Draft Study Plan

Fall Biological Surveys of Area IV and the Northern Undeveloped Land

Santa Susana Field Laboratory

September 25, 2009

1.0 Background and Document Purpose

Under an Interagency Agreement with the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA) will be undertaking radiological gamma surveys, and soil, surface water, and groundwater sampling of Area IV and the Northern Undeveloped Lands of the Santa Susana Field Laboratory (SSFL). The radiological surveys and soil sampling will be used to locate and characterize sources of radiological contamination associated with Area IV of the SSFL. The radiological studies proposed by EPA have the potential for disturbing habitats of native plants and animals, including plants and animals that have protected status. This Study Plan has been developed to identify the presence of protected or sensitive species and to assist EPA in completing its on-site activities.

The biological survey addressed in this plan will be conducted on lands owned by the Boeing Corporation (Boeing). DOE and its predecessor agencies used a portion of Area IV for nuclear energy research. As a result of research activities, portions of Area IV exhibit contamination that will be the focus of EPA's radiological surveys. DOE will use the data produced by EPA as the radiological data input for cleanup impact analyses in the Area IV Environmental Impact Statement (EIS).

EPA's overall scope includes conducting gamma emission surveys of the entire accessible portions of Area IV and the Northern Undeveloped Land, collecting surface soil samples, boring 10-foot deep core holes for subsurface soil sampling and down-hole gamma emissions measurements, sampling of existing groundwater wells, and collection of surface water samples.

In order for EPA to take the best gamma emission readings, the detectors must be maintained at a height approximately12 inches above the soil. Portions of the site exhibit plant growth (grasses, herbaceous plants, and shrubs) that exceed this height goal. EPA's gamma surveys will thus require the cutting and reduction of height of some vegetation. Soil sampling, including the use of a vehicle mounted hydraulic probe, will result in ground disturbances that can impact plant and animal life. The sampling of monitoring wells may involve the use of vehicles using existing access roads. EPA's proposal for surface water sampling is to access drainages in a manner that will not impact vegetation or habitat along drainages.

In advance of EPA's activities, DOE has agreed to conduct biological surveys of Area IV and the Northern Undeveloped Land for plants and animals that are protected under state or federal law, or have special status because they are rare or are apart of dwindling populations (termed sensitive resources in this study plan). DOE will provide the results of the surveys to EPA who then can use the information in the

planning of its studies for avoidance, protection, or mitigation for any impacts. In addition, DOE will use the results of these surveys for the evaluation of the environmental impacts resulting from further cleanup of SSFL and for the planning of those cleanup actions.

The objective of the proposed surveys is to locate and document occurrences of these and other listed and sensitive species, facilitating compliance with environmental regulations prior to the EPA sampling activities, develop mitigation measures as necessary, and to develop the biological baseline for the Area IV EIS. A report of the biological surveys will be provided to EPA and all interested stakeholders in the cleanup of Area IV of the SSFL.

Seasonal considerations: This study plan addresses the biological field survey activities that DOE biologists will use to identify and locate the sensitive biological resources in the study area that will be evident in the fall of 2009. This primarily involves mapping locations of perennial plants that have physical characteristics allowing for their identification during the fall season. This study plan identifies the areas targeted for the survey, the survey methods, and the plant and animal species targeted for the field studies. Subsequent surveys are planned for the winter of 2009-2010 and spring of 2010 to identify annual plants that are not evident in the fall and wildlife species not active or present during the fall.

