

BIOLOGICAL RESOURCES STUDY FOR THE BOEING COMPANY SANTA SUSANA FIELD LABORATORY

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1.0 INTRODUCTION

This Biological Resources Study (Study) has been prepared to document biological resources present or potentially present at Santa Susana Field Laboratory (Santa Susana). Santa Susana is located in southeastern Ventura County, adjacent to Los Angeles County, near the crest of the Simi Hills at the western border of the San Fernando Valley (see Figure 1). Santa Susana 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.

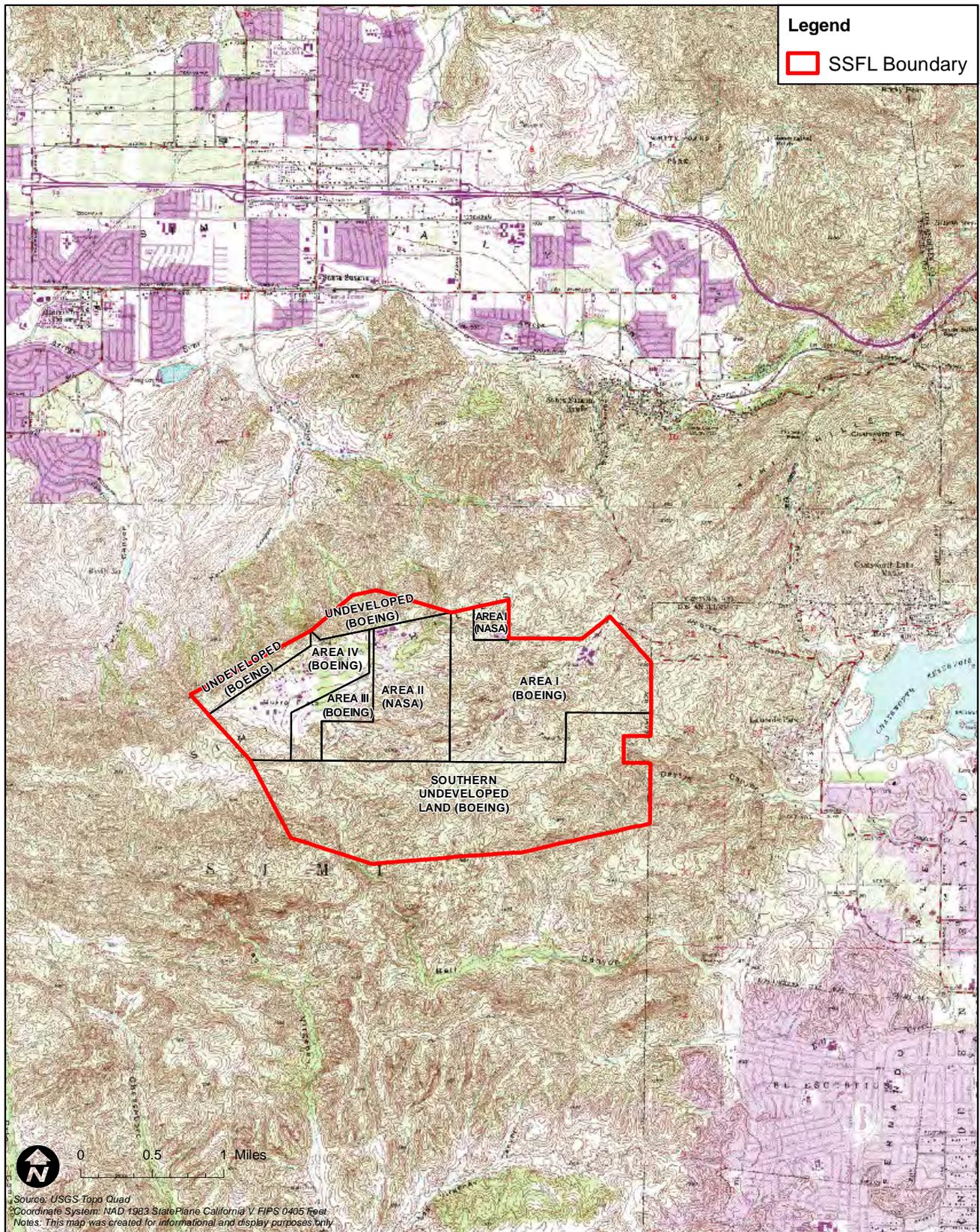
Santa Susana is owned by Boeing and the federal government (under the administration of the National Aeronautics and Space Administration [NASA]), and has been divided into four administrative areas that include Areas I through IV, and two undeveloped areas known as the Northern Undeveloped Land (also known as the Northern Buffer Zone) and the Southern Undeveloped Land. Currently, the three responsible parties at Santa Susana include Boeing, NASA, and the Department of Energy (DOE). Administrative Areas I and III are operated by Boeing, which owns the majority of Area I and all of Area III. A portion of Area I (40 acres) and all of Area II are owned by the federal government, and administered by NASA. The land within Area IV is owned by Boeing, and was formerly operated by Boeing for DOE. The Northern and Southern Undeveloped Lands of Santa Susana are owned by Boeing and were not used for industrial activities.

1.1 BIOLOGICAL SURVEY COMPILATION

Padre Associates, Inc. (Padre) Biologists were retained to conduct pre-activity biological surveys and part-time to full-time biological monitoring at Santa Susana dating back initially to 1999, with the most pronounced presence at Santa Susana 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 of hydroseeded versus relatively natural areas in regards to pollinator habitat (in conjunction with Pollinator Partnership, a San Francisco-based non-profit conservationist organization). Padre Biologists have logged approximately 3,600 field hours at Santa Susana to date. Other biological surveys have also been performed by volunteer members of the San Fernando Audubon Society and Southern California Herpetological Society.

1.2 REPORT PURPOSE

The purpose of this Study is to document biological resources that are known, or have the potential to occur at Santa Susana and more specifically, within Areas I and III, and portions of the Southern Undeveloped Land (Study Area). The Study relies heavily on past survey data compiled by Padre Biologists at Santa Susana, and may also contain some sighting information within the adjacent administrative areas or undeveloped lands, where noted. Separate reports prepared by other professional biological firms exist for Santa Susana (e.g., in adjacent Areas II and IV) and can provide relevant data of biological resources that may also be expected to occur.



2.0 STUDY METHODOLOGY

Biological resources of Santa Susana 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 17 years (however, more frequently during the last 12 years) 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 survey 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 Santa Susana from 2005 through February 2016 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 provided 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, 2016);
- Final Environmental Impact Statement (FEIS), Proposed Demolition and Environmental Cleanup Activities at Santa Susana Field Laboratory (SSFL), Ventura County, California (National Aeronautics & Space Administration, March 2014);
- 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 assessed by aerial photography analysis, review of catalogued survey data, and ground-truthing. Plant communities were characterized according to the California Vegetation Classification and Mapping Program's list of vegetation alliances (CDFG [now CDFW], 2010). A comprehensive vegetation map of the entire property does not currently exist, but is being developed by others.

3.0 ENVIRONMENTAL SETTING

Santa Susana is located in southeastern Ventura County, near the crest of the Simi Hills at the western border of the San Fernando Valley. Santa Susana 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. Santa Susana includes approximately 2,850 acres of land, of which a majority is undeveloped. Santa Susana is divided into four administrative areas (Areas I through IV), in addition to three (3) undeveloped portions (two to the north, and one to the south). The property boundaries are shown on Figure 1.

Santa Susana is composed of 17 sub-watersheds. 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. Physical site features including drainages and surface water ponds are provided in Appendix A (MWH Figure 2).

Santa Susana is predominantly composed of open space supporting chaparral, coastal sage scrub, riparian woodland and thickets, oak woodland, annual and perennial grasslands, and ephemeral streambeds, along with a smaller fraction of the property supporting historically developed areas consisting of paved and unpaved roads, and numerous intact or recently decommissioned former test facility areas. The geology at Santa Susana consists mainly of shallow alluvium underlain by bedrock of sandstone and siltstone. The depth of alluvium varies with location throughout Santa Susana, with substantial portions exhibiting large sandstone outcrops.

4.0 DESCRIPTION OF BIOLOGICAL RESOURCES

4.1 VEGETATION

Vegetation throughout Santa Susana is composed of various coastal sage scrub and chaparral plant communities, oak woodland, mulefat scrub, and annual grassland or other disturbed areas. Portions of the property 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 property have recently undergone demolition and interim reclamation (restoration) activities including hydroseeding, and in some locations, replanting with native species.

Where present, native vegetation types at Santa Susana are predominantly composed of (in descending order) yerba santa (*Eriodictyon crassifolium*) scrub, deerweed (*Acemisson 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 Santa Susana, and many areas exhibit 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 Santa Susana, with trees and shrubs exhibiting regeneration from individual stumps and shrubby vegetation recolonizing in dense thickets. However, drought conditions in the last four years (2012 through 2015) have resulted in substantial senescence of perennial vegetation, as noted by substantial dieoff, low amounts of new vegetation and a very short blooming seasons during this time period.

