APPENDIX D

Fall 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory

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FINAL REPORT

Fall 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory

National Aeronautics and Space Administration
Marshall Space Flight Center
Huntsville, Alabama

February 2011

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Acronyms

CDFG	California Department of Fish and Game
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
^{o}F	Fahrenheit
FACW	Facultative Wetland
ft	Feet
msl	Mean Sea Level
NASA	National Aeronautics and Space Administration
NRMP	Natural Resources Management Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SOI	Species of Interest
SSC	Species of Special Concern
SSFL	Santa Susana Field Laboratory

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SECTION 1

Introduction

This report presents the findings of Fall 2010 habitat and listed species surveys conducted on National Aeronautics and Space Administration (NASA)-administered property at Santa Susana Field Laboratory (SSFL), located in southern California. SSFL was established shortly after World War II and has been used primarily as a site to develop and test nuclear reactors, rockets, and missiles. The site is 2,850 acres and is divided into four production and two buffer areas, (Area I, II, III, and IV, and the northern and southern buffer zones). A portion of SSFL is federally-owned property that is administered by NASA. The remaining property at SSFL is owned by the Boeing Company. NASA-administered property at SSFL consists of 40 acres within Area I and all 404 acres of Area II. The Boeing Company owns the remainder of Area I, all of Area III and Area IV, and the northern and southern buffer areas at the site.

The Fall 2010 surveys were conducted to support NASA's preparation of a Natural Resources Management Plan (NRMP) for the property it administers at SSFL. The primary tasks were to characterize/map natural communities; conduct species-specific and general (opportunistic) surveys for listed and special-status species; and develop plant and animal inventories. NASA conducted past ecological surveys on portions of the property it administers at SSFL in April 2008 and May 2009 as part of Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs) (CH2MHILL, 2008, 2009, 2009a). The Fall 2010 surveys were intended to expand upon these past ecological surveys through survey of all NASA-administered property at SSFL, including those areas not previously surveyed outside the RFI areas. The findings of the surveys will be incorporated into the SSFL NRMP, which is being prepared by NASA to provide guidance on the management of natural resources on the property it administers at SSFL.

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SECTION 2

Location and Environmental Setting

2.1 General

SSFL is located mostly within an unincorporated part of Ventura County, California; its easternmost portion extends slightly into an unincorporated part of Los Angeles County (Figure 1). The site is approximately 7 miles northwest of the community of Canoga Park and approximately 30 miles northwest of downtown Los Angeles. It encompasses 2,850 acres within a remote, mountainous area near the crest of the Simi Hills at the western border of the San Fernando Valley.

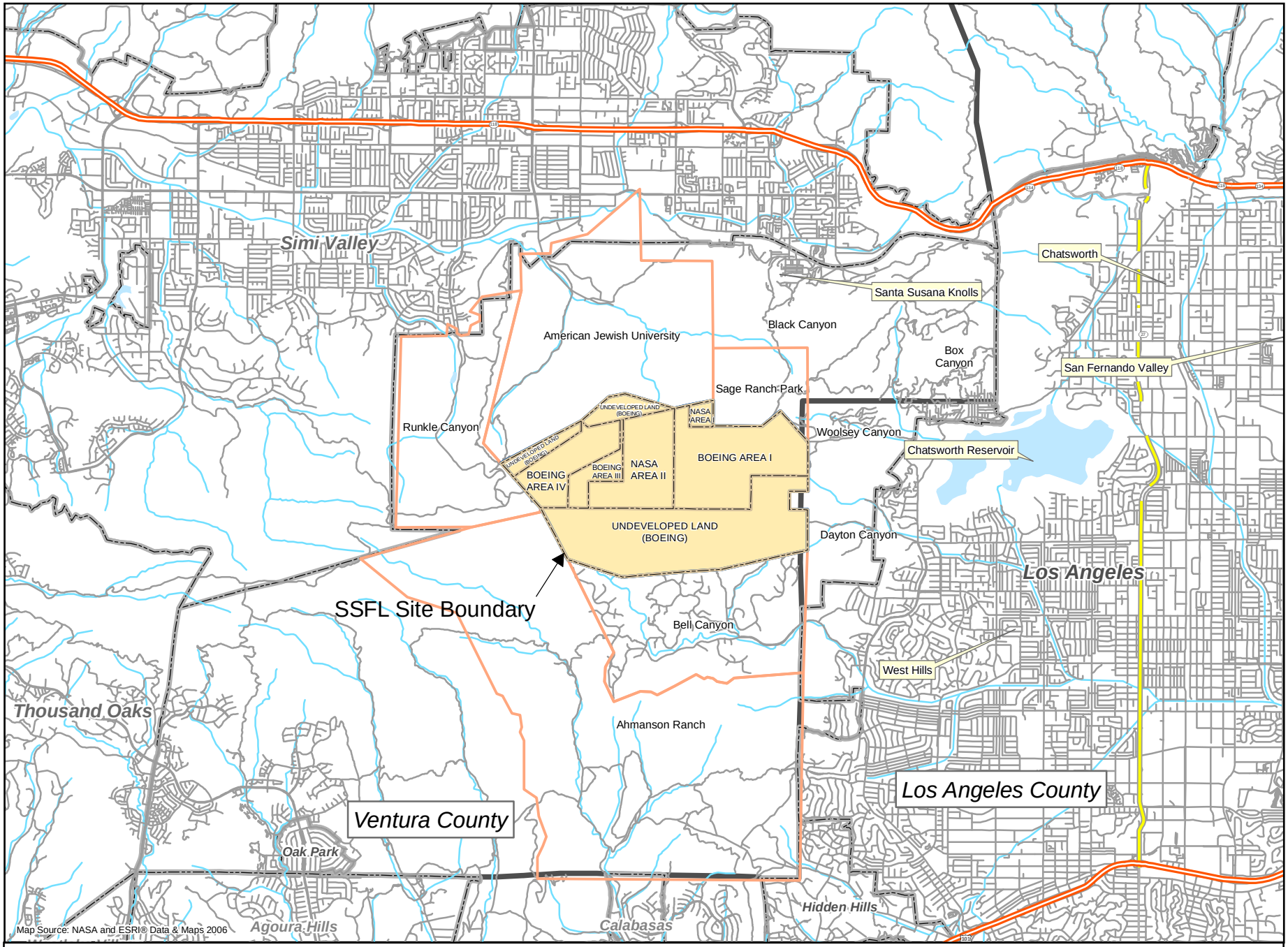
NASA-administered property at SSFL consists of 40 acres within Area I and all 404 acres of Area II (Figure 2). The Boeing Company owns the remainder of Area I, all of Area III and Area IV, and the northern and southern buffer areas at the site. Area II and Area I are located in the central and north-central parts of SSFL, respectively. NASA-administered property at SSFL represents approximately 15.6 percent of the total area of the site.

SSFL's landscape is dominated by sandstone outcropping hills. Numerous industrial facilities, man-made drainage systems, and roadways have been developed within this hilly landscape. The site is located within the central portion of the Southern California Coast ecological subregion in the Simi Valley – Santa Susana Mountains (261Be) ecological subsection (Miles and Goudey 1998). This subsection includes steep mountains, moderately steep to steep hills, and nearly level to gently sloping floodplains, terraces, and alluvial fans. The predominant natural plant communities in the area include California sagebrush series, Mixed sage series, Chamise series, Mixed scrub oak series, and Coast live oak series. There are small areas of California walnut series (Miles and Goudey 1998).

2.2 Physiography

SSFL is located within the Pacific Mountain System, Pacific Border Province, and Los Angeles Ranges (also known as the Transverse Ranges) physiographic region. Generally, the Transverse Ranges represent a complex of tectonic forces resulting from the interaction of the Pacific and the North American plates along the San Andreas Fault. The Transverse Ranges are oriented predominantly east-west and include the Santa Ynez Mountains, San Rafael Mountains, Sierra Madre Mountains, Topatopa Mountains, Santa Susana Mountains, Simi Hills, Santa Monica Mountains, San Gabriel Mountains, Puente Hills, Chino Hills, and San Bernardino Mountains.

The Transverse Ranges are characterized by extreme differences in geologic age and composition, varying from sedimentary rocks in the western Santa Ynez and Santa Monica Mountains to primarily granitic and metamorphic rock in the eastern regions, where they terminate abruptly in the San Gabriel and San Bernardino Mountains.



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Drawn By:
A. Cooley

Figure 1
Regional Map
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\SSFL_Regional_8x11.mxd ES012111042614TPA

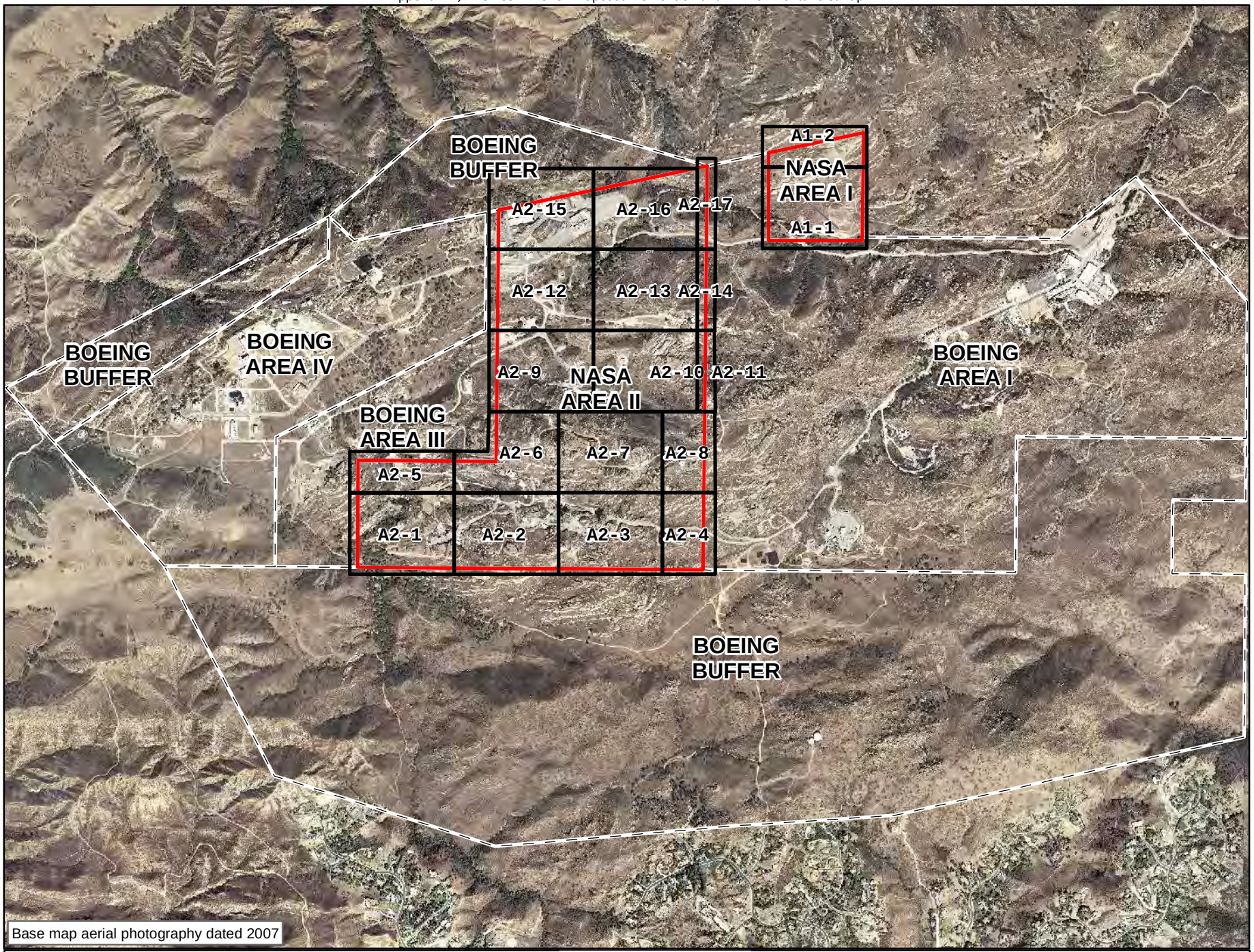

Figure 2
Site Overview
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Site_Overview.mxd)

SSFL consists of hilly terrain that expresses approximately 1,100 feet (ft) of topographic relief. The highest surface elevation at SSFL exists near the center of the site at an approximate elevation of 2,245 ft above mean sea level (msl). The highest surface elevations at SSFL exist in two general bands that strike along a northeast-southwest trend, consistent with the geology of the area. The lowest elevation, which exists at the eastern property boundary, is approximately 1,175 ft above msl. The lower elevations at SSFL exist primarily along the eastern, southern, and north-central to northwestern perimeters of the property.

There are no natural lakes at SSFL. Streams occur within highly fractured breaks between uplifted and eroded rock formations. Small, isolated wetlands may occur in areas where seeps exist or runoff accumulates. Runoff is rapid and all streams are generally dry during summer.

2.3 Geology

SSFL is located in the Transverse Ranges of southern California, which are characterized by north-south compression that has produced geologic structures such as faults, synclines, and anticlines that are elongated in an east-west direction. The primary geologic units at SSFL are the Quaternary Alluvium and the Cretaceous Chatsworth Formation. The Chatsworth is overlain by the Simi Conglomerate Member of the Paleocene Santa Susana Formation in the northern part of the site, and is faulted against the Santa Susana Formation in the western part of the site. To the south, the Chatsworth is overlain by southward dipping late Tertiary formations. Structurally, SSFL is located on the southern flank of an east-west striking and westward plunging syncline that passes through the central part of the Simi Valley. These geologic formations are described below:

Quaternary Alluvium–Alluvial soils are generally thin and typically 5 to 15 ft thick at SSFL. Alluvial soils usually occur in topographic lows and along stream drainages. Disturbed soils also have been used as fill material in developed portions of SSFL. Thick fill soils (up to 35 to 40 ft) have been identified in the northeastern and north-central parts of SSFL. The alluvium generally consists of weathered Chatsworth Formation sediments and is usually a fine-grained silty sand.

Chatsworth Formation–Most of SSFL is underlain by the Cretaceous Chatsworth Formation, which consists of interbedded sandstone and shale. These sediments have been interpreted as deep-sea turbidite deposits. The Chatsworth Formation has been divided into the Lower Chatsworth Formation and the Upper Chatsworth Formation. The Upper Chatsworth Formation has been further subdivided into the Sandstone 1 and Sandstone 2 units.

2.4 Climate and Meteorology

Climate and meteorological data have been collected for SSFL since the 1960s. The climate falls within the Mediterranean sub-classification, and monthly mean temperatures range from 50 degrees Fahrenheit (^{o}F) during the winter months to 70^{o} F during the summer months (SAIC, 1994). During the summer months (April through October), an onshore wind pattern occurs because of the proximity of the adjacent Pacific Ocean; during the winter months, this pattern is interrupted by weather fronts (SAIC, 1994). Wind measurements collected at SSFL in 2003 indicate that the prevailing wind pattern is northwest-southeast (Sonoma Technology, Inc., 2003). This wind rose pattern is consistent with historical data collected in the 1960s and 1990s.

Precipitation at SSFL is normally in the form of rain, although snow occasionally falls during winter. Precipitation at the site has averaged approximately 18 inches per year between 1960 and 2006. During this period, the annual precipitation has ranged from a low of 5.7 inches in 2002 to a maximum of 41.2 inches in 1998. Most of the annual precipitation at SSFL occurs between November and March, which is consistent with the regional precipitation pattern of southern California.

Wildfires are common in the part of California where SSFL is located. A large portion of the SSFL was burned during the Topanga Fire of October 2005. Evidence of this fire was visible in the form of burned tree stumps and shrubs in many of the areas investigated during the Fall 2010 surveys. Crown sprouting was common where fire damage to native perennial vegetation was less severe. Previously burned annual vegetation, such as grasslands and ruderal areas, have been largely replaced with new growth since the 2005 fires.

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SECTION 3

Methods

3.1 General

The Fall 2010 habitat and listed species surveys were conducted from September 28 to October 8, 2010 by two experienced CH2M HILL Inc. biologists. The primary tasks were to characterize/map natural communities; conduct species-specific and general (opportunistic) surveys for listed and special-status species; and develop plant and animal inventories on all of NASA-administered property at SSFL accessible by foot.

Natural communities encountered during the surveys were characterized and mapped. The approximate boundaries of each identified natural community were delineated on aerial photographs based on aerial photo-interpretation. Natural communities were characterized based on dominant plant species composition and information on each community was recorded on Natural Community Datasheets. Recorded data included dominant plant species, wildlife observations, and information on the habitat quality of each community. Assessments of habitat quality included identification of obvious impacts to the community, such as physical disturbance (including wildfire), hydrological impairments, and the presence of exotic/invasive species.

The species-specific survey was focused on the Braunton's milk-vetch (*Astragalus brauntonii*), which is a plant species that is federally listed as Endangered. Although this plant had not been sighted on NASA-administered property in the past, it is known to spread in response to wildfires and, therefore, was expected to have potentially recruited onto NASA-administered property following recent fires near SSFL.

General (opportunistic) surveys were conducted for other species that could be identified during the same time the milk-vetch survey was being conducted. The general surveys were designed to focus on those plant and animal species that have been documented to occur, or are expected to potentially occur, within or in the vicinity of SSFL during fall based on previous surveys and other data sources. Based on this approach, the general surveys were focused on the Santa Susana tarplant (*Deinandra minthornii*), which is state listed as Rare; non-chalky (i.e., without a white powdery bloom) species of dudleya (*Dudleya* spp.); and California black walnut (*Juglans californica*), which is not state or federally listed but is considered vulnerable due to overgrazing and habitat loss. Non-chalky species of dudleya were surveyed because they could potentially be listed or special-status species of dudleya, such as the Agoura Hills dudleya (*Dudleya cymosa* ssp. *agourensis*) or Conejo dudleya (*Dudleya parva*), both of which are federally listed as Threatened. Because dudleya species are not in bloom during fall, this approach was used to identify areas within the study area where listed species of dudleya could potentially occur.

In addition to the plant surveys, the general surveys included binocular surveys for raptor nests and surveys for rock basins and depressions that could potentially support listed fairy shrimp species. The rock basin surveys involved searches for basins that have adequate size and structure to potentially hold enough water during the wet season to potentially support fairy shrimp. The surveys did not include sampling of the basins to determine presence or absence of fairy shrimp. The existence of raptor nests on test stands and other man-made structures was assessed only by utilizing binoculars to minimize safety risks to survey

personnel. Survey personnel did not enter or climb onto any man-made structure during the surveys. The locations of targeted species sighted during the species-specific and general surveys were recorded by GPS (where accessible) and on aerial photographs. Information on targeted species identified, such as species description, habitat type, and other relevant observations, was recorded on Species of Interest (SOI) Datasheets.

3.2 Desktop Preparations

Desktop preparations for the field surveys included reviews of published reports on the ecology and habitats of California, including Miles and Goudey (1998), Sawyer et al. (2010), and Holland (1986). This information was used to develop a comprehensive understanding of the primary vegetation and habitat types expected to occur in the study area.

Desktop preparations also included reviews of previous ecological surveys conducted at SSFL (CH2MHILL, 2008, 2009, and 2009a; SAIC, 2009; and MWH, 2007), a search of the California Natural Diversity Data Base (CNDDB), and a review of the California Native Plant Society (CNPS) On-line Inventory of Rare and Endangered Plants (CNPS, 2010). Information from the previous ecological surveys and CNDDB search (CNDDB, 2008) were used to develop a tentative plant list to be used during the field surveys. Representative photographs of many of the species on the tentative plant list were obtained from the internet to facilitate field identification of plant species. The CNDDB occurrence data was rendered into a map that was used as a field aid during the surveys. The CNPS Inventory of Rare and Endangered Plants provided information on the flowering periods of listed and special-status plant species that could occur within the study area.

Ortho-rectified, 150-scale (1 inch = 150 ft) aerial photographs with overlain survey area boundaries were prepared as the base maps for the field surveys. These aerial photograph base maps were generated from the NASA GIS database using the following base datum coordinate system: NAD_1927_StatePlane_California_V_FIPS_0405. Vegetation mapping previously conducted for the entire SSFL site (TAIC, 2002) was also overlain onto the base maps to facilitate natural community characterization and mapping during the field surveys.

3.3 Field Survey Detail

The field surveys were conducted via systematic walking. Due to rugged terrain and impenetrable vegetation in some areas, transects were not used and not all areas were traversed; however, the foot surveys allowed view of most of the study area. The aerial photograph base maps were used in the field to delineate the habitats in the study area. The delineated habitats were subsequently digitized into the NASA GIS database and re-mapped onto the ortho-rectified aerial photograph base maps.

Because the field surveys were conducted during the months of September and October, many of the plants, especially flowering plants and grasses, were senescent, and migratory breeding birds were not present in the study area. The time spent at each site within the study area was limited; therefore, wildlife observations were opportunistic rather than systematic. Direct observations, calls, and signs of wildlife were recorded during the field surveys. Active survey techniques, such as the use of kicknets to identify benthic invertebrates or searches under logs, rocks, and debris for herpetiles were not used due to time constraints.

Field observations were recorded on Natural Community Datasheets and SOI Datasheets. Observations of listed and special-status species and sensitive habitat were also recorded on the aerial photograph base maps. Digital photographs were taken of species of interest and representative natural communities at the locations where corresponding datasheets were completed and the photographs were attached to the corresponding datasheets. Other photographs were taken of relevant site features and representative habitats to provide a visual record of conditions in the study area. The location of each digital photograph was mapped onto the aerial photograph base map. The following information was recorded for each photograph: date, name of the site, general description of the subject, and location of the photograph.

An area known to contain Braunton's milk-vetch is located in the southern part of Boeing Area IV (Figure 1). This species was sighted at this location during 2008 field surveys, so the same location was re-visited to determine the current physical appearance of the species. This reference observation was intended to calibrate the search image for this species on NASA-administered property during the Fall 2010 surveys. Known locations of Santa Susana tarplant at the ELV Site on NASA-administered property were also visited to inspect the current appearance of this species.

Locations of Santa Susana tarplants were recorded by taking a GPS point for each tarplant wherever they could be accessed. In cases where plants were small and tightly clustered, a single GPS point could represent one to five plants. Tarplants that could not be safely reached by foot were identified and counted using binoculars. These locations were pin-pricked on the base maps and their coordinates were later determined using GoogleTM Earth. In some areas, buildings and rock walls interfered with the GPS signal and limited satellite reception. Therefore, the GPS data collected for tarplants and other species/features has variable accuracy and all GPS locations should be considered approximate.

Locations of non-chalky dudleya and California black walnut were recorded by GPS. Because the dudleya plants were small and outside of their flowering period (senescent), a comprehensive survey of listed and special-status species of dudleya within the study area was not conducted. The GPS points taken of dudleya locations represent areas and habitats where listed and special-status species of dudleya could potentially occur within the study area.

GPS points were taken of rock basins that could potentially support fairy shrimp. However, given the range in size and continuity of rock basins within the study area, it is likely that all potentially suitable rock basins were not identified during the survey.

Voucher samples of plants that could not be identified in the field were collected in Ziploc bags for later identification using local taxonomic keys. The voucher plants were integrated with the field-identified plants for the study; however, it should be noted that many annual plants had senesced to a point that did not allow identification.

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SECTION 4

Results

4.1 Habitat Characterization and Mapping

A variety of habitat types were characterized and mapped during the Fall 2010 surveys. Information on the habitat types identified during the surveys is presented in Table 1 and the habitat mapping is shown on the figures in Appendix A (Appendix A figures are based on the grid on Figure 2 and labels in Table 1). The Natural Community Datasheets with corresponding photographs completed for representative habitat types are provided in Appendix B.

Because most of the annual plants were in a state of senescence and not readily identifiable, a comprehensive inventory of plant species for the study area could not be developed during the Fall 2010 surveys. A list of plant species sighted during ecological surveys conducted as part of RFIs in April 2008 and May 2009 is provided as Appendix C. During the Fall 2010 surveys, the survey team sighted many of the same species identified during the April 2008 and May 2009 surveys, as well as four additional species not previously identified. These additional species are included in the plant list in Appendix C.

4.1.1 Natural Habitats

4.1.1.1 Baccharis Scrub

Baccharis scrub consists mostly of shrub vegetation that is dominated by coyote brush (*Baccharis pilularis*). The coverage of this habitat type on NASA-administered property at SSFL is relatively limited (2.62 total acres). Other designations for this habitat type include northern coyote brush scrub (CNDDB 1990), *Baccharis pilularis s*hrubland alliance, and coyote brush scrub (Sawyer et al. 2009). This habitat typically occurs in areas that are windy and exposed with shallow rocky soils (Holland 1986) and is often found on the sides of streams or on terraces (Sawyer et al. 2009). A photograph taken of this habitat type during the surveys is provided as Photo 1 in Appendix D.

Within the study area, coyote brush can be relatively dense and can occur in nearly pure stands, which is the case in the eastern part of the Bravo Site (Appendix A Figures A2- 9 and A2-10) and on the western and northern sides of the B515 STP Site (Appendix A Figure A2-12), or it can be relatively sparse, which is the case in the disturbed HWSA Site (Appendix A Figure A2-9).

4.1.1.2 Chaparral

Chaparral is the dominant habitat type on NASA-administered property at SSFL (172.63 total acres). This habitat type includes northern and southern mixed chaparral (CNDDB 1990). It is generally associated with dry, rocky, often steep slopes with little soil. Within the study area, chaparral is dominated by chamise (*Adenostoma fasciculatum*), thickleaf yerba santa (*Eriodictyon crassifolium*), and laurel sumac (*Malosma laurina*) with numerous interspersed sage (*Salvia* spp.) and other species. Poison oak (*Toxicodendron diversilobum*) in this habitat is primarily associated with dense vegetation along drainages. Information collected on a representative of this habitat type during the surveys is documented on Natural Community Datasheet D-CHP801 in Appendix B.

TABLE 1
Habitat Types Identified on NASA-Administered Property at SSFL During Fall 2010 Surveys

Label	Description[1] Total Acreage	CNDDB Natural Community Designation[2]
Natural Habitats		
BS	Baccharis Scrub 2.62 acres	32110 Northern Coyote Brush Scrub
CHP	Chaparral 172.63 acres	37110 Northern Mixed Chaparral 37120 Southern Mixed Chaparral
CLORF	Coast Live Oak Riparian Forest 9.16 acres	61300 Southern Coast Live Oak Riparian Forest
CLOW or CLO[3]	Coast Live Oak Woodland 13.22 acres	71160 Coast Live Oak Woodland
FWM	Freshwater Marsh 0.17 acres	52410 Coastal and Valley FWM
MFS	Mulefat Scrub 2.09 acres	63310 Mulefat Scrub
NNG	Non-native Grassland 18.62 acres	42200 Non-Native Grassland
SS	Venturan Coastal Sage Scrub 64.44 acres	32300 Venturan Coastal Sage Scrub
SWS	Southern Willow Scrub 1.04 acres	63320 Southern Willow Scrub
WET	Undifferentiated Wetland 0.57 acres	NA
Non-Natural Habitats		
DEV	Developed 58.10 acres	NA
OW	Open Water 0.41 acres	NA
RH	Ruderal 16.75 acres	NA

NOTES:

[1] Vegetation classifications based on Holland (1986).

[2] California Natural Diversity Data Base (CNDDB) Natural Communities, November 1990.

[3] CLO label used for free standing or small clusters of oak trees.

NA – Not Applicable. No corresponding designation in Holland (1986) for this type.

When multiple habitats occur in a mosaic within the mapping unit, the dominant habitat type (based on proportion of cover) is listed first. Estimated acreages are based on the dominant habitat type.

Total area of all mapped habitat types is 444.3 acres.

Habitat Unit Modifiers on Appendix A Figures:

RO - Rock Outcrop area. May occur by itself or is co-located with other vegetation types. Total rock outcrop area with no significant co-located habitat type is 84.47 acres.