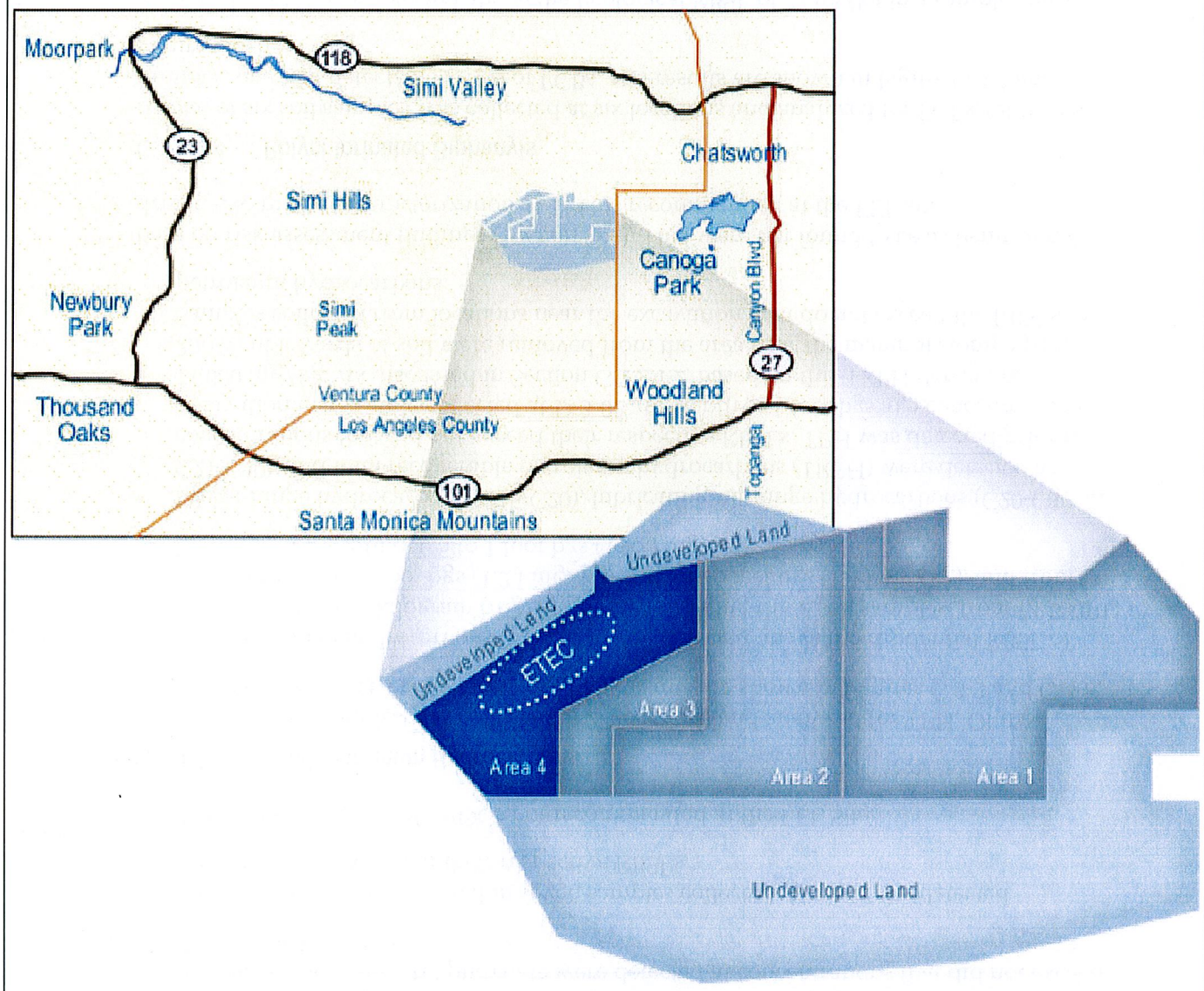
For example, Lyon's pentachaeta, an annual species, may be in flower from as early as March until late August. In the fall months it would exist as seed. Plummer's mariposa would be dormant during the dry summer and fall months, existing as seed or deeply buried corms (bulb-like structures that re-sprout during the rainy season), and thus unlikely to be encountered during the fall. Of the endangered plant species identified as potentially occurring within the project area, Braunton's milk vetch and Santa Susana tarplant would be detectable during the summer and fall months allowing for determination of their presence and extent of populations all year.

2.0 Study Area Setting

The SSFL is located 29 miles northwest of downtown Los Angeles, California, in the southeast corner of Ventura County (Figure 1). The SSFL occupies approximately 2,850 acres of hilly terrain, with approximately 700 feet of topographic relief near the crest of the Simi Hills. The Simi Hills are bordered on the east by the San Fernando Valley and to the north by the Simi Valley. SSFL Area IV consists of 290 acres located in the northwestern portion of the SSFL property where nuclear research once occurred and final demolition and remediation activities will occur (Figure 2). The adjacent Northern Undeveloped Lands abut the northern boundary of SSFL Area IV and are approximately 182 acres in extent. Although there was no use of the Northern Undeveloped Lands for nuclear research, drainages leading northward from Area IV cross a portion of these lands.

Physical Setting: The SSFL area in general is characterized by steep outcrops of the Chatsworth formation, a thick sequence of steeply dipping sandstone beds interbedded with siltstone, which are conspicuous features of the site. Between the resistant outcrops are more or less level areas that overlie more erodible portions of the formation. Much of the development in Area IV took place on "Burro Flats", the largest of these areas of relatively flat topography.

