UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

June 16, 2010

Ms. Mary Meyer
California Department of Fish and Game
226 West Ojai Avenue, Suite 101
PMB 501
Ojai, CA 93023

Subject: Santa Susana Field Laboratory Radiological Survey of Area IV
Response to Comments on the Biological Assessment

Dear Ms. Meyer,

On February 18, 2010, the California Department of Fish and Game submitted a letter providing input regarding implementation of the radiological survey activities that will occur within Area IV and the Northern Buffer Zone of the Santa Susana Field Laboratory (SSFL). The letter provided comments to the Biological Assessment prepared by the U.S. Environmental Protection Agency (EPA), and conveyed recommendations for additional avoidance and minimization measures to be implemented during the proposed action. Where applicable, comments on the Biological Assessment were incorporated and used by the U.S. Fish and Wildlife Service (USFWS) to prepare their Biological Opinion, which was issued on May 25, 2010.

Based on the Biological Opinion, technical requirements of the state Codes, and your recommendations, we have developed the attached avoidance and minimization measures for inclusion in our Site Management Plan (SMP). EPA's SMP describes the protocols and procedures for fieldwork and overall implementation of EPA's radiological study at SSFL. The attached avoidance and minimization measures will be monitored via the presence of EPA-contracted biological monitors and on-site EPA staff oversight of the project. The results of the biological monitoring will be documented in reports that will be prepared pursuant to the attached outline and distributed by EPA on a quarterly basis.

As we have previously discussed, it is our goal to meet the substantive technical requirements of the California Endangered Species Act and California Department of Fish and Game Code Section 1602; however, EPA is conducting this project pursuant to federal legislative mandate HR2764, the Consolidated Appropriations Act of 2008, and the authority

granted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Please give me a call at (415) 947-4148 if you have any questions regarding the information provided herein.

Sincerely,

Craig Cooper
Project Manager
SSFL Site

Cc: Mr. Edmund Pert

Attachments:

- *Appendix G (Revision 1) to EPA's Site Management Plan; Protection of Natural Resources*
- *Appendix N (Revision 1) to EPA's Site Management Plan; Field Protocols for Protection of Riparian Resources*
- *Outline for EPA's SSFL Routine Quarterly Biological Monitoring Report Radiological Study at the Santa Susana Field Laboratory*

Outline for EPA's Routine Quarterly Biological Monitoring Report
Radiological Study at the Santa Susana Field Laboratory
June 2010

USWFS has requested that an annual biological monitoring report be submitted on May 1 for each year that activities are conducted pursuant to the May 25, 2010, biological opinion issued by USFWS pursuant to Section 7 of the Endangered Species Act. In addition, EPA is required to comply with the substantive, technical requirements required under the California ESA and the Stream-Bed Alteration regulations administered by the California Department of Fish and Game.

EPA believes that it is prudent to prepare voluntary quarterly reports documenting compliance with the BO and these two State laws. The quarterly reports will address the same issues required in the annual report, while providing for more frequent reporting and organization of materials to be included within the annual report.

Due Dates
The quarterly reports will be prepared and submitted by HGL to EPA on July 26, October 25, and January 25, which is one week in advance of the targeted issuance dates of August 1, November 1 and February 1. The fourth quarterly report will be combined with the annual report required by USFWS, and will be submitted to EPA on April 16, two weeks in advance of the May 1 deadline. EPA will transmit quarterly and annual reports to the USFWS and CDFG.

Report Content
The following is an outline for the monitoring reports:

Monitoring Report

- Introduction, Purpose, and Period Covered by the Report
- Activities and Operations
    - Description of the location and activities conducted within the monitoring period.
- Surveys and Monitoring
    - Results of the biological surveys and observation records.
- Impacts to Federally Listed Species
    - Documentation of the impacts on the federally listed species or critical habitats addressed in the biological opinion.
    - Documentation of the number of individuals of federally listed species harassed, injured or killed, including the date, time, location, approximate size, age and location of relocation sites (if applicable).
    - Location and acreage of habitat for federally listed species temporarily or permanently lost.
- Impacts to State Listed Species
    - Documentation of the impacts on the State listed species or critical habitats addressed in the biological opinion.

- Documentation of the number of individuals of State listed species harassed, injured or killed, including the date, time, location, approximate size, age and location of relocation sites (if applicable).
- Location and acreage of habitat for State listed species temporarily or permanently lost.

- Riparian Area Impacts
  - Acreage of riparian area where work occurred
  - Description of protective measures undertaken
  - Description of any significant impacts to riparian areas and resources

- Issues Encountered and Adaptive Management
  - Discussion of problems encountered implementing the terms, conditions and/or other protective measures.
  - Recommendations for modifying the terms and conditions to enhance the conservation of State and federally listed species.

PROTECTION OF RIPARIAN RESOURCES
Revision 1, June 2010

Field activities associated with EPA's proposed action at the SSFL site will occur within riparian habitat within Area VI and the Northern Buffer Zone. EPA is conducting this project pursuant to federal legislative mandate 2764, the Consolidated Appropriations Act of 2008, and the authority granted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

California Department of Fish and Game Code 1602 requires notification to California Department of Fish and Game should any person, business, state or local government agency, or public utility propose an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

With implementation of the avoidance and minimization measures identified by EPA, the proposed action does not meet these criteria. In addition, the administrative requirements of State and Federal environmental laws are not applicable to on-site activities under CERCLA. Therefore, although a notification is not required for this project, the proposed action will be conducted in a manner that meets the substantive, technical requirements of the California Department of Fish and Game Code 1602. Avoidance and minimization measures will be implemented to avoid impacts to riparian resources in the study area. The avoidance and minimization measures listed below were developed in consultation with the California Department of Fish and Game. These measures will be enforced via the presence of EPA's biological monitors and on-site EPA staff oversight of the project. Additional details regarding protected species and associated avoidance and minimization measures can be found in the Biological Opinion prepared by the United States Fish and Wildlife, Appendix G [Natural Resource Protection Measures] of this Site Management Plan and in accordance with the substantive requirements of applicable Federal and State laws, local requirements and regulations and Executive Orders (EOs) applicable for this site described in Table 5.1 of this Site Management Plan.

Applicable Federal and State Laws, Local Regulations, and Executive Orders

California Department of Fish and Game Code 1602

Riparian Habitat Avoidance and Minimization Measures

1. A qualified biological monitor shall be present during work in all Department jurisdictional areas, and shall survey for the presence of any state and federally listed threatened or

endangered species or state species of special concern, potentially or locally known in the area. If any life stages of any native vertebrate species are found in the path of construction, the monitor shall make every effort to relocate the species to a safe location. In accordance with Appendix G [Protection of Natural Resources Measures] and where applicable, exclusionary devices shall be erected to prevent the migration into or the return of species into the work areas.

2. Between March 1 and September 15, two weeks before initiation of action-related activities, a qualified biologist will survey the area to determine the presence/absence of nesting threatened, endangered, and/or migratory birds. If breeding activities are observed or an active bird nest is located, a buffer shall be established using stakes and tape to demarcate the setback zone. The area will not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the proposed action.

3. Thinning of riparian vegetation should be limited to the minimum extent necessary and will not involve the removal of trees. Where necessary, riparian vegetation will be trimmed to a height of 6 to 18 inches and will not involve grubbing or disturbance of root systems. Non-native invasive species found within riparian habitats will be removed and disposed of off-site. Vegetation Cutting Protocols are described in detail in Appendix E.

4. Vegetation removed from a stream shall not be stockpiled in the streambed or on its bank. Cut vegetation will be stockpiled in upland areas outside the stream channel. The vegetation piles shall not be placed in areas that may impact sensitive floral resources or dormant seeds, or in areas where rodent populations may be deemed a nuisance (such as, adjacent to agriculture lands and residential properties).

5. While conducting gamma scanning surveys within riparian habitat, appropriate scanning equipment shall be selected that minimizes the physical effects to the habitat, while achieving maximum sensitivity of the scanner.

6. If measurable rain is predicted within 24 hours, ground-disturbing activities within riparian habitat shall cease. Surface water sampling activities in riparian habitat is allowed before, during, and after any rainfall event. As deemed necessary by EPA, protective measures to prevent siltation/erosion shall be implemented/maintained in accordance with the sampling procedures and protocols identified in EPA's field sampling plan for groundwater, surface water and sediment testing.

