TRTP BIOLOGICAL EVALUATION 2010

USDA FOREST SERVICE
ANGELES NATIONAL FOREST

TEHACHAPI RENEWABLE TRANSMISSION PROJECT
BIOLOGICAL EVALUATION

LOS ANGELES COUNTY
CALIFORNIA

August 2010

PREPARED BY:  DATE: 12 Aug 10
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ACCEPTED AND REVIEWED BY:  DATE: 8/9/10
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ACCEPTED AND REVIEWED BY:  DATE: 8/9/10
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INTRODUCTION

The Angeles National Forest (ANF) is proposing to upgrade and install 42.25 miles of transmission lines on National Forest System lands. This project is part of a larger project that involves the construction of 172.5 miles of new or upgraded transmission line extending south from the Tehachapi Wind Resource Area to Ontario, California.

The purpose of this Biological Evaluation/Biological Assessment is to review the proposed project in sufficient detail to determine to what extent any species currently designated as sensitive by the Regional Forester, R5-USDA, may be affected on National Forest System Lands. This document is consistent with the requirements and follows the standards established in the Forest Service Manual (Section 2672.4 through 2672.42).

Table 1 identifies all FS sensitive species on the Angeles National Forest (ANF) and identifies those species considered for detailed analysis in this document. All species were considered for analysis, however only those species that contain suitable habitat in the project area or are known to be present or likely to be present in the project area were analyzed in detail in this analysis. Species that did not contain suitable habitat potentially affected by the project area were dismissed from detailed analysis.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Listing Status</th>
<th>General Habitat Description</th>
<th>Presence of Suitable Habitat within Site?</th>
<th>Potentially Affected By Project?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANTS</td>
<td></td>
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</tr>
<tr>
<td>San Gabriel Manzanita (Arctostaphylos gabrieliensis)</td>
<td></td>
<td>FSS, 1B</td>
<td>Rocky outcappings, chaparral around 1500 m. Only known from the area near Mill Creek Summit. Often associated with gneiss outcappings.</td>
<td>Yes</td>
<td>Yes</td>
<td>This species occurs in close proximity to Mill Creek Summit Divide, the type locality of this species and was detected within 200 feet of tower locations 30, 31, and 33 of this alignment. Suitable habitat occurs along 4N24 on either side of Mount Gleason Road.</td>
</tr>
<tr>
<td>Forest Camp Sandwort (Arenaria macradenia var. kuschei)</td>
<td></td>
<td>FSS, 1B</td>
<td>Chaparral (openings, granitic, usually oak dominated). 1,200-1,700 m. Forest Camp, San Bernardino County; Liebre Mtn., Los Angeles County.</td>
<td>Yes</td>
<td>No</td>
<td>Outside of known distribution range for this species although marginal habitat exists. Not located during focused surveys.</td>
</tr>
<tr>
<td>Crested Milk-vetch (Astragalus bicristatus)</td>
<td></td>
<td>FSS, 4</td>
<td>Open, rocky areas in coniferous forests. 1,700-2,750 m. Los Angeles,</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known range of</td>
</tr>
</tbody>
</table>
### Table 1. TEPCS Species for the Angeles National Forest Considered for Analysis