Because of the SSFL's location at and near the summit of a low mountain range in a semi-arid environment, water is scarce and consequently development of riparian and wetland vegetation is much localized to intermittent drainages and small man-made impoundments.



CDM

Santa Susana Field Laboratory Area IV
Ventura County, California

Figure 1
SSFL Location

The Northern Undeveloped Lands adjacent to Area IV are characterized by steep, nearly barren sandstone outcrops that parallel the northern border of Area IV to the west, giving way to relatively dense chaparral on less rocky slopes toward the eastern boundary of Area IV.

Several intermittent drainages lead north from Area IV into the Northern Undeveloped Land and south east into Areas II and III. Engineered stormwater collection and treatment systems, developed to address National Pollutant Discharge Elimination System stormwater discharge requirements, control stormwater flows northward from Area IV. These systems are primarily used during the winter rain season (November through April) as there is no permanent water flow or natural water bodies within the study area.

The vegetation of the site is in the process of recovering from a wildland fire that burned through most of the SSFL in September, 2005. Upland vegetation of Area IV is primarily grassland dominated by non-native species, and chaparral communities dominated by native species, with oak woodland present in locations having favorable exposures and soil conditions. Oak woodlands have an understory of weedy grasses and forbs that are typically also present in the annual grassland community. Disturbed areas exhibit a vegetative cover dominated by both introduced and native species that have good ability to disperse to and establish in open habitats. Sandstone outcrops support a distinctive community of primarily native herbs and subshrubs (i.e., low growing shrub with a woody base) in fissures and other areas where soil can accumulate and trap seeds. Mosses, club mosses, and lichens are prevalent on sandstone outcrops, particularly on shaded northerly exposures, where they trap soil and facilitate the establishment of flowering plant species.

Biological resources at the SSFL have been described by Ogden Energy and Environmental Services (1998). An addendum to the Ogden report was prepared by MWH Americas, Inc. (MWH) and AMEC Earth & Environmental, Inc. (2005), based upon additional surveys conducted by AMEC, MWH, and Padre Environmental between 2000 and 2004. The Ogden (1998) study included reconnaissance level field surveys conducted on various dates during 1995-1997 and vegetation mapping of the SSFL site, including Area IV. The studies encompassed the entire SSFL site but were focused on sites potentially undergoing remediation and closure. All habitats were visited but no trapping, quantitative surveys, or focused protocol surveys for endangered, threatened, or rare species were conducted (Ogden 1998).

Species of interest: At least one plant species known to occur at the site, Braunton's milk vetch (*Astragalus brauntonii*), is protected under the federal Endangered Species Act (ESA). Critical habitat was formally designated by the U. S. Fish and Wildlife Service (USFWS) in November 2006 for this species (50 CFR Part 17; Federal Register/Vol. 71, No. 219, pp. 66374-66423). This endangered species has been documented on the site with critical habitat designated in the southwestern corner of Area IV. Attachment A provides further details regarding the biology and conservation strategy for this species.

Lyon's pentachaeta (*Pentachaeta lyonii*), an annual plant species also federally listed as endangered, may occur on the site based on habitat and other occurrences in the project region. It is typically associated with clay soils of volcanic origin and has not been documented from the site. Attachment B provides further details regarding the biology and conservation strategy for this species.

The Santa Susana tarplant (*Deinandra minthornii*) is known to occur at the site and is protected under the California Endangered Species Act (CESA). The tarplant is protected as a "Rare" species under CESA. Attachment C provides further details regarding the biology and conservation strategy for this species.

Several other plant species are known exist in the study area but are not protected under the federal ESA or CESA, but are nevertheless considered sensitive by recognized authorities including the California Native Plant Society (CNPS) or the California Department of Fish and Game (CDFG). These include Plummer's mariposa lily (*Calochortus plummerae*), and Southern California black walnut (*Juglans californica* var. *californica*). Animal species considered sensitive that have been observed within the study area include the San Diego coast horned lizard (*Phrynosoma coronatum blainvillei*), silvery legless lizard (*Anniella pulchra pulchra*), and two-striped garter snake (*Thamnophis hammondii*). Most nesting birds on site are protected by federal, state, and local regulation until nesting has been completed and the young birds have left the nest.