D – Disturbed, either due to previous clearing or wildlife.

Northern mixed chaparral typically consists of tall (6.5 to 13 ft), dense to nearly impenetrable vegetation on north-facing slopes in southern California (Holland 1986). Within the study area, this habitat type was identified in the vicinity of the LOX Site in Area I (Appendix A Figure A1-1); north of the Area II Landfill (Appendix A Figure A2-17); south of the roadway between the Area II Landfill and Alfa Site (Appendix A Figures A2-13, A2-14, and A2-17); and north of Skyline Road in Area II (Appendix A Figures A2-6, A2-7, and A2-8).

Most of the chaparral on NASA-administered property at SSFL is southern mixed chaparral, which is similar in species composition to northern mixed chaparral but is typically not as dense or tall (5 to 10 ft). Southern mixed chaparral has occasional patches of bare soil or forms a mosaic with Venturan coastal sage scrub (Holland 1986). These habitats were identified on slopes of various aspects within the study area.

4.1.1.3 Coast Live Oak Riparian Forest

Coast live oak riparian forest is limited to the largest canyons and drainages on NASA-administered property at SSFL (9.16 total acres). Mature coast live oak (*Quercus agrifolia*) is the dominant canopy species in this habitat type. The ground cover in this habitat is typically dominated by various grasses and mugwort (*Artemisiadouglasiana*). The shrub layer is typically poorly developed (Holland 1986); however, poison oak was common near drainage channels in this habitat in the study area. A photograph taken of this habitat type during the surveys is provided as Photo 2 in Appendix D.

Another designation for coast live oak riparian forest (as well as for coast live oak woodland described below) is *Quercus agrifolia* woodland alliance (Sawyer et al. 2009). This habitat type is associated with alluvial terraces, canyon bottoms, stream banks, slopes and flats with deep sandy or loamy soils with high organic matter. Because of its thick bark, coast live oak is exceptionally resistant to periodic wildfires.

Within the study area, coast live oak riparian forest was identified in the drainage south and west of the LOX Site (Appendix A Figure A1-1); in the drainages southwest of the R-2 Ponds and north of the Delta Site (Appendix A Figures A2-1 and A2-2); in the drainage west of the CDFF Site (Appendix A Figure A2-5); along the roadway northwest of the Bravo Site (Appendix A Figure A2-9); and west and northwest of the Area II Landfill (Appendix A Figures A2-16 and A2-17).

4.1.1.4 Coast Live Oak Woodland

Coast live oak woodland is a relatively widespread, although not extensive, habitat type on NASA-administered property at SSFL (13.22 total acres). It occurs in areas not associated with a canyon or major drainage where mature coast live oak is the dominant canopy species. This habitat type also includes individual or small groups of trees that are probably remnants of formally more extensive oak woodlands or riparian forests. It typically occurs on north-facing slopes in southern California (Holland 1986). Information collected on a representative of this habitat type during the surveys is documented on Natural Community Datasheet CLOW801 in Appendix B. A photograph taken of this habitat type during the surveys is provided as Photo 3 in Appendix D.

As with coast live oak riparian forest, the shrub layer in coast live oak woodland is poorly developed. Within the study area, the shrub layer, where present, included blue elderberry (*Sambucus mexicana*) and poison oak. The herbaceous layer was dominated by various grasses such as wild oats (*Avena fatua*) and ripgut brome (*Bromus diandrus*), and by weedy

species such as milk thistle (*Silybum marianum*), Italian thistle (*Carduus pycnocephalus*), and cobweb thistle (*Cirsium occidentale*).

Within the study area, coast live oak woodland was identified in the drainage south and west of the LOX Site (Appendix A Figure A1-1); in the large meadow southwest of the Delta Site (Appendix A Figure A2-1); west and northwest of the Bravo Site (Appendix A Figure A2-9); and north and northeast of the ELV Site (Appendix A Figures A2-15 and A2-16). Individual and small clusters of coast live oaks exist throughout the study area.

4.1.1.5 Freshwater Marsh

Freshwater marsh habitat on NASA-administered property at SSFL is associated only with artificial stormwater detention basins that have been constructed along natural drainageways (0.17 total acres). Emergent wetland vegetation has developed within these basins with cattail (*Typha latifolia*) being the dominant plant species. Freshwater marsh typically exists in the wettest portions of the basins adjacent to the open water habitat. Slightly drier margins of the ponds are dominated by common reed (*Phragmites australis*). The adjacent upland banks of these basins are covered mostly by willow trees and shrubs (*Salix* spp.). Freshwater marshes lack significant current and are permanently flooded by fresh water rather than water that is brackish, alkaline, or variable (Holland 1986).

Information collected on a representative of this habitat type during the surveys is documented on Natural Community Datasheet FWM-OW01 in Appendix B. Within the study area, freshwater marsh was identified around the R-2 Ponds (Appendix A Figures A2-1 and A2-5) and the detention basin north of the Coca Site (Appendix A Figure A2-2).

4.1.1.6 Mulefat Scrub

Mulefat scrub is a relatively limited habitat type on NASA-administered property at SSFL (2.09 total acres). Mulefat scrub consists mostly of shrub vegetation that is dominated by mulefat (*Baccharis salicifolia*). Other designations for this habitat type include *Baccharis salicifolia s*hrubland alliance and mulefat thickets (Sawyer et al. 2009). This habitat type is typically associated with intermittent stream channels with fairly coarse-textured soils, and is maintained by frequent flooding (Holland 1986). Mulefat scrub occurs in canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels. Mulefat is designated as a "Facultative Wetland" (FACW) plant species by the U.S. Fish and Wildlife Service. The FACW designation indicates that the species usually occurs in wetlands (67 – 99 percent probability), and occasionally occurs in non wetlands.

Within the study area, mulefat scrub was identified around the R2-Ponds (Appendix A Figures A2-1 and A2-5); north and northeast of the Coca Site (Appendix A Figures A2-3 and A2-4); on the northeastern side of the Bravo Site (Appendix A Figure A2- 9 and A2-10); north of the LOX Site (Appendix A Figure A1-1); and south of the ELV parking lot (Appendix A Figure A2-16).

4.1.1.7 Non-native Grassland

Non-native grassland is a relatively widespread habitat type on NASA-administered property at SSFL (18.62 total acres). This habitat type is characterized by dense to sparse cover of annual grasses that are between 0.6 and 3.3 ft in height. The grass cover is often associated with numerous species of native annual forbs (i.e., showy wildflowers) especially in years of favorable rainfall. With a few exceptions, the plants in this habitat are dead through the summer-fall dry season (Holland 1986). Information collected on a

representative of this habitat type during the surveys is documented on Natural Community Datasheets NNG801 and RO-NNG in Appendix B. Photographs taken of this habitat type during the surveys are provided as Photos 4 through 7 in Appendix D.

Within the study area, the grasses in this habitat type consist of slender oat (*Avena barbata*), wild oat, red brome (*Bromus madritensis* spp. *rubens*), ripgut brome, and wild rye (*Lolium multiflorum*). Non-native grassland occurs throughout the study area in a mosaic with chaparral, sage scrub, and rock outcrops (Appendix D Photo 4). This habitat type is also associated with dove weed (*Eremocarpus setigerus*) and telegraph weed (*Heterotheca grandiflora*) (Appendix D Photo 5) and occurs in patches on eroded rock outcrop slopes (Appendix D Photo 6).

Within the study area, large, nearly pure grasslands were identified in the southwestern portion of Area II (Appendix A Figure A2-1) and within undisturbed ravines between uplifted rock outcrops (Appendix A Figures A2-1, A2-4, A2-6, A2-7, A2-8, A2-10, A2-11, and A2-13). This habitat type also occurs within or adjacent to coast live oak woodland (Appendix D Photo 7), such as in the area between the ELV Site and Alfa Site (Appendix A Figure A2-13).

4.1.1.8 Venturan Coastal Sage Scrub

Venturan coastal sage scrub is a relatively widespread habitat type on NASA-administered property at SSFL (64.44 total acres). This habitat type is characterized by lower (1.6 to 6.6 ft) and less dense vegetation than that which exists in chaparral habitat. Most of the flowering in this habitat type occurs during spring and early summer and the plants are mostly dormant during late summer through early fall. This habitat type often occurs on dry, rocky slopes and many of the plant species are adapted to fire via crown sprouting (Holland 1986). Information collected on a representative of this habitat type during the surveys is documented on Natural Community Datasheet D-SS01 in Appendix B. Photographs taken of this habitat type during the surveys are provided as Photos 8 through 10 in Appendix D.

Within the study area, Venturan coastal sage scrub consists of thickleaf yerba santa, California buckwheat (*Eriogonum fasculatum*), deer weed (*Acmispon glaber*), purple sage (*Salvia leucophylla)*, black sage (*Salvia mellifera)*, and chaparral yucca (*Yucca whipplei*). This habitat type was identified throughout the undeveloped portions of the study area, often in a mosaic with chaparral and rock outcrops (Appendix D Photo 10). Some of this habitat was observed to be disturbed by wildfire or by clearing where adjacent to developed areas. The largest areas of non-disturbed habitat within the study area was found in the southwestern portion of Area II (Appendix A Figure A2-1); near the ABFF Site (Appendix A Figure A2-12); north of the Alfa Site (Appendix A Figures A2-13 and A2-14); and east of the ELV Site parking lot (Appendix A Figure A2-16). In areas where past fires had completely removed the vegetation, some of the re-growth was dominated by deer weed. An example of this case was observed near the detention pond at the Coca Site (Appendix D Photo 8).

4.1.1.9 Southern Willow Scrub

Southern willow scrub is a relatively limited habitat type on NASA-administered property at SSFL (1.04 total acres). It is a wetland habitat that is associated with drainages and more permanent water sources. Photographs taken of this habitat type during the surveys are provided as Photos 11 and 12 in Appendix D.

Within the study area, arroyo willow (*Salix lasiolepis*) is the most common willow species within this habitat type; however, red willow (*Salix laevigata*) and narrow-leaved willow

(*Salix exigua*) also occur in some areas. Small areas of southern willow scrub were identified in the drainage north of the Area II Landfill (Appendix A Figure A2-17); in the drainage north of the Coca Site (Appendix A Figure A2-3); around the R-2 Ponds (Appendix A Figures A2-1 and A2-5); and around the Coca Site detention pond (Appendix A Figure A2-2; Appendix D Photo 12). The largest area of southern willow scrub within the study area was identified in the drainage on the southern side of the Alfa Site (Appendix A Figures A2-10, A2-13, and A2-14).

4.1.1.10 Undifferentiated Wetland

Undifferentiated wetland habitat is a limited habitat type on NASA-administered property at SSFL (0.57 total acres). Within the study area, this habitat type occurs in small areas where restricted drainage traps and ponds water for long enough periods to support wetland vegetation. Most of the wetlands within the study area hold water seasonally and are usually dry during fall and winter. Within the study area, common reed is the dominant wetland plant species in this habitat type. Photographs taken of this habitat type during the surveys are provided as Photos 13, 14, and 15 in Appendix D. Undifferentiated wetland habitat was identified in six areas within the study area (Appendix A Figures A1-2, A2-2, A2-13, and A2-14).

4.1.2 Non-Natural Habitats

4.1.2.1 Developed

Developed areas on NASA-administered property at SSFL consist of buildings, paved roadways, parking areas, and other development. This category also includes unpaved (dirt or gravel) roadways in more remote areas of the site. Developed areas total 58.10 acres on NASA-administered property at SSFL.

In some cases, long disused facilities, such as old roadways or parking areas, have reverted to disturbed natural communities with varying amounts of vegetation cover. Examples of these areas include the roadways northwest of the Coca Site (Appendix A Figure A2-6) and the old parking area southwest of the ELV Site (Appendix A Figure A2-12).

4.1.2.2 Open Water

Open water habitat on NASA-administered property at SSFL is restricted to two stormwater detention basins: the R-2 Ponds (Appendix A Figures A2-1 and A2-5) and the detention basin west of the Coca Site (Appendix A Figure A2-2). There are 0.41 total acres of open water habitat within study area. Photographs taken of this habitat type during the surveys are provided as Photos 16 and 17 in Appendix D.

4.1.2.3 Ruderal

Ruderal habitats are areas with varying amounts of vegetation cover that have experienced man-made disturbance. Within the study area, this habitat type is dominated by weedy and invasive plant species that include red-stem filaree (*Erodium cicutarium*), mustard (*Brassica* spp.), deer weed, and telegraph weed. Ruderal areas total 16.75 acres on NASA-administered property at SSFL. Information collected on a representative of this habitat type during the surveys is documented on Natural Community Datasheet RH801 in Appendix B. A photograph taken of this habitat type during the surveys is provided as Photo 18 in Appendix D.

Examples of large areas of ruderal habitat identified within the study area include previously cleared or restored (capped) areas that have re-vegetated such as the LOX Site (Appendix A Figure A1-1; Appendix D Photo 18); the cap near the R-2 Ponds (Appendix A Figures A2-1 and A2-5); the cap north of the Bravo Site (Appendix A Figure A2-9); and the areas south of the roadway in the vicinity of the Alfa Site (Appendix A Figure A2-13). Numerous small areas of ruderal habitat exist throughout the study area along roadways where herbicide spraying is conducted, or near existing buildings and other development.

4.2 Listed and Special-Status Species Surveys

4.2.1 Plant Species

Braunton's milk-vetch and Santa Susana tarplant are the only two listed/special-status plant species documented by the CNDDB in the vicinity of the study area (Appendix E Figure E-1). Braunton's milk vetch is federally listed as Endangered and the Santa Susana tarplant is state listed as Rare. The other documented plant species occurrences in the vicinity of the study area shown on the CNDDB map are of species that are neither listed nor have special status.

As discussed in Section 3.3, an area in the southern part of Boeing Area IV known to contain Braunton's milk-vetch was visited prior to the Fall 2010 surveys to determine the physical appearance of this species at the time. The Braunton's milk-vetch occurrence location shown on the CNDDB map does not correspond with the known location for this species in Boeing Area IV. The occurrence location is shown on the CNDDB map to be in NASA Area II. It is possible that the documented occurrence is the same as the known location in Boeing Area IV because occurrence locations on the CNDDB map have a spatial accuracy variability of one-mile radius.

All inspected specimens of Braunton's milk vetch in Boeing Area IV were in a state of senescence (Appendix D Photo 19). Nearly all the leaves had fallen off of the plants; the few leaves remaining on the stems were dried and curled. The stems, which were dry and grey, were either intact and approximately 2 or 3 ft in height or were broken and shorter (approximately 1 ft in height). No specimens of Braunton's milk-vetch were sighted in the general area of the CNDDB occurrence location or anywhere else on NASA-administered property at SSFL during the Fall 2010 surveys.

Based on inspections of Santa Susana tarplants at a known location at the ELV Site on NASA-administered property, all specimens were observed to be in bloom (Appendix D Photo 20). Santa Susana tarplants were sighted in 3,657 locations within the study area. Of these locations, only 324 were found in Area II, all of which were on the sandstone outcrops north of the LOX Site (Appendix F Figures A1-01 and A1-02). The overwhelming majority of the Santa Susana tarplants (3,333 locations or 91 percent of the total) were sighted in Area II, where they were widespread throughout the area in association with sandstone outcrop habitat (Appendix F Figures A2-01 through A2-17). Information collected on two of the Santa Susana tarplant locations is documented on SOI Datasheets ST01 and ST14 in Appendix G.

As discussed in Section 3, the dudleya surveys focused on non-chalky species of dudleya because non-chalky specimens could potentially be listed or special-status species. Photographs of non-chalky and chalky specimens of dudleya are provided as Photos 21 and 22, respectively in Appendix D. Because the dudleya plants are not in bloom during fall, a comprehensive survey of listed and special-status species of dudleya within the study area

was not conducted. The GPS points taken of dudleya locations represent areas and habitats where listed and special-status species of dudleya could potentially occur within the study area. A spring dudleya survey is recommended to provide a more comprehensive assessment of listed and special-status species of dudleya within the study area.

Non-chalky dudleya plants were sighted in 30 locations within the study area, all of which were in Area II (Appendix E Figure E-2). The plants were almost exclusively associated with remnant patches of grasses located on north-facing sandstone slopes (Appendix D Photos 23 and 24), such as the grass patches on the northern and southern sides of Skyline Road and on the slopes south of the Coca and Delta Sites (Appendix E Figure E-2). These small patches of grass are believed to be remnants of more extensive grass cover on these slopes that has been disturbed by human activity and has subsequently eroded. An alternative, but less likely, theory is that these patches of grass have established within pockets of accumulated sediment (colluvium) within cracks and microtopographic basins on the sandstone slope surface. Information collected on one of the dudleya locations is documented on SOI Datasheet Dud801in Appendix G.

Three individual California black walnut trees were sighted within the study area. Two of the walnut trees were co-located near the Bravo Site and one tree was located within a narrow canyon on the northern side of Skyline Road (Appendix E Figure E-2).

4.2.2 Animal Species

No listed or special-status wildlife species occurrences are documented by the CNDDB within or in the immediate vicinity of the study area or SSFL (Appendix E Figure E-1). Three California Department of Fish and Game (CDFG) Species of Special Concern (SSC) occurrences are documented by the CNDDB within the general vicinity of SSFL: western spadefoot toad (*Spea hammondii*), arroyo toad (*Anaxyrus californicus*), San Diego desert woodrat (*Neotoma lepida intermedia*), tricolored blackbird (*Agelaius tricolor*), and western mastiff bat (*Eumops perotis californicus*). The arroyo toad is also federally listed as Endangered. No evidence was found during the surveys indicating the potential occurrence of any of these species except for potentially the San Diego desert woodrat. Evidence of potential occurrence of woodrat species was found during the surveys; however, the species of woodrats in the study area could not be identified because no species-specific surveys were conducted.

One SSC reptile species, one SSC bird species, and one fully protected mammal species were sighted, and one federally Endangered butterfly species was potentially sighted, within the study area during the surveys. No occurrences of these species within the vicinity of SSFL are documented by the CNDDB.

The SSC reptile species sighted within the study area was the coast horned lizard (*Phrynosoma coronatum* (*blainvillii* population). Two individuals of this species were sighted, one in ruderal habitat on the Area II Landfill (Appendix E Figure E-3) and one in rock outcrop habitat north of the LOX Site in Area I (Appendix E Figure E-4). Both lizards were juveniles; one was approximately 1.5 inches in length and the other was approximately 1 inch in length. Information collected on these sightings is documented on SOI Datasheets HL01 and HL02 in Appendix G.

The SSC bird species sighted within the study area was the loggerhead shrike (*Lanius ludovicianus*). One individual loggerhead shrike was sighted flying across the road toward the eastern side of the SPA Site in Area II (Appendix E Figure E-3).

The fully protected mammal species sighted within the study area was the ring-tailed cat (*Bassariscus astutus*). One individual ring-tailed cat was sighted on a rock outcrop near a riparian drainage northwest of the SPA Site (Appendix E Figure E-3). The "fully protected" classification was the State of California's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Species that have this classification cannot be taken or possessed at any time.

The Quino checkerspot butterfly (*Euphydryas editha quino*), which is federally listed as Endangered, was potentially sighted within the study area. One individual butterfly that may have been this species was sighted southwest of the Bravo Site in mosaic habitat consisting of rock outcrop, non-native grassland, and Venturan coastal sage scrub (Appendix E Figure E-2). The butterfly was observed in flight and a positive identification was not possible. It was rust/orange colored and had white markings on its wings. The butterfly did not land long enough for a positive identification or photograph. It flew away in a zig-zag pattern similar to that described for male Quino checkerspot butterflies. Information collected on this sighting is documented on SOI Datasheet QCB01 in Appendix G.

4.3 Wildlife Observations

Observations of wildlife within the study were recorded during the Fall 2010 surveys. The animal species identified within the study area via sightings, calls, and other evidence of occurrence are listed in Table 2. As indicated in Table 2, 7 herpetile (reptiles and amphibians) species, 51 bird species, and 10 mammal species were identified during the surveys. Some animal species may not occur within the study area during fall, such as certain migratory bird species; therefore, a spring wildlife survey is recommended to provide a more comprehensive inventory of wildlife within the study area.

Signs of occurrence of the California mule deer (*Odocoileus hemionus californicus*) (Appendix D Photo 25) and wild pig (*Sus scrofa*), and of their predators, such as the mountain lion (*Felis concolor*) and bobcat (*Felis rufus*), were found throughout the study area. The types of wildlife that are supported by the various habitats within the study area can be assessed based on the field observations made during the surveys. It is important to note that the ecotones between the habitats are important to wildlife, especially for foraging, and the majority of animal species are not restricted to the habitat type that they may be most associated with.

Grasslands and some ruderal habitats within the study area support a variety of small mammals and provide important foraging and nesting habitat for raptors and other birds. Birds that forage in grasslands include the red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and loggerhead shrike (*Lanius ludovicianus*). Ground nesting birds utilize grasslands and to a certain extent, ruderal habitats, including the western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), and savannah sparrow (*Passerculus sandwichensis*). Graveled areas associated with ruderal habitats can provide ground nesting opportunities for species such as the killdeer (*Charadrius vociferus*). Ruderal vegetation occurring within and along the margins of disturbed areas are often utilized by birds such as the American goldfinch (*Carduelis tristis*), house finch (*Carpodacus mexicanus*), and Brewer's blackbird (*Euphagus cyanocephalus*). Mammal species that occur in grasslands and ruderal habitats include the cottontail rabbit (*Sylvilagus* sp.), California ground squirrel (*Spermophilus beecheyi*), and Botta's pocket gopher (*Thomomys bottae*). Rodent burrows in these habitats provide essential upland refuge sites for certain amphibians and reptiles,

including the western toad (*Anaxyrus boreas*) and western fence lizard (*Sceloporus occidentalis*).

TABLE 2
Animal Species Sighted on NASA-Administered Property at SSFL During Fall 2010 Surveys

Common Name	Scientific Name
Herpetiles	
Western Toad	*Anaxyrus* [*Bufo*] *boreas*
Coast Horned Lizard	*Phrynosoma blainvillii*
Western Fence Lizard	*Sceloporus occidentalis*
California Whiptail	*Aspidoscelis tigris munda*
Mountain Gartersnake	*Thamnophis elegans elegans*
Ring-necked Snake	*Diadophis punctatus*
Western Rattlesnake	*Crotalus oreganus helleri*
Birds	
Mallard	*Anas platyrhynchos*
California Quail	*Callipepla californica*
Great Blue Heron	*Ardea herodias*
Green Heron	*Butorides virescens*
Turkey Vulture	*Cathartes aura*
Cooper's Hawk	*Accipiter cooperii*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
American Kestrel	*Falco sparverius*
Rock Pigeon	*Columba livia*
Band-tailed Pigeon	*Patagioenas fasciata*
Mourning Dove	*Zenaida macroura*
White-throated Swift	*Aeronautes saxatalis*
Black-chinned Hummingbird	*Archilochus alexandri*
Anna's Hummingbird	*Calypte anna*
Rufous/Allen's Hummingbird	*Selasphorus rufus/sasin*
Belted Kingfisher	*Megaceryle alcyon*
Acorn Woodpecker	*Melanerpes formicivorus*
Nuttall's Woodpecker	*Picoides nuttallii*
Northern Flicker	*Colaptes auratus*
Black Phoebe	*Sayornis nigricans*

TABLE 2
Animal Species Sighted on NASA-Administered Property at SSFL During Fall 2010 Surveys

Common Name	Scientific Name
Say's Phoebe	*Sayornis saya*
Loggerhead Shrike	*Lanius ludovicianus*
Cassin's Vireo	*Vireo cassinii*
Western Scrub-Jay	*Aphelocoma californica*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Oak Titmouse	*Baeolophus inornatus*
Bushtit	*Psaltriparus minimus*
White-breasted Nuthatch	*Sitta carolinensis*
Pygmy Nuthatch	*Sitta pygmaea*
Rock Wren	*Salpinctes obsoletus*
Canyon Wren	*Catherpes mexicanus*
Bewick's Wren	*Thryomanes bewickii*
House Wren	*Troglodytes aedon*
Wrentit	*Chamaea fasciata*
Northern Mockingbird	*Mimus polyglottos*
California Thrasher	*Toxostoma redivivum*
Orange-crowned Warbler	*Vermivora celata*
Yellow-rumped Warbler	*Dendroica coronata*
MacGillivray's Warbler	*Oporornis tolmiei*
Wilson's Warbler	*Wilsonia pusilla*
Spotted Towhee	*Pipilo maculatus*
California Towhee	*Melzone crissalis*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Lark Sparrow	*Chondestes grammacus*
Fox Sparrow	*Passerella iliaca*
Lincoln's Sparrow	*Melospiza lincolnii*
White-crowned Sparrow	*Zonotrichia leucophrys*
House Finch	*Carpodacus mexicanus*
American Goldfinch	*Spinus tristis*
Mammals	
Desert Cottontail	*Sylvilagus audubonii*

TABLE 2
Animal Species Sighted on NASA-Administered Property at SSFL During Fall 2010 Surveys

Common Name	Scientific Name
California Ground Squirrel	*Spermophilus beecheyi*
Ring-tail cat	*Bassariscus astutus*
Raccoon	*Procyon lotor*
Coyote	*Canis latrans*
Bobcat	*Felis rufus*
Mountain lion	*Felis concolor*
California Mule Deer	*Odocoileus hemionus californicus*
Wild Pig	*Sus scrofa*
Vole species	*Microtus* sp.

Wooded areas within the study area provide foraging, nesting, and shelter habitat for many bird and mammal species. Birds that occur in wooded areas include the Cooper's hawk (*Accipiter cooperii*), oak titmouse (*Baeolophus inornatus*), nuthatches (*Sitta* spp.), and woodpeckers. A variety of warbler and vireo species are also expected to occur in the woodlands within the study area during the breeding season. Mammals, including various rodent species (e.g., *Peromyscus* spp., *Perognathus* spp., and *Mus musculus*), fox (e.g., *Urocyon cinereoargenteus* and *Vulpes* sp.), mule deer, and bobcat use the woodlands within the study area for foraging and denning.

Rock outcrops within the study area serve as breeding habitat for a variety of birds and mammals, and also provide cover for small mammals, reptiles, and amphibians. Rock outcrops can serve as nesting habitat for raptor species including the red-tailed hawk, for owls including the barn owl (*Tyto alba*), and for other birds such as the rock wren (*Salpinctes obsoletus*). Rock outcrops also provide cover and nesting habitat for small mammals including the cottontail rabbit and California ground squirrel, and for reptiles including the California whiptail (*Aspidoscelis tigris munda*) and western rattlesnake (*Crotalus oreganus heller)* (Appendix D Photo 26). Reptiles and small mammals attracted to rock outcrops provide prey opportunities for larger mammals including the coyote (*Canis latrans*), bobcat, and foxes, and for raptors.

Basins and depressions on rock outcrops that are inundated during the wet season could potentially support listed fairy shrimp species. Based on available information, several listed fairy shrimp species are considered to have the potential to occur in seasonally inundated pools on rock outcrops in the study area. Listed fairy shrimp species known to occur on rock outcrops in southern California include the federally Endangered longhorn fairy shrimp (*Branchinecta longiantenna*) and the federally Threatened vernal pool fairy shrimp (*Branchinecta lynchi*). The federally Endangered Riverside fairy shrimp (*Streptocephalus woottoni*) was addressed in a 2010 USFWS Biological Opinion prepared for a proposed remediation project on Boeing's property at SSFL. The Biological Opinion concluded that the project would have no effect on this species due to the absence of critical habitat on the property. During the Fall 2010 surveys, several basins on rock outcrops were

sighted within the study area. Photographs of some of the sighted basins are provided as Photos 27 through 29 in Appendix D. Only one of the basins (Basin 03) contained water (Appendix D Photo 28). The two largest basins were sighted in Area I (Appendix E Figure E-4).