<table>
<thead>
<tr>
<th>Common Name Scientific Name</th>
<th>Listing Status</th>
<th>General Habitat Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Riverside and San Bernardino Counties.</td>
<td>San Antonio Milk-vetch (<em>Astragalus lentiginosus</em> var. <em>antonius</em>)</td>
<td>Open slopes in pine forest, 1,500-2,600 m, San Gabriel Mtns.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td></td>
<td>Scalloped Moonwort (<em>Botrychium crenulatum</em>)</td>
<td>Bogs and fens, lower montane coniferous forest, meadows and seeps, and marshes &amp; swamps (freshwater). 1,500-3,300 m.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td></td>
<td>Slender Mariposa Lily (<em>Calochortus clavatus</em> var. <em>gracilis</em>)</td>
<td>Chaparral on slopes or in canyons below 1200 m, south base of San Gabriel and Sierra Pelona mountains.</td>
<td>Yes</td>
<td>Yes</td>
<td>Located along an access road to Segment 6 in the vicinity of Cogswell Reservoir.</td>
</tr>
<tr>
<td></td>
<td>Palmer’s Mariposa Lily (<em>Calochortus palmeri</em> var. <em>palmeri</em>)</td>
<td>Meadows, vernaly moist places in pine forest or chaparral, or occasionally dry areas in yellow pine forest. 1,100-2,200 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>The species was observed along the access road to the Chilao helicopter site, for Segment 6</td>
</tr>
<tr>
<td></td>
<td>Plummer’s Mariposa Lily (<em>Calochortus plummerae</em>)</td>
<td>Dry, granitic, rocky chaparral, yellow pine forests, cismontane woodland, coastal scrub, and valley &amp; foothill grasslands. &lt;1,700 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>The species was observed on Segment 6 along Rincon Red Box Road, north of Spring Camp, along Lynx Gulch Road just south of Iron Mountain, along the Alder Creek access road, and at Upper Big Tujunga Canyon.</td>
</tr>
<tr>
<td></td>
<td>Alkali Mariposa Lily (<em>Calochortus striatus</em>)</td>
<td>Alkaline meadows and seeps, moist creosote bush scrub, and chenopod scrub. 60-1,400 m.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td></td>
<td>Late-Flowered Mariposa Lily</td>
<td>Dry, open coastal woodland; chaparral, 400-</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is</td>
</tr>
<tr>
<td>Common Name</td>
<td>Listing Status</td>
<td>General Habitat Description</td>
<td>Presence of Suitable Habitat within Site?</td>
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<td>Comments</td>
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</tr>
<tr>
<td>(Calochortus weedii var. vestus)</td>
<td></td>
<td>1500 m, locally up to 2500 m. Often in serpentine soil. Coast ranges, Ventura county west.</td>
<td></td>
<td></td>
<td>outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>Pygmy Poppy (Canbya candida)</td>
<td>FSS, 4</td>
<td>Sandy places, 610-1,200 m. Joshua tree woodland, Mojavean scrub, and pinyon/juniper woodland. Mojave desert adjacent to Sierra Nevada.</td>
<td>Yes</td>
<td>No</td>
<td>Suitable habitat for this species is present. There is a recorded occurrence 3 miles east of Vincent. The range of this species does not extend south of the Mill Creek Summit Divide. Not located during focused surveys</td>
</tr>
<tr>
<td>Mt. Gleason’s Paintbrush (Castilleja gleasonii)</td>
<td>FSS, 1B</td>
<td>Granitic substrates in coniferous forest, generally west of Chilao area. 1,200-2,200 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>Occupied habitat is present in the Project area near Mt. Gleason. Found along Santa Clara Divide access road as well.</td>
</tr>
<tr>
<td>Mojave Indian Paintbrush (Castilleja plagiotoma)</td>
<td>FSS, 4</td>
<td>Dry flats and ridges, Sagebrush Scrub, Joshua Tree Woodland, Pinyon/Juniper Woodland, Yellow Pine Forest. North base of mountains, 300-2500 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>Several populations found along access road at northern end of segment 6 and near helicopter site in Chilao area.</td>
</tr>
<tr>
<td>Peirson’s Spring Beauty (Claytonia lanceolata var. peirsonii)</td>
<td>FSS, 1B</td>
<td>Gravelly conifer woodlands, scree slopes. 1,500-2,600 m.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>Parry’s Spineflower (Chorizanthe parryi var. parryi)</td>
<td>FSS, 4</td>
<td>Dry slopes in chaparral coastal sage scrub, or alluvial scrub, often in ecotones. Dry, sandy areas, 40-1700 m.</td>
<td>Yes</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>Mojave tarweed (Deinandra mohavensis)</td>
<td>FSS, 1B</td>
<td>Washes, seasonal creeks/seeps, openings in chaparral, disturbed areas. Not known from ANF,</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
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<tr>
<td>San Gabriel River Dudleya</td>
<td>FSS, 1B</td>
<td>On exposed granite outcroppings in CSS or chaparral areas. Fish Canyon, possibly Lytle Creek area. 300-1100 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>This subspecies was detected along the road cut of Sawpit Truck Trail during 2008 and 2009 surveys.</td>
</tr>
<tr>
<td>Dudleya (Dudleya cymosa crebrfolia)</td>
<td></td>
<td>most occurrences in San Bernardino, San Jacinto mts. 900-1600 m.</td>
<td></td>
<td></td>
<td>geographical range of species.</td>
</tr>
<tr>
<td>San Gabriel Mountain Dudleya</td>
<td>FSC, FSS, 1B</td>
<td>Steep granitic canyon walls adjacent to chaparral, coastal scrub, and coniferous forest. Southeast San Gabriel Mountains. 275-525 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>This species was detected along the road cut of Van Tassel Truck Trail during 2008 surveys.</td>
</tr>
<tr>
<td>Dudleya (Dudleya densiflora)</td>
<td></td>
<td>Steep granitic canyon walls adjacent to chaparral, coastal scrub, and coniferous forest. Southeast San Gabriel Mountains. 275-525 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>This species was detected along the road cut of Van Tassel Truck Trail during 2008 surveys.</td>
</tr>
<tr>
<td>Many-stemmed Dudleya (Dudleya</td>
<td>FSC, FSS, 1B</td>
<td>Heavy soils, often clayey, coastal plain. Chaparral, coastal scrub, and valley &amp; foothill grassland. &lt;600 m.</td>
<td>Yes</td>
<td>No</td>
<td>This species is generally restricted to the Los Angeles Basin; however there are several populations in the southern foothills of the San Gabriel Mountains. Suitable habitat exists in the foothills just south of the ANF. Not located during focused surveys.</td>
</tr>
<tr>
<td>multicaulis)</td>
<td></td>
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<tr>
<td>Southern Alpine Buckwheat</td>
<td>FSS, 1B</td>
<td>Alpine boulder and rock fields, subalpine, granitic gravel, found on high peaks and ridgetops. 2,600-3,500 m.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>(Eriogonum kennedyi var.</td>
<td></td>
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<tr>
<td>alpigonum)</td>
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</tr>
<tr>
<td>Johnston’s Buckwheat (Eriogonum</td>
<td>FSS, 1B</td>
<td>Rocky, subalpine coniferous forest and upper montane coniferous forest. 1850-2,900 m.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>microthecum var. johnstonii)</td>
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<tr>
<td>San Gabriel Bedstraw</td>
<td>FSC, FSS, 1B</td>
<td>Open, broad-leaved forest, open chaparral, cismontane woodland, and lower forest. Rocky slopes. 455-1,525 m. San Gabriel Mtns.</td>
<td>Yes</td>
<td>Yes</td>
<td>The species was observed immediately adjacent to the proposed Project along the Monrovia Canyon</td>
</tr>
<tr>
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</tr>
<tr>
<td>Abram’s Alumroot</td>
<td>FSS, 4</td>
<td>Upper Montane Coniferous Forest, 2700-3500 m. High peaks of eastern San Gabriel Mountains</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>(Heuchera abramsii)</td>
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</tr>
<tr>
<td>Urn-Flowered Alumroot</td>
<td>FSS, 4</td>
<td>Rocky areas in coniferous forest, 1200-2600 m, San Gabriel and San Bernardino Mountains</td>
<td>Yes</td>
<td>Yes</td>
<td>The species was observed immediately adjacent to the proposed Project along 4N18, just north of Monte Cristo Creek.</td>
</tr>
<tr>
<td>(Heuchera elegans)</td>
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</tr>
<tr>
<td>Mesa horkelia</td>
<td>FSS, 1B</td>
<td>Chaparral, cismontane woodland, coastal scrub. Sandy/gravelly sites at 75-800 m.</td>
<td>Yes</td>
<td>No</td>
<td>Suitable habitat is present, but the potential for occurrence is restricted to the southern foothills of the San Gabriel Mountains near Altadena. Not detected during focused surveys.</td>
</tr>
<tr>
<td>(Horkelia cuneata ssp. puberula)</td>
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<tr>
<td>San Gabriel Mountains sunflower</td>
<td>FSS, 4</td>
<td>Rocky sites in montane coniferous forest, 1200-2800 m. San Gabriel Mountains, Mt. Pinos</td>
<td>Yes</td>
<td>Yes</td>
<td>Multiple populations were located along several access roads to Segment 6.</td>
</tr>
<tr>
<td>(Hulsea vestita ssp. gabrieliensis)</td>
<td></td>
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</tr>
<tr>
<td>Pygmy Alpinegold</td>
<td>FSS, 1B</td>
<td>Gravelly sites of granitic substrate alpine areas or subalpine forest ; 2800-3900 m</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>(Hulsea vestita ssp. pygmaea)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>California Satintail</td>
<td>FSS</td>
<td>Calcareous seeps, hot springs, disturbed wet areas. Generally 300-1500 m</td>
<td>Yes</td>
<td>No</td>
<td>Although suitable habitat may be present, there are no records of the species occurring within the region. Not detected during focused surveys.</td>
</tr>
<tr>
<td>(Imperata brevifolia)</td>
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</tr>
<tr>
<td>Fragrant Pitcher</td>
<td>FSS, 4</td>
<td>Chaparral areas, including</td>
<td>Yes</td>
<td>Yes</td>
<td>Several populations</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
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**Table 1. TEPCS Species for the Angeles National Forest Considered for Analysis**