There are no federally or state listed wildlife species known to be resident on the site or regular visitors to it. The coastal California gnatcatcher (*Polioptila californica californica*), a small songbird federally listed as threatened, could possibly occur onsite, based on occurrences in coastal scrub habitats in the general project region (Moorpark). The nesting period during which habitat disturbances for migratory birds should be minimized is March to August. Raptors, which nest in trees or cliffs in this area, nest earlier in the year. The California gnatcatcher for example lays eggs in late March. Activities where there is potential to disturb nesting birds or their habitat should be conducted from September- February to avoid impacts to migratory birds. Attachment D provides further details regarding the biology and conservation strategy for the California gnatcatcher.

Regulatory Setting (Federal ESA): The Federal Endangered Species Act (ESA) and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Section 7 of the ESA requires federal agencies to aid in the conservation of listed species, and to ensure that the activities of federal agencies will not jeopardize the continued existence of listed species or adversely modify designated critical habitat. At the federal level, the USFWS and the National Oceanic and Atmospheric Administration are responsible for administration of the ESA.

The ESA provides that any interested person may petition the Secretary of the Interior to add a species to, or to remove a species from, the list of endangered and threatened species. Through the candidate assessment process, USFWS biologists identify species as listing candidates. Under the ESA, the following factors determine whether or not a species should be listed as endangered or threatened:

- the present or threatened destruction, modification, or curtailment of the species' habitat or range;
- overutilization for commercial, recreational, scientific, or educational purposes;
- disease or predation; the inadequacy of existing regulatory mechanisms; and
- other natural or manmade factors affecting the species' continued existence.

Section 7 of the ESA directs Federal agencies to use their legal authorities to carry out conservation programs for listed species. It also requires these agencies to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of any endangered or threatened species, or to adversely modify its designated critical habitat (if any). When an agency finds that one of its activities may affect a listed species, it is required to consult with the USFWS to avoid jeopardy. If

necessary, “reasonable and prudent alternatives,” such as project modifications or rescheduling, are suggested to allow completion of the proposed activity. Where a Federal action may jeopardize the survival of a species that is proposed for listing, the Federal agency is required to “confer” with the USFWS (although the recommendations resulting of such a conference are not legally binding).

Additional protection is authorized by Section 9 of the ESA, which makes it illegal to take, import, export, or engage in interstate or international commerce in listed animals except by permit for certain conservation purposes. The ESA also makes it illegal to possess, sell, or transport any listed species taken in violation of the law. For plants, trade restrictions are the same but the rules on “take” are different. It is unlawful to collect or maliciously damage any endangered plant on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law, or in the course of violating a State criminal trespass law, also is illegal under the ESA (USFWS, 1999)[1].

Regulatory Setting (State CESA): CESA states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved. The CDFG will work with all interested persons, agencies and organizations to protect and preserve such sensitive resources and their habitats.

However, CESA also allows for take incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project caused losses of listed species.

The Natural Community Conservation Planning Act (NCCP Act) was added to CESA in 1991 (Fish & Game Code §§2800-2840). These provisions provide for voluntary cooperation among CDFG, landowners, and other interested parties to develop natural community conservation plans which provide for early coordination of efforts to protect listed species or species that are not yet listed. The primary purpose of the NCCP Act is to preserve species and their habitats, while allowing reasonable and appropriate development to occur on affected lands.

Consistency Determination http://www.dfg.ca.gov/habcon/cesa/incidental/consist_determine.html :

Fish and Game Code Section 2080.1 states the requirements and procedures for a 2080.1 Consistency Determination. Section 2080.1 allows an applicant who has obtained a federal incidental take statement pursuant to a federal Section 7 consultation or a federal Section 10(a) incidental take permit to notify the Director in writing that the applicant has been issued an incidental take statement or an incidental take permit pursuant to the federal Endangered Species Act of 1973. The applicant must submit the federal opinion incidental take statement or permit to the Director of Fish and Game for a determination as to whether the federal document is "consistent" with CESA. Receipt of the application by the Director starts a 30-day clock for processing the Consistency Determination.

[1] USFWS. 1999. The Endangered Species Listing Program. Endangered Species Bulletin. Volume XXIV. November/December.

In order for the Department to issue a Consistency Determination, the Department must determine that the conditions specified in the federal incidental take statement or the federal incidental take permit are consistent with CESA. If the Department determines that the federal statement/permit is not consistent with CESA, the applicant must apply for a State Incidental Take Permit under section 2081(b) of the Fish and Game Code.

The exception provided in Fish and Game Code section 2080.1 to CESA's take prohibition can be used only for species that are listed under both federal Endangered Species Act and CESA, and cannot be applied to species that are listed by the State but not federally listed.