7. Staging/storage areas for equipment and materials shall be located outside of the riparian habitat.

8. Any equipment or vehicles driven and/or operated within or adjacent to the riparian habitat shall be checked and maintained daily, to prevent leaks of materials that, if introduced to water, could be deleterious to aquatic life.

9. Stationary equipment (such as motors, pumps, generators, and welders) located within or adjacent to the riparian habitat shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak.

10. No equipment maintenance shall be conducted within or near any stream channel or riparian habitat where petroleum products or other pollutants from the equipment may enter these areas under any flow.

11. Where possible, access to each sampling location within the work site will be via existing roads and access ramps. Off-road access will be limited as much as possible to foot traffic; use of off-road vehicles will be minimized. If no ramps are available in the immediate area, the Applicant may construct a temporary ramp within the footprint of the study area. Temporary ramps shall be removed upon completion of the project and the disturbed area restored to its pre-existing condition.

12. Action will be taken to minimize impacts to stream channels and stream channel alteration is not anticipated. However, if a stream channel has been altered during the operations, then action will be taken to return the altered portion of the channel to pre-project conditions, to the extent practicable, without creating a possible future bank erosion problem, or a flat wide channel or sluice like area.

13. No debris, soil, silt, sand, bark, slash, sawdust, rubbish, construction waste, cement or concrete or washings thereof, asphalt, paint, oil or other petroleum products or any other substances which could be hazardous to aquatic life, or other organic or earthen material from project-related activities shall be allowed to contaminate the soil and/or enter into or placed where it may be washed by rainfall or runoff into, waters of the State. Any of these materials, placed within or where they may enter a stream or lake, shall be removed immediately. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream or lake.

14. The Applicant's activities shall be limited to the period of daylight hours.

PROTECTION OF NATURAL RESOURCES
REVISION 1, JUNE 2010

This document describes the protection measures that will be implemented during the execution of field activities at the Santa Susana Field Laboratory (SSFL) Site. An information sheet is provided for each listed species in the Biological Assessment prepared by the U.S. Environmental Protection Agency (EPA) and the Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS) and classified as listed below. Any additional species determined to be at risk from site activities will be included as necessary.

Braunton's milk-vetch (*Astragalus brauntonii*) **E (Endangered), CH (Critical Habitat)**
Lyon's pentachaeta (*Pentachaeta lyonii*) **E**
Spreading navarretia (*Navarretia fossalis*) **T (Threatened)**
California Orcutt Grass (*Orcuttia californica*) **E (Endangered)**
Conejo dudleya (*Dudleya abramsii* ssp. *parva* [=> *Dudleya parva*]) **T**
Santa Monica Mountains dudleya (*Dudleya cymosa* ssp. *ovatifolia* [inclusive of *Dudleya cymosa* ssp. *agourensis*]) **T**
Marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*) **T**
Coastal California gnatcatcher (*Polioptila californica* ssp. *californica*) **T**
Least Bell's vireo (*Vireo bellii* ssp. *pusillus*) **E**
California red-legged frog (*Rana aurora* ssp. *draytonii* [=> *Rana draytonii*]) **T**
Quino checkerspot butterfly (*Euphydryas editha* ssp. *quino*) **E**
Riverside fairy shrimp (*Streptocephalus woottonii*) **E**
Vernal pool fairy shrimp (*Branchinecta lynchi*) **T**
San Fernando Valley spineflower (*Chorizanthe paryii* var. *fernandina*) **C (Candidate)**
Santa Susana tarplant (*Deinandra minthornii*) **CR (California Rare)**

ACRONYMS AND DEFINITIONS

ac	acres
ft	feet
ha	hectares
m	meter
SSFL	Santa Susana Field Laboratory
spp	species
USFWS	U.S. Fish and Wildlife Service

Candidate (C)—Candidate species are plants and animals for which the USFWS has sufficient information regarding their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. http://www.fws.gov/endangered/factsheets/candidate_species.pdf

Critical Habitat (CH)—Specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and

those features may require special management considerations or protection. They may also be specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/

Endangered (E)—An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. http://www.fws.gov/Endangered/wildlife.html

Primary Constituent Element—primary constituent elements are defined as features that are essential to the conservation of the species.

Rare—Rare species are those with very limited distribution. http://www.dfg.ca.gov/habcon/plant/

Threatened (T)—A threatened species is one that is likely to become endangered in the foreseeable future. http://www.fws.gov/Endangered/wildlife.html

GENERAL REQUIREMENTS AND NOTIFICATION PROCEDURES

- Within two weeks prior to initiating the components of the proposed Action within a specified area, a USFWS-approved biologist shall conduct a pre-construction survey of the area to determine the presence/absence of Federal and/or State listed biological species including California Species of Special Concern. Within areas occupied by Federal listed species, EPA will implement the avoidance and minimization measures identified for each of the Federal listed species discussed in detail below. In the event that a State listed species or California Species of Special Concern is identified, EPA will identify, and to the extent feasible, implement avoidance and minimization measures.
- Within three days of locating a dead or injured coastal California gnatcatcher, California red-legged frog, vernal pool fairy shrimp, or Riverside fairy shrimp, EPA must notify the Ventura Fish and Wildlife Office by telephone (805) 644-1766) and in writing (2493 Portola Road, Suite B, Ventura, California 93003). The notification must include the date, time, location of the carcass, a photograph, cause of death or injury (if known), and any other pertinent information. Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. Should any injured listed species survive, the Service must be contacted regarding their final disposition. The remains of listed species must be placed with educational or research institutions holding the appropriate State and Federal permits, such as the Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (805) 682-4711, extension 321).

BRAUNTON'S MILK-VETCH

Species: *Astragalus brauntonii*

Status: Endangered, Critical Habitat

Habitat: Associated with fire-dependent chaparral habitat dominated by chamise (*Adenostoma fasciculatum*) and yucca (*Yucca whipplei*). The species is primarily known to occur on outcrops and generally occurs along the tops of knolls ranging from 244-640 meter (m) (800-2,100 feet [ft]), and is apparently restricted to carbonate and calcareous soils. The only locations which are non-calcareous are down-wash sites into which seeds have drifted. At the Action Area, Biologists of SWCA conducted an assessment of Braunton's milk-vetch in Critical Habitat Unit 1d in June, 2006. They found that 76.4 percent of the occupied area was found on Gaviota Rocky Sandy Loam, 13.5 percent on Calleguas-Arnold Complex, and the remaining 10.1 percent was Los Osos Clay Loam and Zamora Loam. All of the communities in the Critical Habitat Unit 1d appear to have burned when the Topanga Fire swept through the area in October 2005. A substantial portion of the area within Critical Habitat Unit 1d was used in the past as a soil borrow pit. That area supports non-native grassland, and only a few plants (less than 10) occur therein.

Range: Known from the San Gabriel Mountains near Monrovia, and an unvouchered record for Chino Hills. There are also records in Coal and Gypsum Canyons in the Santa Ana Mountains. Most records are from the core of the Santa Monica Mountains and Simi Hills.

Critical Habitat: Critical Habitat has been designated in Unit 1, The Northern Simi Hills, Subunit 1d: This subunit consists of 27 hectares (ha) (68 acres [ac]) of private land owned by Boeing and 1 ha (2 ac) of local agency lands (Santa Monica Mountains Conservancy). This

subunit contains at least two of the primary constituent elements (2 and 3); whether it contains primary constituent element 1 is unknown. Several hundred plants were reported at this location after a fire in 2006.

***Primary Constituent Elements*:** The primary constituent elements for *Astragalus brauntonii* are: (1) calcium carbonate soils derived from marine sediment; (2) low proportion (less than 10 percent) of shrub cover directly around the plant; and (3) chaparral and coastal sage scrub communities characterized by periodic disturbances that stimulate seed germination (e.g., fire, flooding, erosion) and reduce vegetative cover.

***Threats*:** Urban development, fragmentation of habitat, reduction of necessary pollinators and their associated species, threats from fire suppression activities, and random, naturally occurring extinction due to disturbances in small population sizes. Browsing of the plants at SSFL by mule deer (*Odocoileus hemionus*) may be reducing the amount of seed produced there. Contrary to primary constituent element 2, shrub cover greater than 10 percent appears to offer some protection from browsing.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and/or equipment in the occupied area and Critical Habitat could cause mechanical injury to the plants;
- Physically accessing occupied habitat areas by hand crews and equipment may stimulate mechanical germination from the dormant seed bank;
- Spread of invasive weeds by Action-related vehicles and/or equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as March-August in the first year following a fall season fire event, and continuing for 3 to 5 years, declining with each successive year.