<table>
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<tr>
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<th>Presence of Suitable Habitat within Site?</th>
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<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sage (Lepechinia fragrans)</td>
<td>FSC, FSS, 1B</td>
<td>those recovering from recent fire. Mt. Lukens, western Santa Monica Mountains. 20-1350 m.</td>
<td>No</td>
<td>No</td>
<td>located along Rincon Redbox, Grizzly Flat and CCC Ridge access roads</td>
</tr>
<tr>
<td>Lemon Lily (Lilium parryi)</td>
<td>FSC, FSS, 1B</td>
<td>Meadows, streams, and springs in montane coniferous forest, riparian scrub. 1,225-2,750 m.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present in Project area.</td>
</tr>
<tr>
<td>San Gabriel Linanthus (Linanthus concinnus)</td>
<td>FSC, FSS, 1B</td>
<td>Dry, rocky slopes, coniferous forest. 1,525-2,800 m. San Gabriel Mtns.</td>
<td>Yes</td>
<td>Yes</td>
<td>Several populations found along access roads in Mill Creek summit vicinity.</td>
</tr>
<tr>
<td>Peirson’s Lupine (Lupinus peirsonii)</td>
<td>FSS, 1B</td>
<td>Loose slopes of rock or gravel, Joshua Tree or Pinyon-Juniper Woodland, Yellow Pine Forest. 1200-2400, desert slopes of San Gabriel and Tehachapi mountains</td>
<td>Yes</td>
<td>No</td>
<td>Known occurrence record near Project area in vicinity of Alder Creek. Not detected during focused surveys.</td>
</tr>
<tr>
<td>Hall’s Monardella (Monardella macrantha ssp. hallii)</td>
<td>FSS, 1B</td>
<td>Chaparral, broadleaved upland woodland, cismontane woodland, coniferous forest (usually Bigcone Spruce), and valley &amp; foothill grassland. 600-2,000 m. San Gabriel and San Bernardino Mtns.</td>
<td>Yes</td>
<td>No</td>
<td>Although marginal suitable habitat is present in the Project area, the only known occurrence of this subspecies within the San Gabriel Mountains is over 10 miles east of the proposed Project. Not found during focused surveys.</td>
</tr>
<tr>
<td>Rock Monardella (Monardella viridis ssp. saxicola)</td>
<td>FSS, 4</td>
<td>Broadleaved upland forest, montane chaparral, coniferous forest, and cismontane woodland. Usually in dry, rocky areas. 500-1,825 m; San Gabriel Mts.</td>
<td>Yes</td>
<td>No</td>
<td>The subspecies is endemic to the San Gabriel Mountains north of Altadena and La Cañada Flintridge, and the Consortium of California Herbaria lists 13 records of this subspecies within the area. It has never been found in the project area.</td>
</tr>
<tr>
<td>Baja Navarretia</td>
<td>FSS, 1B</td>
<td>Wet areas in open forest or</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat</td>
</tr>
<tr>
<td>Common Name</td>
<td>Scientific Name</td>
<td>Listing Status</td>
<td>General Habitat Description</td>
<td>Presence of Suitable Habitat within Site?</td>
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</tr>
<tr>
<td>(Navarretia peninsularis)</td>
<td></td>
<td></td>
<td>chaparral. 1,500-2,300 m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-joint Beavertail</td>
<td>(Opuntia basilaris var. brachyclada)</td>
<td>FSC, FSS, 1B</td>
<td>Chaparral, Joshua tree woodland, pinyon/juniper woodland, and Mojavean desert scrub. 1,225-2,300 m. Northern regions, San Gabriel and San Bernardino Mtns.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wooly mountain-parsley</td>
<td>(Oreonana vestita)</td>
<td>FSS</td>
<td>Loose rock, upper montane and subalpine coniferous forest. High ridges of San Gabriel Mountains. 2400-3500 m.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Rock Creek Broomrape</td>
<td>(Orobanche valida ssp. valida)</td>
<td>FSC, FSS, 1B</td>
<td>Chaparral, pinyon/juniper, decomposed granite. 1,250-2,000 m. Topatopa Mtns and San Gabriel Mtns.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fringed Grass-Of-Parnassus</td>
<td>(Parnassia cirrata)</td>
<td>FSS, 1B</td>
<td>Calcareous seeps and meadows, 1250-2450 m. San Gabriel and San Bernardino mountains.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Transverse Range</td>
<td>(Phacelia exilis)</td>
<td>FSS, 4</td>
<td>Sandy or rocky slopes, flats, and meadows, montane conifer forest. 1100-2700 m.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Ewan’s Cinquefoil</td>
<td>(Potentilla glandulosas ssp. ewanii)</td>
<td>FSS, 1B</td>
<td>Seeps in yellow pine forest, 1950-2300 m. Only known from Mt Islip area.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Common Name Scientific Name</td>
<td>Listing Status</td>
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</tr>
<tr>
<td>Southern Skullcap (Scutellaria bolanderi ssp. austromontana)</td>
<td>FSS, 1B</td>
<td>Gravelly streambanks and mesic sites, chaparral, cismontane woodland, lower montane conifer forest. 425-2000 m. Mainly in Riverside, San Diego counties.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>Parish’s Checkerbloom (Sidalcea hickmanii ssp. parishii)</td>
<td>FSS, SR, 1B</td>
<td>Chaparral, cismontane woodland, and open coniferous forest. Often in disturbed areas. 1,000-2,500 m.</td>
<td>Yes</td>
<td>No</td>
<td>Although suitable habitat is present, there are no records of this subspecies in the San Gabriel Mountains.</td>
</tr>
<tr>
<td>Chickweed starry puncturebract (Sidotheca caryophylloides)</td>
<td>FSS</td>
<td>Sandy or gravelly flats, washes, and slopes, chaparral, montane conifer woodlands; 1300-2600 m</td>
<td>Yes</td>
<td>Yes</td>
<td>Located along access roads (upper Big Tujunga and Lynx Gulch) to Segment 6.</td>
</tr>
<tr>
<td>Laguna Mountains Jewelflower (Streptanthus bernardinus)</td>
<td>FSS, 4</td>
<td>Chaparral and lower montane conifer forest; often near disturbed areas.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>Southern Jewelflower (Streptanthus campestris)</td>
<td>FSS, 1B</td>
<td>Rocky openings in chaparral, conifer forest, oak woodland, 600-2790 m. High variation in habitat and elevation of species. San Diego, Riverside, San Bernardino counties.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project site is outside known elevational and geographical range of species.</td>
</tr>
<tr>
<td>San Bernardino Aster (Symphyotrichium defoliatum)</td>
<td>FSS, 1B2</td>
<td>Cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and valley and foothill grassland habitats within vernally mesic areas near ditches, and streams. Elev. 7-6,693 ft. July- November.</td>
<td>Yes</td>
<td>No</td>
<td>Although suitable habitat is present, focused surveys did not locate any individuals.</td>
</tr>
<tr>
<td>Common Name</td>
<td>Scientific Name</td>
<td>Listing Status</td>
<td>General Habitat Description</td>
<td>Presence of Suitable Habitat within Site?</td>
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</tr>
<tr>
<td>Sonoran Maiden Fern (Thelypteris puberula)</td>
<td></td>
<td>FSS, 2</td>
<td>Streams, meadows, and seeps below 550 m.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>BIRDS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bald Eagle (Haliaeetus leucocephalus)</td>
<td></td>
<td>FSS, SE, Fully Protected</td>
<td>Habitat includes rivers and lakes with adjacent woodlands. Large bodies of water are always associated with breeding populations.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Northern Goshawk (Accipiter gentilis)</td>
<td></td>
<td>FSC, CSC, FSS</td>
<td>Species inhabits large, mature stands of conifer and aspen forests near water. Exhibits preference for areas with high canopy closure with sparse understory and high density of larger trees</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Swainson’s Hawk (Buteo swainsoni)</td>
<td></td>
<td>ST, FSS</td>
<td>Species inhabit open riparian habitat in scattered trees or small groves in sparsely vegetated flatlands and undeveloped landscapes that include suitable grassland or agricultural foraging habitat</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>California Spotted Owl (Strix occidentalis occidentalis)</td>
<td></td>
<td>CSC, FSS</td>
<td>Species prefer complex, multi-layered structure including coniferous, hardwood, and mixed forest, high canopy closure and large diameter trees.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Common Name</td>
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</tr>
<tr>
<td>AMPHIBIANS</td>
<td></td>
<td>Ranges from less than 305 m to greater than 2,591 m in elevation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Gabriel Mtn. Slender Salamander <em>(Batrachoseps gabrieli)</em></td>
<td>FSS</td>
<td>Species found on northwest facing talus slopes or near water in mixed hardwood-conifer forest habitats between about 1,158-2,372 m in elevation.</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable habitat is present at numerous locations. However, presence within the project area is unlikely due to limited known range in drainages along Highway 39.</td>
</tr>
<tr>
<td>Yellow-Blotched Salamander <em>(Ensatina eschscholtzi croceater)</em></td>
<td>CSC, FSS</td>
<td>Species occurs in open woodlands dominated by oak and pine and also common in canyons among oak leaf litter and debris.</td>
<td>No</td>
<td>No</td>
<td>Although suitable habitat is present in the project area, this project is outside of current known range.</td>
</tr>
<tr>
<td>Foothill Yellow-Legged Frog <em>(Rana boylii)</em></td>
<td>CSC, FSS</td>
<td>Species occurs in rocky streams in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian in Ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow habitat types from sea level to 1830 m. in elevation.</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable habitat is present in Upper Big Tujunga Canyon and adjacent drainages. Historically found in the West Fork of the San Gabriel River and Fish Canyon. This species is believed to be extirpated from the Angeles National Forest.</td>
</tr>
<tr>
<td>REPTILES</td>
<td></td>
<td>Ranges from less than 305 m to greater than 2,591 m in elevation.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Southwestern Pond Turtle <em>(Clemmys marmorata pallida)</em></td>
<td>FSC, CSC, FSS</td>
<td>Species inhabits variety of aquatic habitats from sea level to freshwater at 1,981 m in elevation. Requires emergent basking sites.</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable habitat is present in several drainages, and several occurrences are recorded within and adjacent to the Project area.</td>
</tr>
<tr>
<td>San Diego Coast Horned Lizard <em>(Phrynosoma coronatum blainvillii)</em></td>
<td>FSC, CSC, FSS</td>
<td>Species requires loose, fine soils with a high sand fraction, abundance of native ants or other insects, open areas with limited</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable habitat is present in the project area. This species has been observed within the project area.</td>
</tr>
<tr>
<td>Common Name</td>
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</tr>
<tr>
<td><strong>California Legless Lizard</strong></td>
<td></td>
<td>overstory for basking and areas with low, dense shrubs for refuge. Elevational range is 10-2130 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>A legless lizard was detected in the West Fork San Gabriel River. May occur across a variety of undeveloped habitats with friable soils and sparse vegetation.</td>
</tr>
<tr>
<td><strong>Southern Rubber Boa</strong></td>
<td></td>
<td>Species is associated with sandy or loose loamy soils under sparse vegetation of beaches, chaparral, or pine-oak woodland or under sycamores, cottonwoods, or oaks growing on stream terraces. Occurs to 1,067 m elevation.</td>
<td>No</td>
<td>No</td>
<td>Site is outside known range of species. Thought to be extirpated from the San Gabriel Mountains, but focused surveys have not been conducted.</td>
</tr>
<tr>
<td><strong>San Bernardino Ringneck Snake</strong></td>
<td></td>
<td>Species found in a variety of habitats from sea level to 1,950 m in elevation. Require moist microclimates and are usually found under rocks, logs, or leaf litter.</td>
<td>Yes</td>
<td>Yes</td>
<td>Occurs in the Arroyo Seco. Potential habitat is present within some undeveloped areas.</td>
</tr>
<tr>
<td><strong>San Diego Mountain Kingsnake</strong></td>
<td></td>
<td>Species is commonly found between elevations of 500-800 m. Common in open stands of Ponderosa Pine, Jeffery Pine, Coulter Pine and/or Black Oak.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Project area is outside known range of species.</td>
</tr>
<tr>
<td><strong>San Bernardino Mountain Kingsnake</strong></td>
<td></td>
<td>Species generally found in sunlit canyons with rocky outcrops. At lower elevations, species</td>
<td>Yes</td>
<td>Yes</td>
<td>Has been found in the West Fork San Gabriel River. Species was also detected in Upper Big</td>
</tr>
<tr>
<td>Common Name</td>
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<tr>
<td><em>zonata parvirubra</em></td>
<td></td>
<td>associated with chaparral species and bigcone spruce and at higher elevations, species is associated with black oak, incense cedar, Jeffrey pine, and Ponderosa pine. 366-2470 m elevational range.</td>
<td></td>
<td></td>
<td>Tujunga Canyon</td>
</tr>
<tr>
<td>Coastal Rosy Boa</td>
<td>FSS</td>
<td>Species inhabits coastal sage scrub and chaparral dominated communities that contain large rocks and boulders for cover and refuge. Generally found near permanent or intermittent streams. Occur from sea level to 2070m.</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable habitat for this species is widespread throughout undeveloped areas.</td>
</tr>
<tr>
<td>Two-Striped Garter Snake</td>
<td>CSC, FSS</td>
<td>Species inhabits perennial and intermittent streams as well as ponds with dense riparian vegetation along the edges. Can be found in chaparral, oak woodland, and forest habitats. Occur from sea level to 2450 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>Occurrence record from the San Gabriel River, and suitable habitat is present in and along several other drainages. Found in Upper Big Tujunga and Alder Creek.</td>
</tr>
<tr>
<td>Arroyo Chub</td>
<td>CSC, FSS</td>
<td>Species found in slow moving or backwater sections of warm to cool streams with mud or sand substrates.</td>
<td>Yes</td>
<td>Yes</td>
<td>Detected in West Fork of the San Gabriel River and suitable habitat occurs along portions of Big Tujunga Creek in the Project area</td>
</tr>
<tr>
<td>Santa Ana Speckled Dace</td>
<td>CSC, FSS</td>
<td>Species inhabits a number of streams and channel types, small springs, brooks, and pools in intermittent streams and large rivers. Generally requires abundant cover and well-oxygenated water flowing over shallow cobble and gravel riffles.</td>
<td>Yes</td>
<td>Yes</td>
<td>Detected in West Fork and Upper West Fork of the San Gabriel River. Although not detected during recent surveys conducted by CDFG, this species is known to occur and suitable habitat occurs along portions of Big Tujunga Creek.</td>
</tr>
</tbody>
</table>
### Table 1. TEPCS Species for the Angeles National Forest Considered for Analysis