2081(b) permits are usually preferable to 2080.1 Consistency Determinations for the reasons listed below. Under a Consistency Determination:

- One cannot add any conditions to the federal incidental take statement/permit or biological opinion to meet the full mitigation standard, and must accept it as is, unless it is determined it to be consistent,
- Often the biological opinion does not contain enough details in describing mitigation measures,
- The federal standard for including plants is jeopardy,
- If pertinent section of the Endangered Species Act change, Consistency Determination could become invalid, and we would have to issue 2081(b) permits for those projects.

3.0 Survey Approach

The first step in completing the biological surveys will be sharing this study plan with resource agencies (USFWS and CDFG) and stakeholders interested in protection of the natural resources of the SSFL. DOE proposes to meet with all interested parties to discuss the survey plan, EPA's study, and the avoidance/mitigation measures needed to address protection of those resources. Implementation of these avoidance mitigation measures related to EPA's survey will be the responsibility of EPA.

As part of the preparatory work for the biological surveys, ecological, natural history and conservation information on species that could potentially be affected by the site characterization surveys will be gathered and reviewed. As described above, at least two federally or state-listed rare, threatened, or endangered species have been identified to occur on site, with the potential for several others. There are also a number of plant and animal species of concern that should be considered as part of site survey and cleanup activities.

Prior investigations of SSFL have identified listed plants and animals for the project area. This information on the ecology and natural history of these species will continue to be reviewed to establish the project area biological understanding. At the same time systematic field surveys for the presence of protected species will be conducted throughout Area IV and the Northern Undeveloped Land. It is recognized that some species may not be present or recognizable during dormant periods and additional seasonal surveys will be required. It is assumed that other listed species could potentially utilize the area, such as migrants and wintering species. Finally, to support the EIS and complete the

biological characterization of Area IV, observations of all wildlife species will also be recorded during the biological surveys.

Survey method: The biological survey routes and coverage will be determined with the aid of high resolution aerial photographs. The biological surveys will be conducted by biologists walking parallel transects over a defined area. Parallel transects will be walked where permitted by the habitat conditions (e.g., in grassland and low scrub) and terrain. Some meandering back and forth over the centerline of each transect is expected so that the biologists will be able to more closely inspect features of interest. In steeper terrain and dense vegetation such as chaparral, additional departures from the centerline may be required to negotiate the terrain and vegetation. Separation between transects will vary with the ability to detect the target species, which is affected by the height and density of the vegetation as well as characteristics such as size and visibility of the target species. In general, spacing between transects will be about 15 meters (~49 feet), but this may be modified upward or downward by the lead investigator according to the circumstances observed in different portions of the survey area. Binoculars and/or spotting scopes will be used from suitable vantage points to supplement the walking transects and to scan inaccessible portions of the site, such as steep rock outcrops. Photographs will be taken to document habitat types, sensitive species, and important features. Locations and/or boundaries of sensitive species occurrences will be delineated using differential global positioning system (GPS) equipment capable of sub-meter accuracy (i.e., repeat measurements would fall less than 1 meter from the actual location). For clusters of plants, their numbers will be counted and the boundaries of the cluster surveyed with the GPS instrument. For individual plants, the location of each occurrence will be identified using GPS measurements.

Wildlife surveys will focus on the most likely habitat areas to support listed and sensitive wildlife species and nesting birds. Surveys will begin early in the day and cover the chaparral and shrubbier areas to increase the probability of detection of the coastal California gnatcatcher. The sandstone rock outcrops and other areas that support the greatest diversity of native plant species will be surveyed next. Finally, any areas that accumulate moisture would be intensively searched for the two-striped garter snake and other sensitive species.

Summary of Technical Approach:

1. Complete a California Department of Fish and Game Natural Diversity Database (CNDDB) review of special status species observed within the areas relevant quadrangles encompassing the study area.
2. Contact Boeing for pertinent site-specific records of the species it and its consultants have observed.
3. Communicate with USFWS, CDFG, and CNPS regarding the study plan prior to and during the study (contact information is listed in Section 4.0).
4. Conduct field surveys to identify listed and sensitive species locations. Capture relevant electronic data using GPS units. Use GPS data to document and delineate all species occurrences as points or polygons on project maps. Plot points/polygons on high resolution air photos.
5. Prepare a survey map that will delineate vegetation types, habitats, and locations of observed listed and sensitive species.
6. Prepare a survey report in a form that can be readily incorporated into an EIS baseline section. The report will identify the surveyed area and locations of listed and sensitive species. GIS records will be provided to the DOE. If applicable, the survey report will identify additional information that may be needed for the EIS analysis based on the findings of the field surveys.