Protective Measures:

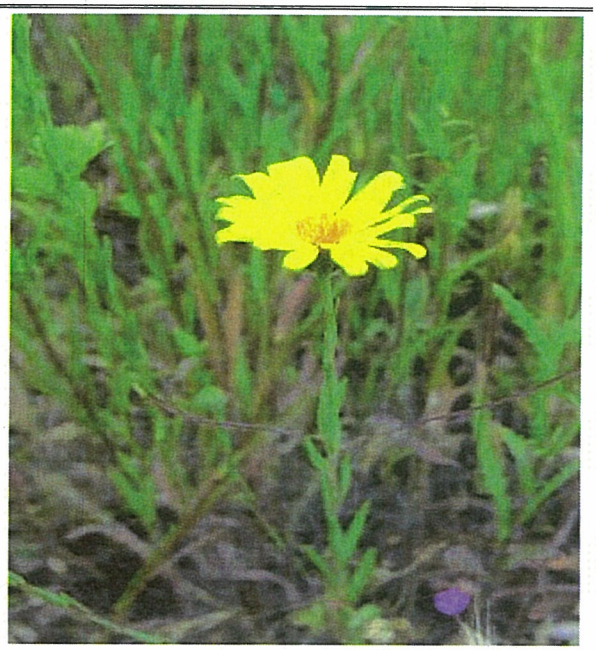
- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to demarcate the limits of areas occupied by Braunton's milk-vetch. Any action-related activities to be undertaken within said areas shall adhere to the avoidance and minimization measures identified below.

- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- A limited number of live outlier individuals may be cut where their removal would facilitate access for scanning equipment into otherwise unoccupied habitat. Standing dead individuals will be allowed to be cut; however, the cut plants including any senescent inflorescences that may contain seeds will remain on site at their original location, or relocated to other suitable habitat, as determined by a USFWS-approved biologist.
- Brush cutting in occupied areas will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Braunton's milk-vetch, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Braunton's milk-vetch, its primary constituent elements and habitats. Surveys undertaken in, or adjacent to, occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitoring well is located within or adjacent to areas occupied by the Braunton's milk-vetch, the monitor well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

LYON'S PENTACHAETA

Species: *Pentachaeta lyonii*

Status: Endangered



Habitat: Occupies coastal habitats mostly below 150 m (500 ft), and pocket grassland sites that are ecotonal (transitional) to shrublands, occurring in openings in chaparral, coastal sage, and along edges of roads and trails. Undisturbed natural habitat is characterized by a low proportion of total vegetative cover and exposed soils with a microbiotic crust, which partially reduces competition with other species. Rodents and harvester ant colonies also manage the density of associated vegetation by reducing competition.

***Range*:** Known from historic records dated around 1900 to be found at San Pedro, Wilmington, Palos Verdes Peninsula, and Santa Catalina Island, but extirpated from those locations. All current records are from the Santa Monica Mountains, western terminus of the Simi Hills, and around the western edge of the Simi Hills to the western edge of the City of Simi Valley.

***Critical Habitat*:** Critical Habitat has been designated in Unit 1: Simi Valley Unit; Unit 2: Montclef Ridge Unit; Unit 3: Thousand Oaks Unit; and Unit 4. Triunfo Canyon Unit; Unit 5: Mullholland Drive Unit; Unit 6: Cornell Road Unit, and; Unit 7: Malibu Lake Unit. None of these designated Units include SSFL.

***Primary Constituent Elements*:** primary constituent elements for *Pentachaeta lyonii* are: (1) clay soils of volcanic origin; (2) exposed soils that exhibit a microbiotic crust which may inhibit invasion by other plant competitors; and (3) a mosaic of bare ground (greater than 10 percent) patches in an area with less than 60 percent cover.

***Threats*:** Direct loss of habitat and influence of development in close proximity to existing populations (fuel modification); introduction of competitive weeds, changes in local hydrology, intensive gopher activity altering soil integrity, and alteration of habitat structure from nearby development.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;

- Operation of action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants;
- Spread of invasive weeds by action-related vehicles and equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

Period of Greatest Sensitivity to Proposed Action: During growth, flowering and seed production of the species; February through August. This annual species is mostly senescent after August.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate areas exhibiting the primary constituent elements or suitable habitat for Lyon's pentachaeta. In these areas, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of year (March to June). Actions undertaken in occupied areas shall be delayed until the dry phase, after the plants have become senescent, typically by late August.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Brush cutting in areas determined to support Lyon's pentachaeta will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Lyon's pentachaeta, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to

determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.

- If a monitoring well is located within or adjacent to areas occupied by the Lyon's pentachaeta, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

SPREADING NAVARRETIA

Species: *Navarretia fossalis*

Status: Threatened

Habitat: Spreading navarretia is primarily associated with vernal pools, alkali playas, and alkali sinks. It sometimes is found in ditches and other artificial depressions, which occur in degraded vernal pool habitat, at elevations between sea level and 1,295 m (0-4,250 ft).

***Range*:** This plant is found in widely disjunct and restricted populations from the Santa Clarita region of Los Angeles County, east to Riverside County, and south through San Diego County and Baja California, Mexico. Historical records indicate that *Navarretia fossalis* is also known from two occurrences near Creston, in San Luis Obispo County.

***Critical Habitat*:** In total, approximately 264 ha (652 ac) have been designated as critical habitat for spreading navarretia within Los Angeles 132 ha (326 ac) and San Diego 132 ha (326 ac) counties. Unit 1: Los Angeles Basin-Orange Management Area is located in northwestern Los Angeles County and consists of Sub-unit 1A Cruzan Mesa and Sub-unit 1B Plum Canyon. These units contain 119 ha (294 ac) of private land in total, and are the closest designated critical habitat to the SSFL. There is currently a proposal to revise the critical habitat designation for this species, which would reduce the quality of designated critical habitat for the species, which would reduce the designated area of the Cruzan Mesa sub-unit by 67 ha (165 ac).

***Primary Constituent Elements*:** (1) Vernal pool, alkali playa, or alkali sink habitats, at elevations between sea level and 1,300 m (0-4,250 ft), found on flat to gently sloping terrain; (2) soils with a clay component or an impermeable surface or subsurface layer known to support vernal pool habitat including, but not limited to Cieneba-Pismo-Caperton in Los Angeles County, Domino, Traver, and Willows in Riverside County and Huerhuero, Placentia, Olivenhain, Stockpen, and Redding in San Diego. Clay soils serve to inhibit rapid infiltration of rainwater. These soils also act as a buffer to moderate the water chemistry and rate of loss of water to evaporation. Clay soils of this nature are known to support vernal pool, alkali playa, and alkali sink habitats; and, (3) associated hydrology that provides water to fill the pools in the winter and spring months. A pool with functional hydrology includes a combination of surface and underground water flow, native upland vegetation, and intact soil substrate. An inundated phase occurring in the winter and spring months followed by a dry phase in the summer and fall months is necessary to maintain these specialized habitats.

***Threats*:** Most of the historical habitat of the spreading navarretia has been eliminated by agriculture and urban development. The species was proposed for listing as threatened on December 15, 1994 after the USFWS determined that *Navarretia fossalis* was declining as a result of habitat destruction and fragmentation from agricultural development, pipeline construction, alteration of wetland hydrology by draining or channelization, off-road vehicle activity, cattle and sheep grazing, weed abatement, fire suppression practices, and competition from non-native plant species.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants although this threat is reduced by its small stature and occurrence with other low growing plant species;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable habitat.
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and/or equipment in the occupied area and Critical Habitat could cause mechanical injury to the plants;
- Spread of invasive weeds by Action-related vehicles and/or equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as January-July.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and/or equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate areas exhibiting the primary constituent elements or suitable habitat for spreading navarretia. In these areas, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of year (March to June). Actions undertaken in occupied areas shall be delayed until the dry phase, after the plants have become senescent, typically by late June.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.