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 are present at Santa Susana. Non-native species include summer mustard (*Hirschfeldia incana*), Italian thistle (*Carduus pycnocephalus*), tree tobacco (*Nicotiana glauca*), totalote (*Centaurea melatensis*), redstem filaree (*Erodium circuitarium*), 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.

A substantial portion of Santa Susana is composed of bare to partially vegetated sandstone outcrops. Vegetation growing on a thin veneer of soil or in the cracks of these 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 Callifornia 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.

A total of 284 vascular plant species have been observed by Padre Biologists at Santa Susana, including 214 native species. This list is likely not an exhaustive flora of all the species present at Santa Susana as additional species may be expected to occur. Potential and known occurrences of special-status plant species are discussed further in Section 6 below.

Plant communities and other landcover types observed at Santa Susana are provided in Table 1 below:

Table 1. Plant Communities and Other Landcovers

Code	Description	Rarity Ranking	Comments
DEV	Developed Areas	N/A	Includes paved and unpaved roads, former or existing building footprints, tarped areas, other concrete structures, etc.
DWS	Deerweed Scrub	G5S5	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*	*Species within Santa Susana 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	Codominants commonly include wildoats (<i>Avena</i> sp.).
CBC	Chamise-Black Sage Chaparral	G5S5	Common south-facing slope vegetation type at Santa Susana.
CLOU	Coast Live Oak Woodland (Upland)	G5S4	May include individual trees.
LSS	Laurel Sumac Scrub	G4S4	Frequently intergrades with other chaparral and scrub types.
CLOR	Coast Live Oak Woodland (Riparian)	G4S4	Includes vegetation otherwise known as Coast Live Oak Riparian Forest where sufficient cover is present to categorize it as forest. May include individual trees.
SAST	Sandstone Vegetation	Varies	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	Ruderal vegetation composed mainly of non-native summer mustard, tocalote, redstem filaree, yellow sweet clover and slender wild oats.
CBS	Coyote Brush Scrub	G5S5	Substantial portions of this type are in restored areas from replanting activities as part of interim erosion control BMPs.
MFT	Mulefat Thicket	G5S4	Substantial portions of this type are in restored areas from replanting activities as part of interim erosion control BMPs.
AWT	Arroyo Willow Thicket	G4S4	Found mainly in riparian corridors.
BMC	Birch-leaf Mountain Mahogany Chaparral	G5S4	Found mainly on north-facing slopes or mesic sites.
GCC	Greenbark Ceanothus Chaparral	G4S4	Found mainly on north-facing slopes or mesic sites.
BMS	Bush Mallow Scrub	G4S4	Found mainly on north-facing slopes or mesic sites.
HLC	Holly-leaf Cherry Chaparral	G3S3	Found mainly on north-facing slopes or mesic sites.
BARE/OW	Bare ground or open water	N/A	Open water was absent during Fall 2013 surveys.
CBM	California Bulrush Marsh	G5S4?	Limited to margins of Silvernale Pond.
CSS	California Sagebrush Scrub	G5S5	Small, recolonized patches of marginal quality.
BSS	Black Sage Scrub	G4S4	Commonly observed in other areas throughout Santa Susana.
EUC	Eucalyptus Windrows or Semi-Natural Stands	Unranked	Blue gum (<i>Eucalyptus globulus</i>) composes the dominant species for this vegetation type.
CWW	California Walnut Woodland	G2S2.1	Occurs in association with annual grassland, mesic chaparral, coastal sage scrub, oak woodland, and riparian vegetation.

4.2 WILDLIFE

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

4.2.1 Habitat

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

Fish. Habitat for fish, including perennial surface flows or remnant pools, is mostly absent at Santa Susana. Several stormwater management ponds are typically dry, but may contain water for limited periods of time, particularly in wetter years. Silvernale Pond may be most likely to routinely contain surface water. Observations of fish species within these ponds according to surveys in previous years are limited to non-native mosquitofish (*Gambusia affinis*). The nearest creek drainage that is known to support fish is likely Arroyo Simi (located approximately 3 miles downstream of Santa Susana), 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 Santa Susana 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 Santa Susana), but is unlikely to occur onsite due to a lack of suitable habitat.

Western spadefoot (*Spea hammondi*, a California species of special concern) was discovered in recent years at Santa Susana, breeding in a former detention basin at CTL-III, and in a seasonally wet depression in the Bowl area, both within Area I. Moderately suitable dispersal habitat is present in the vicinity of CTL-III and several seasonal ponds or swales at CTL-III, which may provide suitable breeding habitat in wetter years with sufficient ponding

duration. Western spadefoot may have a moderate potential to occur elsewhere throughout Santa Susana.

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 Santa Susana. Reptiles commonly observed at Santa Susana include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), coastal western whiptail (*Aspidoscleis tigris stegnegeri*, a CDFW special animal), striped racer (or chaparral whipsnake [Stebbins, 2003], *Masticophis lateralis lateralis*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Other species occasionally observed at Santa Susana 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*), western skink (*Plestiodon skiltonianus*), and common garter snake (*Thamnophis sirtalis*). California 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, 125 bird species have been observed during the field surveys and past surveys at Santa Susana 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 Santa Susana.

The U.S. Fish and Wildlife Service (USFWS) administers 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.

One-hundred twenty-two (122) of the 125 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 Santa Susana. 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-I in Area I, with numerous other potentially suitable nesting and perching sites present throughout Santa Susana, 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 Santa Susana 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:

- Multiple cougar (*Puma concolor*) sightings via camera stations set up at two (2) wildlife watering stations located in the western portion of the Southern Undeveloped Land;
- A cougar sighting in NASA/Area II on April 5, 2010;
- Cougar tracks observed near monitoring well PZ-003 (Boeing Area I) on May 26, 2010; and,
- Several bobcat (*Lynx rufus*) and cougar sightings reported by work crew personnel in 2008 and 2009 at various locations throughout Santa Susana and Sage Ranch Park,

Suitable habitat for a variety of bat species is present at Santa Susana, 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. Species detected during surveys conducted between April and August 2014 included Yuma myotis (*Myotis yumanensis*), California myotis (*M. californicus*), western small-footed myotis (*M. ciliolabrum*), silver-haired bat (*Lasionycteris noctivagans*), canyon bat (*Parastrellus hesperus*), big brown bat (*Eptesicus fuscus*), western red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), Townsend's big-eared bat (*Corynorhinus townsendii*), pallid bat (*Antrozous pallidus*), Mexican free-tailed bat (*Tadarida brasiliensis*), and greater bonneted bat (*Eumops perotis*) (Forde, 2014a).

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 Santa Susana. 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 Santa Susana.

Additionally, there may be other types of vernal pools present within the Santa Susana (Padre, 2010b), but a comprehensive focused survey for vernal pools has not been conducted to date. Several earthen swales or depression areas are present within Santa Susana including within Canyon, Bowl, and CTL-III, but they may not be expected to hold water for sufficient duration to support vernal pool species. Four ponds (R-1, Perimeter, Silvernale and the Biofilter Sedimentation Basin) are maintained for surface water management 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 Santa Susana. 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 Santa Susana. 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*).

A species of shoulderband snail (*Helminthoglypta traskii*) was also observed at Santa Susana in 2016 by Herpetological Society members. Several subspecies in this genus are considered special-status, but it has not yet been determined whether the individual found onsite was a special-status species.

4.2.2 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 Santa Susana 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 Santa Susana 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. Santa Susana is located within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage. Developed portions of Santa Susana exhibit some barriers to wildlife movement such as fencing or other structures, and large, exposed asphalt areas absent of suitable cover. Therefore, wildlife movement is likely focused mainly in undeveloped portions of Santa Susana or adjacent properties.

4.3 LEVEL OF DISTURBANCE

The level of disturbance at Santa Susana varies from none to high based on historical and current disturbances of the 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 Santa Susana 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.

5.0 IMPORTANT BIOLOGICAL RESOURCES

Special-status plants observed within the Study Area included Santa Susana tarplant (*Deinandra minthornii*, a state rare plant and California Native Plant Society [CNPS] California Rare Plant Rank [CRPR] 1B.2 species), Plummer's mariposa lily (*Calochortus plummerae*, a CRPR 4.2 species), Catalina mariposa lily (*Calochortus catalinae*, a CRPR 4.2 species), ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*, a CRPR 4.2 species), coast live oak (*Quercus agrifolia*), scrub oak (*Quercus berberidifolia*), and western sycamore (*Platanus racemosa*), three species covered under the Ventura County Oak Tree Protection Ordinance.