<table>
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<tr>
<td><strong>MAMMALS</strong></td>
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<tr>
<td>Nelson’s Bighorn Sheep (<em>Ovis canadensis nelsoni</em>)</td>
<td>FSS</td>
<td>Steep slopes (&gt;80%) with abundant rock outcrops and sparse shrubs for escape terrain. Escarpment chaparral w/ ceanothus mtn mahogany associations for foraging. Range from 3,000 to 10,000 feet.</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable habitat occurs at several locations within Segment 6. A single sighting has been reported from Santa Anita Canyon. Known to occur from San Gabriel Wilderness area south to West Fork San Gabriel River. Segment 11 is outside of known range.</td>
</tr>
<tr>
<td>Pallid Bat (<em>Antrozous pallidus</em>)</td>
<td>CSC, FSS</td>
<td>Species occurs in variety of habitats ranging from desert scrub grassland, shrubland, woodland, and mixed conifer forest. Found &lt;1830 m; on ANF at 335-2012 m.</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable foraging and roosting habitat present within Upper Big Tujunga Canyon. Located in artificial “bat houses” under a bridge about 325 yards northwest of Alternative 6 helicopter site 3 near Aliso Canyon.</td>
</tr>
<tr>
<td>Western Red Bat (<em>Lasiurus blossevillii</em>)</td>
<td>FSS</td>
<td>Species roosts in habitat bordering forest, rivers, cultivated fields, and urban areas. Occurs in streamside habitats dominated by cottonwoods, oaks, sycamore, and walnut.</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable foraging and roosting habitat present in Upper Big Tujunga Canyon. Additional potential habitat exists in riparian forest in the West Fork of the San Gabriel River drainage.</td>
</tr>
<tr>
<td>White-eared Pocket Mouse (<em>Perognathus alticolus alticolus</em>)</td>
<td>CSC, FSS</td>
<td>Occurs in the western portion of San Bernardino Mountains in the vicinity of Strawberry Peak at altitudes extending from about 1,646-1,768 m.</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Site is well outside known geographical and elevational range of species.</td>
</tr>
<tr>
<td>Tehachapi Pocket Mouse (<em>Perognathus</em>)</td>
<td>CSC, FSS</td>
<td>Species has been found in arid annual grassland, desert scrub communities,</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present. Site is well outside known</td>
</tr>
</tbody>
</table>
### Table 1. TEPCS Species for the Angeles National Forest Considered for Analysis