Freshwater marshes and ponds, and to a certain extent, seasonal wetlands within the study area are highly productive wildlife habitats for amphibians, aquatic reptiles, waterfowl, wading birds, and certain songbirds. Many wildlife species depend on the ponds and associated marshes for their entire life cycles; others use them as temporary refuges or migratory stopover areas. The ponds and associated marshes within the study area provide foraging, nesting and resting habitat for ducks, shorebirds, egrets, and herons including the green heron (*Butorides virescens*) (Appendix D Photo 30). These habitats serve as foraging and breeding habitat for various frogs, salamanders, and aquatic reptiles, and also provide prey opportunities for hawks, owls, coyotes, and foxes.

Intermittent streams and associated riparian habitat, such as coast live oak riparian forest, provide valuable habitat for a variety of wildlife species. Wading birds including the great blue heron (*Ardea herodias*), waterfowl including the mallard (*Anas platyrhynchos*), and other birds including the red-winged blackbird (*Agelaius phoeniceus*) utilize the intermittent streams when they are inundated during the wet season. The associated riparian habitats provide foraging habitat and cover for raptors, owls, and a variety of mammal species.

A total of three inactive raptor stick nests were sighted within the study area during the surveys. Although these nests were inactive during the surveys, they could potentially be used by raptors during the nesting season. A fourth nest was suspected to potentially exist on a cliff north of the LOX Site (Appendix E Figure E-4). Although a nest was not seen on the cliff, a pair of red-tailed hawks was regularly sighted in the area and whitewash and prey remains existed at the bottom of the cliff, suggesting the potential presence of a nest somewhere on the cliff (Appendix D Photos 31 and 32). All of the stick nests that were sighted (Stick Nests 01, 02, and 03) existed around the Alfa Site in Area II (Appendix E Figures E-2 and E-3). Stick Nest 01 is a large nest on a man-made structure within the Alfa Site (Appendix D Photos 33 and 34); Stick Nest 02 is on a cliff south of the Alfa Site (Appendix D Photos 35 and 36); and Stick Nest 03 is on a cliff southwest of the Alfa Site (Appendix D Photos 37 and 38).

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SECTION 5

Conclusions and Recommendations

5.1 Conclusions

All of the natural and non-natural habitat types that exist on NASA-administered property at SSFL were characterized and mapped during the Fall 2010 surveys. The habitat assessments were not limited by season; therefore, the habitat characterizations and mapping conducted are considered to be accurate and comprehensive. The primary natural habitats on NASA-administered property are baccharis scrub, chaparral, coast live oak riparian forest, coast live oak woodland, freshwater marsh, mulefat scrub, non-native grassland, Venturan coastal sage scrub, southern willow scrub, and undifferentiated wetland. The primary non-natural habitats on NASA-administered property are developed, open water, and ruderal. Chaparral (172.63 acres) is the dominant natural habitat type and developed (58.10) is the dominant non-natural habitat type. Overall, the natural habitats on NASA-administered property have relatively good ecological quality and functionality. The effects of recent fires appeared to be relatively minor and impacts from past site operations appeared mostly limited to habitats near developed areas.

No specimens of the federally Endangered Braunton's milk-vetch were sighted on NASA-administered property during the surveys. This plant species has not been sighted on NASA-administered property at SSFL in the past but was expected to have potentially recruited onto NASA-administered property following recent fires near SSFL. Based on inspections of Braunton's milk-vetch at a known location on Boeing's property during the surveys, the species was in a state of senescence. Although senescent, the species appeared to be readily identifiable; therefore, the species-specific survey conducted is considered reliable.

The Santa Susana tarplant, which is state-listed as Rare, was sighted in 3,657 locations on NASA-administered property during the surveys. This species was in bloom and, therefore, easily identifiable during the surveys. It was primarily found in sandstone outcrop habitat and the majority of the sightings were in Area II.

Dudleya surveys focused on non-chalky species of dudleya because non-chalky specimens could potentially be listed or special-status species. Because the dudleya plants are not in bloom during fall, a comprehensive survey of listed and special-status species of dudleya was not conducted. Non-chalky dudleya plants were sighted in 30 locations, all of which were in Area II. The plants were almost exclusively associated with remnant patches of grasses on north-facing sandstone slopes. The recorded dudleya locations represent areas and habitats where listed and special-status species of dudleya could potentially occur.

The California black walnut is not state or federally listed but is considered vulnerable due to overgrazing and habitat loss. Three individual California black walnut trees were sighted during the surveys. This species is easily identifiable during any season; therefore, the species-specific survey conducted is considered reliable.

Species-specific surveys for listed/special-status animal species were not conducted during the Fall 2010 surveys; however, opportunistic wildlife observations were recorded. A total of 7 herpetile species, 51 bird species, and 10 mammal species were identified during the

surveys. One SSC reptile species (coast horned lizard), one SSC bird species (loggerhead shrike), and one fully protected mammal species (ring-tailed cat) were sighted, and one federally Endangered butterfly species (Quino checkerspot butterfly) was potentially sighted. Several basins on rock outcrops that could potentially support listed fairy shrimp species were found. A total of three inactive raptor stick nests were sighted and a fourth nest was suspected to exist on a cliff based on the presence of whitewash and prey remains at the bottom of the cliff. Although the sighted nests were inactive during the surveys, they could potentially be used by raptors during the nesting season.

5.2 Recommendations

The habitat characterizations and mapping conducted during the Fall 2010 surveys are considered to be accurate and comprehensive; therefore, additional habitat assessments are not recommended for the near term. Additional surveys for listed, special-status, and common plant and animal species are recommended to be conducted during springtime to complement the findings of the Fall 2010 surveys. During fall, most of the annual plants are in a state of senescence and not easily identifiable. Many animal species, including several species of migratory birds, also do not occur in the area during fall. A spring survey would provide a more comprehensive assessment of certain listed/special status plant species as well as a more comprehensive inventory of common plant and animal species on NASA-administered property.

Specifically, a spring dudleya survey is recommended to provide a more comprehensive assessment of listed and special-status species of dudleya on NASA-administered property. During spring, the species and protection status of the dudleya plants found during the Fall 2010 surveys could be determined, and additional focused surveys could be conducted in specific habitats. Focused spring surveys are also recommended for listed fairy shrimp species; species that occur in seasonal drainages and undifferentiated wetlands; and nesting birds, including raptors. The occurrence location for Braunton's milk-vetch shown on the CNDDB map is also recommended to be revisited during spring to confirm the presence or absence of this species in this area. Further assessment of potential Quino checkerspot butterfly occurrence on the property could also be considered for the spring surveys.

SECTION 6

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Appendix A
Habitat Mapping

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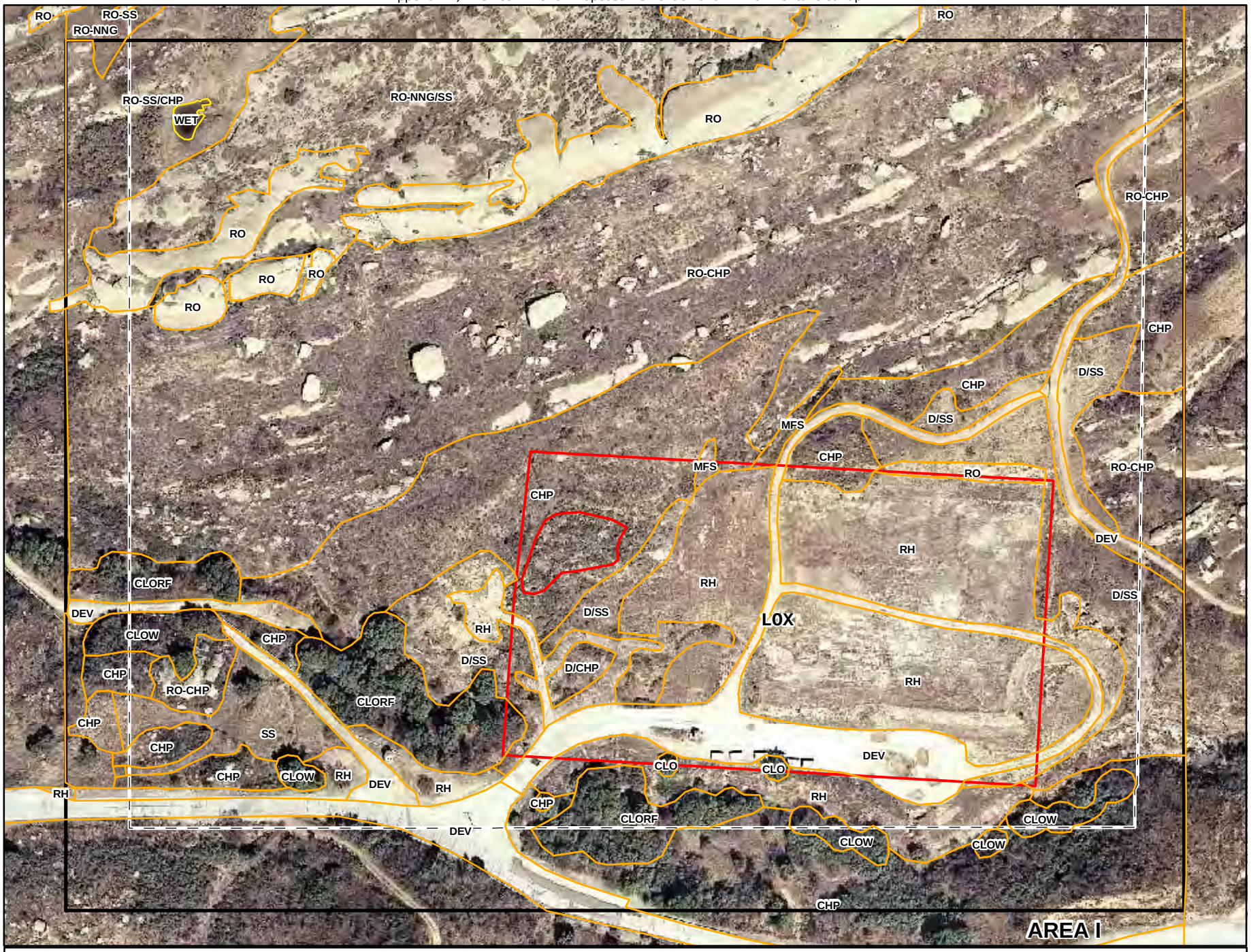


29-DEC-2010
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

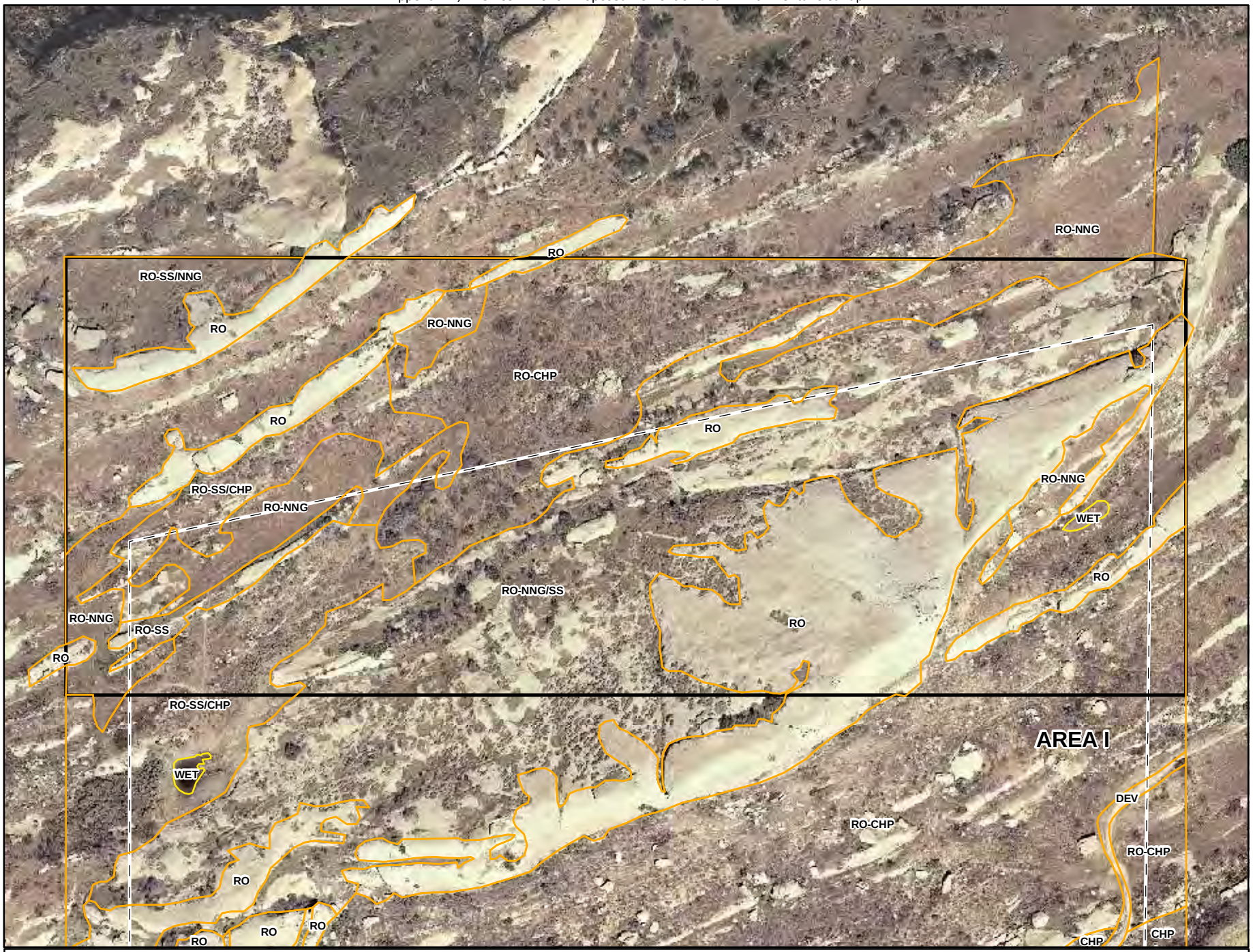
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Wetland

A1-1
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A1-1.mxd)



29-DEC-2010
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

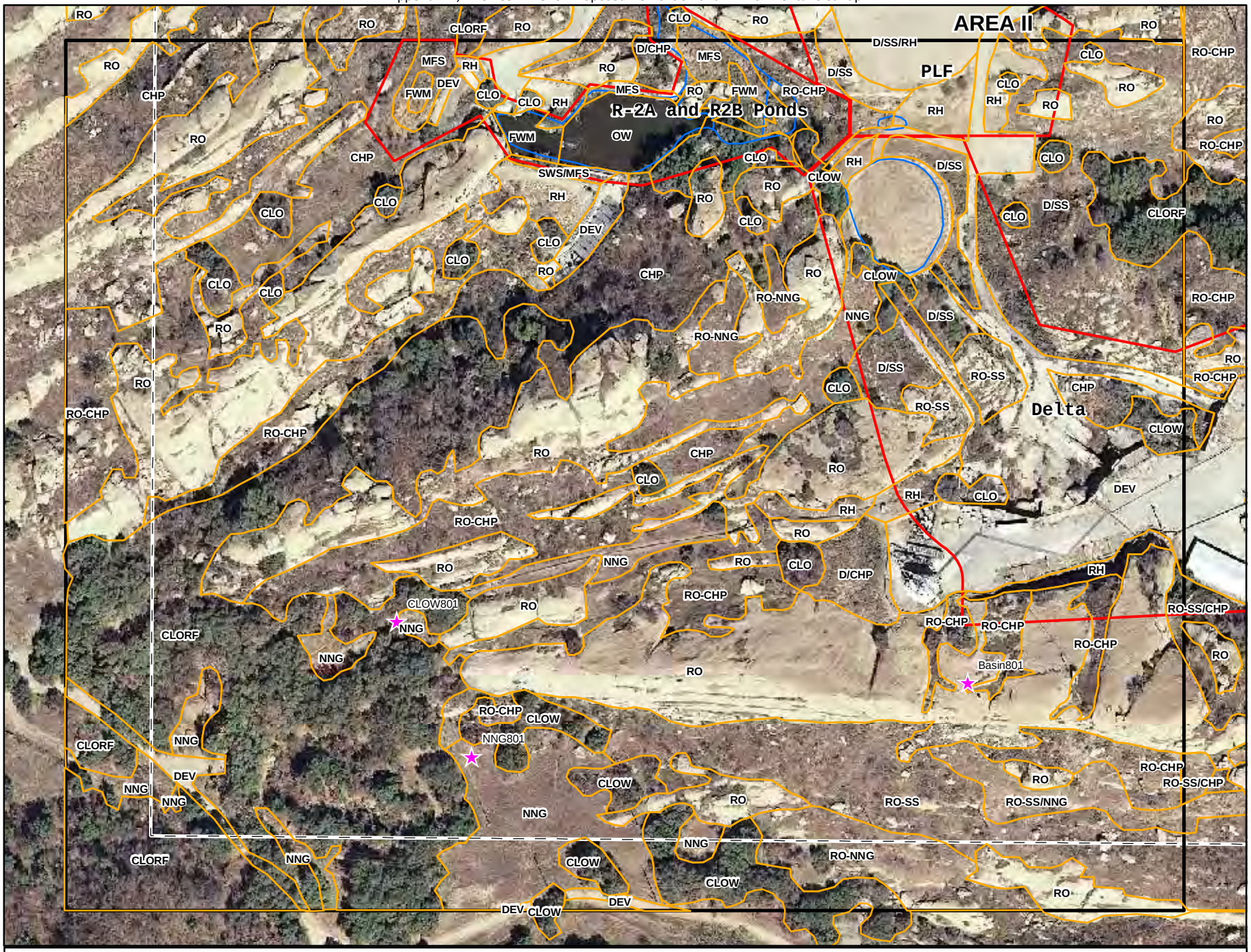
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

Grid
SWMU or AOC
NASA Property Boundary
Wetland

A1-2
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A1-2.mxd)



Notes:

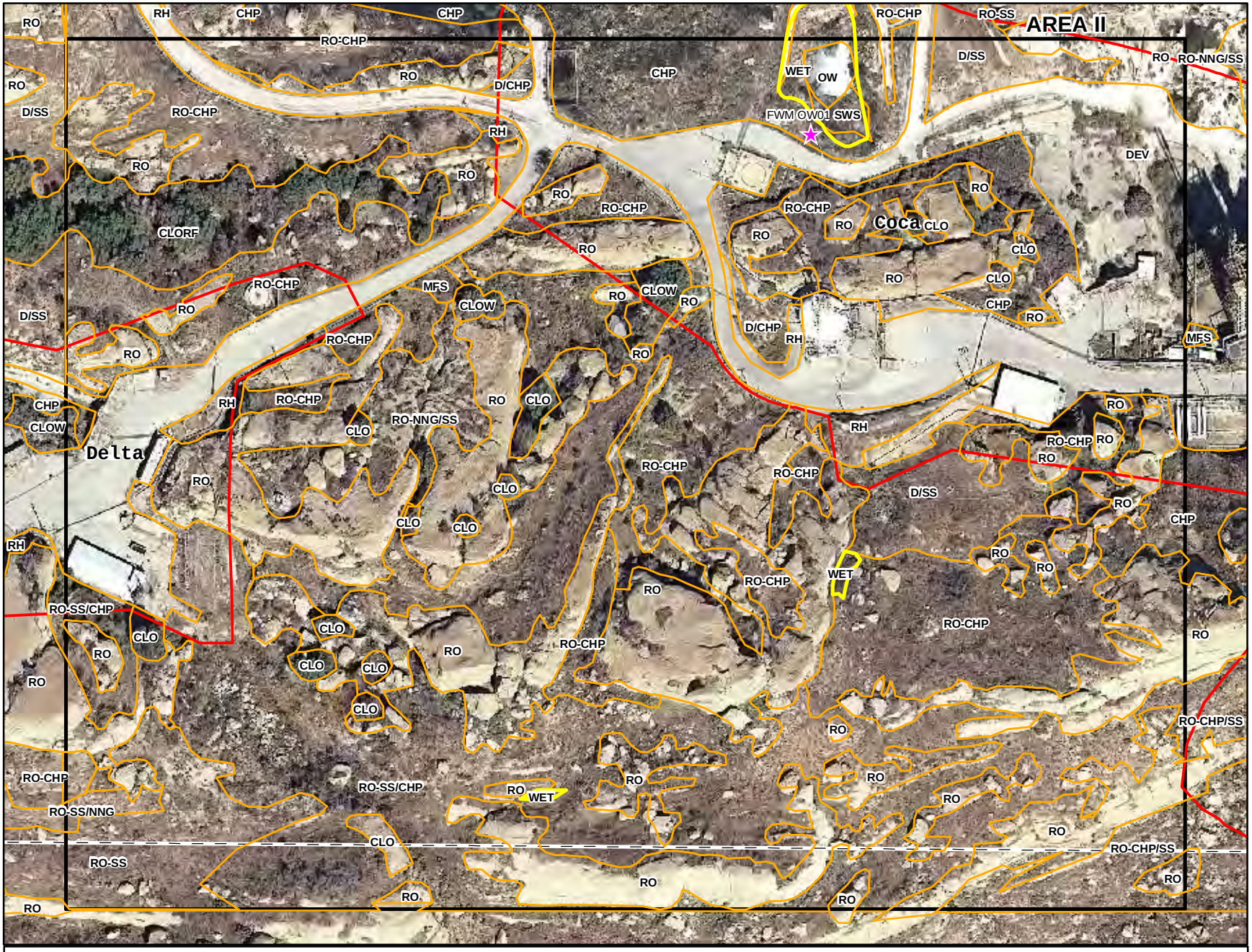
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

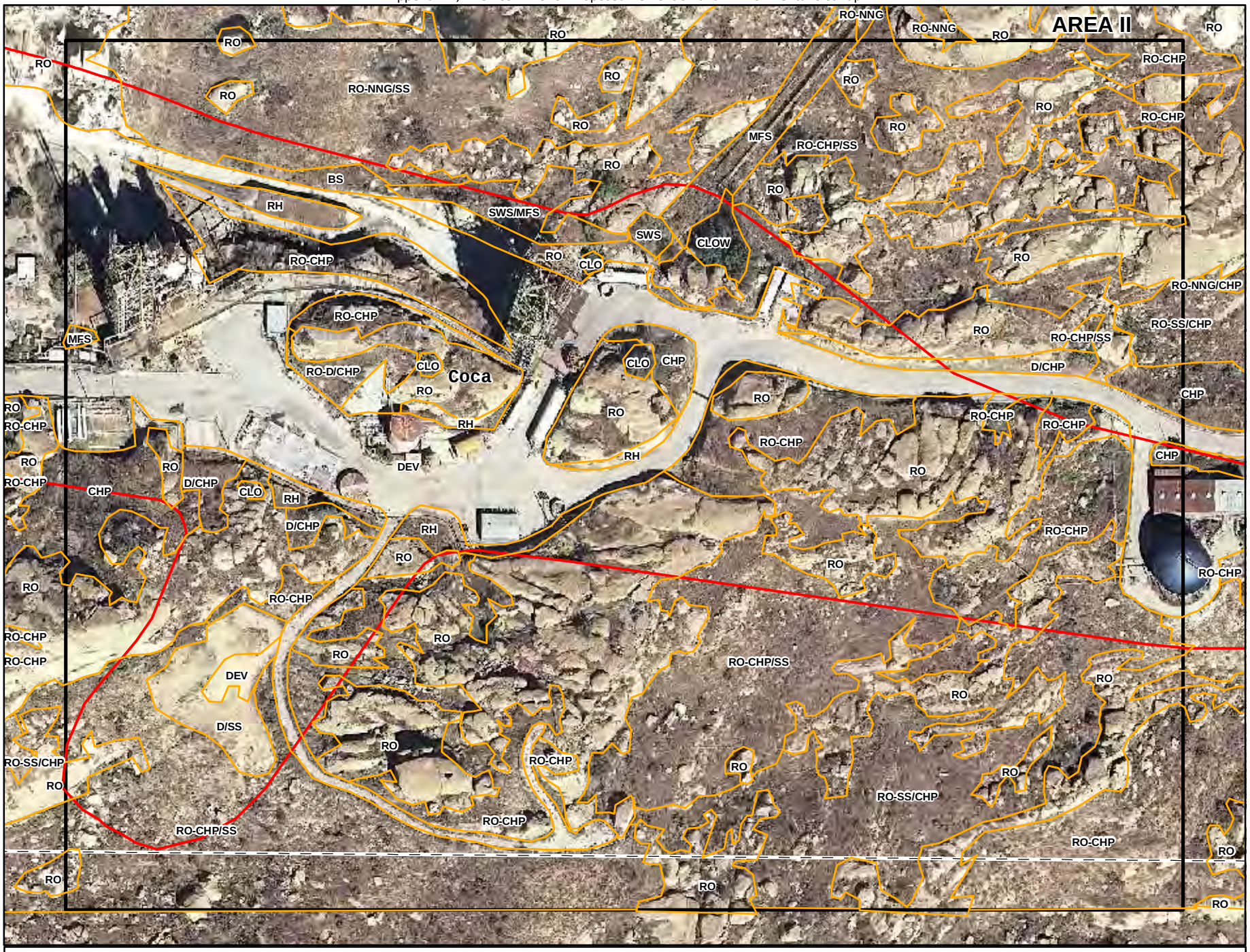
Legend

- Natural Community Data Sheet Points
- Wetlands
- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-1
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey\SSFL_Habitat_A2-1.mxd)


AREA II
Coca
Delta
FWM OW01 SWS
RO
RH
CHP
RO-CHP
RO-SS
RO-NNG/SS
D/SS
D/CHP
CHP
WET
OW
CLO
CLOW
CLORF
MFS
DEV
RO-SS/CHP
RO-CHP/SS
RO-SS/NNG
RO-SS
5-JAN-2011
Drawn By:
A. Cooley
0 25 50 100 150 200
Feet
Notes:
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.
Legend
Natural Community Data Sheet Points
Wetlands
Grid
SWMU or AOC
NASA Property Boundary
Pond
A2-2
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California
Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-2.mxd)



Notes:

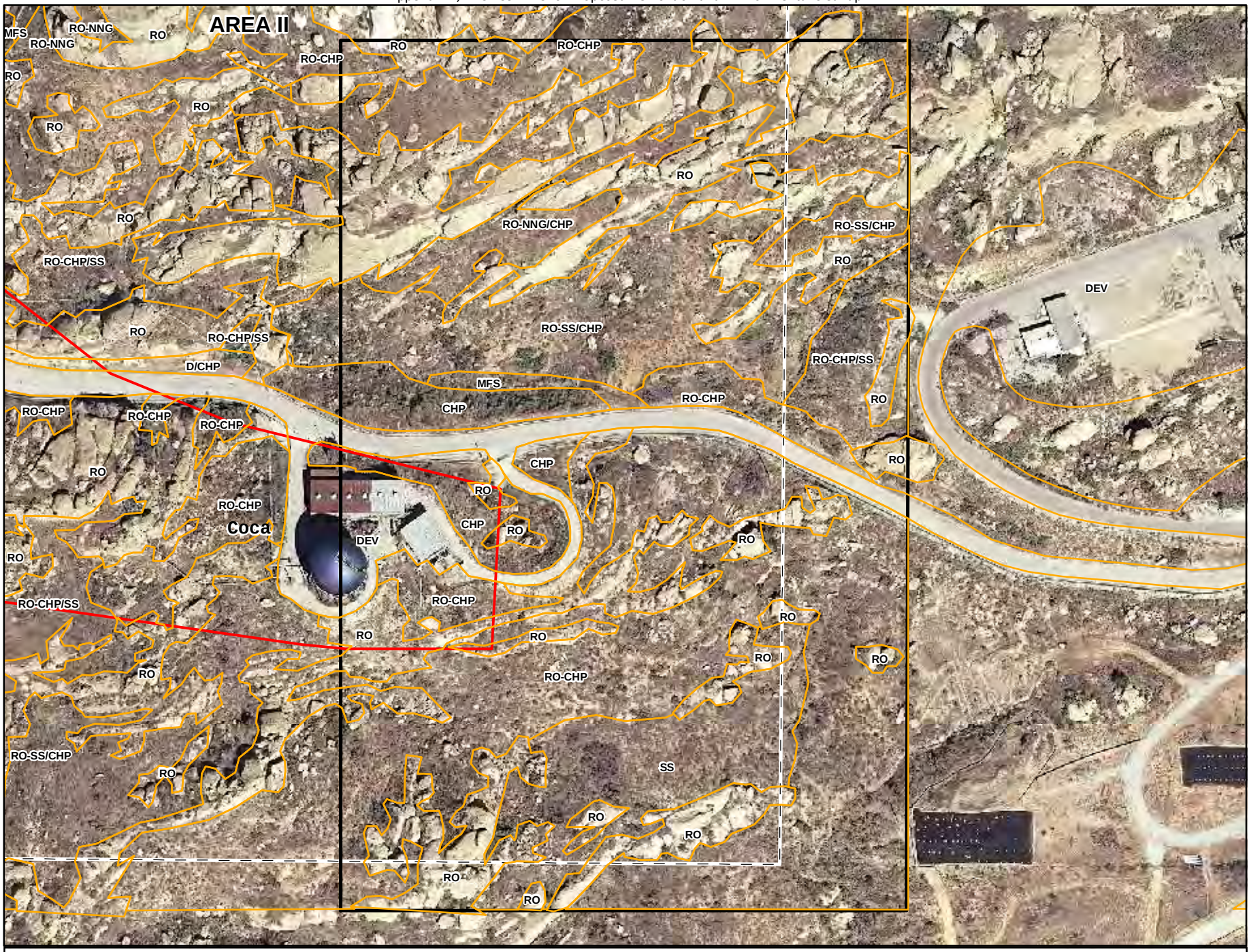
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