Special-status wildlife species observed during field surveys by Padre included Cooper's hawk (*Accipiter cooperi*, a CDFW Watch List species), southern California rufous-crowned

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.

sparrow (*Aimophila ruficeps* ssp. *canescens*, a CDFW Watch List species), white-tailed kite (*Elanus caeruleus*, 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), California legless lizard (*Anniella 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), San Bernardino ring-neck snake (*Diadophis punctatus* ssp. *modustus*, a U.S. Forest Service sensitive species), and western spadefoot (*Spea hammondi*, a CDFW species of special concern). Special-status plant and wildlife sighting locations at Santa Susana are presented in Appendix B. Habitats for additional special-status plants and wildlife species are present at Santa Susana, and are described below. Additional bird sightings by others (e.g., San Fernando Audubon Society) are also documented in Appendix D.

5.1 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 the California Environmental Quality Act (CEQA). All other (non-listed) special-status species are also given consideration under CEQA.

Special-status plant species are defined in Table 2. The literature search and field surveys conducted for this Study indicates that 28 special-status plant species have the potential to occur in the project region. Table 3 lists these species, their current status, and the nearest known location relative to the Study Area.

Table 2. Definitions of Special-Status Plant Species

Special-Status Plant Species
<ul style="list-style-type: none"> ➤ 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 (Rare Plant Ranks 1B and 2 in CNPS, 2001). ➤ Plants listed by CNPS as plants about which we need more information and plants of limited distribution (Rare Plant Ranks 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, April 2015 Quarterly publication). ➤ Trees protected under Ventura County Ordinance no. 4092 (Zoning Ordinance Section 8107-25).

Table 3. 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, CRPR 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, CRPR 1B.1	Ahmanson Ranch, 4.5 miles to the south
Spreading navarretia	<i>Navarretia fossalis</i>	Vernal pools	FT, CRPR 1B.1	Ventura County, unspecified
Round-leaved filaree	<i>Erodium</i> (= <i>California</i>) <i>macrophyllum</i>	Valley and foothill grassland	CRPR 1B.1	Vicinity of Reagan Library, 9 miles to the west
Santa Susana tarplant	<i>Deinandra minthornii</i>	Chaparral, coastal scrub	SR, CRPR 1B.2	Onsite at numerous locations.
Southern California black walnut	<i>Juglans californica</i> var. <i>californica</i>	Riparian corridors, mesic hillsides	CRPR 4.2	Various locations throughout Santa Susana
Lyon's pentachaeta	<i>Pentachaeta lyonii</i>	Chaparral, valley and foothill grassland	SE, FE, CRPR 1B.1	North of Wood Ranch Reservoir, 7 miles to the west
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.
Western sycamore	<i>Platanus racemosa</i>	Riparian corridors, mesic hillsides	TPO	Onsite at limited locations
Chaparral nolina	<i>Nolina cismontane</i>	Chaparral, coastal scrub	CRPR 1B.2	Palo Comado Canyon, 4 miles to the southwest

Table 3. Continued

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Dune larkspur	<i>Delphinium parryi</i> ssp. <i>blochmaniae</i>	Chaparral, coastal dunes	CRPR 1B.2	Lake Eleanor, 11 miles to the southwest
Conejo buckwheat	<i>Eriogonum crocatum</i>	Chaparral, coastal scrub, valley and foothill grassland	CRPR 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, CRPR 1B.2	Norwegian Grade, 10 miles to the west
Many-stemmed dudleya	<i>Dudleya multicaulis</i>	Chaparral, coastal scrub, valley and foothill grassland	CRPR 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, CRPR 1B.2	Cornell Corners, 7 miles to the southwest
Marcescent dudleya	<i>Dudleya cymosa</i> ssp. <i>marcescens</i>	Chaparral	FT, SR, CRPR 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	CRPR 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, CRPR 1B.1	Southern portion of Area IV
Ocellated Humboldt lily	<i>Lilium humboldtii</i> ssp. <i>ocellatum</i>	Oak canyons	CRPR 4.2	Tributaries to Northern Drainage, and Bell Canyon, (Padre obs. 2009 et seq.).
Slender mariposa lily	<i>Calochortus clavatus</i> var. <i>gracilis</i>	Chaparral, coastal scrub	CRPR 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, grassland	CRPR 4.2	Southern Undeveloped Land (Padre obs., 2014)
Plummer's mariposa lily	<i>Calochortus plummerae</i>	Chaparral	CRPR 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, CRPR 1B.1	Thousand Oaks, 8 miles to the southwest
Malibu baccharis	<i>Baccharis malibuensis</i>	Chaparral, coastal scrub	CRPR 1B.1	Southern portion of Area IV

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
 CRPR 1B Plants considered rare or endangered in California and elsewhere (CNPS, 2001)
 CRPR 2 Plants considered rare or endangered in California, more common elsewhere (CNPS, 2001)
 CRPR 3 Plants for which more information is needed, review list (CNPS, 2001)
 CRPR 4 Limited distribution, watch list (CNPS, 2001)
 TPO Ventura County Tree Protection Ordinance

5.1.1 Braunton's Milkvetch

Braunton's milkvetch (*Astragalus brauntonii*) is a federally endangered species known to occur in limited distribution at Santa Susana, 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 Santa Susana and Sage Ranch Park. These surveys have resulted in no observations of Braunton's milkvetch within the Study Area.

The nearest known population of this species at Santa Susana is within or directly adjacent to USFWS-designated Critical Habitat Unit 1d in the southern portion of Area IV. A small portion of Critical Habitat Unit 2f is also located at the southeast corner of the Southern Undeveloped Land, 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.

5.1.2 Santa Susana Tarplant

Santa Susana tarplant (*Deinandra minthornii*) is categorized as a State rare species by CDFW that commonly occurs throughout Santa Susana 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). 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 Santa Susana (Padre, 2010). This total estimate of approximately 12,000 individuals Santa Susana-wide was roughly consistent with data compiled by others in NASA Area I, Area II, and Area IV. NASA (2010) estimated 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) estimated that Area IV and the Northern Undeveloped Lands support roughly 850 individuals.

More recent observations in 2013 of Santa Susana tarplant throughout Santa Susana 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.

A comprehensive survey of Area III was conducted by Padre in summer 2014, resulting in the tally and mapping of no less than 1,183 individuals. The vast majority of Santa Susana tarplant individuals are located in sandstone rock outcrop areas (Padre, 2014). A

comprehensive survey of Canyon in Area I was conducted by Padre in summer 2015, resulting in the tally and mapping of no less than 2,922 individuals (Padre, 2015). 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.

5.1.3 Ocellated Humboldt Lily

Ocellated Humboldt lily is a CRPR 4.2 species that occurs in canyon bottoms. Dating back to 2009, observations of ocellated Humboldt lily at Santa Susana 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). Ocellated Humboldt lily was observed sprouting at the Northern Drainage location in 2016.

5.1.4 Plummer's Mariposa Lily

Plummer's mariposa lily (*Calochortus plummerae*) is a CRPR 4.2 (downgraded from 1B.2) species that typically occurs in chaparral. Past biological surveys at Santa Susana and Sage Ranch Park resulted in observations of Plummer's mariposa lily at multiple locations including at or near B-1, former Shooting Range, CTL-I Hilltop, the northern portion of Area III, and in the southwest portion of the Southern Undeveloped Land. Plummer's mariposa lily has also been observed in other areas at Santa Susana, 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 including Catalina mariposa lily (*C. catalinae*, a CRPR 4.2 species) have been observed in the Southern Undeveloped Land (roughly 3,000 individuals according to a Padre, 2014 survey), and other species may be expected to occur, as indicated by CNDDDB records, including slender mariposa lily (*Calochortus clavatus* var. *gracilis*, a CRPR 1B.2 species).

5.1.5 Oak Species

Coast live oak (*Quercus agrifolia*) commonly occurs, and scrub oak (*Quercus berberidifolia*) less commonly occurs throughout Santa Susana, mainly either as individual trees in and around bedrock outcrops or as woodlands or forests along creek drainages and north-facing slopes. 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 Santa Susana; particularly in Bell Canyon upstream of Outfall 002. The Ordinance protects additional tree species within Scenic Resource and Scenic Highway Overlay Zones, but Santa Susana is outside these zones.

Valley oak (*Quercus lobata*) is historically known to occur in low concentrations at Santa Susana, 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 Santa Susana, but could potentially be discovered upon more intensive survey.

5.1.6 Southern California Black Walnut

Southern California black walnut (*Juglans californica*), a CRPR 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 Santa Susana.

5.1.7 Malibu Baccharis

Malibu baccharis (*Baccharis malibuensis*), a CRPR 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 could potentially occur in other parts of Santa Susana due to the abundance of chaparral and coastal scrub habitats.

5.1.8 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 (*California macrophylla*), Lyon's pentachaeta (*Pentachaeta lyonii*), chaparral nolina (*Nolina cismontana*), dune larkspur (*Delphinium parryi* ssp. *blochmaniae*), Conejo buckwheat (*Eriogonum crocatum*), crowned forget-me-not (*Cryptantha corollata*), tiny poppy (*Meconella denticulata*), and Trask yerba santa (*Eriodictyon traskiae*), may all have the potential to occur at Santa Susana.