- Vernal pools or other spreading navarretia habitat will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat.
- Mowing and brush cutting in areas determined to support spreading navarretia will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures. Reasonable care will be taken not to damage soil structure during the brush cutting, or when moving cut brush to temporary stockpiles.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the spreading navarretia, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitoring well is located within or adjacent to areas occupied by the spreading navarretia, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

CALIFORNIA ORCUTT GRASS

Species: *Orcuttia californica*

Status: Endangered

Habitat: California Orcutt grass is primarily associated with vernal pools. It tends to grow in the deeper and wetter portions of the vernal pool basins, but does not show much growth until the basins become somewhat desiccated. Although water chemistry requirements are not well-known, California Orcutt grass often occurs with the Riverside fairy shrimp; therefore, the water quality requirements for these species are possibly similar.

***Range*:** The current range of California Orcutt grass is from the Carlsberg vernal pool located in Moorpark in Ventura County, south to the vernal pools around San Quintin, Baja California, Mexico. It ranges in elevation between 50 and 2,050 ft (15 and 625 m)

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** California Orcutt grass and its habitat are threatened by habitat destruction and fragmentation from urban and agricultural development, pipeline construction, alteration of hydrology and flood plain dynamics, excessive flooding, off road vehicle activity, trampling by cattle and sheep, weed abatement, fire suppression practices (including discing and plowing), competition from alien plant species as well as other vernal pool species, and deleterious effects resulting from habitat fragmentation and adjoining urban land uses such as sedimentation and unseasonal runoff.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants although this threat is reduced by its small stature and occurrence with other low growing plant species;

- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable habitat.
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and/or equipment in the occupied area could cause mechanical injury to the plants;
- Spread of invasive weeds by Action-related vehicles and/or equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

Period of Greatest Sensitivity to Proposed Action: During growth, flowering and seed production of the species, estimated as after the first heavy rainstorms in late fall through spring.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and/or equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate areas exhibiting suitable habitat for California Orcutt grass. In these areas, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of year (March to June). Actions undertaken in occupied areas shall be delayed until the dry phase, after the plants have become senescent, typically by late June.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vernal pools or other California Orcutt grass habitat will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat.
- Mowing and brush cutting in areas determined to support California Orcutt grass will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures. Reasonable care will be taken not to damage soil structure during the brush cutting, or when moving cut brush to temporary stockpiles.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the California Orcutt grass and it's habitat. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and it's habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species and it's habitats.
- If a monitoring well is located within or adjacent to areas occupied by the California Orcutt grass, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, and it's habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, and its habitats.

CONEJO DUDLEYA

Species: *Dudleya abramsii* spp. *parva*

Status: Threatened

Habitat: Conejo dudleya has unique habitat preference compared to all but one of the other local dudleyas. Both *D. a.* species (ssp) *p.* and *D. blochmaniae* ssp. *b.* grow in shallow, rocky soils in grassland and coastal sage habitat. *Dudleya abramsii* ssp. *parva* is restricted to soils derived from Conejo volcanics, and usually grows at the base of small, scattered rock outcrops, at elevations between 60 and 450 m (196-1,476 ft).

***Range*:** All known occurrences of this subspecies are from the Santa Rosa Hills and Montclef Ridge (western terminus of the Simi Hills), and there are none from the Santa Monica Mountains, or Santa Susana Mountains. However, there is one anomalous record from Orange County, coastal plains and basins: south coastal plain region 8 kilometers (5 miles) southeast of Laguna Beach, sea bluffs.

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** Urban development, fire management and suppression, establishment of equestrian facilities on occupied habitat, recreational activities that uproot plants, and removal by plant collectors.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants. Conejo dudleya is intimately associated with rocks and mowing and brush cutting will not be requited on rock surfaces. However, brush adjacent to the shaded faces which this species prefers will need to be cut, and accidental damage could occur;

- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants.

Period of Greatest Sensitivity to Proposed Action: During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

- Before entering natural habitat areas, ation-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate any *Dudleya* species possibly attributable to the listed taxa. *Dudleya* species encountered shall be treated as if they are a listed taxon, unless they can be determined otherwise by a USFWS-approved biologist.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by known or suspected listed *Dudleya* species shall be performed with care by field-trained personnel, so as not to damage or dislodge any of these plants.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Conejo dudleya and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitoring well is located within or adjacent to areas occupied by the conejo dudleya, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

SANTA MONICA MOUNTAINS DUDLEYA

Species: *Dudleya cymosa* spp. *ovatifolia* and spp. *agourensis*

Status: Threatened

Habitat: The typical form is situated on shaded slopes and canyon bottoms on sedimentary conglomerate rock. The "*agourensis*" form occurs on a band of late Pleistocene dissected gravels that supports a sparser grassland habitat than the surrounding vegetation on the north slope of Ladyface Mountain. It occurs at elevations between 50 and 500 m (165-1,640 ft).

***Range*:** All known occurrences of this subspecies are from the north-facing slopes of the Santa Monica Mountains near Westlake Village to Agoura Hills and in deep canyon bottoms along lower Malibu Creek and Topanga Creek in the Santa Monica Mountains. In the Santa Ana Mountains there are populations in Modjeska Canyon and Modjeska Peak. There are no records of this subspecies from the Santa Rosa Hills, Simi Hills, or Santa Susana Mountains.

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** Bulldozing on private land, commercial and residential development, roadside weed abatement in the City of Agoura Hills.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants. Santa Monica Mountains dudleya is intimately associated with rocks and mowing and brush cutting will not be requited on rock surfaces. However, brush adjacent to the shaded faces which this species prefers will need to be cut, and accidental damage could occur;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of action-related vehicles and/or equipment in the occupied area could cause mechanical injury to the plants.

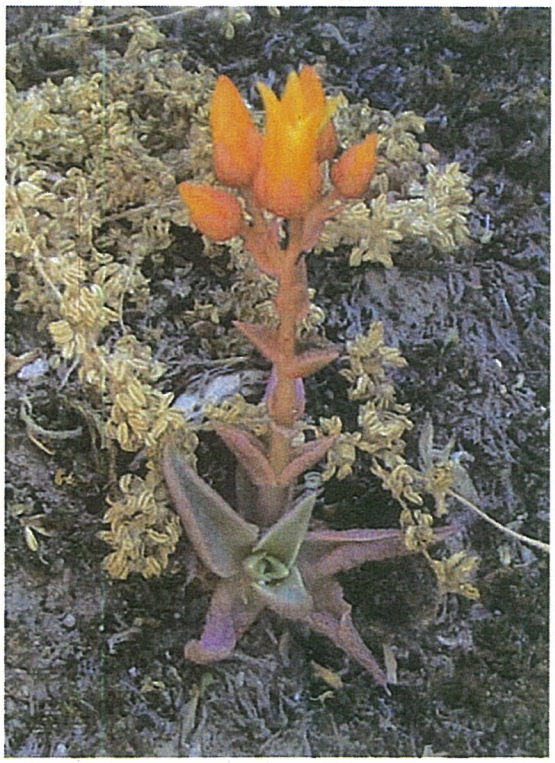
Period of Greatest Sensitivity to Proposed Action: During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate any *Dudleya* species possibly attributable to the listed taxa. *Dudleya* species encountered shall be treated as if they are a listed taxon, unless they can be determined otherwise by a USFWS-approved biologist.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by known or suspected listed *Dudleya* species shall be performed with care by field-trained personnel, so as not to damage or dislodge any of these plants.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Santa Monica Mountains dudleya and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the listed species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

MARCESCENT DUDLEYA

Species: *Dudleya cymosa* spp. *marcescens*



Status: Threatened

Habitat: The microhabitat requirements of the plant and limited distribution of the plant's potential habitat limit the possibility that any additional large populations will be found. *Dudleya cymosa* ssp. *marcescens* typically occurs on the lower reaches of sheer volcanic rock surfaces and canyon walls adjacent to perennial streams in coastal live oak woodland often with California bay (*Umbellularia californica*). In most locations, the topographic relief has prevented deep soil formation; therefore, this dudleya may be the only flowering plant occurring in a microhabitat that is otherwise dominated by mosses, lichens, and ferns (*Pellaea andromedifolia*, and *Polypodium californicum*). It occurs at elevations between 150 and 500 m (492-1,640 ft).

***Range*:** All known occurrences of this subspecies are from the Santa Monica Mountains, and there are none from the Santa Rosa Hills, Simi Hills, or Santa Susana Mountains.