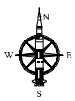
Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-3
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-3.mxd)





4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

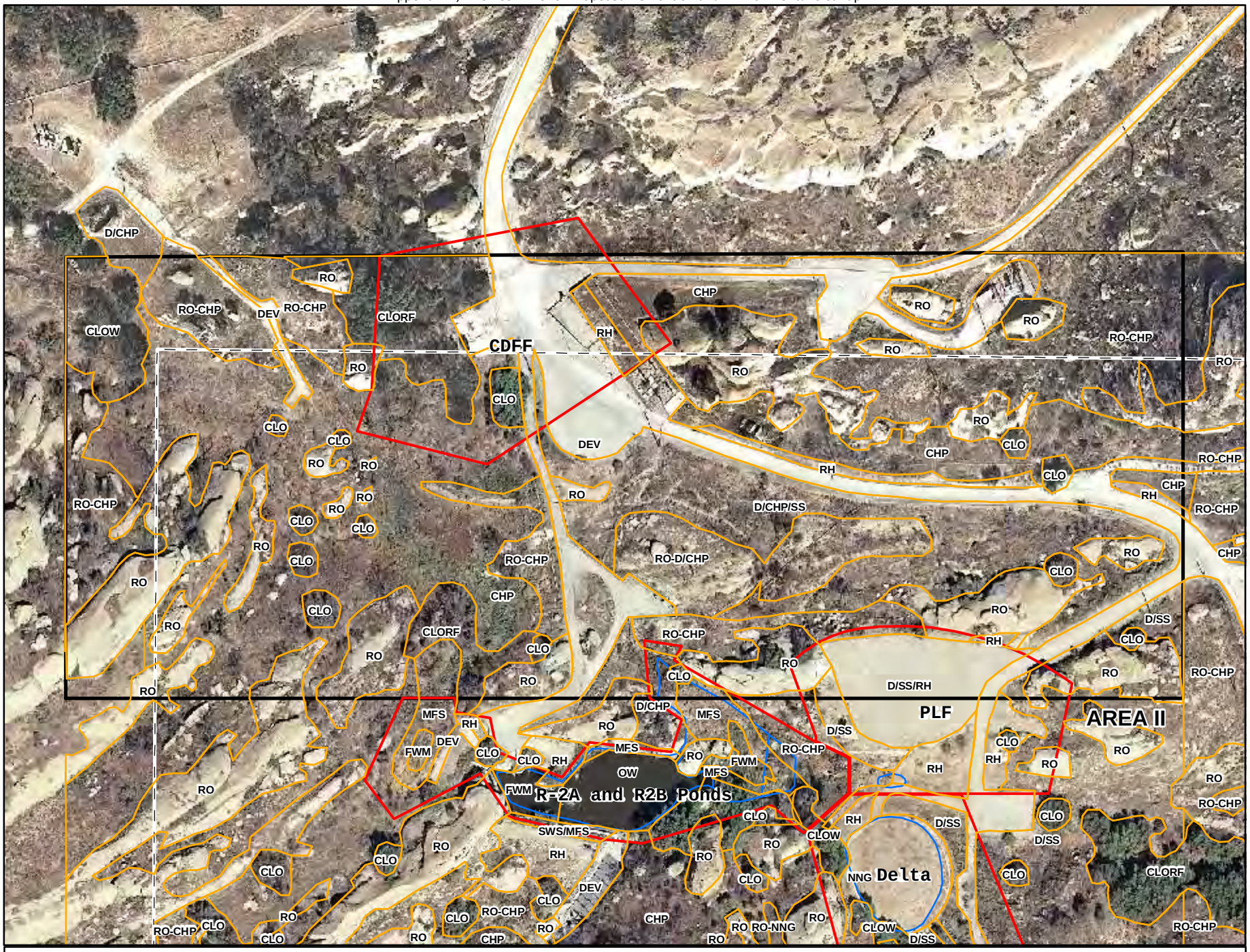
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-4
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-4.mxd)



4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

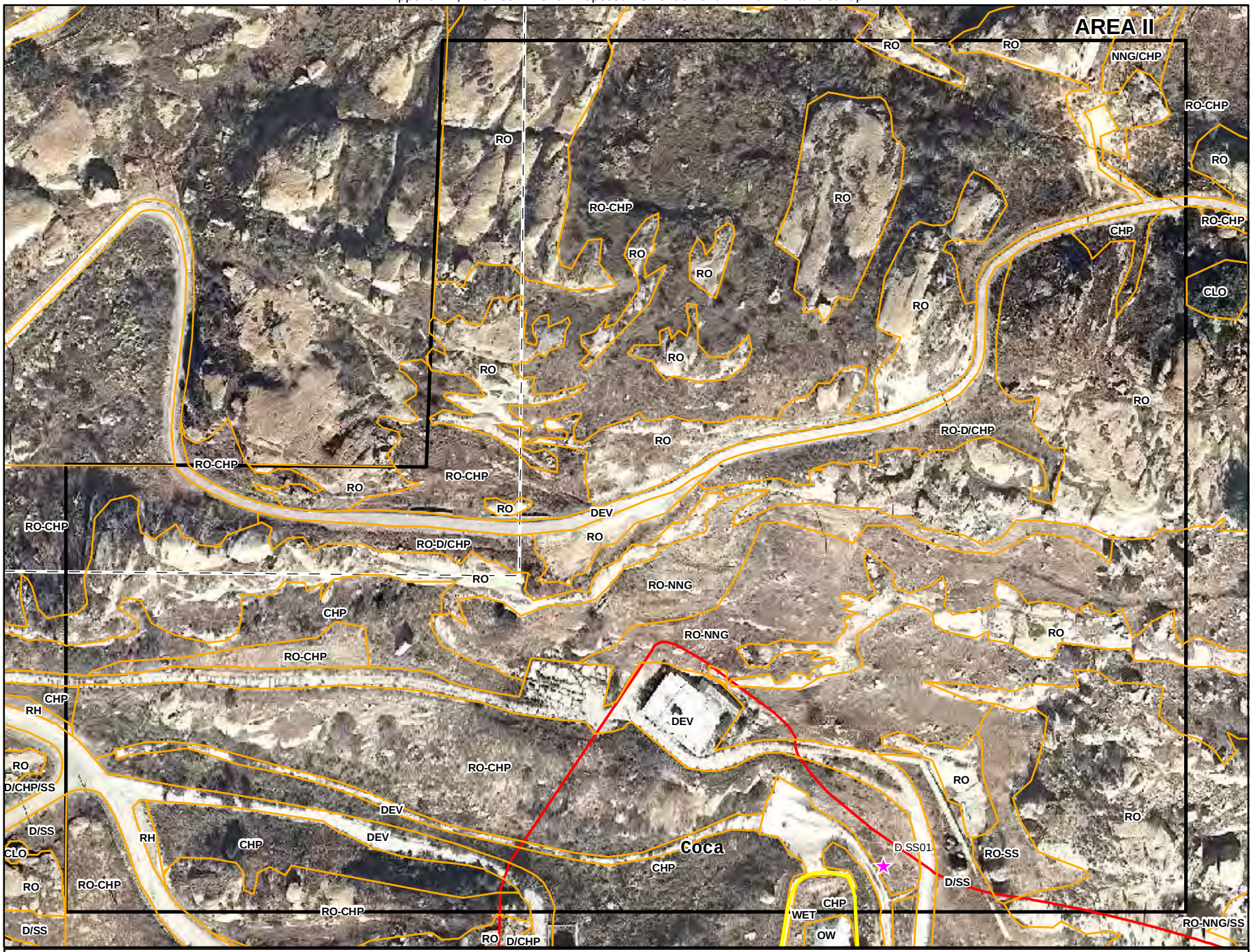
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-5
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-5.mxd)



Notes:

1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Natural Community Data Sheet Points
- Wetlands
- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-6
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

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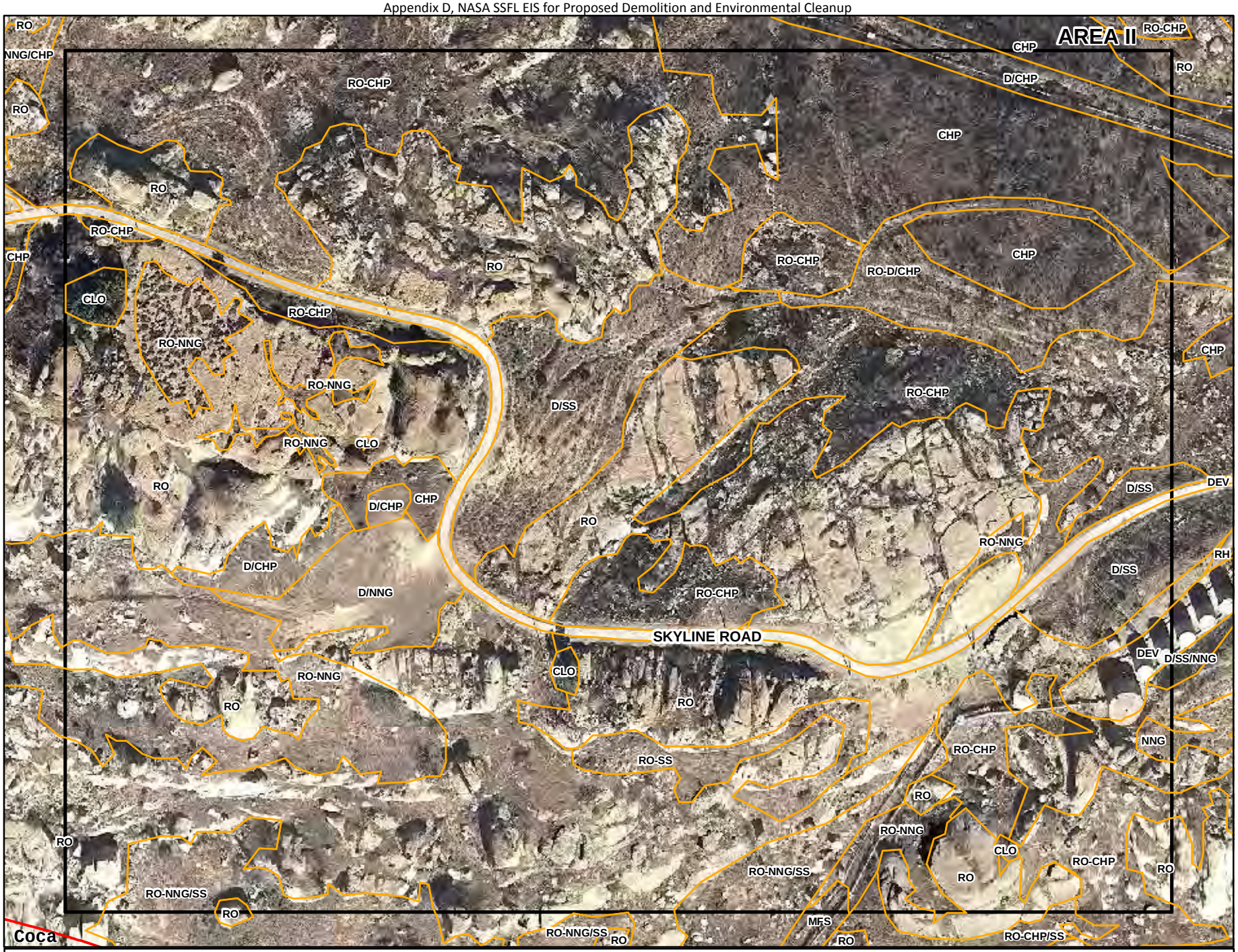


Notes:

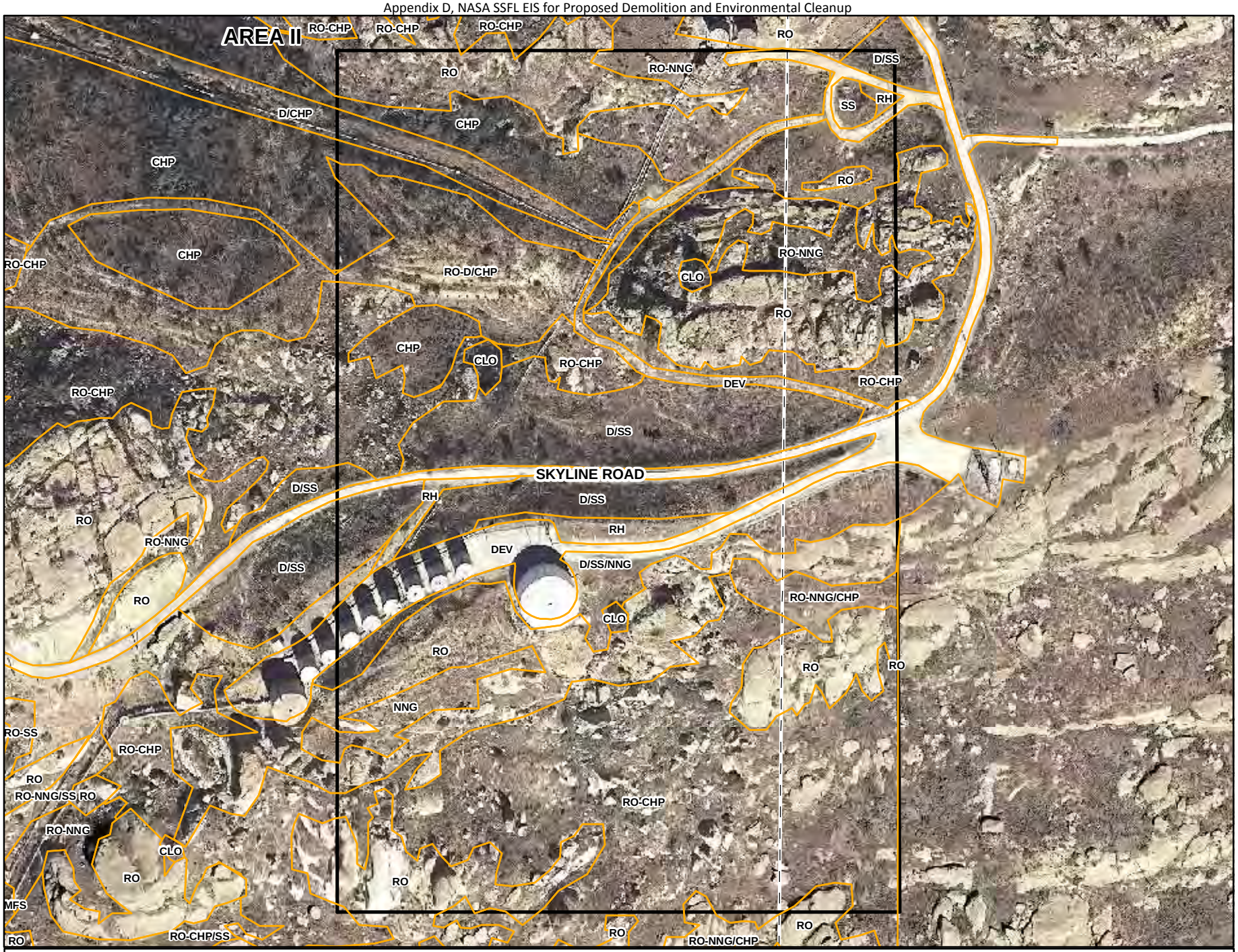
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-7
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-7.mxd)



4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

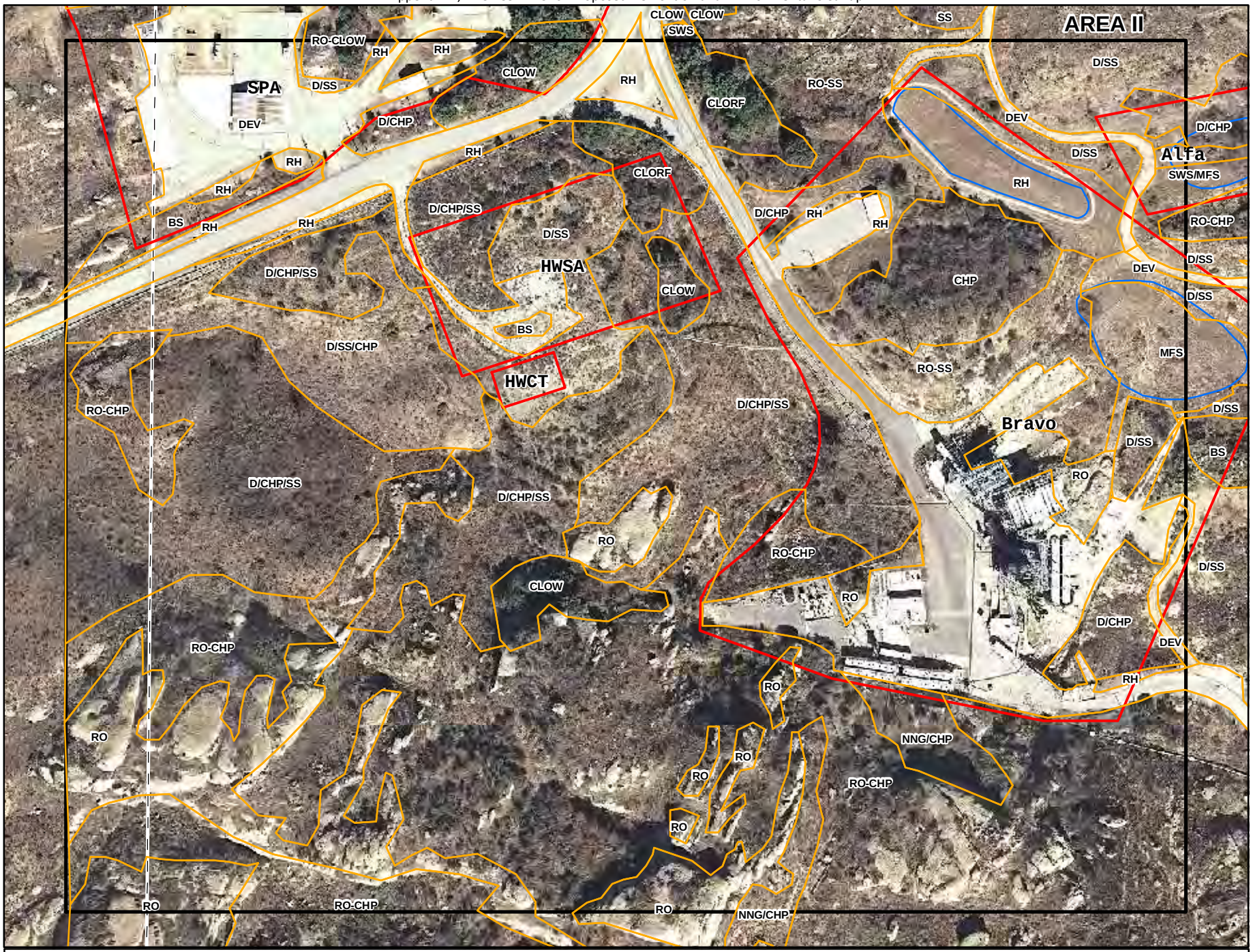
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-8
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-8.mxd)



Notes:

1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-9
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-9.mxd)


AREA II
Alfa
Bravo
CLO
DEV
RH
D/SS
RO-NNG
CHP
SWS
RO-SS
RO
D/CHP
SWS/MFS
NNG
SS
RO-CHP
MFS
BS
D/NNG
BS/MFS
4-JAN-2011
Drawn By:
A. Cooley
0 25 50 100 150 200
Feet
Notes:
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.
Legend
Grid
SWMU or AOC
NASA Property Boundary
Pond
A2-10
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California
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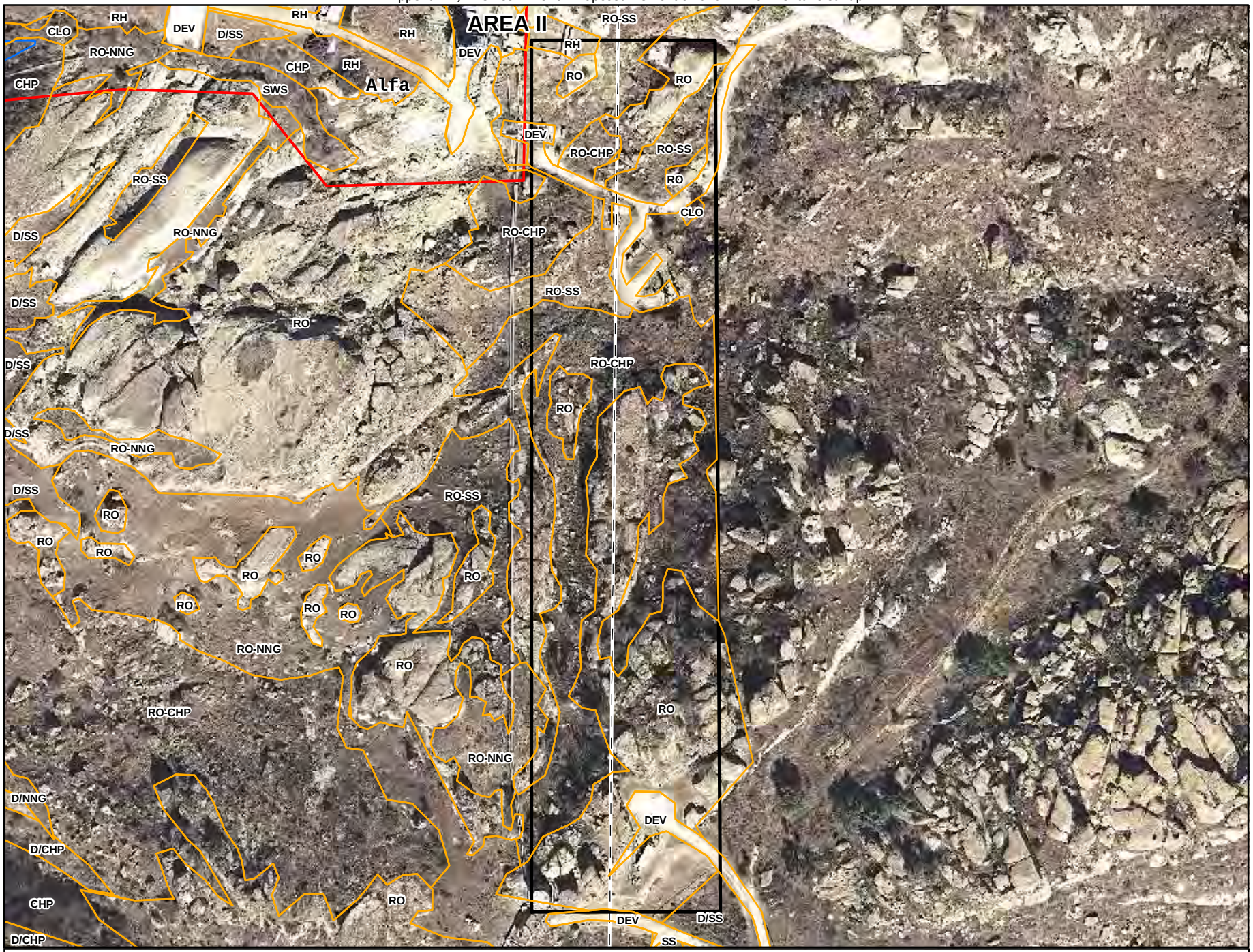


4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-11
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-11.mxd)

4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-12
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-12.mxd)

5-JAN-2011
Drawn By:
A. Cooley

Notes:

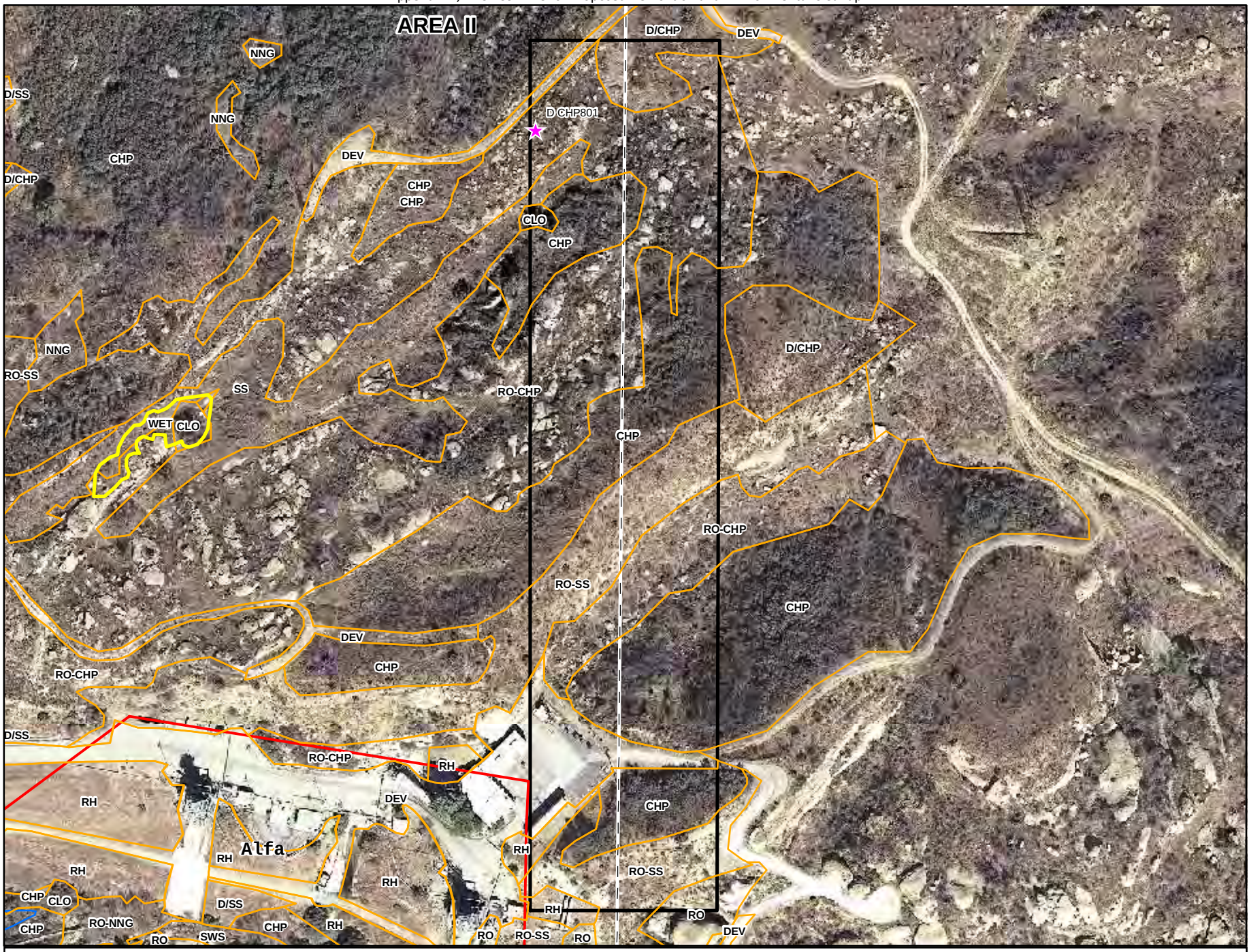
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Natural Community Data Sheet Points
- Wetlands
- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-13
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-13.mxd)