Certain special-status dudleya species including many-stemmed dudleya (*Dudleya multicaulis*), Agoura Hills dudleya (*Dudleya cymosa* ssp. *agourensis*), Marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*), and Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*) may also have the potential to occur at Santa Susana, especially on sedimentary rock outcrops where the non-special-status lanced-leaved dudleya (*Dudleya lanceolata*) is commonly observed.

Conejo dudleya (*Dudleya parva*), is unlikely to occur at Santa Susana 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, may have the small potential to occur due to limited suitable vernal pool habitat, but have not been observed to date at Santa Susana.

5.2 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 1 above provides a list of the predominant vegetation alliances present at Santa Susana. Holly-leaf cherry chaparral 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 at Santa Susana 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. Vegetation alliances at Santa Susana that are ranked G1 and G2, or S1 and S2 (critically imperiled or imperiled) include, but may not be limited to California walnut woodland. All other unranked vegetation types in Table 1 are not considered sensitive.

5.3 SPECIAL-STATUS WILDLIFE SPECIES

Special-status wildlife species are defined in Table 4. The potential for these species to occur in the project area was determined by completion of various biological surveys throughout Santa Susana, and review of sight records from other environmental documents and range maps including Zeiner et al. (1988, 1990a, 1990b). Table 5 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 4. Definitions of Special-Status Wildlife Species

Special-Status Wildlife Species
<ul style="list-style-type: none"> ➤ 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 2016).

Table 5. 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, 2016)
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, 2016)
Arroyo toad	<i>Anaxyrus californicus</i>	Semi-arid regions near intermittent streams	FE, CSC	Chatsworth Creek, 4 miles to the east (historical sighting, NDDDB, 2016)
Western spadefoot	<i>Spea hammondi</i>	Vernal pools	CSC	Onsite at CTL-III detention basin, and Bowl (Padre obs., 2010 and 2014)
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				
California legless lizard	<i>Anniella pulchra</i>	Woodlands under leaf litter	CSC	Onsite at several locations in the Northern Drainage, and near CTL-I (Padre obs., 2008, 2009, 2010), and SUL (Herp Society, 2016).
Pacific pond turtle	<i>Actinemys marmorata</i>	Stream pools, vegetated ponds	USFSS, CSC	Box Canyon, 1.3 miles to the northeast (NDDDB, 2016)

Table 5. 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., 2005-2015)
Coast horned lizard	<i>Phrynosoma blainvillii</i>	Scrubland, grassland, or woodlands	CSC	Various locations onsite (Padre obs., 2008-2014)
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), SUL (Herp Society, 2016).
Coast patch-nosed snake	<i>Salvadora hexilepis</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 (NDDB, 2016)
Southwestern willow flycatcher	<i>Empidonax trailii 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 (NDDB, 2016)
White-tailed kite	<i>Elanus caerulus</i>	Grasslands, meadows, farmlands	FP	Various locations throughout Santa Susana (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 onsite (Padre obs. 2012)
Golden eagle	<i>Aquila chrysaetos</i>	Rolling foothill mountain areas	FP, WL (nesting & wintering), BEPA	Rarely observed onsite in the Northern Undeveloped Land, 0.1 miles northwest of B204 in Area III (Padre obs. 2013 and 2014)
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 onsite (Padre obs. 2008-2012)

Table 5. Continued

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Coastal California gnatcatcher	<i>Polioptila californica</i> ssp. <i>californica</i>	Coastal sage scrub	FT, CSC	Onsite (unspecified location) (USFWS, 2010). North end of Las Virgenes Road, 5 miles to the south; Little Simi Valley, 6.5 miles to the northwest (NDDB, 2016). Note: Absent during Area I & III 2014 protocol surveys (Forde, 2014).
Tri-colored blackbird	<i>Agelaius tricolor</i>	Cattail and bulrush thickets, open water	CSC	Chatsworth Reservoir, 2 miles to the east (NDDB, 2016)
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 Santa Susana (Padre obs., 2008-2014)
Bank swallow	<i>Riparia riparia</i>	Vertical streambanks	ST (nesting)	Simi Valley, 4 miles to the northwest (NDDB, 2016)
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 (NDDB, 2016)
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	Onsite (Forde, 2014)
Western small-footed myotis	<i>Myotis ciliolabrum</i>	Roosting: Crevices in cliff faces, caves, buildings, etc. Foraging: Woodlands, water sources	WBWG	Onsite (Forde, 2014)
Pallid bat	<i>Antrozous pallidus</i>	Roosting: Crevices in cliff faces, caves, buildings, etc. Foraging: Woodlands, coastal scrub, grasslands, chaparral	CSC	Onsite (Forde, 2014)
Western red bat	<i>Lasiurus blossevillii</i>	Roosting: trees along edge habitats. Foraging: Woodlands, coastal scrub, grasslands, chaparral	CSC	Onsite (Forde, 2014)

Table 6. Continued

Common Name	Scientific Name	Habitat	Status	Nearest Known Location
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Roosting: Crevices in cliff faces, caves, buildings, etc. Foraging: Woodlands, coastal scrub, grasslands, chaparral	SC, CSC	Onsite (Forde, 2014)
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, 2016)
San Diego desert woodrat	<i>Neotoma lepida ssp. intermedia</i>	Chaparral and other habitats, building houses at base of tree or cliffs	CSC	Immediately adjacent to IEL, likely numerous other locations at Santa Susana (Padre, 2013)
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, 2016)
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, 2016)

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)
SC	State Endangered Species Act Candidate (CDFW)
USBC	U.S. Bird Conservation Watch List
WBWG	Western Bat Watch Group List
USFSS	Sensitive (U.S. Forest Service)

5.3.1 Fish

Habitat for fish, including perennial surface flows or remnant pools, is mostly absent at Santa Susana. Several stormwater management ponds are typically dry, but may contain water for limited periods of time, particularly in wetter years. The nearest creek drainage that is known to support special-status fish is likely Arroyo Simi (located approximately 3 miles downstream of Santa Susana), which is known to support arroyo chub.

5.3.2 Amphibians

Overall habitat quality for California red-legged frog (*Rana draytonii*, a federally threatened species and California species of special concern) is low at Santa Susana due to the lack of abundant 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 Santa Susana resulting in no observations of California red-legged frog (including at least one nighttime aquatic survey, but not any protocol-level surveys). California red-legged frog has been observed in Las Virgenes Creek (NDDDB, 2016) 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 directly abuts the western portion of the Southern Undeveloped Land and southwestern corner of Area IV. 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.

Habitat quality for coast range newt (*Taricha torosa torosa*, a California species of special concern) is low from Santa Susana 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 Santa Susana, including the observation of two-striped garter snake at this same location, and no western spadefoots have been observed subsequent to the 2010 sightings at this location. The CTL-III sighting location now consists of several earthen swales (constructed following the removal of the detention basin) that are considered to likely provide suitable breeding habitat in wetter years based on observations of persistent ponded water during the winter months. Sufficient dispersal habitat is also present adjacent to these swales.

In spring 2014, several eggmasses releasing approximately 40 western spadefoot tadpoles were discovered in a fabric-lined, wetted depression in the Bowl area of Area I. One sub-adult and one juvenile two-striped garter snake were also observed simultaneously in this depression. The tadpoles were periodically monitored to document their metamorphosis, which never occurred prior to the depression drying up. But the presence of eggmasses and tadpoles was an indication that breeding adults are still present onsite.

Arroyo toad (*Anaxyrus californicus*, a federally endangered species and California species of special concern) has historically been documented in Chatsworth Creek below Chatsworth Reservoir (NDDB, 2016). However, suitable habitat for arroyo toad (large, widespread, intermittent streambeds with sandbars) is absent from Santa Susana and Sage Ranch Park, and geographic or manmade barriers exist between Santa Susana and Chatsworth Reservoir. Therefore, arroyo toad is not expected to occur at Santa Susana.

5.3.3 Reptiles

Habitat quality for special-status reptiles is moderate to high at the 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 Santa Susana and Sage Ranch Park.

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 Santa Susana, including at the Northern Drainage (Padre obs. 2010), Area II Landfill and in Area IV (Padre obs. 2004), and more recently by Southern California Herpetological Society members in the Southern Undeveloped Land in 2016.

California legless lizard (*Anniella 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, in an upland oak woodland immediately south of CTL-I (Padre obs., 2008, 2009, and 2010), and more recently by Southern California Herpetological Society members in the Southern Undeveloped Land in 2016. Therefore, California legless lizard may be expected to occur in areas of suitable habitat (typically moist soils beneath oak tree duff).

Coast patch-nosed snake (*Salvadora hexilepis* ssp. *virgultea*, a California species of special concern) was recently observed on two (2) occasions at Santa Susana, 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 in areas of suitable scrubland habitat.