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** Recreational use, particularly rock-climbing, collection, fire, and clearing or modification of native landscape vegetation.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants. Santa Monica Mountains dudleya is intimately associated with rocks, therefore, mowing and brush cutting will not be required on rock surfaces. However, brush adjacent to the shaded faces, which this species prefers, will need to be cut, and accidental damage could occur;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;

- Operation of action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants.

Period of Greatest Sensitivity to Proposed Action: During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

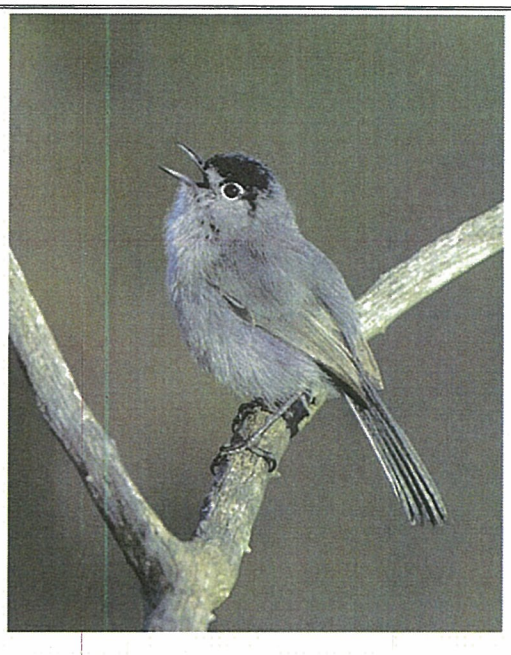
- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate any *Dudleya* species possibly attributable to the listed taxa. *Dudleya* species encountered shall be treated as if they are a listed taxon, unless they can be determined otherwise by a USFWS-approved biologist.
- Within the two week period before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by known or suspected listed *Dudleya* species shall be performed with care by field-trained personnel, so as not to damage or dislodge any of these plants.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the marcescent dudleya and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the marcescent dudleya, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sampling crew shall coordinate with a USFWS-

approved biologist to take measures to minimize physical damage to the species and its habitats.

COASTAL CALIFORNIA GNATCATCHER

Species: *Polioptila californica* spp. *californica*

Status: Threatened



Habitat: Coastal California gnatcatchers are found exclusively in coastal sage scrub habitat. Coastal sage scrub is composed of low-growing, drought-deciduous, and succulent plant species such as coastal sagebrush, California buckwheat, prickly pear, cholla, and various species of sage.

***Range*:** Generally found at elevations below 914 m (3,000 ft), the gnatcatcher ranges from California's Ventura County south through Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties, extending into Baja California, Mexico. The coastal California gnatcatcher is not known to occur at the SSFL site. The species was heard vocalizing at the north end of Las Virgenes Road in Los Angeles County, which is probably the closest known occurrence of the species to the project site. In Ventura County the gnatcatcher has been observed northwest of Highway 23 and Tierra Rejada Road in Moorpark, at Montclef Ridge between Santa Rosa Road and West Olsen Road, and 4 kilometers (2.5 miles) west of Santa Paula.

***Critical Habitat*:** Designated critical habitat includes coastal California gnatcatcher habitat throughout the species' range in the United States (i.e., Ventura, Los Angeles, Orange, San Bernardino, and San Diego Counties, California) in a variety of climatic zones and vegetation types to preserve the genetic and behavioral diversity that currently exists within the species. Unit 13 is the closest to the SSFL, and contains 23,365 ha (57,737 ac) of designated critical habitat on federal, state, local, and private lands in western Los Angeles County and Ventura County. Unit 13 is located along the southern and eastern slopes of the Santa Susana Mountains and a portion of the interior foothills of the San Gabriel Mountains.

***Primary Constituent Elements*:** (1) Dynamic and successional sage scrub habitats: Venturan coastal sage scrub, Diegan coastal sage scrub, Riversidean sage scrub, maritime succulent scrub,

Riversidean alluvial fan scrub, southern coastal bluff scrub, and coastal sage-chaparral scrub in Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties that provide space for individual and population growth, normal behavior, breeding, reproduction, nesting, dispersal and foraging; and (2) non-sage scrub habitats such as chaparral, grassland, riparian areas, in proximity to sage scrub habitats as described for primary constituent element 1 above that provide space for dispersal, foraging, and nesting.

***Threats*:** Threats to the coastal California gnatcatcher include habitat loss, fragmentation, and degradation, urban and agricultural development, livestock grazing, invasive exotic grasses, off-road vehicles, pesticides, and military training activities.

Stressors: Mowing and brush cutting of understory riparian vegetation within riparian woodlands to a height of approximately six to 18 inches could result in disturbance or direct harm to nesting coastal California gnatcatchers, and could reduce the value of the habitat for cover and foraging.

***Period of Greatest Sensitivity to Proposed Action*:** During the breeding season for this species; February through August.

Protective Measures:

- Before action-related activities commence within areas identified as potential habitat for the coastal California gnatcatcher, a Section 10(a)(1)(A) permitted biologist will survey the potential habitat to determine the extent of suitable habitat present. For areas identified as suitable habitat, protocol surveys will be conducted between February 15 and August 30, according to Presence/Absence Survey Guidelines. If active nests are found, the EPA must not conduct activities within 400 ft (122m) of the nest. No project activities will occur within the setback area until the nest is vacated and juveniles have fledged, and there is no evidence of a second attempt at nesting as determined by the Service-approved biologist.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the coastal California gnatcatcher, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveying undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to

determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.

- If a monitor well is located within or adjacent to areas occupied by the coastal California gnatcatcher, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the coastal California gnatcatcher, the monitoring well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

LEAST BELL'S VIREO

Species: *Vireo bellii* spp. *pusillus*

Status: Endangered

Habitat: A riparian species, Least Bell's Vireos depend on dense, low-growing thickets of willows, mulefat, mugwort, and California wild rose. Vireos inhabit areas where an overstory of taller willows, cottonwoods, and sycamores is also present. During the winter, they are known to occur in mesquite scrub vegetation. Foraging sometimes takes place in adjacent chaparral and coastal sage scrub.

Range: The Least Bell's Vireo was once widespread with a summer range from northern California all the way to Baja California, Mexico, extending as far east as Death Valley. The Vireo can today be found in a handful of locations from Santa Barbara to San Diego counties. The Least Bell's Vireo is not known to occur at the SSFL site or the surrounding area. The species has been observed at several locations within Ventura County and a few locations in Los Angeles County. For example, the Least Bell's Vireo has been observed at the Santa Clara River and Arroyo Simi in Ventura County and at Hansen Dam in Los Angeles County.

Critical Habitat: A total of about 14,569 ha (36,000 ac) is designated critical habitat for the Least Bell's Vireo at ten localities in portions of six counties in southern California. The nearest designated critical habitat to the SSFL is along the Santa Clara River generally between Piru and Castaic Junction within Ventura and Los Angeles Counties.

Primary Constituent Elements: Riparian woodland vegetation that generally contains both canopy and shrub layers, and includes some associated upland habitats.

Threats: The Least Bell's Vireo has suffered habitat loss due to urbanization, agricultural development, the damming and canalization of rivers and streams, invasion of non-native plants, pesticides, road construction, and sand and gravel mining. Brood parasitism by the brown-headed cowbird is another serious threat.

Stressors: Mowing and brush cutting of understory riparian vegetation within riparian woodlands to a height of approximately six to 18 inches could result in disturbance or direct harm to nesting Least Bell's Vireos.

***Period of Greatest Sensitivity to Proposed Action*:** During the breeding season for this species; March through September.

Protective Measures:

- Action-related activities within areas identified as potential habitat will be conducted between October 1 and March 14.
- Before initiating action-related activities between March 15 and September 30 within areas identified as potential habitat, protocol surveys will be conducted by a permitted biologist to determine presence and absence of species. If present, the nature of their activities will be determined and USFWS will be consulted.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Least Bell's Vireo, their primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Least Bell's Vireo, its primary constituent elements and habitats. Surveying undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the Least Bell's Vireo, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the Least Bell's Vireo, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

CALIFORNIA RED-LEGGED FROG

Species: *Rana aurora* spp. *draytonii*

Status: Threatened

Habitat: This frog prefers aquatic habitat such as ponds, marshes and creeks with still water for breeding. It needs riparian and upland areas with dense vegetation and open areas for cover, aestivation food and basking. Frogs in cooler areas may hibernate in burrows for the winter.