5-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Natural Community Data Sheet Points
- Wetlands
- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-14
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

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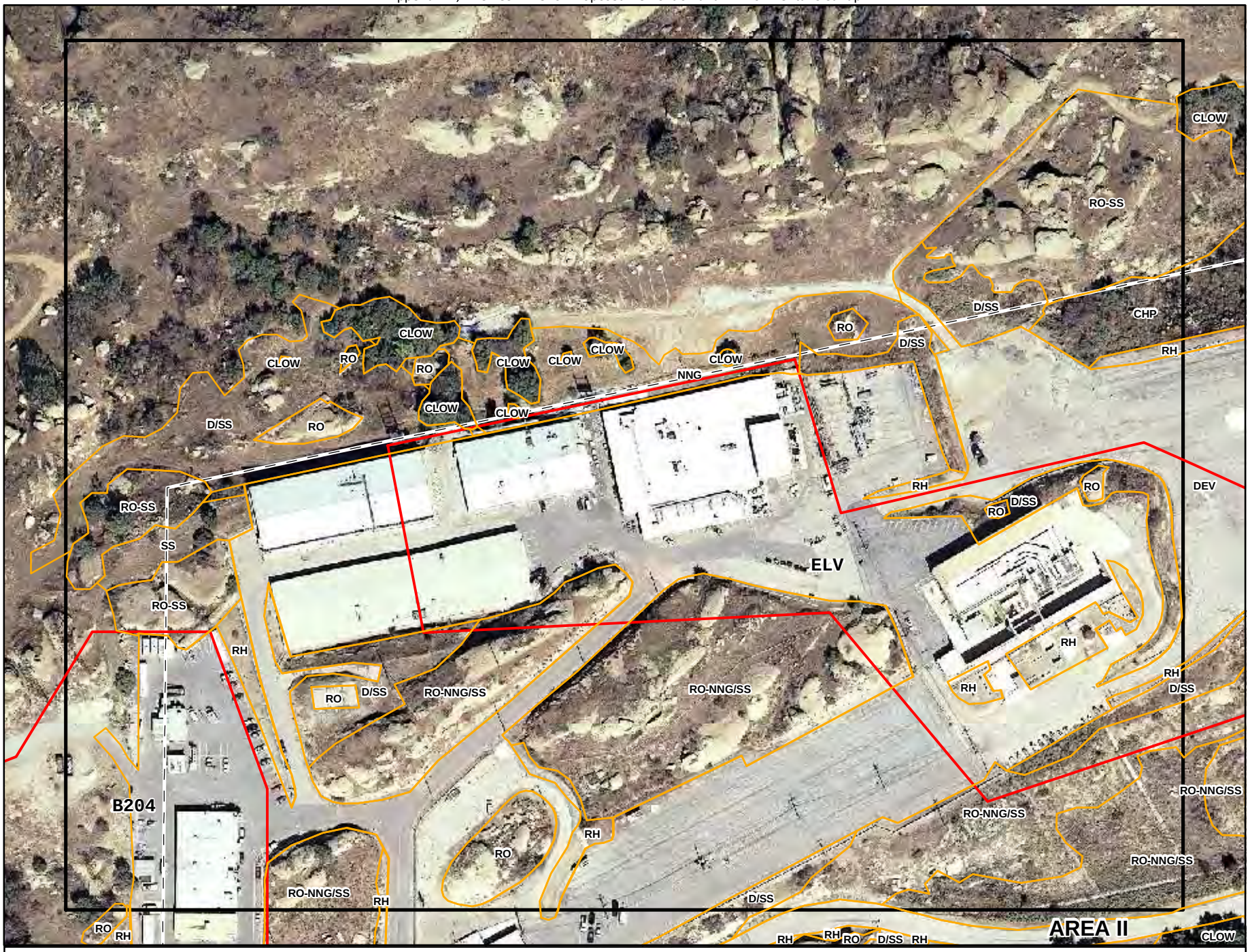


4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

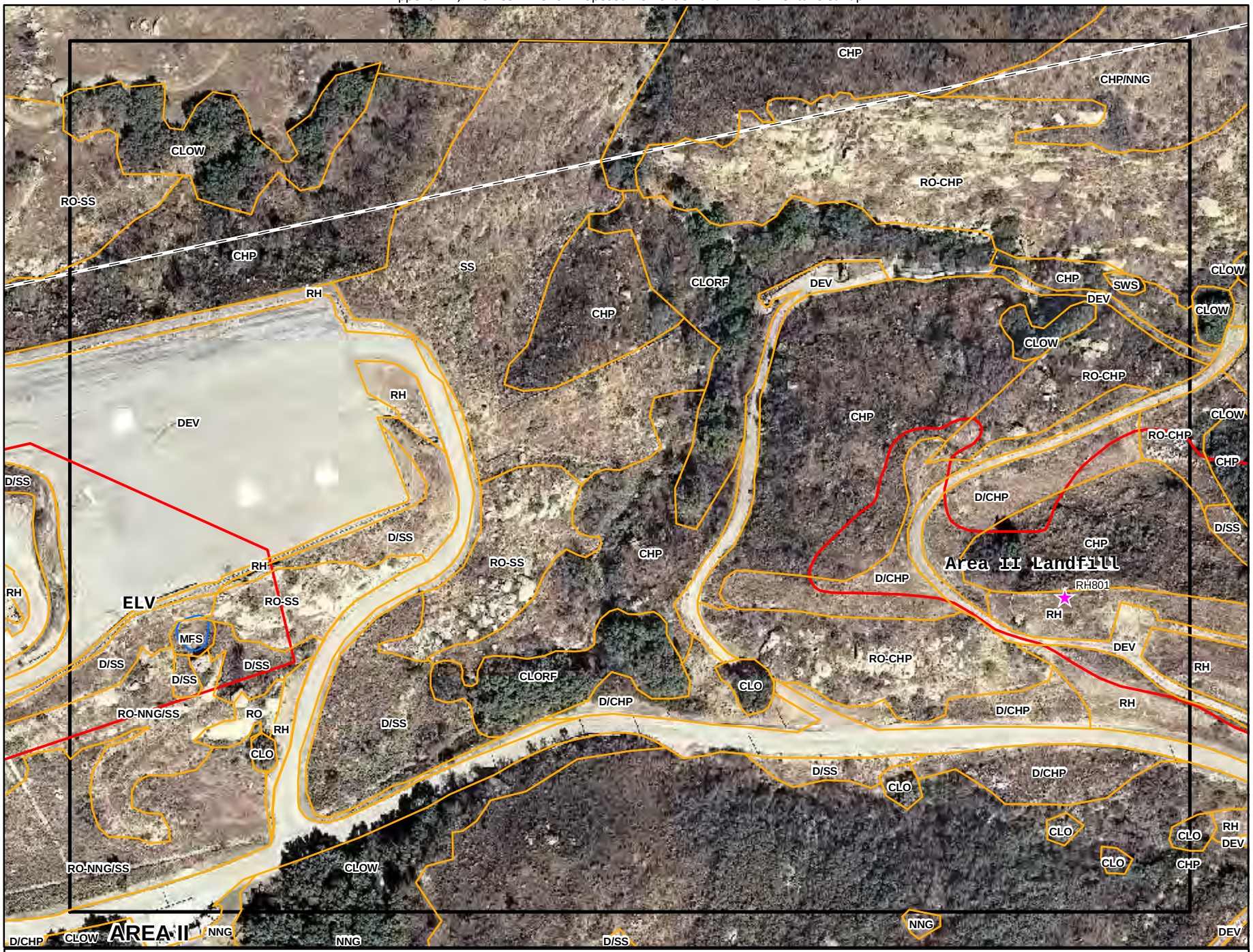
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-15
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-15.mxd)



4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

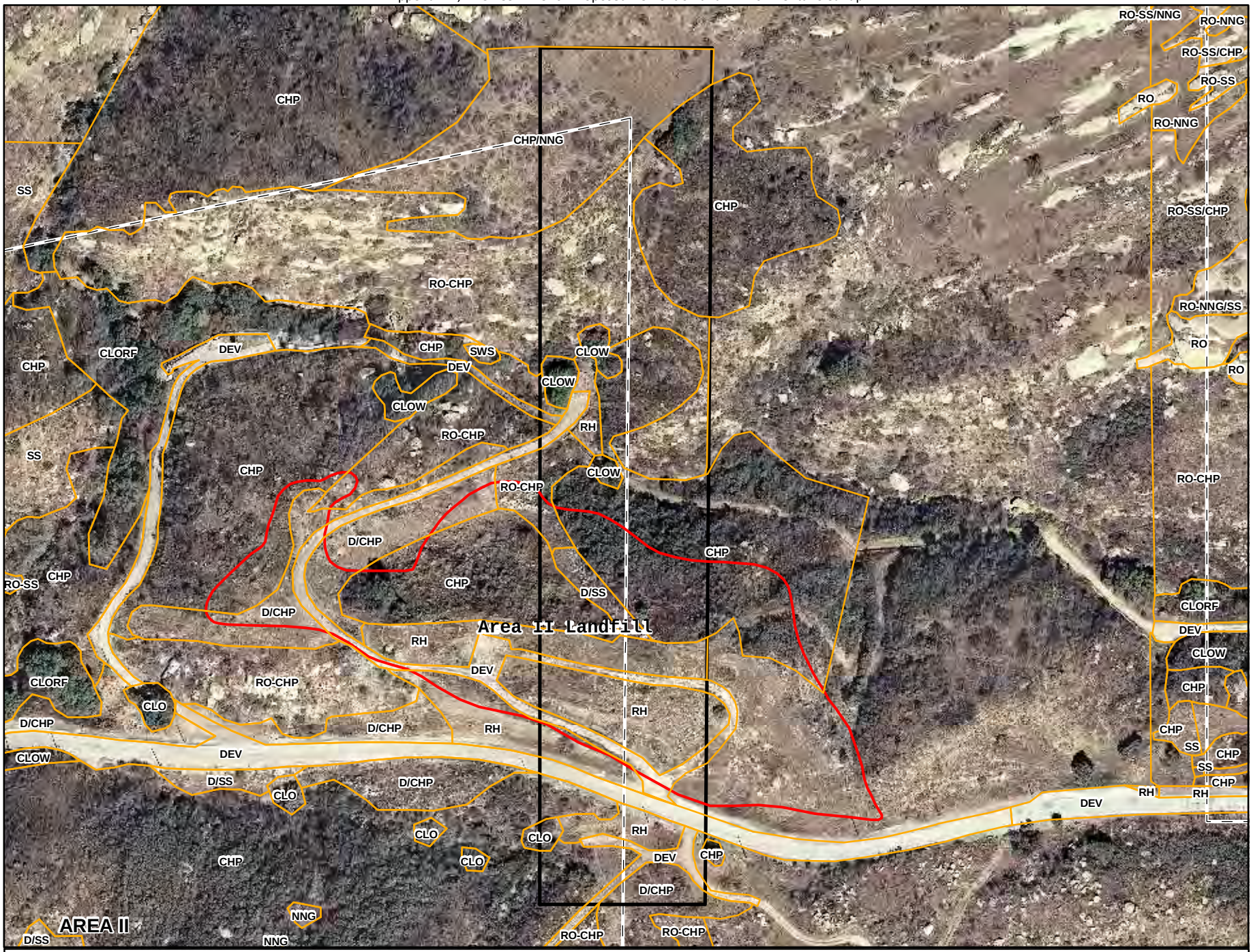
1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

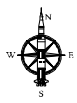
Legend

- Natural Community Data Sheet Points
- Wetlands
- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-16
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-16.mxd)





4-JAN-2011
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Notes:

1. Base map aerial photography dated 2007.
2. Habitat boundaries are approximate as shown based on in-field reference to surface features.
3. Habitat classifications are based on Holland (1986) except where no suitable category exists.

Legend

- Grid
- SWMU or AOC
- NASA Property Boundary
- Pond

A2-17
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document:(O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_Habitat_A2-17.mxd)

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Appendix B
Natural Community Datasheets

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NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: CLOW801

Lat/Long: 34°13'29.4"/118°42'24.9"

Date: 10/08/2010

Investigators: S. Long; G. Santolo

Community Type: Coast Live Oak Woodland

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree- *Quercus agrifolia* (coast live oak) / Shrub- *Sambucus mexicana* (blue elderberry), *Toxicodendron diversilobum* (poison oak) / Herb - *Phragmites australis* (common reed grass), *Carduus pycnocephalus* (Italian thistle), *Rosa californica* (wild rose), *Avena* sp. (oat), other grasses (indeterminate)

Habitat Quality: Adjacent to pond in Coca Site

Invasive Species: common reed, Italian thistle

Wildlife Observations: Nuttall's woodpecker (*Picoides nuttallii*), western scrub-jay (*Aphelocoma californica*), mule deer (*Odocoileus hemionus*), small mammal burrows

Notes:

Coast Live Oak Woodland habitat

NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: D-CHP801

Lat/Long: 34°13'08.8"/118°41'33.4"

Date: 10/08/2010

Investigators: S. Long; G. Santolo

Community Type: Disturbed Chaparral

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree - *Quercus agrifolia* (coast live oak; occassional), *Crataegus* sp. (hawthorn), *Ceanothus* sp. (California lilac) / Shrub - *Adenostoma fasciculatum* (chamise), *Ribes malvaceum* (chaparral currant), *Phacelia ramosissima* (branching phacelia), *Eriodictyon crassifolium* (Thickleaf yerba santa), *Yucca whipplei* (yucca), *Salvia mellifera* (black sage) / Herb – *Acmispon glaber* (deer weed), *Eriogonum fasciculatum* (California buckwheat) *Bromus diandrus* (ripgut brome), *Bromus madritensis* ssp. *rubens* (red brome)

Habitat Quality: Area had been previously burned in the 2005 fires

Invasive Species: None

Wildlife Observations: Cooper's hawk (*Accipiter cooperii),* bushtit (*Psaltriparus minimus*), California thrasher (*Toxostoma redivivum*), yellow-rumped warbler (*Dendroica coronata*), western scrub-jay (*Aphelocoma californica*), spotted towhee (*Pipilo maculatus*), coyote scat (*Canis latrans*), mule deer trails (*Odocoileus hemionus*), small mammal burrows

Notes: Excellent cover, but no water sources

Disturbed Chaparral habitat

NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: D-SS01

Lat/Long: 34°13'37.5"/118°42'00.6"

Date: 10/08/2010

Investigators: S. Long; G. Santolo

Community Type: Disturbed Sage Scrub

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree – None / Shrub - *Salvia leucophylla* (Purple sage*)*, *Eriodictyon crassifolium* (Thickleaf yerba santa), *Baccharis pilularis* (coyote brush), *Baccharis salicifolia* (mulefat) / Herb - *Heterotheca grandiflora* (telegraph weed), *Acmispon glaber* (deer weed), *Brassica nigra* (black mustard)

Habitat Quality: Adjacent to pond in Coca site; previously burned in 2005

Invasive Species: None

Wildlife Observations: Western fence lizard (*Sceloporus occidentalis*), rufous hummingbird (*Selasphorus rufus*), white-throated swifts (*Aeronautes saxatalis*), black phoebe (*Sayornis nigricans*), western scrub-jay (*Aphelocoma californica*), California towhee (*Melozone crissalis*), desert cottontail (*Sylvilagus audubonii*), small mammal burrows

Notes: Adjacent to roadways

Disturbed Sage Scrub habitat

NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: FWM-OW01

Lat/Long: 34°13'35.7"/118°42'01.7"

Date: 10/08/2010

Investigators: S. Long; G. Santolo

Community Type: Freshwater Marsh – Open Water

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree - *Salix lasiolepis* (arroyo willow) / Shrub - *Baccharis pilularis* (coyote brush), *Baccharis salicifolia* (mulefat), *Malosma laurina* (laurel sumac) / Herb - *Deinandra minthornii* (Santa Susana tarplant), *Acmispon glaber* (deer weed), *Typha latifolia* (broad-leaved cattail)

Habitat Quality: Relatively diverse vegetation; unknown chemical stressor

Invasive Species: None

Wildlife Observations: Dragonflies (*Odonata* sp.), fish (possibly *Gambusia*), belted kingfisher (*Megaceryle alcyon*), wrentit (*Chamaea fasciata*), yellow-rumped warbler (*Dendroica coronata*), spotted towhee (*Pipilo maculatus*), American goldfinch (*Spinus tristis*)

Notes: Aeration spray device (possibly to address VOCs in runoff); concrete reinforced construction with soil accumulations

Freshwater Marsh-Open Water habitat

NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: RO-NNG

Lat/Long: 34°13'52.3"/118°41'36.7"

Date: 10/01/2010

Investigators: S. Long; G. Santolo

Community Type: Rock Outcrop – Non-native Grassland

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree – None / Shrub – None / Herb - *Avena fatua* (oat), *Eremocarpus setigerus* (doveweed), *Conyza canadensis* (Canadian horseweed), *Brassica nigra* (black mustard), *Bromus diandrus* (ripgut brome), *Bromus madritensis* ssp. *rubens* (red brome)

Habitat Quality: Relatively undisturbed

Invasive Species: Canadian horseweed

Wildlife Observations: Possible raptor stick nest in this area, mule deer, vole runways, grazed plants, and woodrat scat.

Notes:

Rock Outcrop – Non-native Grassland habitat

NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: RH801

Lat/Long: 34°13'13.9"/118°42'35.4"

Date: 10/08/2010

Investigators: S. Long; G. Santolo

Community Type: Ruderal

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree – None / Shrub - *Phacelia ramosissima* (branching phacelia), *Centaurea melitensis* (tocalote), *Artemisia californica* (California sagebrush), *Symphyotrichum* or *Dieteria* (purple aster)? *Salvia apiana* (white sage), *Baccharis pilularis* (coyote brush) / Herb - *Carduus pycnocephalus* (Italian thistle), *Cirsium occidentale* (cobweb thistle), *Rumex crispus* (curly dock), *Brassica nigra* (black mustard), *Acmispon glaber* (deer weed), *Bromus madritensis* ssp. *rubens* (red brome)

Habitat Quality: moderately disturbed

Invasive Species: Italian thistle

Wildlife Observations: Western fence lizard (*Sceloporus occidentalis*), coast horned lizard (*Phrynosoma coronatum* [=*Phrynosoma blainvillii*]), California thrasher (*Toxostoma redivivum*), western scrub-jay (*Aphelocoma californica*), mule deer (*Odocoileus hemionus*), small mammal burrows

Notes: Possible limited fire damage. Most trees not burned but several large old dead trees within rock; scorched trunks.

Ruderal habitat

NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: NNG801

Lat/Long: 34°13'27.7"/118°42'23.7"

Date: 10/08/2010

Investigators: S. Long; G. Santolo

Community Type: Non-native Grassland southeast corner

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree - *Quercus agrifolia* (coast live oak) / Shrub - *Toxicodendron diversilobum* (poison oak), *Phacelia ramosissima* (branching phacelia) / Herb - *Avena* sp. (oat)*, Bromus diandrus* (ripgut brome), *Eremocarpus setigerus* (doveweed), *Centaurea melitensis* (tocalote), *Centaurea solstitialis* (yellow star thistle)

Habitat Quality: Previously burned in 2005

Invasive Species: yellow star thistle

Wildlife Observations: Acorn woodpecker (*Melanerpes formicivorus*), black-chinned hummingbird (*Archilochus alexandri*), wrentit (*Chamaea fasciata*), western scrub-jay (*Aphelocoma californica*), coyote scat (*Canis* latrans), gopher burrows (*Thomomys bottae*), mule deer (*Odocoileus hemionus*), small mammal burrows

Notes: Possible limited fire damage. Most trees not burned but several large old dead trees within rock; scorched trunks.

Non-native Grassland habitat

NASA Santa Susana Field Laboratory
Natural Community Datasheet

ID#: RO-NE corner

Lat/Long: 34°14'26.5"/118°41'07.0"

Date: 9/28/2010

Investigators: S. Long; G. Santolo

Community Type: Rock Outcrop

Photos: Attached

Dominant Vegetation (Stratum: T/S/H): Tree – None / Shrub – None / Herb - *Malosma laurina* (laurel sumac), *Brassica* sp. (mustard), *Deinandra minthornii* (Santa Susana tarplant), *Avena fatua* (wild oat), *Bromus madritensis* ssp. *rubens* (red brome)

Habitat Quality: Relatively undisturbed except for foot trails. Depauperate rock outcrop with sand seams and accumulations where plants take hold.

Invasive Species: None

Wildlife Observations: Western fence lizard (*Sceloporus occidentalis*)

Notes: Elevation ~600 feet

Rock Outcrop with sand seams and accumulations where Santa Susana tarplants take root.

Appendix C
Plant List

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APPENDIX C

Plant Species Identified During April 2008 and May 2009 Surveys of RFI Areas on NASA-Administered Property at SSFL

Common Name	Scientific Name	Group 2 Sites					Group 3 Sites						Group 9 Sites	
		LOX	Landfill	ELV	Ash Pile	B515 STP	Alfa	Bravo	ABFF	SPA	B204	WCT	R2 Ponds	CDFF
Agave (ornamental)	*Agave* sp.						X							
Arroyo willow	*Salix lasiolepis*												X	
Black mustard	*Brassica nigra*	X	X		X									
Black sage	*Salvia mellifera*	X		X	X	X				X		X		
Blue dick	*Dichelostemma capitatum*				X		X	X	X			X		
Blue elderberry	*Sambucus mexicana* (*S. nigra* subsp. caerulea)												X	X
Branching phacelia	*Phacelia ramosissima*	X		X			X	X	X	X	X	X	X	X
Broad-leaved cattail	*Typha latifolia*												X	
California buckwheat	*Eriogonum fasciculatum*						X	X			X	X		
California burclover	*Medicago polymorpha*						X		X	X				
California dodder	*Cuscuta californica*					X	X		X			X		X
California everlasting	*Gnaphalium californicum*			X			X	X			X			X
California poppy	*Escholzia californica*						X							
California or coastal sagebrush	*Artemisia californica*	X	X	X	X	X			X	X	X	X		X
Canadian horseweed	*Conzya canadensis*	X				X		X						
Canyon sunflower	*Venegasia carpesoides*							X	X				X	
Chalk live-forever	*Dudleya pulverulenta*										X		X	X

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Plant Species Identified During April 2008 and May 2009 Surveys of RFI Areas on NASA-Administered Property at SSFL

Common Name	Scientific Name	Group 2 Sites					Group 3 Sites						Group 9 Sites	
		LOX	Landfill	ELV	Ash Pile	B515 STP	Alfa	Bravo	ABFF	SPA	B204	WCT	R2 Ponds	CDFF
Chamise	*Adenostoma fasciculatum*	X	X				X	X	X	X	X	X	X	X
Chaparral currant	*Ribes malvaceum*						X					X		X
Chaparral yucca	*Yucca whipplei*	X							X		X	X	X	X
Chia sage, Chia	*Salvia columbariae*							X						
Chilcothe, wild cucumber	*Marah macrocarpus*	X	X	X	X			X		X		X		
Coast live oak	*Quercus agrifolia*	X	X	X	X	X	X	X	X	X	X		X	X
Cobweb thistle	*Cirsium occidentale*			X				X	X	X			X	X
Common Fiddleneck	*Amsinckia menzesii* var. *intermedia*	X	X			X	X	X		X			X	
Common ice plant	*Mesembryanthemum crystallinum*						X	X						
Common reed	*Phragmites australis*			X			X			X				
Coulter pine (ornamental)	*Pinus coulteri*						X							
Coyote brush	*Baccharis pilularis*	X		X	X	X		X	X	X		X	X	X
Crimson fountaingrass	*Pennisetum setaceum*			X			X	X	X		X			
Curly dock	*Rumex crispus*									X			X	
Deer weed	*Acmispon glaber*		X	X	X		X	X	X	X		X	X	X
Ceanothus	*Ceanothus* sp.						X						X	X
Fremont's cottonwood	*Populus fremontii*												X	

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Plant Species Identified During April 2008 and May 2009 Surveys of RFI Areas on NASA-Administered Property at SSFL

Common Name	Scientific Name	Group 2 Sites					Group 3 Sites						Group 9 Sites	
		LOX	Landfill	ELV	Ash Pile	B515 STP	Alfa	Bravo	ABFF	SPA	B204	WCT	R2 Ponds	CDFF
Fringed Indian pink	*Silene lacinata*								X					
Golden yarrow	*Eriophyllum confertiflorum*												X	X
Hoary-leaf ceanothus	*Ceanothus crassifolius*	X	X	X				X				X		
Holly-leaved cherry	***Prunus ilicifolia***	X												
Holly-leaved redberry	*Rhamnus ilicifolia*												X	X
Honeysuckle	*Lonicera sp.*						X							
Italian thistle	*Carduus pycnocephalus*			X										
Laurel sumac	*Malosma laurina*	X	X	X	X	X	X	X	X	X	X	X	X	X
Leafy daisy, fleabane	*Erigeron foliosus*												X	
Lotus	*Lotus hamatus*			X				X			X			
Manzanita	*Arctostaphylos* sp.			X				X						
Mexican fan palm	*Washingtonia robusta*								X				X	
Milk thistle	*Silybum marianum*		X	X	X	X	X	X	X	X	X			X
Mugwort	*Artemisia douglasiana*								X	X			X	X
Mulefat	*Baccharis salicifolia*	X				X	X	X		X	X	X	X	X
Narrow-leaved milkweed	*Asclepias fascicularis*												X	X
Narrow-leaved willow	*Salix exigua*						X							
Peach (ornamental)	*Prunus* sp.						X							

APPENDIX C

Plant Species Identified During April 2008 and May 2009 Surveys of RFI Areas on NASA-Administered Property at SSFL

Common Name	Scientific Name	Group 2 Sites					Group 3 Sites						Group 9 Sites	
		LOX	Landfill	ELV	Ash Pile	B515 STP	Alfa	Bravo	ABFF	SPA	B204	WCT	R2 Ponds	CDFF
Perennial ryegrass	*Lolium perenne*									X				
Peruvian pepper tree	***Schinus molle***	X												
Pitcher sage, hummingbird sage	*Salvia spathacea*									X				
Poison oak	*Toxicodendron diversilobum*	X		X	X	X		X	X	X			X	X
Popcorn flower	*Plagiobothrys* spp.					X	X	X	X	X	X	X		
Prickly lettuce	*Lactuca serriola*						X	X						
Prickly sow thistle	*Sonchus asper* spp. *asper*		X				X			X	X			X
Purple needlegrass	*Nassella pulchra*			X	X		X						X	
Purple nightshade	*Solanum xanti*	X	X	X		X			X	X		X		X
Purple sage	*Salvia leucophylla*					X	X	X			X	X		
Rabbitsfoot grass, annual beard grass	*Polypogon monspeliensis*									X			X	X
Red brome	*Bromus madritensis* ssp. *rubens*	X	X	X	X	X	X	X	X	X	X	X	X	X
Red willow	*Salix laevigata*						X	X	X	X			X	X
Red-stem filaree	*Erodium cicutarium*	X	X		X	X		X	X	X	X		X	X
Ripgut brome	*Bromus diandrus*	X		X	X	X	X	X	X	X	X		X	X
Rock cress	*Arabis sparsiflora* var. *californica*												X	