No sight records for Pacific pond turtle (*Actinemys marmorata*, a California species of special concern) exist at Santa Susana, including from numerous surveys conducted by Padre Biologists at any of the aquatic habitats (streams, pools, and vegetated ponds) in recent years. The nearest sight record is in Box Canyon, approximately 1.3 miles to the northeast (NDDB, 2016), with substantial geographic or manmade barriers existing between this location and Santa Susana. Although this species is known to migrate over upland areas to adjacent aquatic habitats, the lack of sight records onsite, difficult terrain, and substantial distances from suitable habitats in the region, Pacific pond turtle is not expected to occur at Santa Susana.

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 Santa Susana, including 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. One sub-adult and one juvenile were observed in a wetted depression in Bowl in March 2014. Please refer to Appendix A for locations of each of these locations described above. Two-striped garter snake is known to utilize upland habitats and burrows, and can travel substantial distances between aquatic habitats. Therefore, two-striped garter snake may have a moderate likelihood to occur at a variety of locations within Santa Susana, especially during wetter months when surface waters are present or recently present.

5.3.4 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 at Santa Susana. Several special-status raptors (birds-of-prey) have been observed during field surveys. Cooper's hawk (*Accipiter cooperii*, a California watch list species protected while nesting), was observed nesting in Area II 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 Santa Susana. 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 Santa Susana.

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 Areas II, III and IV in 2013 and 14, 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, 2016); therefore, golden eagle may be expected to forage, and has a low likelihood to nest within the main administrative areas or Southern Undeveloped Land, based on the presence of nearby rocky cliffs or ledges.

Other special-status chaparral-dependent species observed at various locations throughout Santa Susana 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. Bell's sparrow (*Artemisiospiza belli*, a California watch list species) has been recorded at Santa Susana by members of the San Fernando Audubon Society (see Appendix D). Due to the prevalence of chaparral habitats and known sight records within 7 miles, Bell's sage sparrow may be expected to forage or nest at Santa Susana.

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 Santa Susana.

No gnatcatcher observations have been recorded by Padre Biologists during past opportunistic surveys in recent years. In addition, California gnatcatcher was not detected during USFWS-protocol level surveys performed in 2014 throughout Areas I and III, and portions of the Southern Undeveloped Land (Forde, 2014)

Of particular note, however, is sighting information at Santa Susana 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 (NDDDB, 2016). In addition, coastal California gnatcatcher was 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 Santa Susana.

Special-status species dependent on riparian habitats that have been observed at Santa Susana 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 of Santa Susana. 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.

Willow riparian-dependent species such as least Bell's vireo (*Vireo belli* ssp. *pusillus*, a federal and California endangered species), southwestern willow flycatcher (*Empidonax trailii 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 Santa Susana, and may have a low likelihood to occur onsite. 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, 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 Santa Susana 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 Santa Susana including, but not limited to Anna's hummingbird (*Calypte anna*), cliff swallow (*Petrochelidon pyrrhonota*), mallard (*Anas platyrhynchos*), bushtit (*Psaltriparus 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*), great horned owl (*Bubo virginianus*), mallard (*Anas platyrhynchos*), hooded oriole (*Icterus cucullatus*), and phainopepla (*Phainopepla nitens*). 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 consecutive 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.

5.3.5 Mammals

Observations of special-status mammals during field surveys within the 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 IEL in Area I. 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 other areas within Santa Susana, particularly riparian corridors. 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 Santa Susana.

Forde (2014a) observed ample foraging and roosting habitat for bats, and detected five (5) special status bat species during acoustical surveys performed in 2014, including California mastiff bat (a California species of special concern), western small-footed myotis (a Western Bat Watch Group species), pallid bat (a California species of special concern), western red bat (a California species of special concern), and Townsend's big-eared bat (a state Candidate for listing as Threatened, and California species of special concern). Foraging habitat (woodlands and chaparral) and roosting habitat (cliff faces, caves, buildings, and to a lesser degree, tree hollows or other crevices) for California leaf-nosed bat (a California species of special concern

and Western Bat Watch Group species) is present at Santa Susana. Therefore, this bat species may also be expected to forage and roost at Santa Susana.

No California or federally threatened or endangered mammals are anticipated to occur at the Santa Susana.

5.3.6 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 Santa Susana (Padre, 2010b). As stated in the discussion above, earthen swales or depressional areas are present at Santa Susana, but many of them may not be expected to hold water for sufficient duration to support vernal pool species. In addition, man-made ponds (e.g., 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.

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 Santa Susana, but based on the absence site records (including no sightings during the 3-year pollinator study described above), and the absence of these host plants, Quino checkerspot is not anticipated to occur at Santa Susana.

6.0 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).

6.1 USACE JURISDICTION

A formal wetland delineation or jurisdictional determination has not been performed within the Study Area; however, based on numerous field surveys at Santa Susana by Padre Biologists trained to perform wetland delineations, potential USACE jurisdictional areas are anticipated to be present at locations that are within the OWHM 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.

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 OWHM width of the subject drainages is 6 feet. 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.

6.2 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 OWHM. CDFW jurisdictional areas are present where established streambeds or banks, and riparian woodland (oak or willow) corridors are present. 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.

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. 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.

6.3 COUNTY OF VENTURA WETLANDS

Some areas within Santa Susana 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.

7.0 REFERENCES

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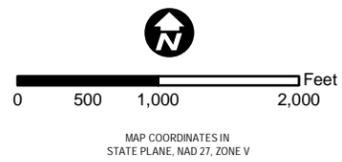
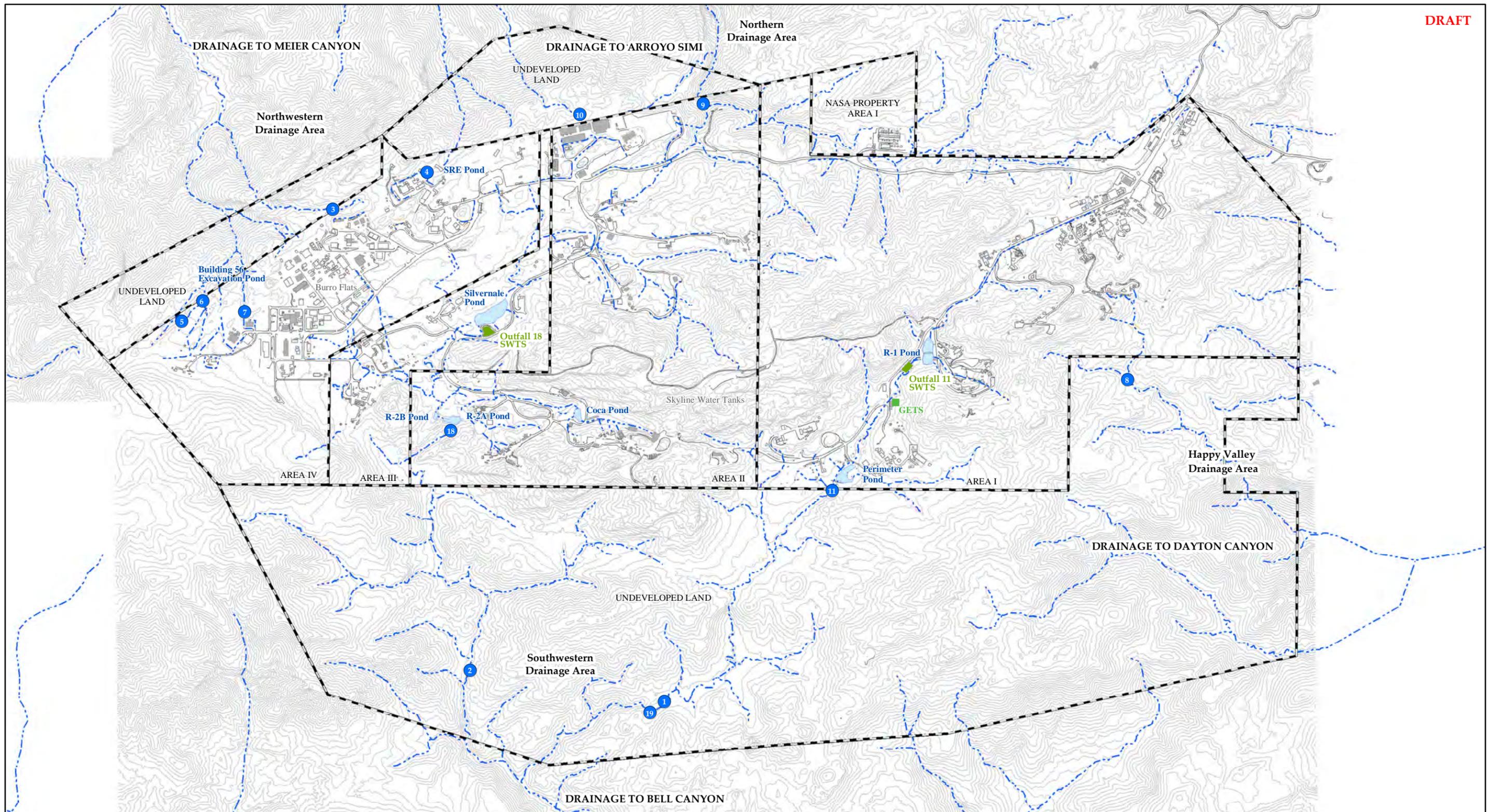
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APPENDIX A. SSFL SITE FEATURES