7. Identify “environmentally sensitive” zones in which a qualified biological monitor should be present during EPA’s radiological survey and sampling efforts to guide and assist EPA in navigating through sensitive areas.
8. Assist EPA field supervisors to identify sensitive areas for mitigation planning purposes and to respond to EPA questions regarding the survey recommendations.

Schedule
The biological survey work described in this plan is anticipated to start the first week of October 2009. A draft report of the survey findings will be available in mid November.

4.0 Coordination with Regulatory Agencies and Interest Groups

This section identifies and provides contact information for regulatory agencies and local interest groups having specific oversight or focused interest in biological resources including endangered, threatened, and sensitive species, and preservation and management of natural environments.

4.1 Regulatory Agencies with Threatened/Endangered Species Focus:

USFWS:

U.S. Fish & Wildlife Service
Ventura Fish & Wildlife Office
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4.2 Interest Groups with Focus on Threatened/Endangered Species, Wetlands, and Preservation of Natural Environments:

California Native Plant Society (CNPS):

The CNPS has expressed interest to DOE in writing regarding need to protect natural resources at SSFL. Representatives of the CNPS will be invited to review this study plan and to further develop the study approach for Area IV and the Northern Undeveloped Land.

Santa Monica Mountains Conservancy:

The SSFL property is within the Santa Monica Mountains Conservancy "Rim of the Valley Trail"/Parkland System Plans—see: http://smmc.ca.gov/about.html and http://smmc.ca.gov/parkland_map.pdf. Representatives from the Conservancy will be contacted regarding their interest in participating in the Area IV biological surveys.

Mountains Recreation & Conservation Authority (MRCA):

The MRCA, a local partnership between the Santa Monica Mountains Conservancy, Conejo Recreation and Park District, and the Rancho Simi Recreation and Park District, is dedicated to the preservation and management of local natural resources http://www.mrca.ca.gov. They will be contacted regarding interest in participating in the Area IV biological surveys.

Santa Susana Mountain Park Association:

The Santa Susana Mountain Park Association will be contacted regarding interest in participating in the Area IV biological surveys.
(http://www.ssmpa.com/About_Us.html)

Attachment A
Biology and Conservation Strategy for Braunton's Milkvetch (*Astragalus brauntonii)*

Braunton's milk vetch (*Astragalus brauntonii*)- Federally listed as endangered
A robust, short-lived perennial in the pea family (Fabaceae), Braunton's milk vetch is one of the tallest members of the genus, reaching a height of 60 inches, and is covered with woolly hairs. It blooms from March through July. It typically lives 2 to 3 years, with 5 years being the reported maximum life-span.

Braunton's milk vetch is associated with the fire-dependent chaparral habitat dominated by chamise (*Adenostoma fasciculatum*), and yucca *(Yucca whipplei*) (USFWS, 1997). The species is primarily known to occur on outcrops and generally occurs along the tops of knolls ranging from 800 to 2,100 ft (244 to 640 m) in elevation.

Although there are disputes on the required frequency of wildland fires, fire is a natural requirement for the survival of this species. Prior to human development within the chaparral, the estimates of the natural frequency of fire range between 20 to over 100 years, with an average of 70-year intervals. Higher fire frequencies have resulted from increasing human populations in southern California, mostly in the form of arson-caused fires. There is some concern that more frequent fire intervals may adversely affect the species survivability through increased competition by non-native grasses and plants that may crowd out the milkvetch.

Although the species has a relatively short life span, it can survive for extended periods dormant as a seed. Fire appears to be the primary mechanism needed for seed germination, although other seed scarification (mechanical disturbance) can lead to seed germination. Because of its relatively short life span, the need for fire for germination, a given population may be visible only once in 20 to 50 or more years (USFWS, 1997). Robust populations can be observed after fires, but as the land recovers and shrub growth blocks sunlight, the populations appear to die out. The total number of individuals in any population varies with current fire cycles.

The habitat of the Braunton's milkvetch has been described as scrub dominated by chaparral with a high overall percentage (>80 percent) of vegetative cover; however, the species does not tolerate shading and is associated with surrounding bare ground (Carroll 1987, Fotheringham and Keeley 1998). It may persist for several years where microsite conditions inhibit shrub growth, or it may be gradually crowded out by more robust and tough-woody chaparral plants until the next disturbance that removes plant cover (Carroll 1987, Fotheringham and Keeley 1998).