APPENDIX C

Plant Species Identified During April 2008 and May 2009 Surveys of RFI Areas on NASA-Administered Property at SSFL

Common Name	Scientific Name	Group 2 Sites					Group 3 Sites						Group 9 Sites	
		LOX	Landfill	ELV	Ash Pile	B515 STP	Alfa	Bravo	ABFF	SPA	B204	WCT	R2 Ponds	CDFF
Salt cedar	*Tamarix chinensis*			X										
Santa Susana tarplant	***Deinandra minthornii***	X	X	X	X	X	X	X	X	X	X	X	X	X
Scarlet pimpernel	*Anagallis arvensis*											X		
Shortpod mustard	*Hirschfeldia incana*	X	X	X	X	X	X	X	X	X	X	X	X	X
Silver carpet, California aster	*Lessingia filagnifolia*	X	X				X	X		X			X	
Slender wild oats	*Avena barbata*		X	X	X		X	X	X		X			
Smilo grass	*Piptatherum miliaceum*												X	
Soap plant, Amole	*Chlorogalum pomeridianum*						X							
Soft chess	*Bromus hordeaceus*	X							X			X	X	
Sticky monkeyflower	*Mimulus longiflorus*			X				X		X	X		X	X
Stinging lupine	*Lupinus hirsutissimus*							X						
Sweet fennel	*Foeniculum vulgare*												X	
Telegraph weed	*Heterotheca grandiflora*			X		X	X	X	X	X				
Thickleaf yerba santa	*Eriodictyon crassifolium*	X	X	X	X	X	X	X	X	X	X	X	X	X
Tocalote, yellow star thistle	*Centaurea melitensis*			X			X		X	X	X	X	X	X
Tree tobacco	*Nicotiana glauca*			X			X	X			X		X	X
Tree-of-heaven	*Ailanthus altissima*									X				

APPENDIX C

Plant Species Identified During April 2008 and May 2009 Surveys of RFI Areas on NASA-Administered Property at SSFL

Common Name	Scientific Name	Group 2 Sites					Group 3 Sites						Group 9 Sites	
		LOX	Landfill	ELV	Ash Pile	B515 STP	Alfa	Bravo	ABFF	SPA	B204	WCT	R2 Ponds	CDFF
White sage	*Salvia apiana*												X	
White snapdragon	*Antirrhinum coulterianum*												X	
Wild barley	*Hordeum murinum*						X						X	X
Wild morning glory	*Calystegia macrostegia*						X		X			X		
Wild oats	*Avena fatua*												X	X
Wild peony	*Paeonia californica*								X	X				
Winter vetch	*Vicia villosa*		X	X	X	X				X	X		X	X
Yellow sweetclover	*Melilotus indica*	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes:

1. Group 2 and 3 sites were surveyed in April 2008; Group 3 sites were surveyed in May 2009.

2. Plants in boldface were sighted during the Fall 2010 survey only.

3. Non-chalky species of *Dudleya* were sighted outside RFI areas during the Fall 2010 survey (not listed in table).

Appendix D
Survey Photographs

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Photo 1 Coyote brush (*Baccharis pilularis*) scrub at HWSA Site

Photo 2 Coast live oak riparian forest

Photo 3 Coast live oak woodland underlain by non-native grassland

Photo 4 Mosaic of non-native grassland, chaparral, sage scrub, and rock outcrop

Photo 5 Non-native grassland with dove weed and telegraph weed

Photo 6 Non-native grassland (eroded) on rock outcrop slope

Photo 7 Non-native grassland adjacent to coast live oak woodland

Photo 8 Disturbed (previously burned) sage scrub near Coca Site pond

Photo 9 Sage scrub southeast of Coca Site

Photo 10 Mosaic of chaparral, sage scrub, and rock outcrop

Photo 11 Southern willow scrub south of Alfa Site along base of rock slope

Photo 12 Southern willow scrub adjacent to Coca Site pond

Photo 13 Undifferentiated wetland dominated by common reed

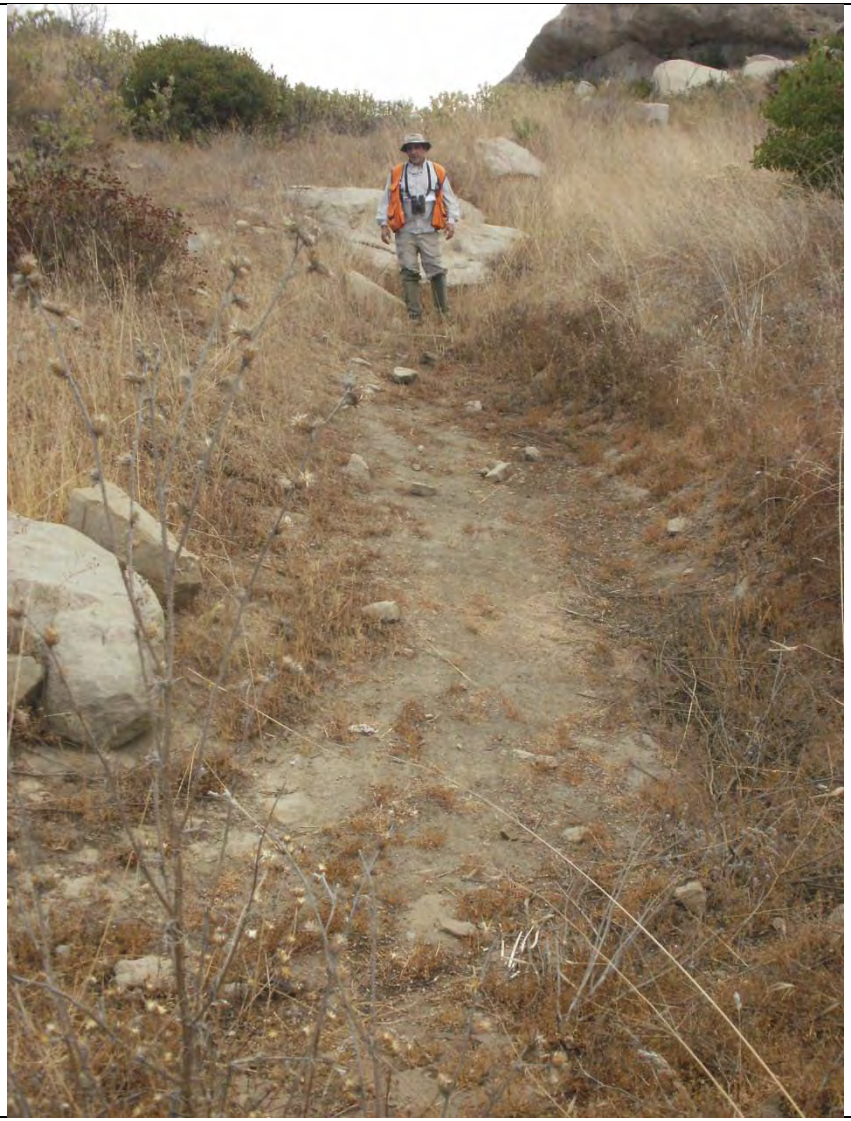

Photo 14 Wetland basin with cocklebur (*Xanthium* sp.) in foreground

Photo 15 Temporary ponded area between rock outcrops

Photo 16 Open water habitat at R-2 Pond

Photo 17 Open water habitat at Coca Site

Photo 18 Capped LOX Site

Photo 19 Appearance of Braunton's milk-vetch at time of surveys

Photo 20 Appearance of Santa Susana tarplant at time of surveys

Photo 21 Non-chalky *Dudleya lanceolata*

Photo 22 Chalky *Dudleya pulverulenta*

Photo 23 Typical north-facing rock slope habitat where *Dudleya* sp. was found

Photo 24 Eroded grassland rock slope habitat where *Dudleya* sp. was found

Photo 25 Mule deer buck rub in Area II

Photo 26 Western rattlesnake in Area II

Photo 27 Basin 01

Photo 28 Basin 03 (contains water)

Photo 29 Series of rock basins

Photo 30 Green heron in Area II

Photo 31 Possible raptor cliff nest north of LOX Site in Area I

Photo 32 Whitewash and prey remains below possible raptor cliff nest

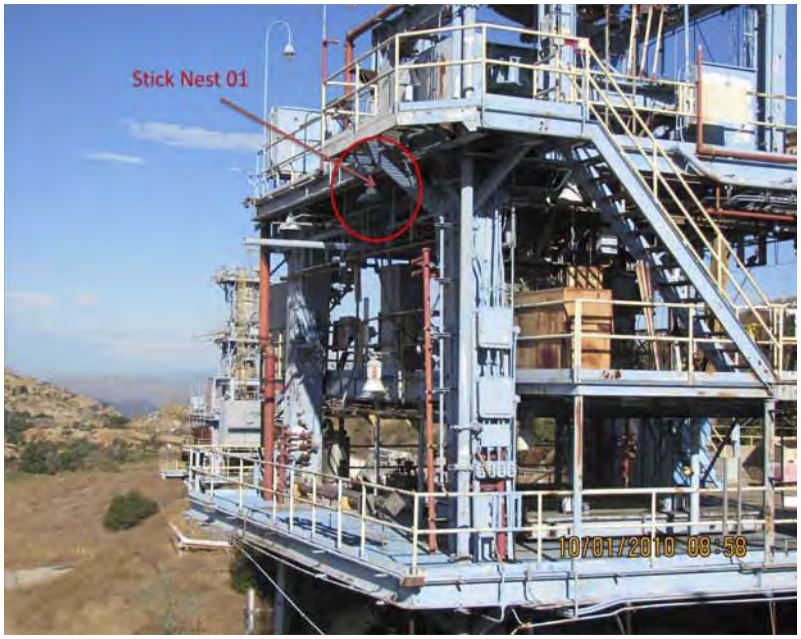

Photo 33 Stick Nest 01 on structure in Alfa Site

Photo 34 Stick Nest 01 close up

Photo 35 Stick Nest 02 on cliff south of Alfa Site

Photo 36 Stick Nest 02 close up

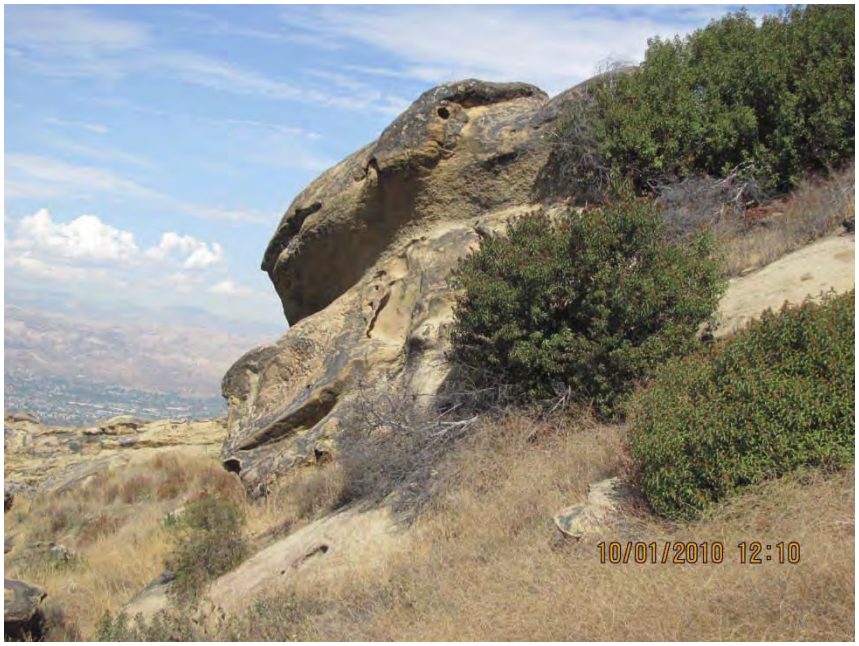	
Photo 37 Stick Nest 03 southwest of Alfa Site	Photo 38 Stick Nest 03 close up

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Appendix E
Species of Interest Mapping

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Legend

CNDDB March 2008

- Santa Susana tarplant
- Braunton's milk-vetch
- many-stemmed dudleya
- slender mariposa-lily
- Plummer's mariposa-lily
- Blochman's dudleya
- western spadefoot
- arroyo toad
- western mastiff bat
- San Diego desert woodrat
- tricolored blackbird
- Southern Sycamore Alder Riparian Woodland
- Southern Coast Live Oak Riparian Forest

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (circular)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)
- Animal (circular)
- Terrestrial Community (80m)
- Terrestrial Community (specific)
- Terrestrial Community (non-specific)
- Terrestrial Community (circular)
- RFI Sites
- RFI Groups

California Dept. of Fish and Game, California Natural Diversity Database (CNDDB), March 2008

0 3,000 Feet

N

southern California rufous-crowned sparrow
Plummer's mariposa-lily
western spadefoot
San Diego desert woodrat
western mastiff bat
San Fernando Valley spineflower
uthern Sycamore Alder Riparian Woodland
Santa Susana tarplant
tricolored blackbird
Blochman's dudleya
Braunton's milk-vetch
slender mariposa-lily
many-stemmed dudleya
Southern Coast Live Oak Riparian Forest
arroyo toad
pallid bat
golden eagle
chaparral nolina
California leaf-nosed bat

E-1
CNDDB Data (March 2008)
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

SAC \\ZION\SACGIS\PROJ\343638_SIMIVALLEYEAST\MAPFILES\CNDDB_11X17.MXD CNDDB_11X17.PDF SSCOPES 8/7/2008 14:49:41

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SensitiveSpecies_South.mxd) ES012111042614TPA

N
W E
S

0 100 200 400 600 800 Feet

19-NOV-2010
Drawn By:
A. Cooley

Legend
Pond
SWMU or AOC
NASA Property Boundary

E-3
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SensitiveSpecies_North.mxd)

N
W E
S

0 100 200 400 600 800 Feet

19-NOV-2010
Drawn By:
A. Cooley

Legend
Pond
SWMU or AOC
NASA Property Boundary

E-4
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SensitiveSpecies_AI.mxd)

Appendix F
Santa Susana Tarplant Mapping

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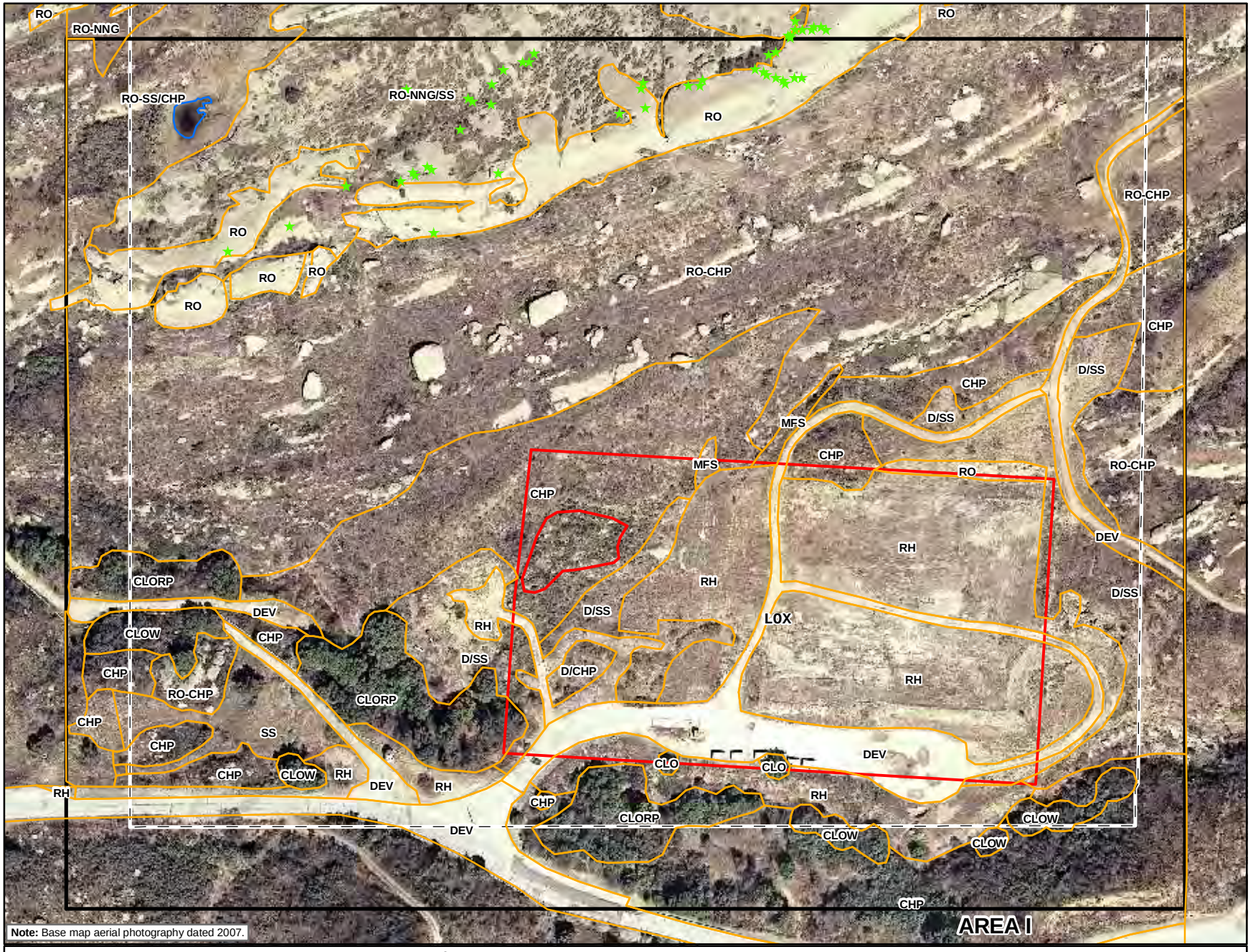

Note: Base map aerial photography dated 2007.

15-NOV-2010
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A1-1
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

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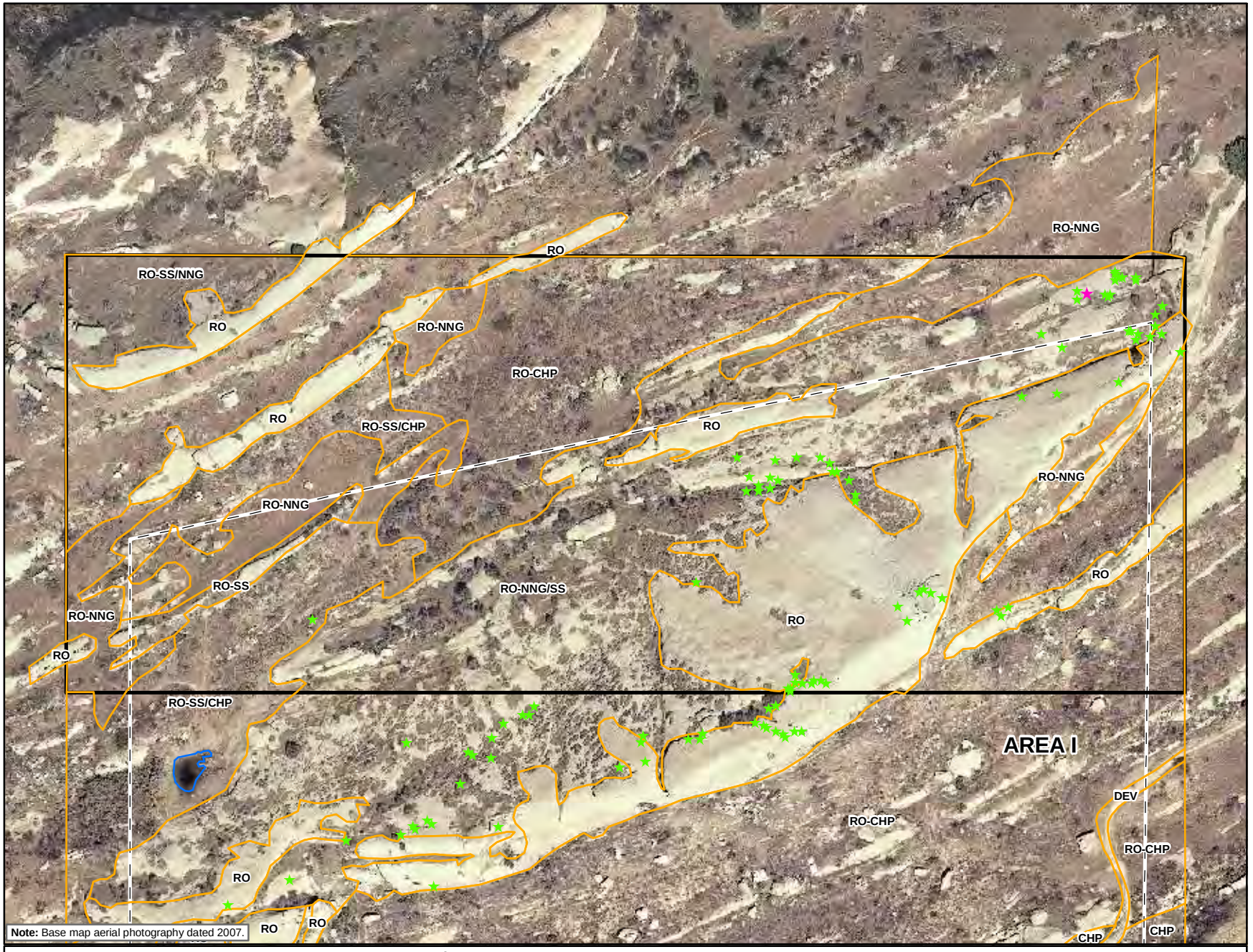

15-NOV-2010
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A1-2
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A1-2.mxd)


AREA II
PLF
R-2A and R2B Ponds
Delta
Note: Base map aerial photography dated 2007.
10-NOV-2010
Drawn By:
A. Cooley
0 25 50 100 150 200
Feet
Legend
11-40 Santa Susana Tarplants
6-10 Santa Susana Tarplants
1-5 Santa Susana Tarplants
Grid
Pond
SWMU or AOC
NASA Property Boundary
A2-1
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California
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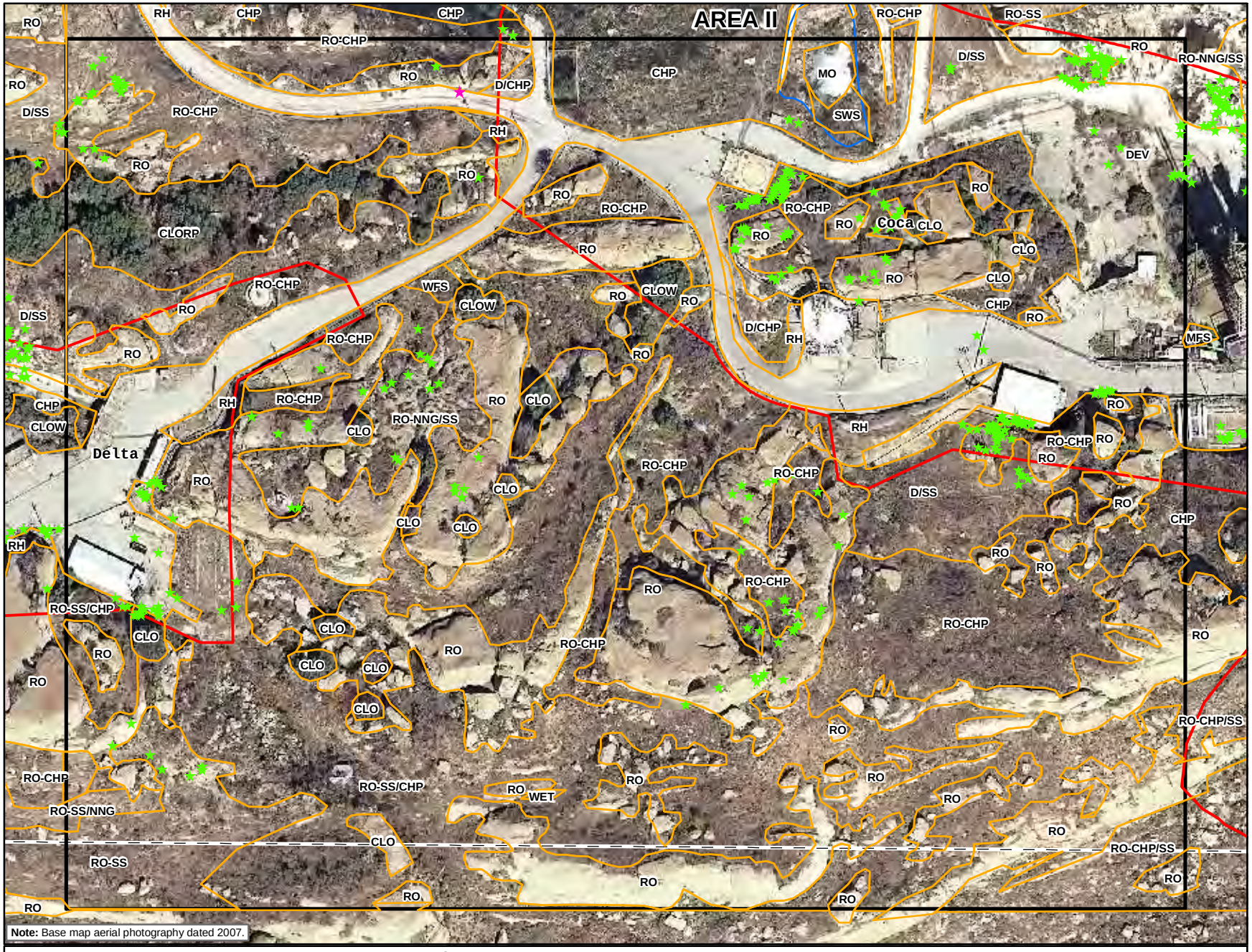

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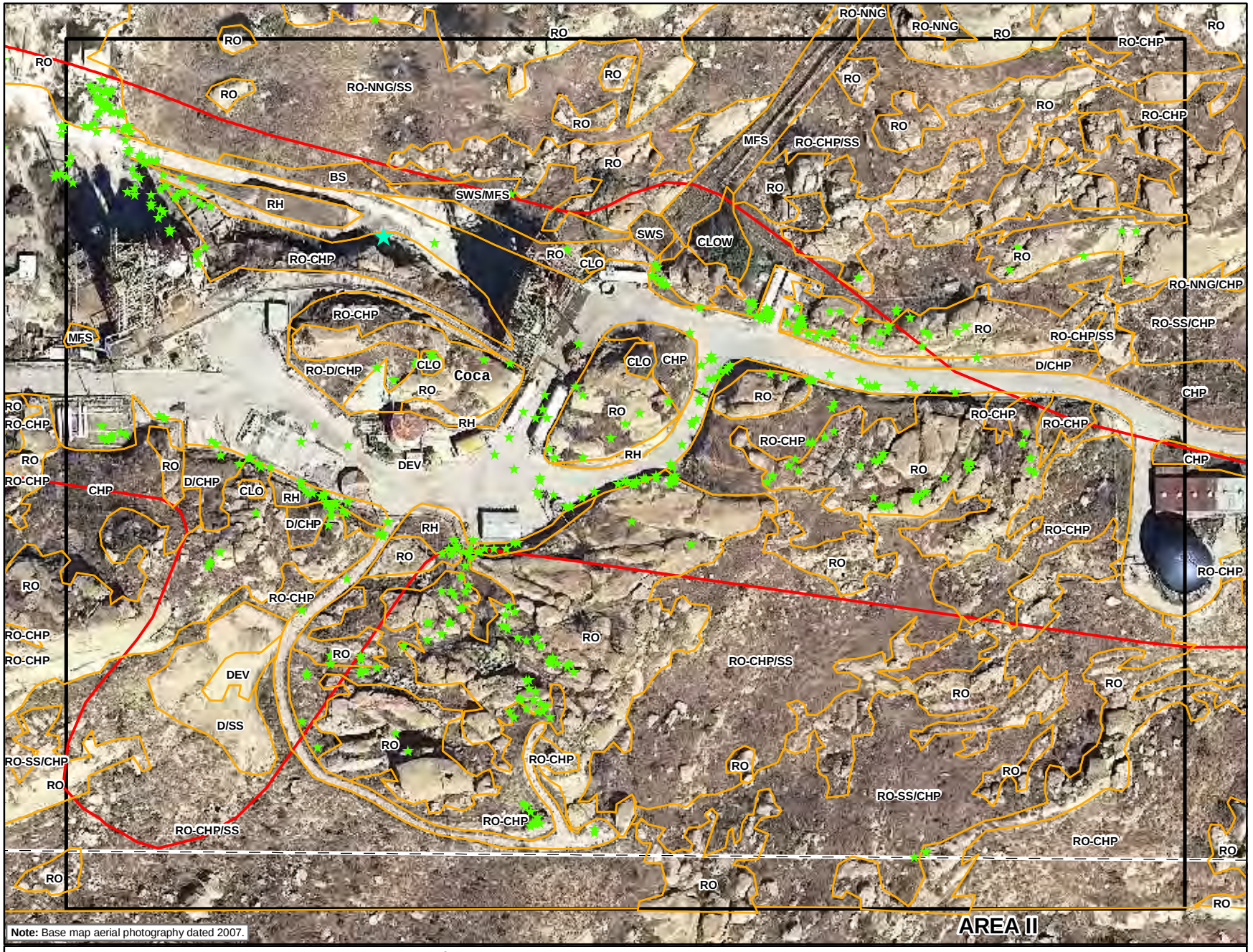

Note: Base map aerial photography dated 2007.