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<tr>
<th>Common Name</th>
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<tbody>
<tr>
<td>alticolus</td>
<td></td>
<td>pinyon pine woodland, a</td>
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<tr>
<td>inexpectatus</td>
<td></td>
<td>grain field, and open desert-</td>
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<tr>
<td></td>
<td></td>
<td>side pine forest at</td>
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<tr>
<td></td>
<td></td>
<td>elevations of 1,070-1,830 m.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles</td>
<td>CSC, FSS</td>
<td>Species occurs in fine,</td>
<td>No</td>
<td>No</td>
<td>No suitable habitat present.</td>
</tr>
<tr>
<td>Pocket Mouse</td>
<td></td>
<td>sandy soils, typically in arid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Perognathus</td>
<td></td>
<td>grassland, or coastal sage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>longimembris</td>
<td></td>
<td>scrub habitats, generally</td>
<td></td>
<td></td>
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<tr>
<td>brevinasus</td>
<td></td>
<td>below 670 m in elevation.</td>
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</table>

**Notes:**

**Federal Status:**
- FE Federally Listed Endangered
- FT Federally Listed Threatened
- FPE Federally proposed (Endangered)
- FPT Federally proposed (Threatened)
- FC Federal Candidate
- FSC Federal Species of Concern

**California Native Plant Society (CNPS) List:**
- 1A Presumed extinct in California
- 1B Rare or Endangered in California and elsewhere
- 2 Rare or Endangered in California, more common elsewhere
- 3 Plants for which we need more information - Review list
- 4 Plants of limited distribution – Watch list

**State Status:**
- SE State listed as endangered
- ST State listed as threatened
- SR State listed as rare
- SCE State candidate for listing as Endangered
- SCT State candidate for listing as Threatened
- CSC California Department of Fish and Game species of concern

**Forest Service Status:**
- FSS Forest Service Sensitive Species
CURRENT MANAGEMENT DIRECTION

Forest Land and Resources Management Plan (LRMP)

Specific management direction for the area of the Proposed Action located within the Angeles National Forest can be found within the Angeles National Forest Land and Resources Management Plan (2005). The decision to perform these land management activities on these specific areas was included in the Environmental Impact Statement (EIS) for the Angeles National Forest FLMP (USDA Forest Service 2005). Specific direction includes:

Goal 2.1 - Reverse the trend of increasing loss of natural resource values due to invasive species.
  - Implement projects to minimize the presence or spread of invasive nonnative plants (Part 1, p. 32).

  The following objective supports this goal: 1. Objective: Work with other agencies to identify and designate corridors for energy facilities, improve permit application processing efficiency, and establish appropriate land tenure (including transferability clauses) in easements and other authorizations to provide for long-term project viability. (Part 1, p.55)

Goal 5.1 - Improve watershed conditions through cooperative management.
  - Watersheds, streams, groundwater recharge areas, springs, wetlands and aquifers are managed to assure the sustainability of high quantity and quality water (Part 1, p. 40).
  - Watercourses are functioning properly and support healthy populations of native and desired nonnative riparian dependent species (Part 1, p. 41).

Goal 5.2: Improve riparian conditions.
  - Riparian Standards and Guidelines (S&Gs) apply to the aquatic, wetland, and upland riparian zones whether mapped or not.
  - Special attention shall be given to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes, and other bodies of water. This area shall correspond to at least the recognizable area dominated by riparian vegetation.
  - Secondary zone of potential riparian vegetation has been identified in association with intermittent streams. This secondary zone will be considered “riparian” until such time as field investigation has shown that on-site conditions do not warrant management under these S&Gs.
  - Riparian S&Gs apply only to areas above the high water mark of lakes and reservoirs.
  - Management activities can occur in riparian areas. However, these activities will be compatible with the needs of the riparian dependent resources. Resource conflicts must be mitigated in favor of the dependent resources.
  - Practices and all necessary management activities will be applied to riparian areas that will prevent detrimental changes to water quality, aquatic flora and fauna, and/or hydrophytic vegetation, and adverse riparian area changes in water temperature, chemistry, sedimentation, channel blockages, and riparian-dependent resources.

The following objectives support this goal: 1. Objective: Assess and restore high-priority watersheds and maintain riparian habitat within these watersheds. 2. Objective: Monitor water quality impacts of activities on National Forest System lands. 3. Objective: Restore and maintain native and desired nonnative plant and animal species diversity within terrestrial and aquatic ecosystems and reduce the rate of species endangerment by contributing to species recovery.
Goal 6.2 - Provide ecological conditions to sustain viable populations of native and desired nonnative species.

- Habitats for federally listed species are conserved; habitats for sensitive species and other species of concern are managed to prevent downward trends in populations or habitat capability; and, habitat conditions sustain healthy populations of native and desired nonnative fish and game species (Part 1, p. 45).

Program Strategies and Tactics

1. **WL 1** - Threatened, Endangered, Proposed, Candidate, and Sensitive Species Management. Manage habitat to move listed species toward recovery and de-listing. Prevent listing of proposed and sensitive species.
   - Implement priority conservation strategies (see table 528 Angeles NF Conservation Strategy).

2. **WL 2** - Management of Species of Concern. Maintain and improve habitat for fish, wildlife, and plants, including those with the following designations: game species, harvest species, management indicator species, and watch list species.
   - Monitor habitat for ecological health indicators (e.g., tamarisk, aquatic macroinvertebrates, and bullfrogs).
   - Cooperate with other agencies, partners, and other national forest programs to maintain and improve landscape level habitat conditions and ecological processes over the long-term for landscape linkages, wildlife movement corridors, key deer and bighorn sheep fawning, lambing, and winter ranges, and raptor nesting sites.