The USFWS identified six habitat units and ten subunits with known occurrences of Braunton's milk vetch as critical habitat. In relation to SSFL, the USFWS designated Subunit 1d on Boeing Property (Area IV) as critical habitat (Federal Register/Vol. 71, No 219, pp. 66389).

In identifying areas as critical habitat, the Service considered those physical and biological habitat features that are essential to the conservation of the species. These essential features are referred to as the species' primary constituent elements (PCEs). Areas that do not contain any PCEs at the time of critical habitat designation are not considered critical habitat, whether or not they occur within a mapped critical habitat unit. The primary constituent elements for milkvetch are as follows:

1. Calcium carbonate soils derived from marine sediment;
2. Low proportion (<10%) of shrub cover directly around the plant; and
3. Periodic disturbances that stimulate seed germination (e.g., fire, flooding) and reduce vegetative cover.

According to the designation of Subunit 1d, the USFWS indicates that the subunit consists of 68 acres (27 hectares) with at least two of the three PCEs (2 and 3). The presence of calcium carbonate soils for Subunit 1d is unknown. Within Area IV, the known population of Braunton's milkvetch inhabits sandstone of the Chatsworth and Santa Susana geologic formations derived from marine sediment.

Land management actions that result in frequent disturbances, such as yearly road maintenance where *Astragalus brauntonii* occurs, may be contributing to the decline of populations by mowing and removing plants before seeds mature and replenish the seed bank. Therefore, total brush removal is adverse to the plant's existence. This has been known to occur for plants along unpaved fire access roads and utility corridors. Other land management activities such as herbicide application, cattle grazing, and recreational activities such as off-road vehicle and equestrian use that results in trampling of plants may be affecting the species (USFWS, 2009).

Braunton's milk vetch seeds have been collected from the wild and successfully propagated on several occasions (USFWS, 2009). Known habitat that has undergone succession and is dominated by dense woody shrubs may not be harmful to the long-term persistence of the plant as long as periodic disturbances are allowed to occur and nonnative species have not altered the habitat in some fundamental way that does not allow the seed bank to be expressed.

A recovery plan for Braunton's milk vetch and five other species was finalized in 1999 (USFWS, 1999). Noted conservation measures include conducting pre-construction surveys to identify and avoid plants, preserving plants within a reserve, collecting mature seeds, spreading seeds onto suitable habitat, and planting in the fall with watering in case of drought (USFWS, 1999; 2009).

References

Carroll, M. 1987. Draft report of the status of *Astragalus brauntonii* in the Simi Hills. Prepared for Morrison Homes. 17 pp. Agoura, California.

Fotheringham, C. and J. Keeley. 1998. Ecology and distribution of Braunton's milk-vetch (*Astragalus brauntonii*) and Lyon's pentachaeta (*Pentachaeta lyonii*). Prepared for California Department of Fish and Game, USFWS section 6 contract No. FG5636-R5.

USFWS. 1997. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Two Plants and Threatened Status for Four Plants From Southern California. FR 62: 4172-4183.

USFWS. 2006. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Astragalus brauntonii* and *Petachaeta lyonii*; Final Rule. Federal Register, Tuesday November 14, 2006. Volume 71, No. 219, pp. 66374-66423.

USFWS. 2009. Braunton's milk-vetch *(Astragalus brauntonii)* 5-Year Review: Summary and Evaluation

Attachment B
Biology and Conservation Strategy for Lyon's Pentachaeta (*Pentachaeta lyonii*)

Lyon's Pentachaeta (*Pentachaeta lyonii*)- Federally listed as Endangered
Lyon's pentachaeta is a federally listed endangered annual plant that tends to occur in a patchy distribution on rocky clay soils often of volcanic origin (USFWS, 2008). Habitat for the species is also described as transition areas between grasslands and shrublands (USFWS, 1999). The species blooms in late spring (April to June) and is dependent upon pollinators for successful reproduction. The seeds likely persist in the soil for several years during extended dry spells (Fotheringham and Keeley 1998).

Critical habitat for Lyon's pentachaeta was designated on November 14, 2006 (USFWS, 2006). Soils of Area IV of the SSFL are sandstone of marine sediment origin and critical habitat was not designated within SSFL. A recovery plan was finalized for Lyon's pentachaeta, *Astragalus brauntonii*, and four other plants in 1999 (USFWS, 1999). Unlike *Astragalus brauntonii,* Lyon's pentachaeta has no close relationship with fire. Seeds remain dormant for long periods of low rainfall and there are large annual fluctuations in population size (USFWS, 2008). Threats to the species include habitat loss and displacement by non-native annual grasses (USFWS, 1999).