15-NOV-2010
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-3
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

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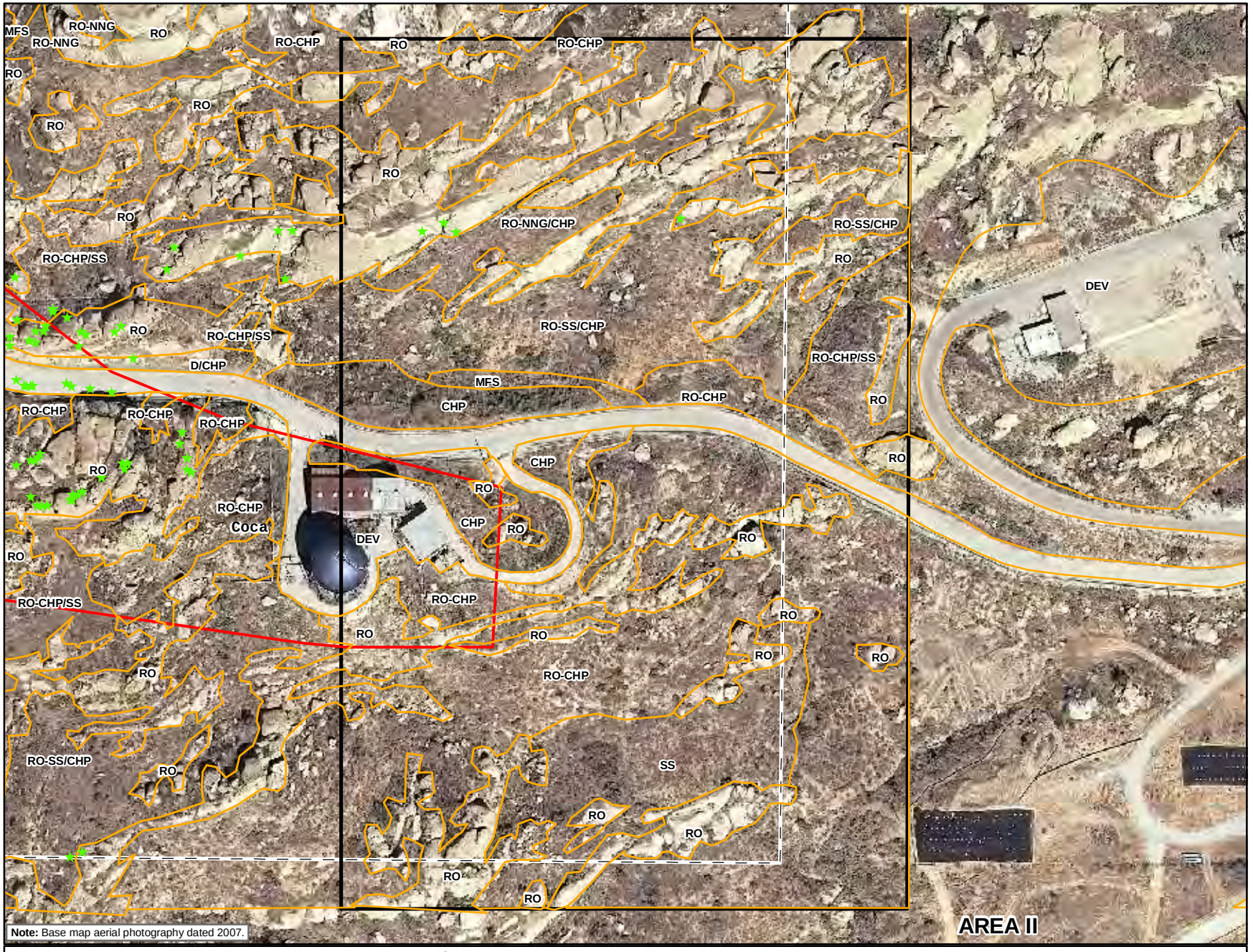
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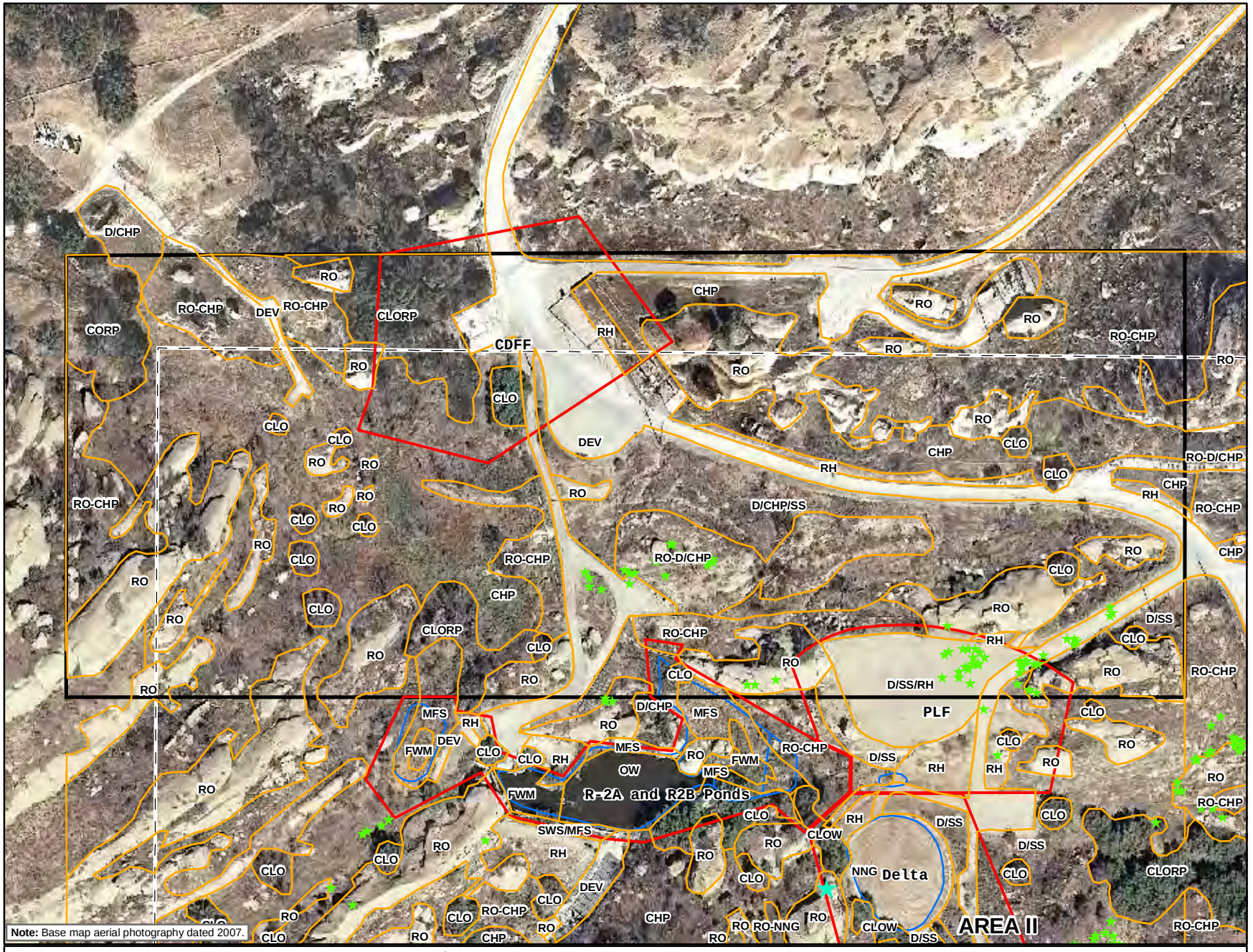
RO-NNG
RO
RO-CHP
RO-NNG/CHP
RO-SS/CHP
RO-CHP/SS
D/CHP
CHP
MFS
DEV
Coca
SS
AREA II
Note: Base map aerial photography dated 2007.
15-NOV-2010
Drawn By:
A. Cooley
0 25 50 100 150 200
Feet
Legend
11-40 Santa Susana Tarplants
6-10 Santa Susana Tarplants
1-5 Santa Susana Tarplants
Grid
Pond
SWMU or AOC
NASA Property Boundary
A2-4
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California
Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-4.mxd)



15-NOV-2010
Drawn By:
A. Cooley

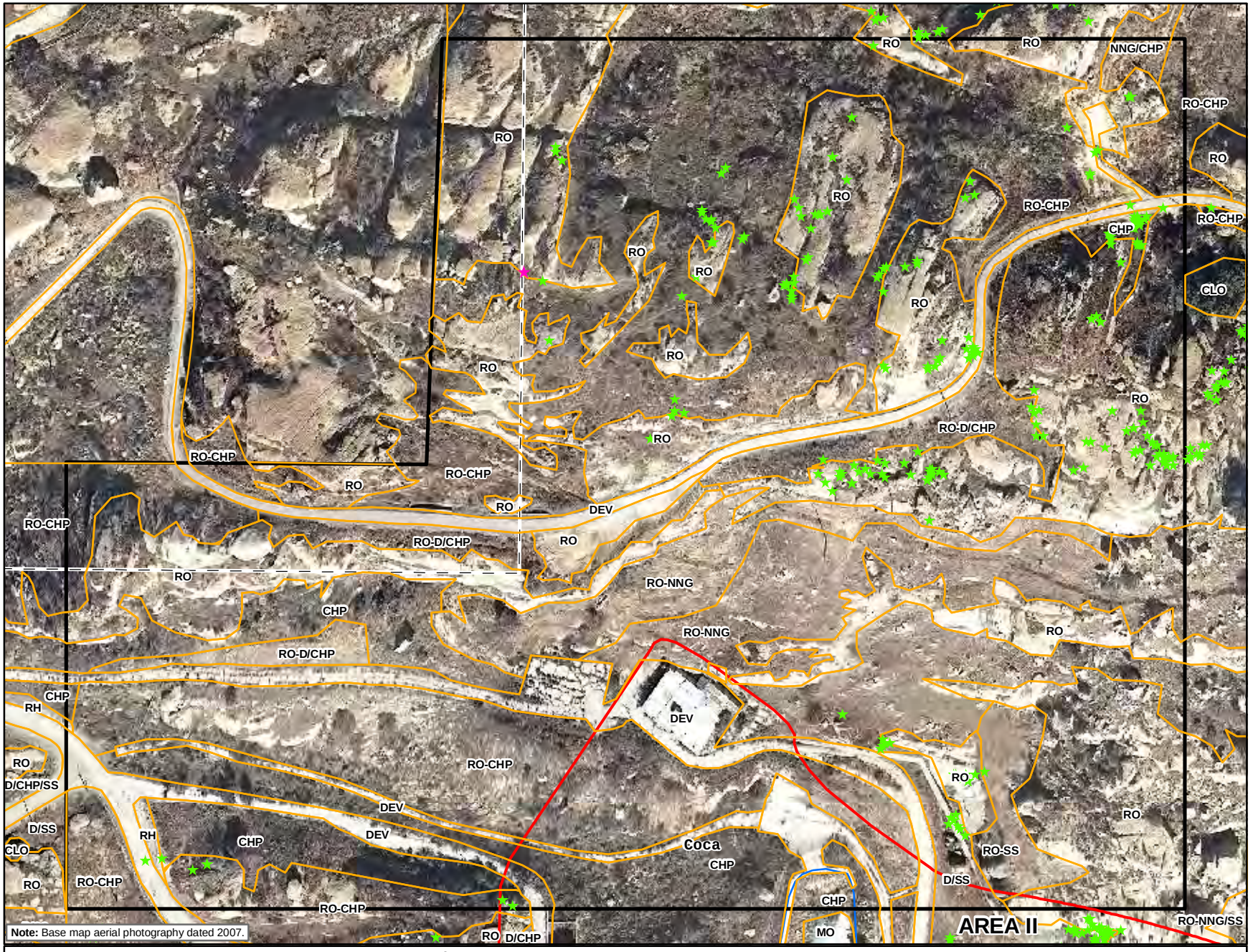
0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-5
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-5.mxd)



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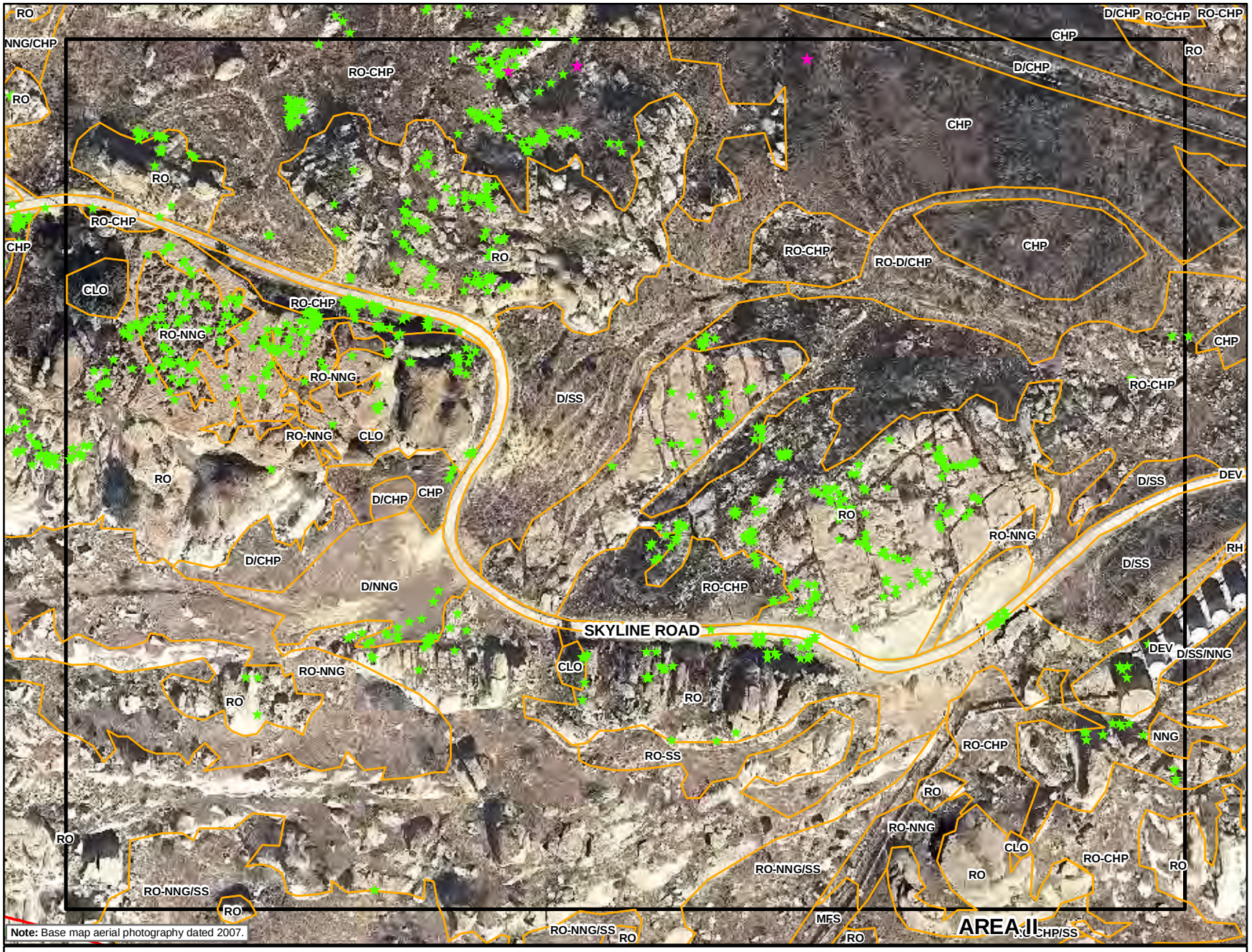

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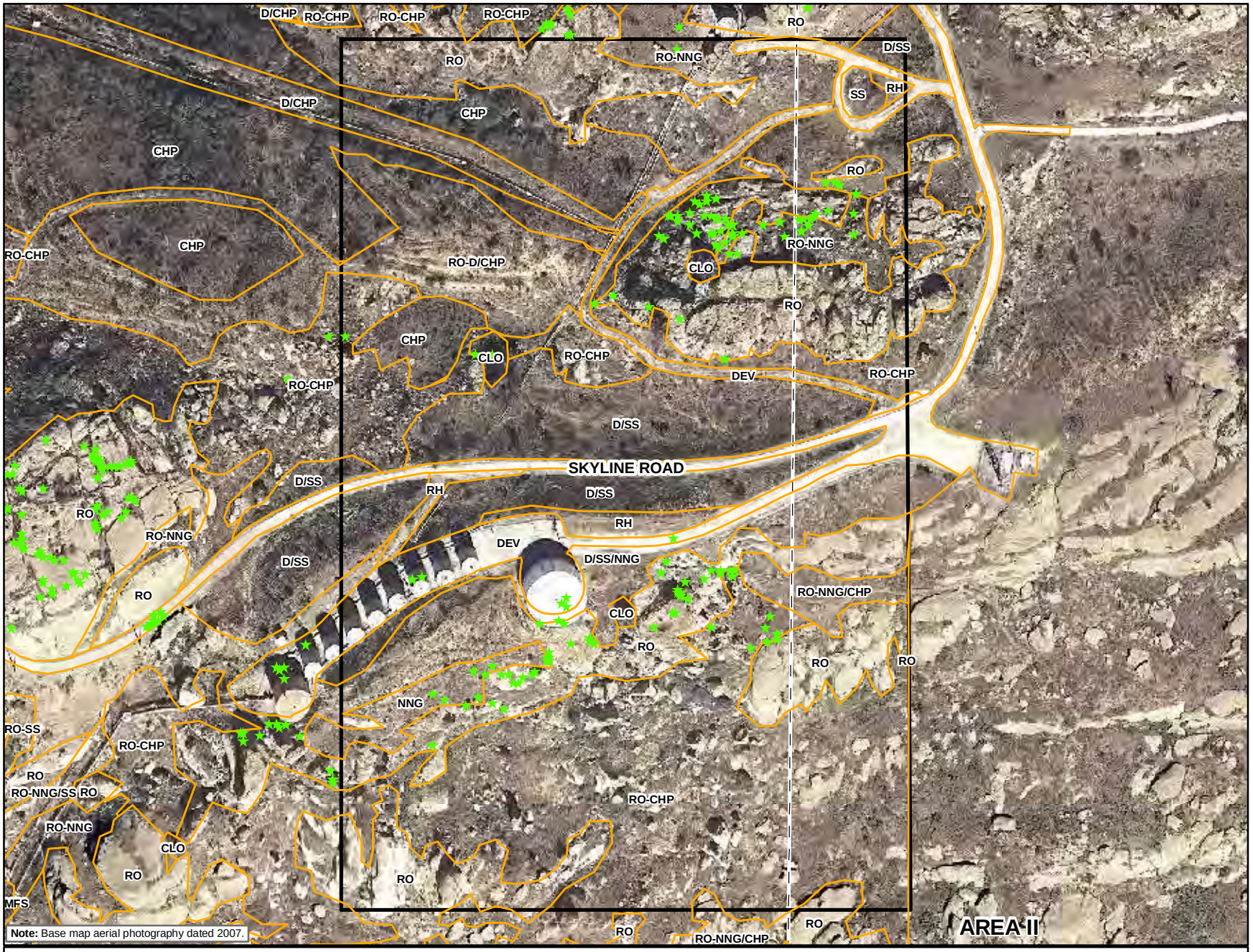


15-NOV-2010
Drawn By:
A. Cooley

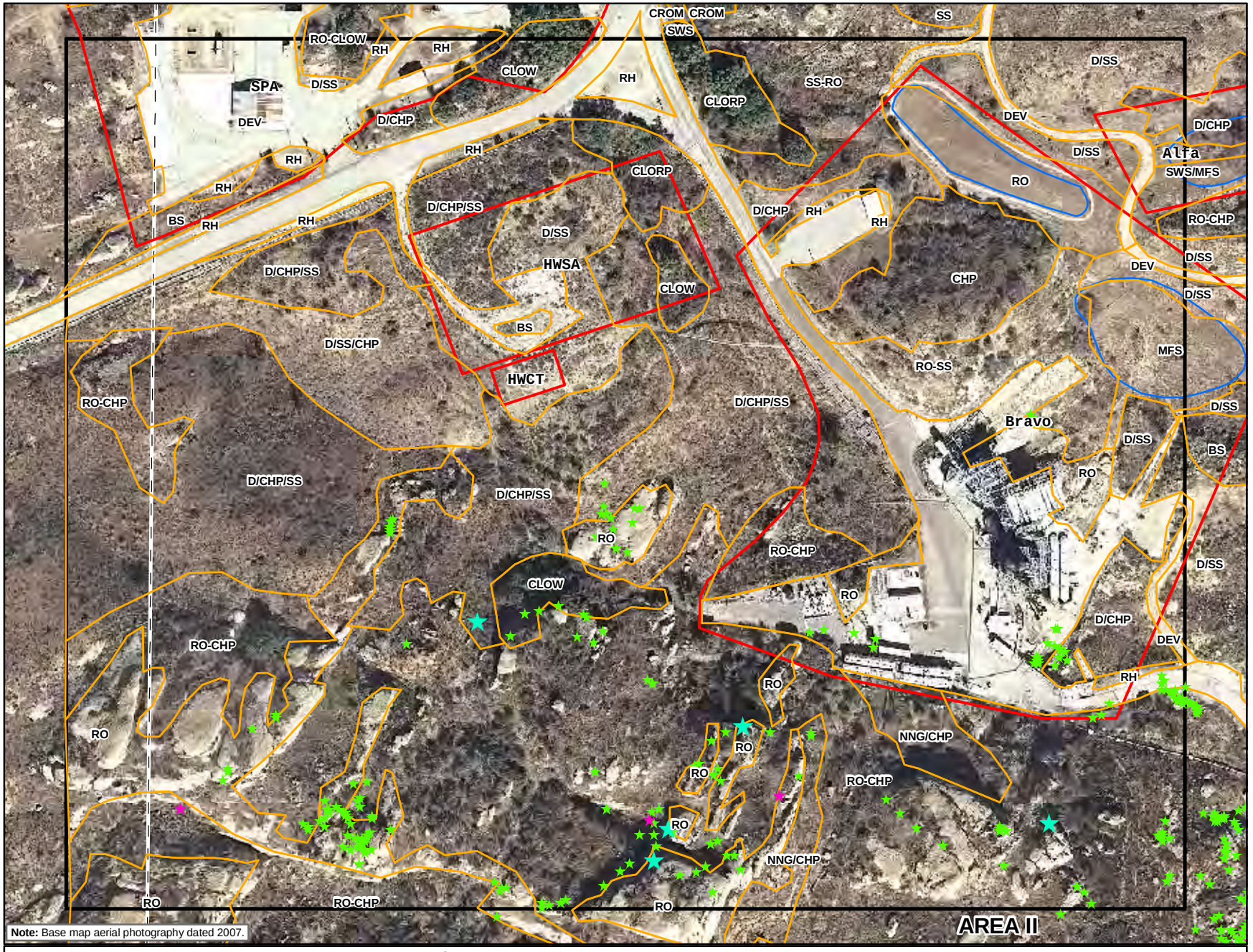
0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-8
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-8.mxd)



Note: Base map aerial photography dated 2007.