***Range*:** California red-legged frogs were once common throughout California's Central Valley, from Point Reyes National Seashore down to northwestern Baja California. Today they occupy Sonoma and Butte counties in the north to Riverside County in the south, mostly in the western counties. They reside in about 238 streams or drainages in 23 counties, with Monterey, San Luis Obispo, and Santa Barbara counties supporting the most frogs. They now exist in about 30 percent of their historic range.

***Critical Habitat*:** The Service has recently reopened the comment period on the proposed revision of critical habitat, whereby they propose to revise designated critical habitat from the previous final rule designating 182,225 ha (450,288 ac) to approximately 730,403 ha (1,804,865 ac) in 28 California counties, an increase of approximately 548,178 ha (1,354,577 ac). The closest proposed Critical Habitat areas to SSFL are: VEN–1, San Antonio Creek; VEN–2, Piru Creek; VEN–3, Upper Las Virgenes Canyon, and; LOS–1, San Francisquito Creek.

***Primary Constituent Elements*:** According to USFWS the primary constituent elements are: (1) *Aquatic Breeding Habitat*: standing bodies of fresh water, including: natural and manmade stock ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years. (2) *Non-Breeding Aquatic Habitat:* freshwater and wetted riparian habitats that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period. (3) *Upland Habitat.* upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1.6 kilometers (1 mile) in most cases and comprised of various vegetation such as grasslands, woodlands, wetland, or riparian plant species that provides shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval

frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter. (4) *Dispersal Habitat:* accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1.6 kilometer (1 mile) of each other and that allows for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 20 ha (50 ac) in size, or other areas that do not contain those features identified in primary constituent element 1, 2, or 3 as essential to the conservation of the subspecies.

***Threats*:** Habitat loss to urban development, agriculture, logging and wetland draining, impacts of dams and water diversions, competition and predation by introduced species, pesticides, cattle grazing, and global warming are driving frog populations down.

Stressors:

- Operation of action-related vehicles and equipment, as well as foot traffic, within aquatic habitats or riparian habitats, or upland habitats within 300 feet thereof;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could potentially result in an indirect impact to the species by altering the quantity of water flowing to suitable aquatic or wetted habitats.

***Period of Greatest Sensitivity to Proposed Action*:** During breeding from November through April.

Protective Measures:

- Actions conducted within aquatic or riparian habitats, and upland habitats within 300 feet thereof, shall be supervised by a USFWS-approved biologist. Actions other than water sampling activities within intermittent aquatic habitats shall be conducted when the intermittent water body is dry.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- Vegetation cutting activities within aquatic or riparian habitats, and upland habitats within 300 feet thereof, will be monitored by a USFWS-approved biologist. Within these areas, only hand tools will be used for cutting vegetation.
- Aquatic habitats will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows, or the amount of sediment discharged to aquatic habitats. If significant negative effects result from the proposed changes, measures will be taken to divert flows to redirect the necessary quantity of surface water to the habitat.

- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the California red-legged frog, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- Gamma scanning surveys conducted within aquatic or riparian habitats and upland habitats within 300 feet thereof, shall be supervised by a USFWS-approved biologist. Gamma scanning surveys of intermittent aquatic habitats shall only be conducted when the intermittent water body is dry.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveying undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Geophysical surveys conducted within aquatic or riparian habitats and upland habitats within 300 feet thereof, shall be supervised by a USFWS-approved biologist. Geophysical surveys of intermittent aquatic habitats shall only be conducted when the intermittent water body is dry.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitoring well is located within or adjacent to areas occupied by the California red-legged frog, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the California red-legged frog, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If activities occur within aquatic habitat suitable to support red-legged frog, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force must be followed at all times as listed below. Items D, E, and F are listed in the unlikely event that the red-legged frog is encountered at the sampling point. If this occurs, specimens will be captured and relocated to suitable habitat

  A. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (boiled or treated) water before leaving each work site.

  B. Boots, nets, traps, and other types of equipment used in the aquatic environment should then be scrubbed with 70 percent ethanol solution and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.

  C. In remote locations, clean all equipment with 70 percent ethanol or a bleach

solution, and rinse with sterile water upon return to the lab or "base camp". Elsewhere, when washing-machine facilities are available, remove nets from poles and wash in a protective mesh laundry bag with bleach on the "delicates" cycle.

D. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves and change them between handling each animal. Dedicate sets of nets, boots, traps, and other equipment to each site being visited. Clean them as directed above and store separately at the end of each field day.

E. When amphibians are collected, ensure that animals from different sites are kept separately and take great care to avoid indirect contact (e.g., via handling, reuse of containers) between them or with other captive animals. Isolation from unsterilized plants or soils, which have been taken from other sites is also essential. Always use disinfected and disposable husbandry equipment.

F. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly screened for the presence of any potential disease agents.

G. Used cleaning materials and fluids should be disposed of safely and, if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

QUINO CHECKERSPOT BUTTERFLY

Species: *Euphydryas editha* spp. *quino*

Status: Endangered

Habitat: The Quino checkerspot may occupy a variety of habitat types including grasslands, coastal sage scrub, chamise chaparral, red shank chaparral, juniper woodland, and semi-desert scrub that support native species of plantain, the butterfly's primary larval host plant. This checkerspot can also be found at the lower edge of the chaparral, in desert canyons, and in canyon washes.

***Range*:** Historically, this butterfly was distributed throughout the coastal slopes of southern California, from Los Angeles, Orange, Riverside, San Diego, and San Bernardino counties southward to El Rosario in northern Baja California, Mexico. Its historic distribution included the westernmost slopes of the Santa Monica Mountains, the Los Angeles plain, and the Transverse Ranges to the edge of the upper Anza-Borrego desert. The Quino checkerspot is not known to occur at the SSFL property. All current records for this species are within San Diego and Riverside County.

***Critical Habitat*:** Approximately 25,141 ha (62,125 ac) of critical habitat is designated for the Quino checkerspot butterfly within 9 units. All designated critical habitat is located in Riverside and San Diego counties.

***Primary Constituent Elements*:** (1) Open areas within scrublands at least 2 square m (21.5 square ft) in size that: (A) contain no woody canopy cover; and (B) contain one or more of the host plants *Plantago erecta, Plantago patagonica*, *Antirrhinum coulterianum*, or *Collinsia concolor* used for Quino checkerspot butterfly growth, reproduction, and feeding; or (C) contain one or more of the host plants *Cordylanthus rigidus* or *Castilleja exserta* that are within 100 m (328 ft) of the host plants listed in (B) above; or (D) contain flowering plants with a corolla tube less than or equal to 11 millimeters (0.43 inches) used for Quino checkerspot butterfly feeding; (2) open scrubland areas and vegetation within 200 m (656 ft) of the open canopy areas (primary constituent element 1) used for movement and basking; and (3) hilltops or ridges within scrublands that contain an open, woody-canopy area at least 2 square m (21.5 square ft) in size used for Quino checkerspot butterfly mating (hilltopping behavior) and are contiguous with (but not otherwise included in) open areas and natural vegetation described in primary constituent elements 1 and 2 above.

***Threats*:** The Quino checkerspot is threatened by elimination, fragmentation, and degradation of habitat caused by urban and suburban development, increased fire frequency, pesticide spraying, unauthorized trash dumping, exotic plants, off-road vehicles, and collecting. On national forest

lands the species is threatened by displacement of larval host plants and adult nectar sources, the spread of invasive plants, livestock grazing, predation by exotic invertebrates, off-road vehicle activity, and fire-management practices.

Stressors:

- Mowing and brush cutting of primary host plant species and adult nectar sources to a height of approximately six to 18 inches. Larval host plants include *Plantago erecta, Plantago patagonica, Antirrhinum coulterianum, Collinsia concolor, Cordylanthus rigidus* and *Castilleja exserta.* Adult nectar sources are flowing plants with a corolla tube less than or equal to 0.43 inches.
- Operation of action-related vehicles and equipment in occupied areas my cause direct mortality to all life stages of the species as well as to primary host plants.
- Operation of action-related vehicles and equipment could serve to transport invasive seeds to areas supporting host plant species. Invasive plant species may out-compete primary host plants, resulting in habitat loss and indirect impacts to the species.

***Period of Greatest Sensitivity to Proposed Action*:** During growth of the larval host plants, as well as the peak of adult egg-laying activity, estimated February through May.