3. **IS 1** - Invasive Species Prevention and Control. Prevent the introduction of new invaders, conduct early treatment of new infestations, and contain and control established infestations:
   - Implement the Noxious Weed Management Strategy for the four southern California national forests (see Part 3, Appendix M of the LRMP).
   - Limit ground disturbance to the minimum area necessary during project activities. Promote conditions to enhance the recovery of vegetation in project planning, design, and implementation. Use native plant materials as needed to restore disturbed sites to prevent the introduction or reintroduction of invasive nonnative species. Conduct follow-up inspections of ground disturbing activities to monitor the effectiveness of restoration efforts in reducing or preventing the introduction or re-introduction of invasive non-native plants.
   - When setting priorities for treating invasive species, consider the rate of spread, the likeliness of environmental harm resulting from the establishment and spread of the invasive non-native species; the geographical location within the watershed, and the sensitivity of the location, especially invasions occurring within occupied or potential habitat for threatened, endangered or proposed species or within special management areas, such as research natural areas, special interest areas, and wildernesses; and the probability that the treatment(s) will be successful.
   - Prevent the introduction of invasive species and coordinate the treatment of invasive species across jurisdictional boundaries. Coordinate internally, as well as with local, state and federal agencies and permittees to prevent future introductions of invasive species through stocking, recreation use, special-use authorizations and all other national forest management and emergency activities or decisions that could promote additional invasions. Emphasize using weed management areas to consolidate and coordinate weed prevention and treatment efforts across jurisdictional boundaries.
   - Routinely monitor noxious weed control projects to determine success and to evaluate the need for follow-up treatments or different control measures. Monitor known infestations as appropriate in order to determine changes in density and rate of spread.
• Treatments may include herbicide application if approved through environmental analysis.
• Facilitate research

4. **FH 1 - Vegetation Restoration.** Restore vegetation through reforestation or other appropriate methods after stand replacing fires, drought, or other events or activities that degrade or cause a loss of plant communities.
• Where needed, implement reforestation using native tree species grown from local seed sources. In such plantings, consider long-term sustainability of the forest vegetation by taking into account factors such as fire regime and regional climate. Consider small nursery operations to facilitate reforestation and to improve restoration success where direct seeding is ineffective. Use noxious-weed-free seed in all plantings.

5. **Air 1 - Minimize Smoke and Dust Control.** Minimize smoke and reduce smoke and fugitive dust to protect human health, improve safety and/or reduce or eliminate environmental impacts.
• Incorporate visibility requirements into project plans.
• Use emission reduction techniques (ERT).

6. **WAT 1 - Watershed Function.** Protect, maintain and restore natural watershed functions including slope processes, surface water and groundwater flow and retention, and riparian area sustainability:

**Applicable Land Management Plan Standards**

S5: Treat all freshly cut live or recently dead conifer stumps with a registered fungicide to prevent the establishment of annosus root disease.

S6: Seed to be used on National Forest System lands will be certified to be free of noxious weeds. Where available, only locally collected native seed will be used, or seeds will be used from species that are noninvasive and nonpersistent. When available, wattles, mulch and livestock feed to be used on National Forest System lands will be certified to be free of noxious weeds.

S11: When occupied or suitable habitat for a threatened, endangered, proposed, candidate or sensitive (TEPCS) species is present on an ongoing or Alternative 2 site, consider species guidance documents (see Appendix H of EIR/EIS) to develop project-specific or activity-specific design criteria. This guidance is intended to provide a range of possible conservation measures that may be selectively applied during site-specific planning to avoid, minimize or mitigate negative long-term effects on threatened, endangered, proposed, candidate or sensitive species and habitat. Involve appropriate resource specialists in the identification of relevant design criteria. Include review of species guidance documents in fire suppression or other emergency actions when and to the extent practicable.

S12: When implementing new projects in areas that provide for threatened, endangered, proposed, and candidate species, use design criteria and conservation practices (see Appendix H) so that discretionary uses and facilities promote the conservation and recovery of these species and their habitats. Accept short-term impacts where long-term effects would provide a net benefit for the species and its habitat where needed to achieve multiple-use objectives.

S13: Manage Critical Biological land use zones so that activities and discretionary uses are either neutral or beneficial for the species and habitats for which the area was established. Accept short-term adverse impacts to threatened, endangered, and proposed species if such impacts will be compensated by the accrual of long-term benefits to habitat for threatened, endangered, and candidate species.
S15: Within riparian conservation areas retain snags and downed logs unless they are identified as a threat to life, property, or sustainability of the riparian conservation area.

S17: In areas outside of Wildland/Urban Interface Defense Zones and fuelbreaks, retain soft snags and acorn storage trees unless they are a safety hazard, fire threat, or impediment operability.

S18: Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging.

S19: Protect all spotted owl territories identified in the Statewide California Department of Fish and Game database (numbered owl sites) and new sites that meet the state criteria by maintaining or enhancing habitat conditions over the long-term to the greatest extent practicable while protecting life and property. Use management guidelines in the species conservation strategy (or subsequent species guidance document; see Appendix H) to further evaluate protection needs for projects, uses and activities.

S20: Maintain a limited operating period (LOP) prohibiting activities within approximately .25 miles of a California spotted owl nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15), unless surveys confirm that the owls are not nesting. Follow the USDA Forest Service (1993, 1994 or subsequent) protocol to determine whether owls are nesting. The LOP does not apply to existing road and trail use and maintenance, use of existing developed recreation sites, or existing special-uses, such as recreation residence tracts. When evaluating the need to implement a limited operating period, site- and project-specific factors need to be considered (use species management strategy or subsequent guidance; see Appendix H).

S21: California spotted owl habitat that is lost to development for a compelling reason should be mitigated up to a two-to-one basis considering quality of habitat lost, number of territories affected, reproductive history of pair(s) displaced, location, and related factors. Development includes ski area creation or expansion, new roads or trails, special-use sites and corridors, new recreation or administrative facilities, land exchanges, etc. Mitigation land should be sought first within the mountain range where the impacts occur; if this is not possible, mitigation land should be acquired within the San Gabriel or San Bernardino Mountains.

S22: Except where it may adversely affect threatened and endangered species, linear structures such as fences, major highways, utility corridors, bridge upgrades or replacements, and canals will be designed and built to allow for fish and wildlife movement.

S24: Mitigate impacts of on-going uses and management activities on threatened, endangered, proposed, and candidate species.

S25: Conduct road and trail maintenance activities during the season of year that would have the least impact on threatened, endangered, and proposed wildlife species in occupied habitats, except as provided by site-specific consultation.

S27: Use seasonal closures as specified by site-specific analysis to protect occupied bald eagle wintering, breeding, or nesting habitat.

S28: Avoid or minimize disturbance to breeding and roosting California condors by prohibiting or restricting management activities and human uses within 1.5 miles of active California condor nest sites.
and within 0.5 miles of active roosts. Refer to California condor species account (or subsequent species guidance document; see Appendix H) for additional guidance.

S30: Avoid activities that result in removal, crushing, burying, burning, or mowing of host plants within critical and occupied habitat for threatened, endangered, and proposed butterfly species; unless guided differently by a species-specific consultation.

S31: Design new facilities or expansion of existing facilities to direct public use away from occupied habitat for threatened, endangered, proposed and candidate species.