- Legend**
- Groundwater Extraction Treatment System (GETS)
 - Surface Water Treatment System (SWTS)
 - Surface Water Pond/Feature
 - NPDES Outfall

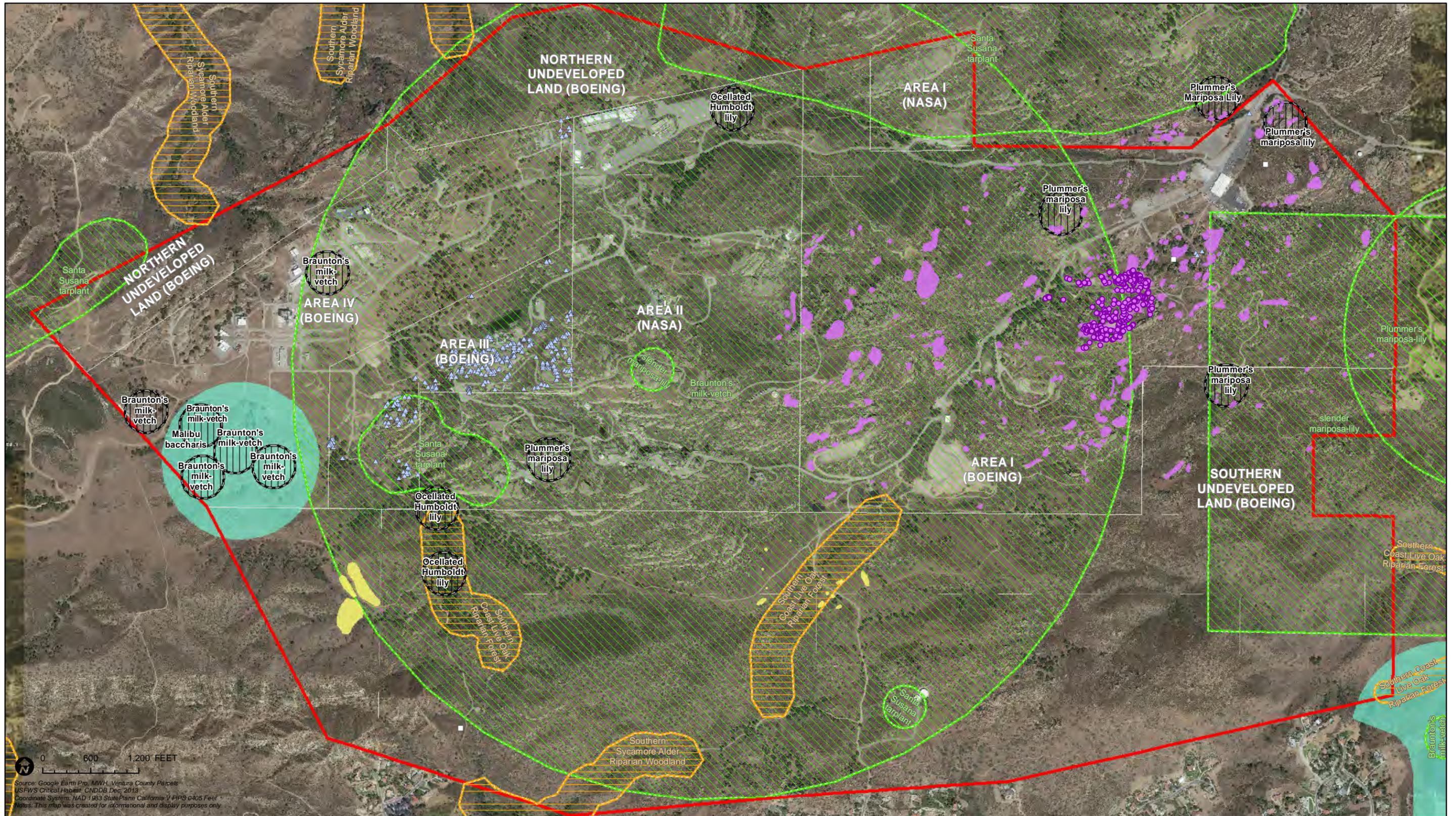
- Base Map Legend**
- SSFL Property Boundary
 - Administrative Area Boundary
 - Drainages (jurisdictional and non-jurisdictional)
 - A/C Curbing
 - Ground Elevation Contours (20 ft)
 - Structures (in place)

SSFL Site Features

Date: March 17, 2016
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APPENDIX B. SPECIAL-STATUS SPECIES MAPS



0 600 1,200 FEET
 Source: Google Earth Pro, MWH, Ventura County Parcels
 USFWS Critical Habitat, CNDDDB Dec, 2013
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
 Notes: This map was created for informational and display purposes only

- | | | |
|---|--|--------------------------|
| ▲ Santa Susana Tarplant Mapped Location (Padre, 2014) | ● Braunton's milk-vetch Critical Habitat | CNDDDB Occurrence |
| ● Santa Susana Tarplant Mapped Location (Padre, 2015) | ● Catalina Mariposa Lily (Padre, 2014) | □ Plant |
| □ Plummer's Mariposa Lily (Padre, 2014) | ○ Padre Observation | □ Community |
| ● Santa Susana Tarplant Mapped Location (Padre, 2010) | □ Project Area | |

SPECIAL-STATUS PLANT SPECIES MAP
FIGURE B-1

**APPENDIX C. VASCULAR PLANT FLORA OBSERVED WITHIN
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA**

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

Scientific Name	Common Name	Habit	Family	Invasiveness Rating
<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>	Sacapellote	PH	Asteraceae	
<i>Adenostoma fasciculatum</i>	Chamise	S	Rosaceae	
<i>Adiantum jordanii</i>	California maidenhair fern	PF	Pteridaceae	
<i>Aesculus californica</i>	California Buckeye	T	Sapindaceae	
<i>Ailanthus altissima</i> *	Tree of heaven	T	Simaroubaceae	Moderate
<i>Allophyllum glutinosum</i>	Stinky gilia, false gilyflower	AH	Polemoniaceae	
<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>Artemisia dranunculus</i>	Wild tarragon	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	Moderate
<i>Avena fatua</i> *	Wild oats	AG	Poaceae	Moderate
<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>Boechera sparsiflora</i>	Rock cress	PH	Brassicaceae	
<i>Brassica nigra</i> *	Black mustard	AH	Brassicaceae	Moderate
<i>Brickellia californica</i>	California brickellbush	S	Asteraceae	
<i>Bromus carinatus</i>	California brome	PG	Poaceae	
<i>Bromus diandrus</i> *	Ripgut grass	AG	Poaceae	Moderate
<i>Bromus hordeaceus</i> *	Soft chess	AG	Poaceae	Limited
<i>Bromus madritensis</i> ssp. <i>rubens</i> *	Red brome	AG	Poaceae	High
<i>Bromus tectorum</i> *	Cheat grass	AG	Poaceae	Limited
<i>Calandrinia ciliata</i>	Red maids	AH	Montiaceae	
<i>Calochortus catalinae</i>	Catalina mariposa lily	PH	Liliaceae	
<i>Calochortus clavatus</i> var. <i>pallidus</i>	Yellow mariposa lily	AH	Liliaceae	
<i>Calochortus plummerae</i>	Plummer's mariposa lily	AH	Liliaceae	
<i>Calochortus splendens</i>	Splendid mariposa lily	PH	Liliaceae	
<i>Calystegia macrostegia</i> ssp. <i>cyclostegia</i>	Chaparral morning glory	PV	Convolvulaceae	
<i>Camissonia campestris</i>	Evening primrose	AH	Onagraceae	
<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	Moderate
<i>Carex praegracilis</i>	Clustered field sedge	PH	Cyperaceae	
<i>Carpobrotus edulis</i> *	Hottentot fig	PH	Aizoaceae	Moderate
<i>Carthamus tinctorius</i> *	Safflower	AH	Asteraceae	
<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>Centaurea calcitrapa</i> *	Purple starthistle	AH	Asteraceae	Moderate
<i>Centaurea melitensis</i> *	Tocalote	AH	Asteraceae	Moderate
<i>Cercocarpus betuloides</i> var. <i>betuloides</i>	Birch-leaf mountain mahogany	S	Rosaceae	
<i>Chenopodium album</i> *	Lamb's quarters	AH	Chenopodiaceae	
<i>Chenopodium californicum</i>	Soap plant	AH	Chenopodiaceae	
<i>Chlorogalum pomeridianum</i>	Soap plant	PH	Liliaceae	
<i>Chorizanthe staticoides</i>	Turkish rugging	AH	Polygonaceae	
<i>Cirsium occidentale</i>	Cobweb thistle	BH	Asteraceae	
<i>Cirsium vulgare</i> *	Bull thistle	AH	Asteraceae	Moderate
<i>Clarkia botatae</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	Montiaceae	
<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	