Protective Measures:

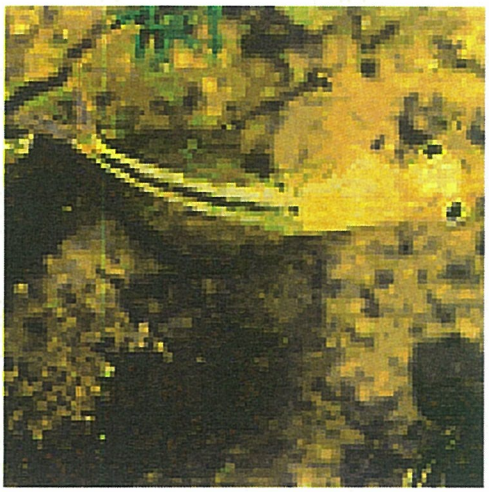
- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall survey the Action Area to identify and flag primary host plants for Quino checkerspot butterfly. Action-related activities to be undertaken within said areas shall adhere to the avoidance and minimization measures identified below.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and/or habitat. Cutting will be performed under the supervision of the biologist.
- Before brush cutting and mowing, a USFWS-approved biologist shall survey the Action Area to identify and flag primary host plants for Quino checkerspot butterfly. Prior to cutting within areas occupied by host plants, a habitat suitability survey shall be conducted. If the host plants are concluded to represent suitable habitat, the host plants will be preserved in their existing condition until a protocol survey can be conducted to determine the presence and absence of Quino checkerspot. If present, the host plants will not be cut and USFWS will be consulted regarding the preservation of adult nectar sources prior to vegetation cutting. Hand tools will be used with extreme care to cut vegetation in the vicinity of primary host plants or plants containing Quino checkerspot larvae.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Quino checkerspot butterfly, its primary constituent elements and habitats. Scanning

undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Quino checkerspot butterfly, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the Quino checkerspot, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the Quino checkerspot, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

RIVERSIDE FAIRY SHRIMP

Species: *Streptocephalus woottonii*



Status: Endangered

Habitat: The Riverside fairy shrimp is restricted to deep vernal pools and ponds with chemistry and temperature conditions specific to non-marine and non-riverine waters. The species has also been found in depressions that support suitable habitat, such as road ruts and ditches. The vernal pools that Riverside fairy shrimp are found in typically have water with a relatively neutral pH (approximately 7), low to moderate salinity, and low to moderate levels of total dissolved solids. Generally, in vernal pools where Riverside fairy shrimp occur, the external ion concentrations (Na+) averaged 0.73 mmol/l^3. All known vernal pool habitat lies within annual grasslands, which may be interspersed with chaparral or coastal sage scrub vegetation. Vernal pools form when winter rains fall on relatively flat lands whose soils are underlain by naturally impervious layers, usually dense clay layers. Because the water can't easily percolate down into the ground, above ground pools form in the vernal months of late winter and early spring, evaporating in late spring. A suite of uniquely adapted plants and animals like the Riverside fairy shrimp depend on these seasonal pools for life.

***Range*:** Known from California's Ventura, Los Angeles, Riverside, Orange, and San Diego counties, the shrimp has also been found at two locations Valle de las Palmas and south of El Rosario in Baja California, Mexico.

***Critical Habitat*:** There is approximately 124 ha (306 ac) of designated critical habitat for the Riverside fairy shrimp within Ventura, Orange and San Diego counties. Of this area, 94 ha (232 ac) are within Ventura County. Designated critical habitat in Ventura County consists of two sub-units. Sub-unit 1A is in the City of Moorpark Greenbelt, north of Tierra Rejada valley, and contains the Carlsberg vernal pool. Sub-unit 1B is located on the east side of the 23 Freeway and south of Tierra Rejada Road.

***Primary Constituent Elements*:** Three main primary constituent elements have been identified for the Riverside fairy shrimp, with the first two considered to be the most significant: (1) small to large pools or pool complexes, with the appropriate size and volume, local climate, topography, water temperature, water chemistry, soil conditions, and length of time of inundation with water necessary for Riverside fairy shrimp incubation and reproduction, as well as dry periods necessary to provide the conditions to maintain a dormant and viable cyst bank; (2) geographic, topographic, and edaphic features that support aggregations or systems of hydrologically interconnected pools, swales, and other ephemeral wetlands and depressions within a matrix of immediately surrounding upslope areas that together form hydrologically and

ecologically functional units called vernal pool complexes. These features contribute to the filling and drying of the vernal pool, maintain suitable periods of pool inundation, and maintain water and nutrient quality and soil moisture to enable the Riverside fairy shrimp to carry out their lifecycle; and (3) soils in the summit, rim and basin geomorphic positions, must have a clay component and/or an impermeable surface or subsurface layer, and must provide a unique assemblage of available nutrients and redox conditions known to support vernal pool habitat. The biogeochemical environment strongly influences hydrologic properties and play a critical role in nutrient cycling in vernal pool ecosystems.

***Threats*:** This shrimp is imperiled by a huge variety of threats, including urban sprawl, agribusiness, off-road vehicles, livestock grazing, wetland draining, pollution, invasion of non-native plants, fire, and fire-suppression activities. The species has a USFWS recovery priority of SC, indicating that it is a species facing a high degree of threat and having a low potential for recovery. The "C" indicates that the species may be in conflict with construction or development projects.

Stressors:

- Operation of action-related vehicles and equipment, as well as foot traffic during the inundation period, in an occupied area could cause injury to the species;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could potentially result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable soil habitats.

***Period of Greatest Sensitivity to Proposed Action*:** During periods of hatching of the eggs and cysts from January to March, and continuing until pools are dry.

Protective Measures:

- Before initiating the proposed Action within areas identified as potentially suitable habitat for Riverside fairy shrimp or vernal pool fairy shrimp, a USFWS-approved biologist will conduct habitat suitability surveys to determine whether suitable habitat is present. Actions undertaken within suitable habitat or areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp will be delayed until the vernal pools have entered their dry phase. Actions within areas of suitable habitat during the dry phase shall be conducted on foot, and to the extent feasible activities shall be limited to those that do not disturb biota or soil structure. In the event that a biota or soil disturbing activity is required within vernal pool branchiopod habitat in order to meet the objectives of the Action, the Applicant will consult with USFWS regarding additional avoidance and minimization measures based upon the conditions at that time.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and/or habitat. Cutting will be performed under the supervision of the biologist.
- Vernal pools, or other spreading navarretia that provides suitable vernal pool branchiopod habitat, will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat. If significant negative effects result from the proposed changes,

measures will be taken to divert flow to provide the necessary quantity of surface water to the habitat.

- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Riverside fairy shrimp, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- Gamma scanning surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Gamma scanning surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- When conducting geophysical surveys within occupied areas, appropriate equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Geophysical surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Geophysical surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitor well is located within or adjacent to areas occupied by the Riverside fairy shrimp, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the Riverside fairy shrimp, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

VERNAL POOL FAIRY SHRIMP

Species: *Branchinecta lynchi*

Status: Threatened

Habitat: Vernal pool fairy shrimp are usually found in vernal pools, although they are sometimes found in a range of natural and artificially created ephemeral habitats such as alkali pools, seasonal drainages, stock ponds, vernal swales, and rock outcrops. Individuals have never been found in riverine, marine, or other permanent bodies of water. Vernal pool habitats form in depressions above an impervious soil layer or duripan. Due to local topography and geology, the depressions are part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages. Water movement within complexes allows vernal pool fairy shrimp to move between individual pools. These movement patterns, as well as genetic evidence, indicate that vernal pool fairy shrimp populations exist within and are defined by entire vernal pool complexes, rather than individual vernal pools.

The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the vernal pool fairy shrimp has been collected from large vernal pools, including one exceeding 10 ha (25 ac) in area, it tends to occur primarily in smaller pools, and is most frequently found in pools measuring less than 0.02 ha (0.05 ac) in area. The vernal pool fairy shrimp typically occurs at elevations from 10 m (33 ft) to 1,220 m (4,003 ft), although the two sites in the Los Padres National Forest have been found to contain the species at an elevation of 1,700 m (5,600 ft) in atypical habitats consisting of vernal pools under a *Pinus jeffreyi* (Jeffrey pine) canopy without a grass understory. The vernal pool fairy shrimp has been collected at water temperatures as low as 4.5 degrees Celsius (°C) (40 degrees Fahrenheit [°F]), and has not been found in water temperatures above about 23°C (73°F). The species is typically found in pools with low to moderate amounts of salinity or total dissolved solids. Although there are many observations of the environmental conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species.