S32: When surveys for species presence/absence are done for threatened, endangered, and proposed species, use established survey protocols, where such protocols exist.

S33: Manage Special Interest Areas so that activities and discretionary uses are either neutral or beneficial for the resource values for which the area was established. Accept short-term adverse impacts to these resource values if such impacts will be compensated by the accrual of long-term benefit.

S42: Include provisions for raptor safety when issuing permits for new power lines and communication sites (see guidelines in Appendix G). Also implement these guidelines for existing permits within one year in identified high-use flyways of the California condor, and within five years in other high-use raptor flyways. Coordinate with California Department of Fish and Game, U.S. Fish & Wildlife Service, and power agencies to identify the high-use flyways.

S47: When designing new projects in riparian areas, apply the Five-Step Project Screening Process for Riparian Conservation Areas as described in Appendix E - Five-Step Project Screening Process for Riparian Conservation Areas.

S49: Require fish passage instream flows associated with dams and impoundments where fish passage will enhance or restore native or selected nonnative fish distribution and not cause adverse effects to other native species.

**Forest Service Manual 2081.03**

FSM 2081.03 directs the Forest Service to require all equipment be cleaned when working in a site contaminated with noxious weeds. As a result of FSM 2081.03, the following components will be required at all project sites.

1. **WASH ALL EQUIPMENT AND VEHICLES:** Vehicles and all equipment must be washed **BEFORE AND AFTER** entering all project sites. This includes wheels, undercarriages, bumpers and all parts of the vehicle. In addition, all tools such as chain saws, hand clippers, pruners, etc must also be washed **BEFORE AND AFTER** entering all project sites. For example, vehicles traveling into contaminated areas are the main dispersal mechanism for yellow star-thistle. All washing must take place where rinse water is collected and disposed of in either a sanitary sewer or a landfill.

2. **KEEP WRITTEN LOGS:** When vehicles and equipment are washed, a daily log must be kept stating:
   - Location
   - Date and time
   - Methods used
   - Staff present
• Equipment washed
• Signature of responsible crew member

3. **TURN IN WRITTEN LOGS**: These written logs will be turned in to the Forest Botanist every week.

**Bald and Golden Eagle Protection Act (1940)**

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668c, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: “disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.’’ (72 FR 31132; 50 CFR 22.3).

**Bald Eagle Management Guidelines (2007)**

The USFWS developed the Bald Eagle Management Guidelines to advise landowners, land managers, et al. who may conduct activities within areas that contain bald eagles when and under what circumstances the Bald and Golden Eagle Act may apply to those activities. The Guidelines are intended to assist people in minimizing impacts to bald eagles, especially where they may constitute “disturbance”, which is prohibited under the Bald and Golden Eagle Protection Act. The Guidelines are intended to:

1. Publicize the provisions of the Eagle Act that continue to protect bald eagles, in order to reduce the possibility that people will violate the law,

2. Advise landowners, land managers and the general public of the potential for various human activities to disturb bald eagles, and

3. Encourage additional nonbinding land management practices that benefit bald eagles

To avoid disturbing nesting bald eagles, the USFWS recommends (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees.

**California Spotted Owl Conservation Strategy**

A conservation strategy for the California spotted owl on the four southern California national forests was completed in 2004. In accordance with the strategy, the following list of conservation practices should be considered for the California spotted owl:

• Maintain or enhance habitat conditions in all territories. All spotted owl territories identified in the statewide Fish and Game database (numbered owl sites) and new sites that meet the State criteria (see below) should be protected from habitat degradation and loss to the greatest extent practicable while protecting life and property.

• In areas without good surveys, all suitable habitat of moderate habitat value and above (see table 1) should be protected from degradation or loss. In areas that have been surveyed thoroughly (e. g., San Bernardino Mountains) the national forests can protect known territories. In areas that have not been
thoroughly surveyed, such as more remote portions of the Los Padres National Forest, suitable habitat should be protected even if occupancy has not been documented. In the absence of good data, all suitable habitat is considered occupied and important. Inventories should be conducted before implementing any management action that will alter habitat structure.

- Delineate and focus protection on spotted owl management areas of up to 600 acres, each comprised of a Home Range Core (HRC) containing a Protected Activity Center (PAC) and Nest Stand.
- Create a map and database of all PACs and HRCs on each southern California National Forest. Update the maps and databases regularly as presence/absence surveys are conducted, projects are implemented, and/or stand conditions change.
- Where nest locations or activity centers have not yet been identified, conduct surveys in suitable habitat and map PACs and HRCs as soon as possible.
- Maintain a limited operating period (LOP) prohibiting activities within approximately ¼ mile of the nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15) unless surveys confirm that California spotted owls are not nesting. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of the project or activities suggests that either existing or proposed activities are likely to result in nest disturbance. When evaluating the need to implement a limited operating period, the following site- and project- specific factors need to be considered (USDA Forest Service 1994):
  - Proximity of activity (Does the activity occur within 0.25 mile of known or suspected activity center).
  - Duration of the activity (How long will the activity occur).
  - Timing of the activity (When in the year does the activity occur? What time of day [daytime versus nighttime] does the activity occur?)
  - Type of activity (Does the activity result in human intrusion or produce loud noises which may influence the behavior of the owl?)
  - Intensity of the activity (Does the activity result in noise levels which exceed ambient levels of the area?)
  - Status of the owl (Is the site occupied by a nesting pair? Pair? Single? Did the owls attempt to nest but failed?)
  - Physiographic feature (Given the location of Alternative 2 and owl activity center, does the landscape [e.g., ridges] and vegetation provide screens or barriers to disturbance likely to result from the activity?)
- Prohibit type conversion of suitable or potentially suitable (i.e., successional stands) owl habitat. Does not apply to fuel breaks or WUI Defense Zones needed to protect human life and property.
- Loss of owl habitat to development should be mitigated up to a three to one basis considering quality of habitat lost, number of territories affected, reproductive history of pair(s) displaced, location, and related factors. Development includes ski area creation or expansion, new roads or trails, special use sites and corridors, new recreation or administrative facilities, land exchanges, etc. Mitigation land should be sought first within the mountain range where the impacts occur; if this is not possible, mitigation land should be acquired within the San Gabriel or San Bernardino Mountains.
- Make every effort possible to keep the southern California spotted owl population intact by maintaining the amount and spatial connectivity of suitable habitat. Avoid creating additional barriers to dispersal.
- Acquire habitat where possible. Priority should be on areas with potential for commercial or residential development that contain PACs and HRCs.
- Planned new activities or uses that have potential to adversely affect owls or suitable owl habitat will be surveyed to protocol prior to conducting the activity or authorizing the use. Suitable habitat will be identified and activity centers or nests will be identified if occupied. Potentially impacted territories should be monitored for 2 years following the activity or use. Utilize the 1993 survey protocol for the spotted owl in California as modified by the Spotted Owl Biologist Team (USDA Forest Service 1993, 1994; Appendix 1, 2):
Within ¼ mile of activity centers, clean up trash daily at recreation sites when dumpsters reach overflow conditions (concern is the attraction of crows and ravens, which could prey on spotted owl young).

Locate new developed recreation sites, roads, OHV trails, and other facilities or improvements outside of PACs.