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

Scientific Name	Common Name	Habit	Family	Invasiveness Rating
<i>Corethrogyne filaginifolia</i>	California aster	PH	Asteraceae	
<i>Cortaderia seloana</i> *	Pampas grass	PG	Poaceae	High
<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 sp.</i>	Dodder	PV	Convolvulaceae	
<i>Cynodon dactylon</i> *	Bermuda grass	PG	Poaceae	Moderate
<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	Moderate
<i>Dodecatheon clevelandii ssp. clevelandii</i>	Shooting star	PH	Primulaceae	
<i>Drymocallis glandulosa</i>	Cinque-foil	PH	Rosaceae	
<i>Dryopteris arguta</i>	Wood fern	PF	Dryopteridaceae	
<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	
<i>Encelia farinosa</i>	Brittlebush	S	Asteraceae	
<i>Epilobium canum ssp. latifolium</i>	California fuschia	PH	Onagraceae	
<i>Eriastrum sapphirinum</i>	Eriastrum	AH	Polemoniaceae	
<i>Ericameria palmeri var. pachylepis</i>	Palmer's goldenbush	S	Asteraceae	
<i>Erigeron canadensis</i>	Horseweed	AH	Asteraceae	
<i>Erigeron foliosus var. foliosus</i>	Flea-bane	PH	Asteraceae	
<i>Eriodictyon crassifolium</i>	Yerba santa	S	Hydrophyllaceae	
<i>Eriogonum elongatum var. elongatum</i>	Wand buckwheat	S	Polygonaceae	
<i>Eriogonum fasciculatum var. fasciculatum</i>	California buckwheat	S	Polygonaceae	
<i>Eriogonum gracile var. gracile</i>	Slender buckwheat	AH	Polygonaceae	
<i>Eriogonum wrightii ssp. 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	Limited
<i>Erysimum capitatum var. capitatum</i>	Western wallflower	PH	Brassicaceae	
<i>Eschscholzia californica</i>	California poppy	AH	Papaveraceae	
<i>Eucalyptus globulus</i> *	Blue gum	T	Myrtaceae	Moderate
<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	Moderate
<i>Festuca microstachys</i>	Vulpia	AG	Poaceae	
<i>Festuca myuros</i> *	Rat-tail fescue	AG	Poaceae	Moderate
<i>Festuca perennis</i> *	Italian rye-grass	AG	Poaceae	
<i>Fraxinus sp.</i>	Ash	T	Oleacea	
<i>Galium angustifolium</i>	Bedstraw	PH	Rubiaceae	
<i>Galium aparine</i> *	Rubiaceae	AH	Rubiaceae	
<i>Geranium dissectum</i> *	Cutleaf geranium	AH	Geraniaceae	Limited
<i>Geranium molle</i> *	Wild geranium	AH	Geraniaceae	
<i>Gilia achilleifolia</i>	Gilia	AH	Polemoniaceae	
<i>Gnaphalium palustre</i>	Cud-weed	AH	Asteraceae	
<i>Gutierrezia californica</i>	Match-weed	S	Asteraceae	
<i>Hazardia squarrosa var. grindelioides</i>	Sawtooth goldenbush	S	Asteraceae	
<i>Helianthemum scoparium</i>	Peak rush-rose	PH	Cistaceae	
<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	Moderate
<i>Hordeum murinum</i> *	Barley	AG	Poaceae	Moderate
<i>Hypochaeris glabra</i> *	Smooth cat's ear	AH	Asteraceae	Limited
<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>Lamium amplexicaule</i>	Henbit	AH	Lamiaceae	
<i>Lasthenia californica</i>	Goldfields	AH	Asteraceae	

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

Scientific Name	Common Name	Habit	Family	Invasiveness Rating
<i>Lathyrus vestitus</i>	Chaparral pea	AV	Fabaceae	
<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 lucidum</i>	Shining 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	Limited
<i>Matricaria discoidea</i> *	Pineapple weed	AH	Asteraceae	
<i>Medicago lupulina</i> *	Black medic	AH	Fabaceae	
<i>Medicago polymorpha</i> *	Bur clover	AH	Fabaceae	Limited
<i>Melica imperfecta</i>	Melic	PG	Poaceae	
<i>Melilotus indicus</i> *	Yellow sweet clover	BH	Fabaceae	
<i>Micropus californica</i>	Q-tips	AH	Asteraceae	
<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 atractyloides</i>	Navarretia	AH	Polemoniaceae	
<i>Nicotiana glauca</i> *	Tree tobacco	S	Solanaceae	Moderate
<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	Moderate
<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 collinus</i> var. <i>californicus</i>	Popcorn flower	AH	Boraginaceae	
<i>Platanus racemosa</i>	Western sycamore	T	Plantanaceae	
<i>Plantago erecta</i>	Plantain	AH	Plantaginaceae	
<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	
<i>Polypogon monspeliensis</i> *	Annual beard grass	AG	Poaceae	Limited
<i>Populus fremontii</i>	Fremont cottonwood	T	Salicaceae	
<i>Prunus ilicifolia</i> ssp. <i>ilicifolia</i>	Holly-leaved cherry	S/T	Rosaceae	
<i>Pseudognaphalium bioletti</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>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>Rosa californica</i>	California wildrose	S	Rosaceae	
<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	Limited
<i>Salix exigua</i>	Sandbar willow	S	Salicaceae	
<i>Salix laevigata</i>	Red willow	T	Salicaceae	
<i>Salix lasiolepis</i>	Arroyo willow	T	Salicaceae	

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

Scientific Name	Common Name	Habit	Family	Invasiveness Rating
<i>Salsola tragus</i> *	Russian thistle	AH	Chenopodiaceae	Limited
<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 ssp. 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	Limited
<i>Schismus barbatus</i> *	Mediterranean grass	AG	Poaceae	Limited
<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 ssp. laciniata</i>	Indian pink	PH	Caryophyllaceae	
<i>Silybum marianum</i> *	Milk thistle	AH	Asteraceae	Limited
<i>Sisymbrium altissimum</i> *	Tumble mustard	AH	Brassicaceae	
<i>Sisymbrium irio</i> *	London rocket	AH	Brassicaceae	Moderate
<i>Sisyrinchium bellum</i>	Blue-eyed grass	PH	Iridaceae	
<i>Solanum americanum</i>	American nightshade	AH	Solanaceae	
<i>Solanum douglasii</i>	White nightshade	AH	Solanaceae	
<i>Solanum xanti</i>	Purple nightshade	PH	Solanaceae	
<i>Solidago velutina ssp. californica</i>	California goldenrod	PH	Asteraceae	
<i>Sonchus asper</i> *	Prickly sow thistle	AH	Asteraceae	
<i>Sonchus oleraceus</i> *	Common sow thistle	AH	Asteraceae	
<i>Stellaria media</i> *	Chick-weed	AH	Caryophyllaceae	
<i>Stephanomeria virgata ssp. virgata</i>	Twiggy wreath plant	AH	Asteraceae	
<i>Stipa miliacea var. miliacea</i> *	Smilo grass	PG	Poaceae	Limited
<i>Stipa pulchra</i>	Purple needlegrass	PG	Poaceae	
<i>Symphoricarpus mollis</i>	Snowberry	S	Caprifoliaceae	
<i>Stylocline gnaphaloides</i>	Everlasting nest straw	AH	Asteraceae	
<i>Tamarix ramosissima</i> *	Salt cedar	T	Tamaricaceae	High
<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>	Woolly blue curls	S	Lamiaceae	
<i>Trichostema lanceolatum</i>	Vinegar weed	AH	Lamiaceae	
<i>Trifolium ciliolatum</i>	Hairy clover	AH	Fabaceae	
<i>Trifolium hirtum</i> *	Rose clover	AH	Fabaceae	Moderate
<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>Urtica dioica</i>	Giant nettle	PH	Urticaceae	
<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 (possibly 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	Moderate
<i>Zeltnera venusta</i>	Charming Centaury	AH	Gentianaceae	

Notes:

Scientific nomenclature follows The Jepson Manual Second Edition (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.