15-NOV-2010
Drawn By:
A. Cooley

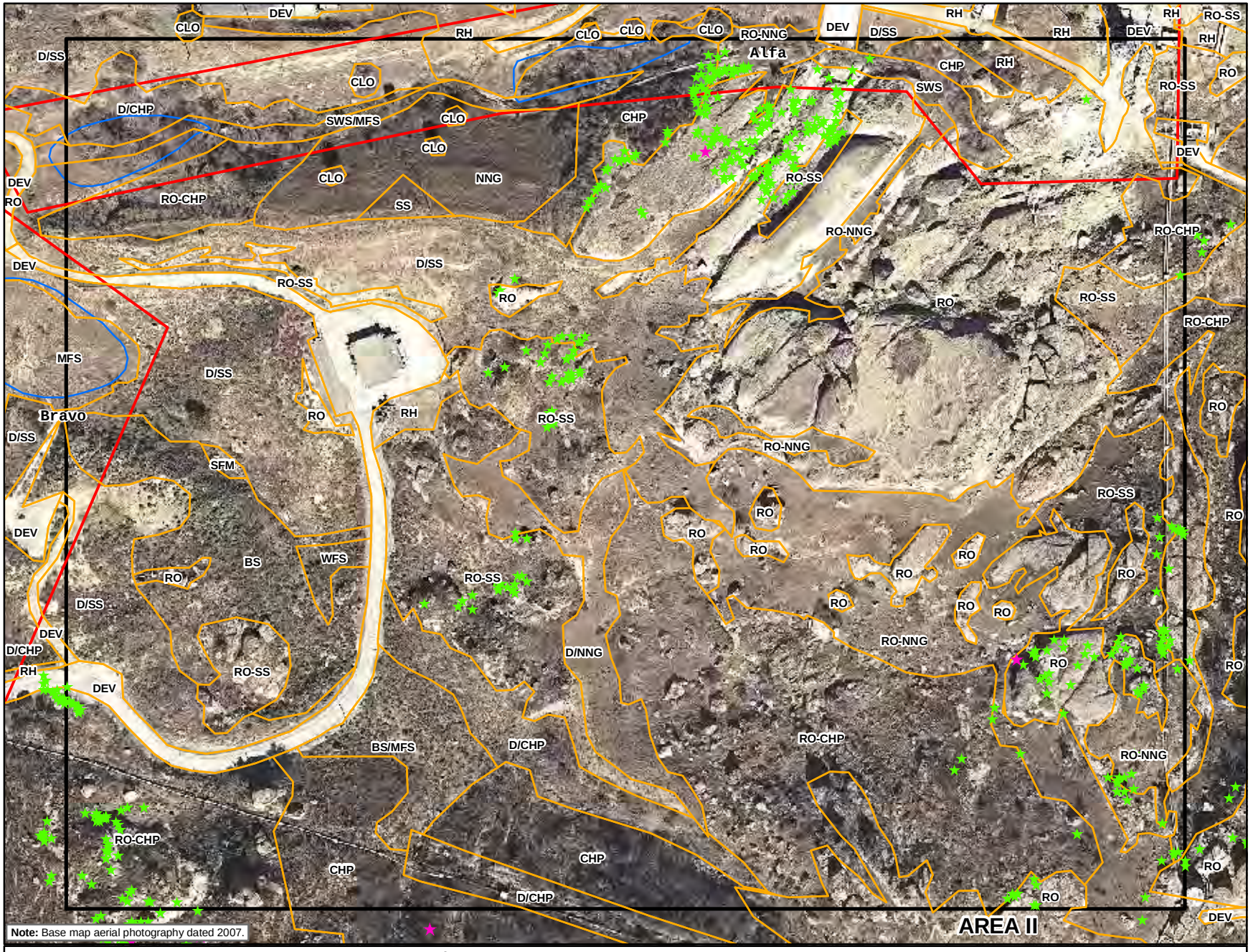
0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-9
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-9.mxd)



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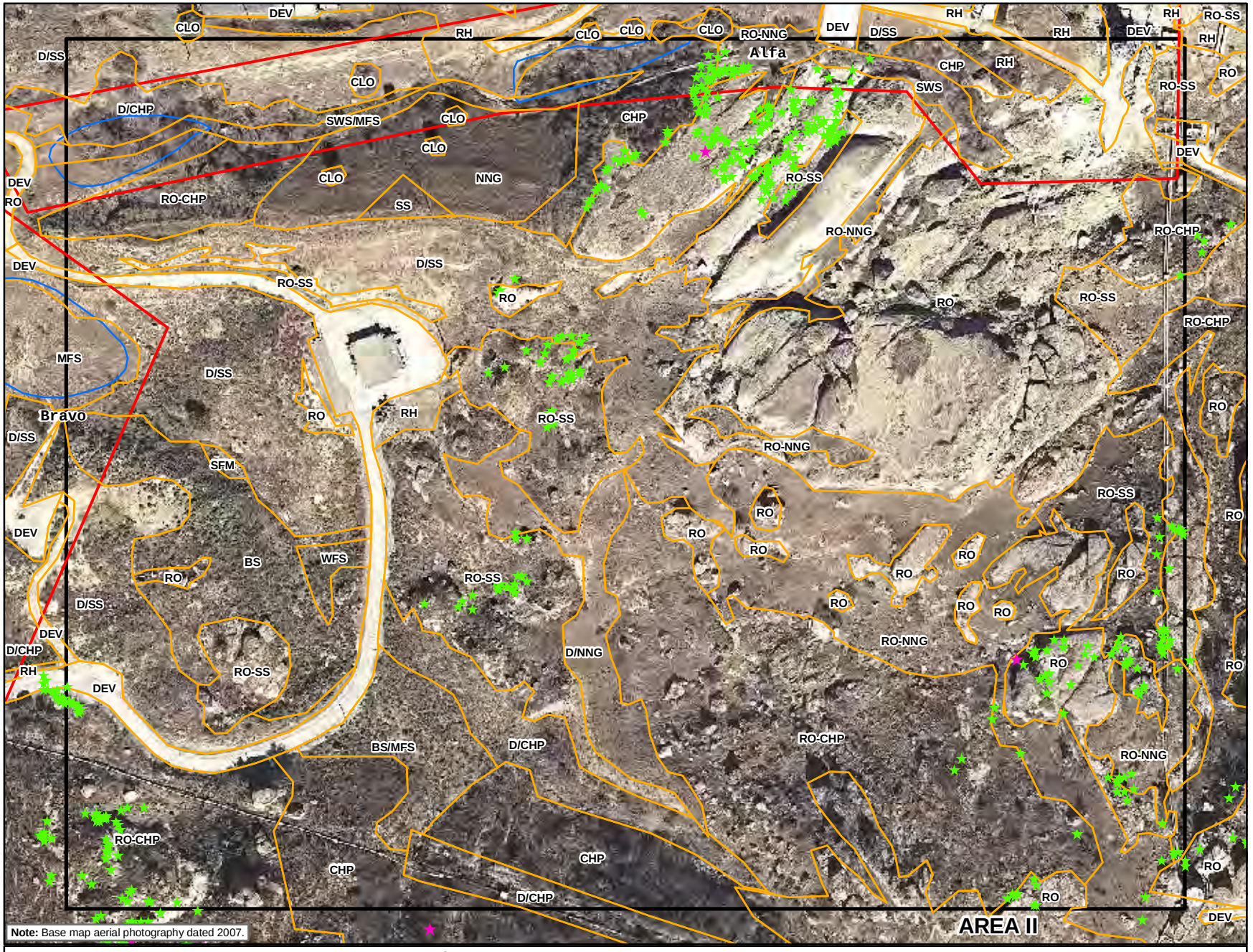

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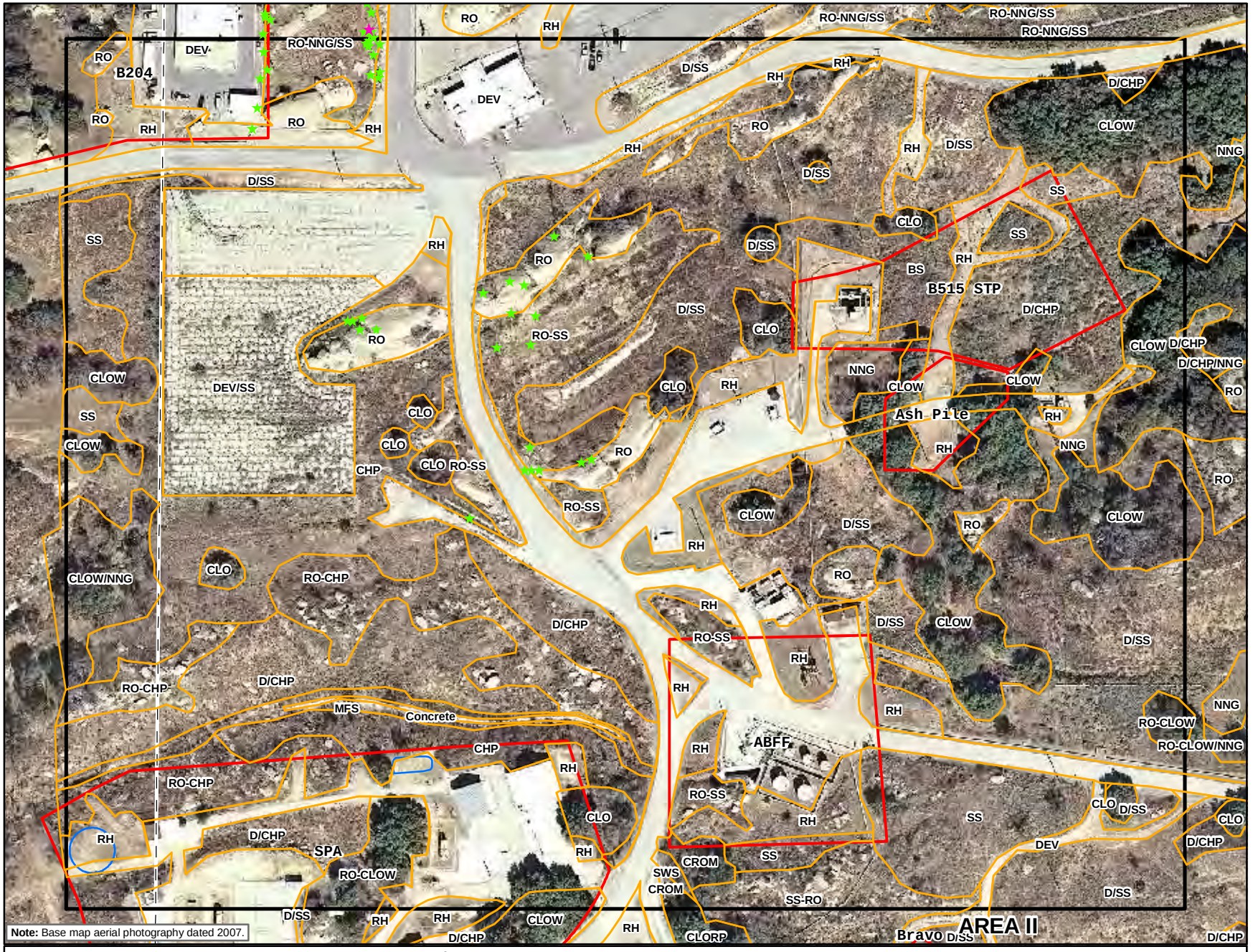


15-NOV-2010
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-12
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-12.mxd)

Note: Base map aerial photography dated 2007.

15-NOV-2010
Drawn By:
A. Cooley

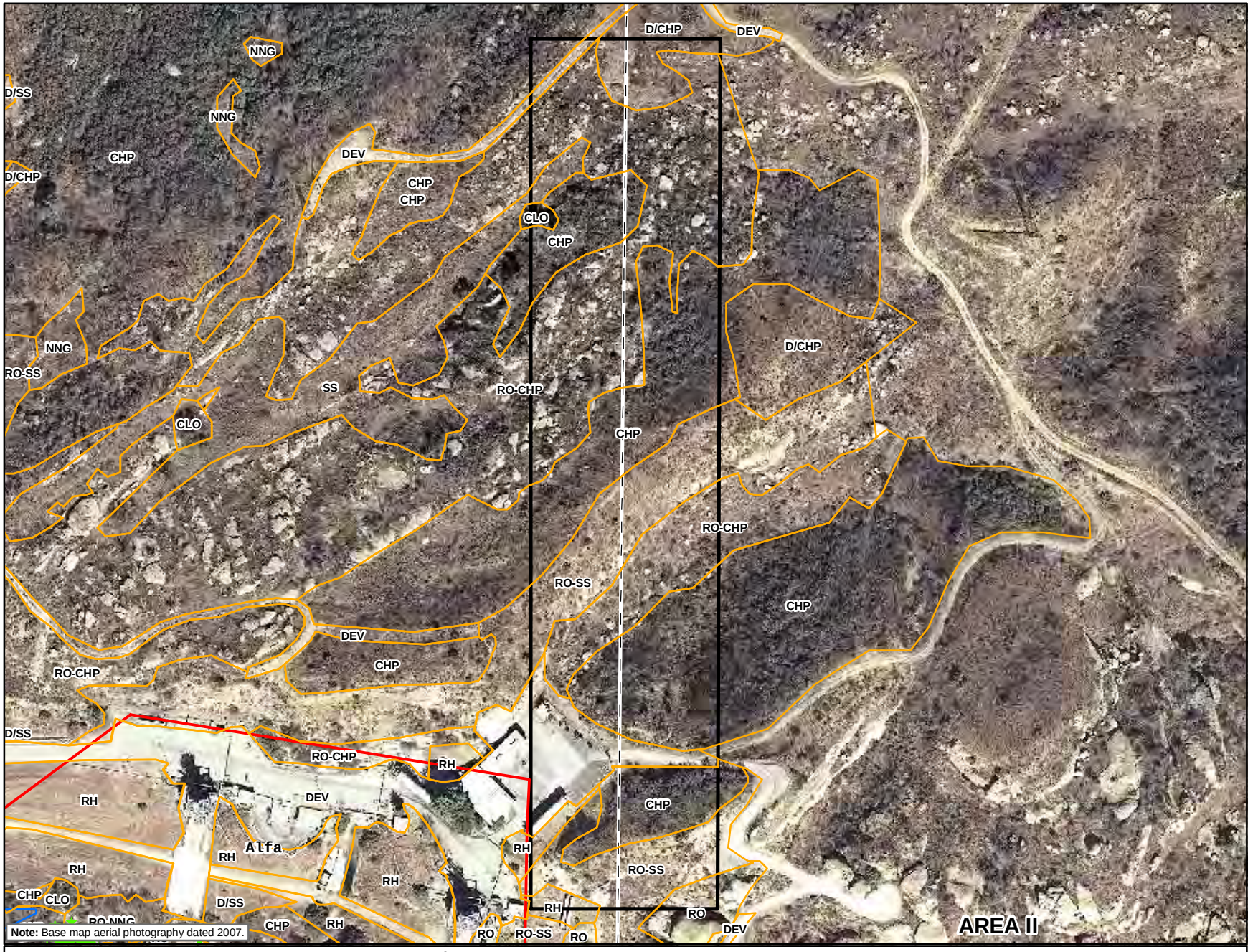
0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-13
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-13.mxd)



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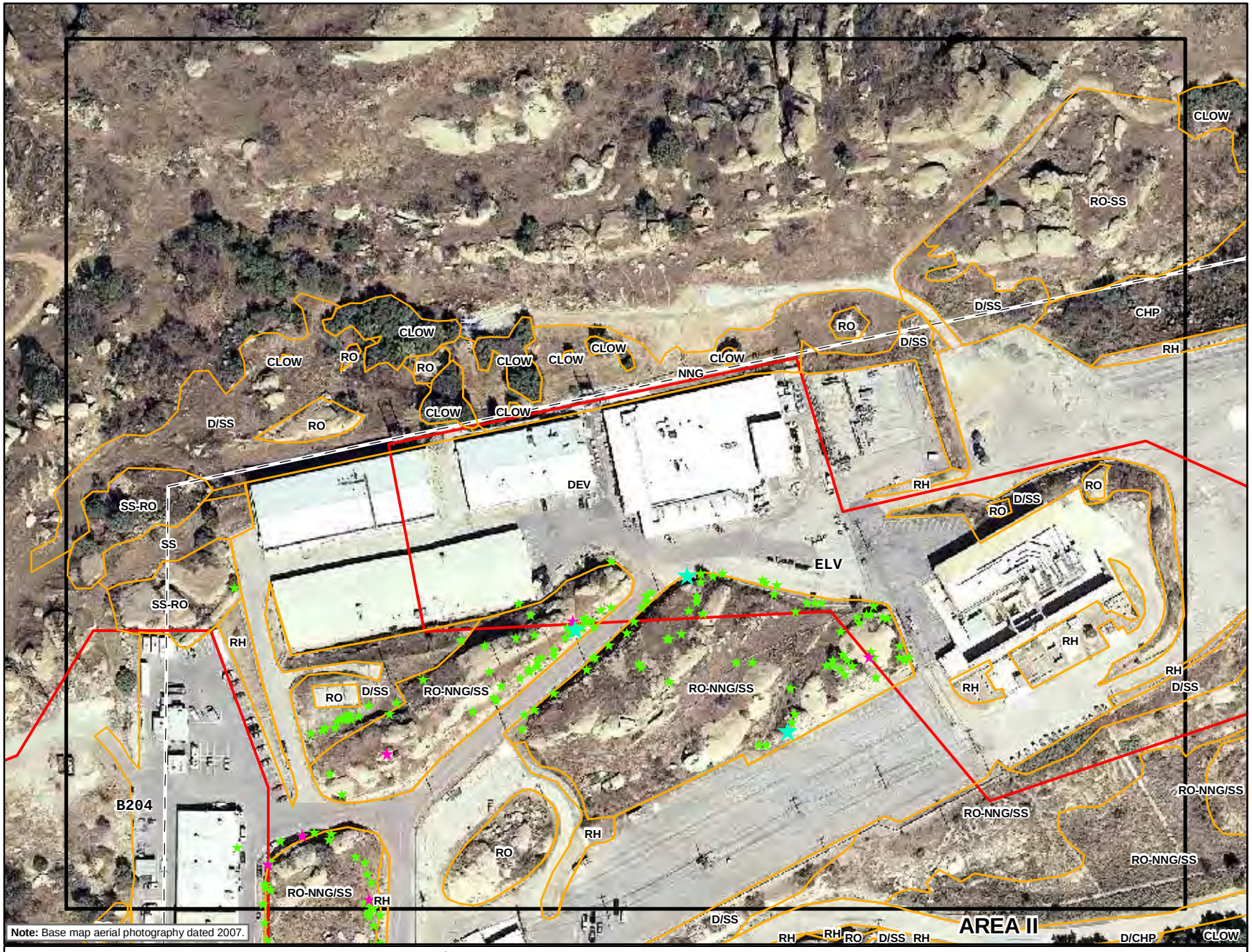

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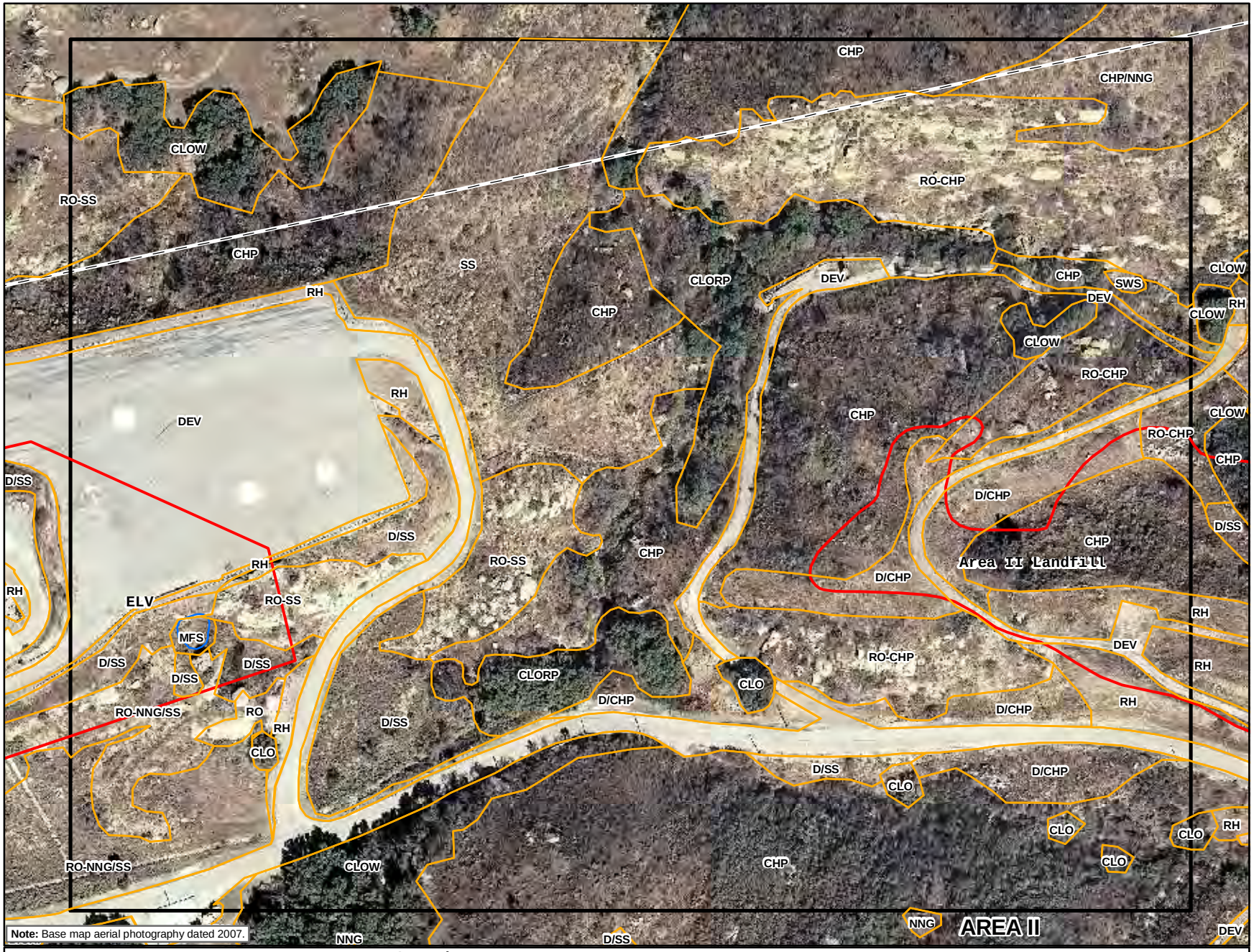


Note: Base map aerial photography dated 2007.

15-NOV-2010
Drawn By:
A. Cooley

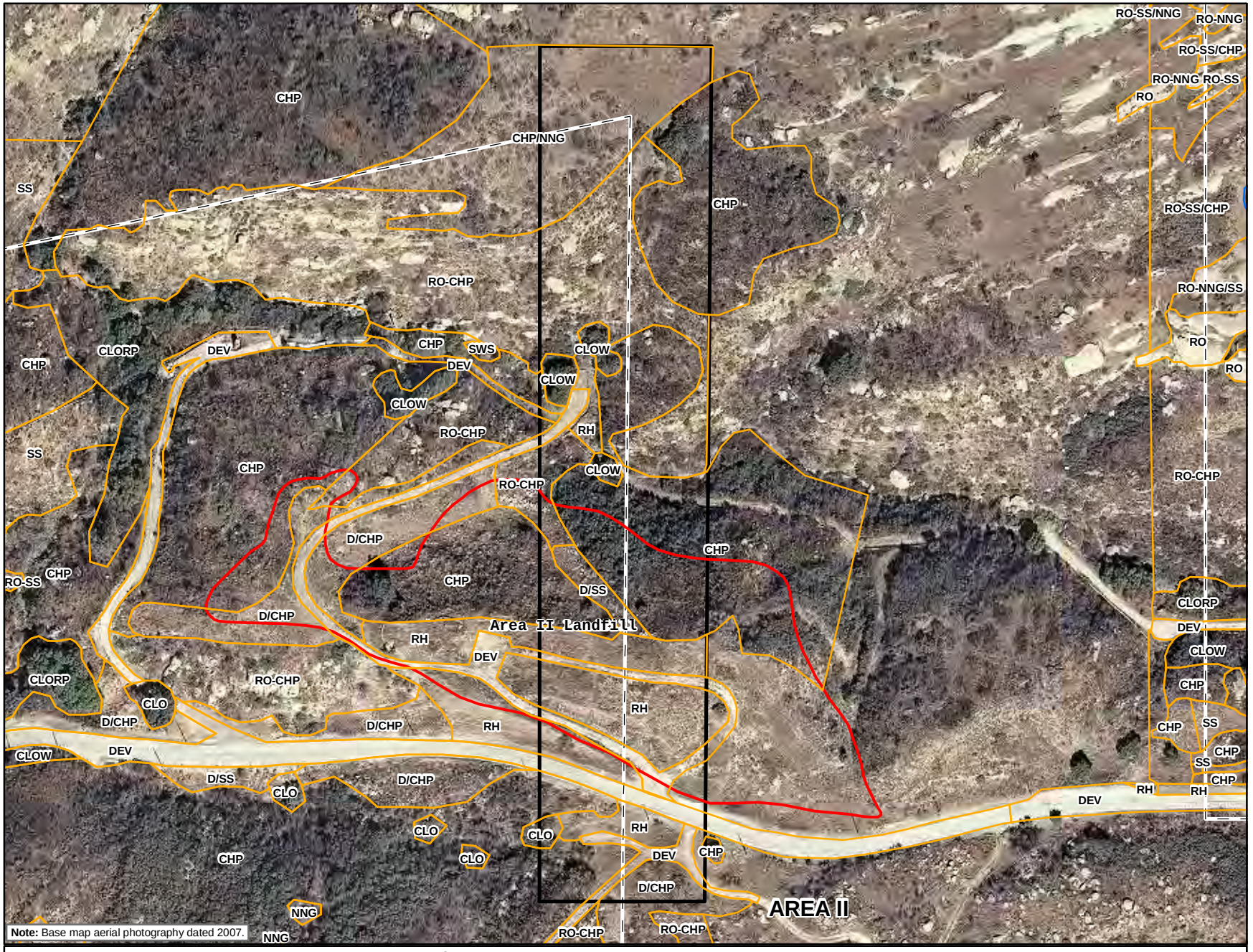
0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-16
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-16.mxd)



Note: Base map aerial photography dated 2007.

15-NOV-2010
Drawn By:
A. Cooley

0 25 50 100 150 200 Feet

Legend

- 11-40 Santa Susana Tarplants
- 6-10 Santa Susana Tarplants
- 1-5 Santa Susana Tarplants
- Grid
- Pond
- SWMU or AOC
- NASA Property Boundary

A2-17
NASA Habitat Survey - Fall 2010
Santa Susana Field Laboratory
Ventura County, California

Map Document: (O:\NASA\SSFL\maps\EcologicalSurvey2010\SSFL_SSTarplant_A2-17.mxd)

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Appendix G
Species of Interest Datasheets

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NASA Santa Susana Field Laboratory
Species of Interest Observation Form

Species: Santa Susana tarplant

ID#: ST01

Lat/Long: 34°13'22.3"/118°41'08.9"

Date: 09/28/2010

Investigators: S. Long; G. Santolo

Associated NC Datasheet ID: None

Population size: 1 individual

Community Type: RO CHP

Photos: Attached

Habitat Description: Mid-slope up rock outcrop on sandy seam

Adjacent Disturbances: None apparent

Notes:

Accumulations in sandy rock seams where Santa Susana tarplant was observed.

NASA Santa Susana Field Laboratory
Species of Interest Observation Form

Species: Santa Susana tarplant

ID#: ST14

Lat/Long: 34°13'26.5"/118°41'07.0"

Date: 09/28/2010

Investigators: S. Long; G. Santolo

Associated NC Datasheet ID: RO northeast corner

Population size: ST03 – ST25 (22 individuals)

Community Type: RO

Photos: Attached

Habitat Description: Rock outcrop, sandstone, northern aspect

Adjacent Disturbances: Hiking trails in area, litter observed

Notes:

Rock outcrop, sandstone where Santa Susana tarplants were observed.

NASA Santa Susana Field Laboratory
Species of Interest Observation Form

Species: Dudleya (*parva*?)

ID#: Dud801 Lat/Long: 34°13'29.6"/118°42'15.9"

Date: 10/08/2010 Investigators: S. Long; G. Santolo

Associated NC Datasheet ID: RO-NNG

Population size: 12 plants within a 15-foot (5-meter) radius

Community Type: Rock outcrop-non-native grassland Photos: Attached

Habitat Description: Patchy remnants of soil and NNG spread over exposed rock slope (sandstone); aspect is NW; slope approximately 22°; soil is bound with moss and lichen (biotic crust). Dominant vegetation: *Avena* sp. (oat), *Bromus madritensis* ssp. *rubens* (red brome), *Bromus diandrus* (ripgut brome), *Yucca schidigera* (yucca), *Deinandra minthornii* (Santa Susana tarplant)

Adjacent Disturbances: Erosion of rock slope

Notes: Small mammal burrows in soil

Rock outcrop-non-native grassland where dudleya were observed.

NASA Santa Susana Field Laboratory
Species of Interest Observation Form

Species: Coast horned lizard

ID#: HL01

Lat/Long: 34°14'23.6"/118°41'11.1"

Date: 9/29/2010

Investigators: S. Long; G. Santolo

Associated NC Datasheet ID: RO- NE corner

Population size: 1 individual – juvenile about 1.5 inches

Community Type: RO

Photos: None

Habitat Description: In sandy accumulations within rock outcrop undulations, hidden beneath Santa Susana tarplant ST 110

Adjacent Disturbances: None apparent

Notes:

NASA Santa Susana Field Laboratory
Species of Interest Observation Form

Species: Coast horned lizard

ID#: HL02

Lat/Long: 34°14'13.9"/118°41'34.9"

Date: 9/29/2010

Investigators: S. Long; G. Santolo

Associated NC Datasheet ID: RH801

Population size: 1 individual – juvenile about 1 inch

Community Type: Ruderal Habitat

Photos: Attached

Habitat Description: Gravelly roadway on landfill

Adjacent Disturbances: Yes, vehicle access roadways and nearby monitoring well (PZ-134) about 30 feet west.

Notes: Lizard about 1 inch long

Coast horned lizard

NASA Santa Susana Field Laboratory
Species of Interest Observation Form

Species: Quino checkerspot butterfly (possible)

ID#: QCB 01

Lat/Long: 34°13'49.3"/118°41'58.6"

Date: 10/04/2010

Investigators: S. Long; G. Santolo

Associated NC Datasheet ID: RO- NNG

Population size: 1 individual

Community Type: RO NNG SS

Photos: Habitat only

Habitat Description: Tall *Avena fatua*/red brome, chamise, laurel sumac, yerba santa, sage, branching phacelia, Santa Susana tarplant

Adjacent Disturbances: Area was previously burned

Notes: No apparent plantago species observed. Individual flew away quickly in a zig-zag pattern suggesting it was a male QCB.

Habitat where possible Quino checkerspot butterfly was observed.

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End of Appendix D

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