibian Species Observed at SSFL

Western toad (<i>Bufo boreas</i>)
Coast range newt (<i>Taricha torosa torosa</i> , a California Species of Special Concern)*
Western spadefoot (<i>Spea hammondi</i> , a California Species of Special Concern)
Black-bellied slender salamander (<i>Batrachoseps nigriventris</i>)
Baja California tree frog (<i>Pseudacris hypochondriaca hypochondriaca</i>)
California tree frog (<i>Pseudacris cadaverina</i>)

*Observed in the Northern Drainage, but thus far only on adjacent Brandeis-Bardin Institute property (not onsite).

BIRDS

Table 3. Bird Species observed at SSFL

Acorn woodpecker	European starling	Red-tailed hawk
Allen's hummingbird	Golden-crowned sparrow	Red-winged blackbird
American crow	Golden eagle**	Rock pigeon
American goldfinch	Great egret	Rock wren
American kestrel	Great horned owl	Ruby-crowned kinglet
Anna's hummingbird	Greater roadrunner	Say's phoebe
Ash-throated flycatcher	Gull sp.	Sharp-shinned hawk
Barn owl	Hermit thrush	Snowy egret
Barn swallow	Hooded oriole	Song sparrow
Belted kingfisher	House finch	S. California rufous-crowned sparrow*
Bewick's wren	House wren	Spotted towhee
Black-chinned hummingbird	Hutton's vireo	Townsend's warbler
Black-crowned night heron	Killdeer	Turkey vulture
Black-headed grosbeak	Lark sparrow	Violet-green swallow
Black phoebe	Lawrence's goldfinch	Warbling vireo
Black-throated gray warbler	Lazuli bunting	Western kingbird
Blue-gray gnatcatcher	Lesser goldfinch	Western meadowlark
Blue grosbeak	Loggerhead shrike***	Western screech owl
Bullock's oriole	MacGillivray's warbler	Western scrub-jay
Bushtit	Mallard	Western tanager

Table 3. Continued

California quail	Mourning dove	Western wood pewee
California thrasher	Northern flicker	White-breasted nuthatch
California towhee	Northern mockingbird	White-crowned sparrow
Canvasback	Northern rough-winged swallow	White-tailed kite****
Canyon wren	Nuttall's woodpecker	White-throated swift
Cassin's kingbird	Oak titmouse	Wilson's warbler
Cliff swallow	Orange-crowned warbler	Wrentit
Common poorwill	Orange bishop	Yellow-rumped warbler
Common raven	Pacific-slope flycatcher	Yellow warbler***
Common yellowthroat	Phainopepla	
Cooper's hawk*	Red-shouldered hawk	

Table 3 Notes: Common species names only (no scientific names) are provided in Table 3 according to generally satisfactory naming practices of the American Ornithological Union's standardized bird species list.

All species listed in Table 3 are protected by the Migratory Bird Treaty Act when nesting, with exception to European starling, orange bishop, and rock pigeon.

*: CDFW Watch List species

**: Golden eagle (*Aquila chrysaetos*, a CDFW Fully Protected Species) has been observed in the nearby Santa Monica Mountains National Recreation Area (Cheeseboro Canyon), and may also be expected to occur at SSFL.

***: California Species of Special Concern (when nesting)

****: CDFW Fully Protected Species

MAMMALS

Table 4. Mammal Species Observed at SSFL

Dusky-footed woodrat (<i>Neotoma fuscipes</i>)
San Diego desert woodrat (<i>Neotoma lepida intermedia</i> , a California Species of Special Concern)*
Audubon's cottontail (<i>Sylvilagus audubonii</i>)
Brush rabbit (<i>Sylvilagus bachmani</i>)
Black-tailed deer (<i>Odocoileus hemionus</i>)
Coyote (<i>Canis latrans</i>)
Gray fox (<i>Urocyon cinereoargenteus</i>)
California ground squirrel (<i>Spermophilus beecheyi</i>)
Western gray squirrel (<i>Sciurus griseus</i>)
Eastern fox squirrel (<i>Sciurus niger</i> , introduced to southern California)
California vole (<i>Microtus californicus</i>)
Deer mouse (<i>Peromyscus maniculatus</i>)

Table 4. Continued

Raccoon (<i>Procyon lotor</i>)
Botta's pocket gopher (<i>Thomomys bottae</i>)
Cougar (<i>Puma concolor</i>)
Bobcat (<i>Lynx rufus</i>)
Bat and myotis sp.
Skunk sp.

*Assumed present due to evidence of likely sightings and prevalence of suitable habitat.

FISH

Fish species observed at SSFL have included non-native mosquitofish (*Gambusia affinis*) and koi carp (*Cyprinus carpio*); however, these sightings were limited to R-2 Pond. Off-site nearby creeks are also known to support mosquitofish, arroyo chub (*Gila orcutti*), brown bullhead (*Ameiurus nebulosus*), green sunfish (*Lepomis cyanellus*), and blunt-nosed minnow (*Pimephales notatus*).

INVERTEBRATES

A variety of species in the phylum Arthropoda (including, but not limited to bugs, beetles (including long-horned beetles such as the banded alder borer, *Rosalia funebris*), flies, moths (including ceanothus silkmoth, *Hyolaphora euryalus*), butterflies (including northern checkerspot, *Chlosyne palla*), bees (including native bees in the genera *Bombus*, *Xylocopa*, *Ceratina*, *Osmia*, *Megachile*, *Anthidium*, *Halictidae* sp., *Melissodes*, and *Andrena*), wasps, bristletails, spiders, ticks, centipedes, and water fleas have been observed, but not necessarily identified to species at SSFL. Of note is the presence of versatile fairy shrimp (*Branchinecta lindahli*, a non-special status species) in seasonal sandstone pools. Additionally, other fairy shrimp species may be expected to occur at SSFL.