Invasiveness Rating from California Invasive Plant Inventory 2006

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

WILDLIFE OF BOEING SANTA SUSANA FIELD LABORATORY

February 2016

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 2016, with contributions by Forde Biological Consultants, the San Fernando Audubon Society, and the Southern California Herpetological Society. 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

Great Basin fence lizard (<i>Sceloporus occidentalis longipes</i>)
California striped racer (or chaparral whipsnake [Stebbins, 2003], <i>Coluber lateralis lateralis</i>)
Coastal whiptail (<i>Aspidoscleis tigris stegnegeri</i> , a CDFW* Special Animal)
Western side-blotched lizard (<i>Uta stansburiana elegans</i>)
Southern Pacific rattlesnake (<i>Crotalus oreganus helleri</i>)
Western yellow-bellied racer (<i>Coluber constrictor mormon</i>)
Blainville's horned lizard (<i>Phrynosoma blainvillii</i> , a California Species of Special Concern)
California king snake (<i>Lampropeltis californiae</i>)
San Diego gopher snake (<i>Pituophis catenifer annectens</i>)
San Bernardino ring-necked snake (<i>Diadophis punctatus modestus</i> , a CDFW Special Animal)
Common garter snake (<i>Thamnophis sirtalis</i>)
Southern California legless lizard (<i>Anniella stebbinsi</i> , a California Species of Special Concern)
Two-striped garter snake (<i>Thamnophis hammondi</i> , a California Species of Special Concern)
San Diego alligator lizard (<i>Elgaria multicarinata webbii</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

California toad (<i>Anaxyrus boreas halophilus</i>)
California newt (<i>Taricha 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, Taxonomically Arranged as of January 15, 2016 (Source: M. Osokow, SFAS)

COMMON NAME	SCIENTIFIC NAME
Mallard	<i>Anas platyrhynchos</i>
Bufflehead	<i>Bucephala albeola</i>
Ring-necked duck	<i>Aythya collaris</i>
California Quail	<i>Callipepla californica</i>
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Eared Grebe	<i>Podiceps nigricollis</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i> *
American White Pelican	<i>Pelecanus erythrorhynchos</i> ***
Great Blue Heron	<i>Ardea herodias</i>
Snowy Egret	<i>Egretta thula</i>
Great Egret	<i>Ardea alba</i>
Green Heron	<i>Butorides virescens</i>
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>
Turkey Vulture	<i>Cathartes aura</i>
Osprey	<i>Pandion haliaetus</i> *
White-tailed Kite	<i>Elanus leucurus</i> ****
Golden Eagle	<i>Aquila chrysaetos</i> **
Northern Harrier	<i>Circus cyaneus</i> ***
Sharp-shinned Hawk	<i>Accipiter striatus</i> *
Cooper's Hawk	<i>Accipiter cooperii</i> *
Red-tailed Hawk	<i>Buteo jamaicensis</i>

Red-shouldered Hawk	<i>Buteo lineatus</i>
American Kestrel	<i>Falco sparverius</i>
Falcon species	<i>Falco sp.</i>
American Coot	<i>Fulica americana</i>
Killdeer	<i>Charadrius vociferus</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Spotted Sandpiper	<i>Actitis macularius</i>
Wilson's Snipe	<i>Gallinago delicata</i>
Western Gull	<i>Larus occidentalis</i>
Gull sp.	<i>Larus sp.</i>
Band-tailed Pigeon	<i>Patagioenas fasciata</i>
Rock Pigeon	<i>Columba livea</i>
Mourning Dove	<i>Zenaida macroura</i>
Greater Roadrunner	<i>Geococcyx californianus</i>
Barn Owl	<i>Tyto alba</i>
Great Horned Owl	<i>Bubo virginianus</i>
Western Screech Owl	<i>Megascops kennicottii</i>
Common Poorwill	<i>Phalaenoptilus nuttallii</i>
Vaux's Swift	<i>Chaetura vauxi</i>
White-throated Swift	<i>Aeronautes saxatalis</i>
Black-chinned Hummingbird	<i>Archilochuys alexandri</i>
Costa's Hummingbird	<i>Calypte costae</i>
Anna's Hummingbird	<i>Calypte anna</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
Allen's Hummingbird	<i>Selasphorus sasin</i>
Acorn Woodpecker	<i>Melanerpes formicivorus</i>
Red-shafted Flicker	<i>Colaptes auratus</i>
Nuttall's Woodpecker	<i>Picoides nuttallii</i>
Olive-sided Flycatcher	<i>Contopus borealis</i>
Western Wood Pewee	<i>Contopus sordidulus</i>
Willow Flycatcher	<i>Empidonax trailii*****</i>
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>
Black Phoebe	<i>Sayornis nigricans</i>
Say's Phoebe	<i>Sayornis saya</i>
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
Cassin's Kingbird	<i>Tyrannus vociferans</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Loggerhead Shrike	<i>Lanius ludovicianus***</i>

Hutton's Vireo	<i>Vireo huttoni</i>
Warbling Vireo	<i>Vireo gilvus</i>
Western Scrub Jay	<i>Aphelocoma californica</i>
American Crow	<i>Corvus brachyrhynchos</i>
Common Raven	<i>Corvus corax</i>
Violet-Green Swallow	<i>Tachycineta thalassina</i>
Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Barn Swallow	<i>Hirundo rustica</i>
Cliff Swallow	<i>Hirundo pyrrhonota</i>
Wrentit	<i>Chamaea fasciata</i>
Oak Titmouse	<i>Parus inornatus</i>
Bushtit	<i>Psaltriparus minimus</i>
Red-breasted Nuthatch	<i>Sitta canadensis</i>
White-breasted Nuthatch	<i>Sitta carolensis</i>
House Wren	<i>Troglodytes aedon</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
Rock Wren	<i>Salpinctes obsoletus</i>
Canyon Wren	<i>Catherpes mexicanus</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Wrentit	<i>Chamaea fasciata</i>
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
Western Bluebird	<i>Sialia mexicana</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Hermit Thrush	<i>Catharus guttatus</i>
American Robin	<i>Turdus migratorius</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
California Thrasher	<i>Toxostoma redivivum</i>
Eurasian Starling	<i>Sturnus vulgaris</i>
Cedar Waxwing	<i>Bombycilla cedrorum</i>
Phainopepla	<i>Phainopepla nitens</i>
Orange-crowned Warbler	<i>Oreothlypis celata</i>
Yellow Warbler	<i>Setophaga petechial</i> ***
Yellow-rumped Warbler	<i>Setophaga coronata</i>
Black-throated Gray Warbler	<i>Setophaga nigescens</i>
Hermit Warbler	<i>Setophaga occidentalis</i>
Townsend's Warbler	<i>Setophaga townsendi</i>
Wilson's Warbler	<i>Cardellina pusilla</i>

Common Yellowthroat	<i>Geothlypis trichas</i>
Spotted Towhee	<i>Pipilo maculatus</i>
California Towhee	<i>Melospiza crissalis</i>
Rufous-crowned Sparrow	<i>Aimophila ruficeps*</i>
Chipping Sparrow	<i>Spizella passerine</i>
Bell's Sparrow	<i>Artemiospiza belli*</i>
Vesper Sparrow	<i>Poocetes gramineus</i>
Lark Sparrow	<i>Chondestes grammacus</i>
Savanna Sparrow	<i>Passerculus sandwichensis</i>
Lincoln's Sparrow	<i>Melospiza lincolni</i>
Song Sparrow	<i>Melospiza melodia</i>
Fox Sparrow	<i>Passerella iliaca</i>
White-throated Sparrow	<i>Zonotrichia albicollis</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Western Tanager	<i>Piranga ludoviciana</i>
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
Blue Grosbeak	<i>Passerina caerulea</i>
Lazuli Bunting	<i>Passerina amoena</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Hooded Oriole	<i>Icterus cucullatus</i>
Bullock's Oriole	<i>Icterus bullockii</i>
House Finch	<i>Carpodacus mexicana</i>
American Goldfinch	<i>Spinus tristis</i>
Lesser Goldfinch	<i>Spinus psaltria</i>
Lawrence's Goldfinch	<i>Spinus lawrencei</i>
Orange Bishop	<i>Euplectes franciscanus</i>
Species = 125	

Table 3 Notes: 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*) is a CDFW Fully Protected Species.

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

****: CDFW Fully Protected Species

*****: California Endangered Species Act (CESA) Endangered

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>)
Raccoon (<i>Procyon lotor</i>)
Botta's pocket gopher (<i>Thomomys bottae</i>)
Cougar (<i>Puma concolor</i>)
Bobcat (<i>Lynx rufus</i>)
Pallid bat (<i>Antrozous pallidus</i> , a California Species of Special Concern)
Canyon bat (<i>Parastrellus hesperus</i>)
Big brown bat (<i>Eptesicus fuscus</i>)
Mexican free-tailed bat (<i>Tadarida brasiliensis</i>)
Small-footed myotis (<i>Myotis ciliolabrum</i> , a Western Bat Watch Group list species)
Yuma myotis (<i>Myotis yumaensis</i>)
California myotis (<i>Myotis californicus</i>)
Silver-haired bat (<i>Lasionycteris noctivagans</i>)
Western red bat (<i>Lasiurus blossevillii</i> , a California Species of Special Concern)
Hoary bat (<i>Lasiurus cinereus</i>)
Townsend's big-eared bat (<i>Corynorhinus townsendii</i> , a federal Candidate species, and CA SSC)
Greater bonneted bat (<i>Eumops perotis</i> , a California Species of Special Concern)
Skunk sp.

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 silkworm, *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. At least one native species in the phylum Gastropoda, the Trask shoulderband snail (*Helminthoglypta traskii*) has been observed at SSFL.