Successful propagation of seeds collected from the wild has been successful on several occasions (Fotheringham and Keeley, 1998).

References

Fotheringham, C. and J. Keeley. 1998. Ecology and distribution of Braunton's milk-vetch (*Astragalus brauntonii*) and Lyon's pentachaeta (*Pentachaeta lyonii*). Prepared for California Department of Fish and Game, USFWS section 6 contract No. FG5636-R5.

USFWS. 1999. Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin. U.S. Department of the Interior, Fish and Wildlife Service, Portland, Oregon. September.

USFWS. 2006. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Astragalus brauntonii and Pentachaeta lyonii. FR 71: 66373-66423.

USFWS. 2008. (*Pentachaeta lyonii*) Lyon's pentachaeta 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, California. September.

Attachment C
Biology and Conservation Strategy for Santa Susana tarplant (*Deinandra minthornii*)

Santa Susana tarplant (*Deinandra minthornii*)-State listed as Rare
Santa Susana tarplant (*Deinandra minthornii*) is a perennial subshrub in the aster family that produces yellow flowers from July to November. It is restricted to the Santa Susana and Santa Monica mountains of Los Angeles and Ventura counties, occurring in crevices of sandstone bluffs and outcrops in the chaparral and coastal scrub communities ranging in elevation from 900–2,500 feet. Associated species include laurel sumac, chamise, California scrub oak, California live oak, California buckwheat, coastal sage, black sage, and fragrant everlasting. A habitat conservation plan is needed and research on its reproductive biology, germination and growth and habitat requirements will be necessary in formulating a conservation strategy (Center for Plant Conservation, 2007).

The Santa Susana tarplant has been successfully grown from seed in a nursery. Transplantation of the species has been conducted with varying degrees of success (CDFG, 1991). Mangione and Vander Pluym (1993) report a mitigation site study at a Las Virgenes Municipal Water District reservoir site in Ventura County. The authors were minimally successful in removing and transplanting tarplants back into the construction site after holding them at a nursery; but had greater success in growing plants from seeds grown in a nursery and transplanting them at the construction site. Natural revegetation of the site from seeds produced by the replanted stock was also observed.

To reduce potential impacts to the species, focused surveys should be conducted during the blooming period. In the event focused surveys locate the species, mitigation would be required to reduce impacts and should be determined through coordination with the California DFG. Mitigation could include avoidance of the plants to the greatest extent possible and, possibly, reestablishment of specimens from seeds collected on site.

References
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Attachment D
Biology and Conservation Strategy for Coastal California Gnatcatcher (*Polioptila californica californica*)

Coastal California Gnatcatcher (*Polioptila californica californica*)- Federally listed as Threatened

The coastal California gnatcatcher (*Polioptila californica californica*) is a small blue-gray songbird that inhabits coastal sage scrub and utilizes chaparral, grassland, and riparian habitats nearby for dispersal and foraging. The *californica* subspecies (coastal California gnatcatcher) has been listed as a Species of Special Concern in California and was listed as Threatened by the U.S. Fish and Wildlife Service in 1993 (USFWS, 1993). Threats to the species include habitat loss and fragmentation resulting from urban and agricultural development and the synergistic effects of cowbird parasitism and predation (USFWS, 2003). The California gnatcatcher is a focal species under California's Natural Communities Conservation Planning (NCCP) program and several conservation plans are approved or in the late planning stages throughout southern California.

Critical habitat was designated in 2000 and revised in 2007 (USFWS, 2007). Critical habitat includes the south-facing slopes of the Santa Susana and San Gabriel Mountains, which are necessary to support populations of coastal California gnatcatchers in the Moorpark area and in the foothills of the San Gabriel Mountains.

The California gnatcatcher is non-migratory and extensive movements by breeding adults are relatively rare (Bailey and Mock, 1998). Breeding occurs from March to August. Post-breeding dispersal by fledglings occurs during late summer and fall. The species generally prefers open sage scrub with California sagebrush (*Artemisia californica*) as a dominant or co-dominant species and occupies dense sage scrub less frequently than more open sites (Atwood and Bontrager, 2001). Nests are typically placed in areas with less than 40 percent slope gradient, particularly along gullies and drainages, when available within territory.

Disturbances that reduce shrub cover, such as frequent fire, mechanical disruption, livestock grazing, off-highway vehicle use, and military training activities appear to reduce habitat suitability for California gnatcatcher (Atwood et al., 1998).

References

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