***Range*:** The vernal pool fairy shrimp is currently found in 28 counties across the Central Valley and Coast Ranges of California, and in Jackson County of southern Oregon. The species occupies a variety of vernal pool habitats, and occurs in 11 of the 17 vernal pool regions identified in California. It is generally uncommon throughout its range and rarely abundant where it does occur.

***Critical Habitat*:** Unit 22A, the Ventura County Unit is within northern Ventura County and contains 18,830 ha (46,531 ac) of critical habitat for the vernal pool fairy shrimp, of which 790 ha (1,951 ac) is privately owned, and the remainder is within the Los Padres National Forest.

Unit 22A is within U.S. Geological Survey (USGS) Alamo Mountain, Lion Canyon, Lockwood Valley, San Guillermo, and Topatopa Mountains quadrangles.

***Primary Constituent Elements*:** (1) Topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools described below, providing for dispersal and promoting hydroperiods of adequate length in the pools; (2) depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands; (3) sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding; and (4) structure within the pools described above, consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

***Threats*:** The vernal pool fairy shrimp is threatened by development and agricultural conversion, military activities, flood control projects, road construction, recreational use, and non-native species introduction, as well as other factors.

Stressors:

- Operation of action-related vehicles and equipment, as well as foot traffic during the inundation period, in an occupied area could cause injury to the species;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could potentially result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable soil habitats.

***Period of Greatest Sensitivity to Proposed Action*:** During periods of hatching of the eggs and cysts from January to March, and continuing until pools are dry (for small pools such as those which could occur at SSFL; expect a longer period for larger pools).

Protective Measures:

- Before initiating the proposed Action within areas identified as potentially suitable habitat for Riverside fairy shrimp or vernal pool fairy shrimp, a USFWS-approved biologist will conduct habitat suitability surveys to determine whether suitable habitat is present. Actions undertaken within suitable habitat or areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp will be delayed until the vernal pools have entered their dry phase. Actions within areas of suitable habitat during the dry phase shall be conducted on foot, and to the extent feasible activities shall be limited to those that do not disturb biota or soil structure. In the event that a biota or soil disturbing activity is required within vernal pool branchiopod habitat in order to meet the objectives of the Action, the Applicant will consult with USFWS

regarding additional avoidance and minimization measures based upon the conditions at that time.

- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- Vernal pools, or other spreading navarretia that provides suitable vernal pool branchiopod habitat, will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat. If significant negative effects result from the proposed changes, measures will be taken to divert flow to provide the necessary quantity of surface water to the habitat.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the vernal pool fairy shrimp, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- Gamma scanning surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Gamma scanning surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- When conducting geophysical surveys within occupied areas, appropriate equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Geophysical surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Geophysical surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitor well is located within or adjacent to areas occupied by the vernal pool fairy shrimp, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the vernal pool fairy shrimp, the monitor well sample crew shall coordinate with

a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

SAN FERNANDO VALLEY SPINEFLOWER

Species: *Chorizanthe parryi* var. *fernandina*

Status: Candidate

Habitat: SFVS is clearly a plant of open habitats, free of shade and competing plants. A small fraction of the plants are known to grow among tall annual grasses or shrubs, and all significant clusters of plants are on open-soils. These areas are not only in full sunlight, but strikingly free of dense exotic grasses. Furthermore, the plant exhibits a wide range of tolerance to soil types, chemistry, and compaction; prefers acidic, fine-sand colluvium that is low in nitrogen, and possibly permeated with mycorrhizal mycelium; is shade and competition intolerant, and is a hardy plant which exploits disturbance by natural bioturbation and anthropogenic processes. It occurs at elevations between 200 and 350 m (656-1,148 ft).

***Range*:** Extant in northeastern Santa Susana Mountains (Newhall Ranch) and southeastern Simi Hills (Upper Las Virgenes Open Space Preserve, formerly Ahmanson Ranch). Historical occurrences in Liebre Mountains (Castaic, Lake Elizabeth), San Gabriel Mountains (Little Tujunga Wash), Los Angeles Basin (Hollywood), and in the San Fernando Valley (Chatsworth, San Fernando Wash).

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** The threats to this plant are high in magnitude due to its concentration in two isolated areas. The existence of only two areas of occurrence, and a relatively small range, makes the variety highly susceptible to extinction or extirpation from a significant portion of its range due to random events such as fire, drought, or erosion. The primary threat from habitat destruction by development is non-imminent due to the ongoing development of a Candidate Conservation Agreement. USFWS retained a listing priority number of six for *Chorizanthe parryi* var. *fernandina* due to a high magnitude of non-imminent threats.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants;
- Operation of action-related vehicles and equipment could serve to transport invasive weeds from known infested locations elsewhere within the Action Area.

Period of Greatest Sensitivity to Proposed Action: During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct surveys to identify areas exhibiting suitable habitat for San Fernando Valley spineflower. Potential suitable habitat areas shall be appropriately demarcated with flagging or fencing, and no Actions shall be undertaken in those areas until it has been determined whether or not they support the candidate species. In areas identified as potentially suitable habitat for San Fernando Valley spineflower, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of the year, March to June, to determine whether these species are present. Actions undertaken within areas occupied by San Fernando Valley spineflower shall be delayed until the dry phase, after plants therein have become senescent, typically by late July.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Mowing and brush cutting in areas determined to support San Fernando Valley spineflower will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures. Reasonable care will be taken not to damage soil structure during the brush cutting, or when moving cut brush to temporary stockpiles.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the San Fernando Valley spineflower and its habitats. Scanning undertaken in or adjacent to

occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the candidate species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the San Fernando Valley spineflower, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

SANTA SUSANA TARPLANT

Species: *Deinandra minthornii*

Status: California rare

Habitat: Grows in crevices in sandstone bluffs and outcrops in chaparral and coastal scrub, 280-760m (919-2,493 ft) elevation. Also occurs at one location in Santa Monica Mountains, north of Lake Sherwood on west-facing cliffs on Conejo volcanic breccia; the only occurrence not associated with sandstone. It typically grows directly upon and within sandstone rock crevices, or in soil in very close proximity to rocks. Mulroy indicates it grows in cracks in asphalt and concrete at one remediated site at SSFL.

Range: Restricted to the Simi Hills, Santa Susana Mountains, and Santa Monica Mountains of Los Angeles and Ventura counties.

Critical Habitat: No critical habitat has been designated for this species.

Primary Constituent Elements: No primary constituent elements have been identified for this species.

Threats: Residential development, road and maintenance activities.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches. This species is intimately associated with rocks, typically associated with cracks and fissures, but also occurring sparingly in cracks in asphalt and concrete, and on some hard-packed remediated soils. In large degree, mowing and brush cutting will not be required on the rock surfaces in order to facilitate scanning. However, attendant brush adjacent to these rock faces will need to be cut, and accidental damage to these plants could occur. This could result in direct damage to living plants that could result in premature mortality or reduced seed production;

- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of ation-related vehicles and equipment in the occupied area and Critical Habitat could cause mechanical injury to the plants. The rockland habitats where Santa Susana tarplant occurs may preclude the use of some equipment being operated thereon.

Period of Greatest Sensitivity to Proposed Action: At all times of the year.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by Santa Susana tarplant will be performed with care by field-trained personnel under the supervision of a USFWS-approved biologist, so as not to damage or dislodge any of these plants. To further prevent impacts to individual plants, the USFWS-approved biologist will flag the species in advance of vegetation cutting activities.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Santa Susana tarplant and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- Gamma scanning surveys conducted within areas occupied by Santa Susana tarplant will be supervised by a USFWS-approved biologist. When scanning over or adjacent to individuals, the biologist will carefully hold the branches down or out of the way to allow the scanning equipment to access the area. Where using the hand scanner in rocky areas, if scanning down to six inches would result in breaking of Santa Susana tarplant branches, the height of the scanner will be backed off to 12 to 18 inches above the ground.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Santa Susana tarplant and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid the species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to

determine the appropriate equipment that will avoid physical damage to the species and its habitats.

- If a monitor well is located within or adjacent to areas occupied by the Santa Susana tarplant, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.