Apply Limited Operating Period guidelines to special use permits. Do not issue permits for special uses or events within ¼ mile of a nest site or activity center that would cause disturbance during nesting season, including organized motor vehicle events on Forest System roads/trails or helicopter use for movies.

**PROJECT DESCRIPTION**

This document only analyzes the NEPA preferred alternative as it affects NFS lands and is identified in the Final EIS for the TRTP project. Please note that all mileage numbers provided in this document are based on the preliminary engineering completed by SCE as part of their Proponent’s Environmental Assessment (PEA), and refined through the development of this document, and do not reflect mileage variations due to topography and other elements that affect transmission segment lengths. Therefore the information provided herein is subject to change during final engineering. For land disturbance numbers, a deviation factor of ±15 percent has been incorporated to provide a range allowing for the error associated with a project that has only gone through preliminary engineering. Furthermore, all mileages are approximate due to differences between engineering miles, which take into account topography, and map miles, which assume no variation in topography. The information provided represents the best available information. In addition, all estimates of construction equipment and workforce, land disturbance, construction waste, schedules, etc., are based on preliminary engineering data and, therefore, are subject to change based on final engineering.

The purpose of the proposed TRTP is to provide the electrical facilities necessary to interconnect and integrate in excess of 700 megawatts (MW) and up to approximately 4,500 MW of new wind generation in the Tehachapi Wind Resource Area (TWRA) currently being planned or expected in the future, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard in an expedited manner (i.e., 20 percent renewable energy by year 2010 per California Senate Bill 107); to further address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley; and to address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin. For a full description of the Project objectives and for background information on the proposed Project (please see Section 1.2-Purpose and Need of the Final EIS).

TRTP project impacts include construction of structures such as new towers and substations, and improvements to existing roads as well as construction of new roads that will be maintained throughout the project. Project impacts are considered permanent if they involve the conversion of land to a new use, such as with the construction of new roads or the footings of towers. Temporary project impacts are those effects that do not result in a permanent land use conversion. Temporary effects to vegetation communities or other ground disturbance activities restricted solely to the construction phase, such as grading roads and clearing vegetation within staging and pulling areas, are considered temporary provided that native vegetation is not replaced with infrastructure or the area is not maintained free of vegetation, and that restoration is deemed feasible prior to project implementation.

On NFS lands, the Preferred Alternative for the TRTP is to upgrade and construct two 500kV transmission lines (Segment 6 and 11 of the TRTP) across the ANF (see Table 1 and Map and Figure Series). The total distance of ROW containing transmission lines to be replaced on the ANF is 42.25
miles, located within existing SCE rights-of-way (ROWS). In order to construct the project, new towers, lines, and related infrastructure (i.e., spur roads, pulling stations, marshalling yards, and helicopter sites) will need to be created. For a more detailed project description see Section 2 of the Final EIS for the Tehachapi Renewable Transmission Project.

Detailed Project Location Maps are provided in the Final EIR Map & Figure Series Volume.

<table>
<thead>
<tr>
<th>Table 2: This table presents the general components required to complete each segment for the TRTP on NFS lands.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment 11: New Mesa – Vincent (via Gould) 500/220-kV T/L</td>
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<tr>
<td>• Initiates at the existing Vincent Substation and ends at the existing Mesa Substation</td>
</tr>
<tr>
<td>• Remove approximately 4 miles of the existing Pardee – Vincent No. 1 220-kV T/L</td>
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<tr>
<td>• Remove approximately 15 miles of the existing Eagle Rock – Pardee 220-kV T/L</td>
</tr>
<tr>
<td>• Construct new approximately 18.7-mile 500-kV single-circuit T/L between Vincent and Gould Substations (initially energized at 220 kV)</td>
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<tr>
<td>• Re-route portions of two existing 220-kV lines into Vincent Substation using currently idle towers.</td>
</tr>
<tr>
<td>• String approximately 17.5 miles (approximately 3.3 miles are located on National Forest System [NFS] lands) of new 220-kV conductor on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L (10 existing structures are located on NFS lands)</td>
</tr>
<tr>
<td>• Most of the proposed infrastructure would be located within existing ROW; however, the ROW may need to be expanded by up to approximately 250 feet to the west along the approximately 16 miles north of Gould Substation to maintain safe clearances from the edge of the ROW due to wire swing of the new 500-kV T/L under wind loading conditions</td>
</tr>
<tr>
<td>• Erect approximately 69 total new transmission structures (59 on NFS lands along approx. 20.4 miles)</td>
</tr>
<tr>
<td>• Construction of 37 structures by helicopter (all on NFS lands), supported by 5 helicopter staging areas on NFS lands</td>
</tr>
<tr>
<td>• Approximately 32.26 miles (±15%) of roads, of which approximately 27.56 miles (±15%) would be on NFS lands, would be created (new), reconstructed, or require some amount of maintenance</td>
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<tr>
<th>Segment 6: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and Section of New Mira Loma – Vincent 500-kV T/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initiates at the existing Vincent Substation and ends at the southern boundary of the ANF</td>
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<tr>
<td>• Remove approximately 5 miles of the existing Rio Hondo – Vincent No. 2 220-kV T/L between Vincent Substation and the “crossover” span (S6 MP 5.0)</td>
</tr>
<tr>
<td>• Construct new approximately 5-mile single-circuit Mira Loma – Vincent 500-kV T/L from the Vincent Substation to the “crossover” span (S6 MP 5.0)</td>
</tr>
<tr>
<td>• Remove approximately 26.9 miles of the existing Antelope – Mesa 220 kV T/L from Vincent Substation to the southern boundary of the ANF</td>
</tr>
<tr>
<td>• Construct new approximately 26.9-mile single-circuit Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV)</td>
</tr>
<tr>
<td>• Eliminate the existing crossing of the Rio Hondo – Vincent No. 2 220-kV T/L over the Antelope – Mesa 220-kV T/L</td>
</tr>
<tr>
<td>• All proposed permanent infrastructure to be located within existing ROW (approx. 32 miles)</td>
</tr>
<tr>
<td>• Erect approximately 137 total new transmission structures (105 on NFS lands along approx. 21.85 miles)</td>
</tr>
<tr>
<td>• Construction of 59 structures by helicopter (all on NFS lands), supported by 10 helicopter staging areas on NFS lands</td>
</tr>
<tr>
<td>• Approximately 46.72 miles (±15%) of roads, of which approximately 44.42 miles (±15%) would be on NFS lands, would be created (new), reconstructed, or require some amount of maintenance</td>
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</tbody>
</table>
Segment 11: Mesa – Vincent (via Gould) 500/220 kV T/L

Segment 11 would replace approximately 19 miles of existing single-circuit 220-kV T/L structures from Vincent Substation, located near Acton, to Gould Substation in La Cañada Flintridge with a new approximately 19-mile single-circuit 500-kV T/L, initially energized to 220-kV (see Final EIS Map and Figure series). Construction of Segment 11 would generally be within existing ROW, except for some areas north of Gould Substation (see Final EIS Map and Figure series). In this area, the ROW width is currently irregular; therefore, SCE may need to expand the ROW up to approximately 250 feet to the west of the existing corridor to allow for a continuous width of 360 feet to provide the required clearances to accommodate the “swing” of the proposed 500-kV T/L under wind loading conditions. Overall, the majority of this segment would be located on NFS lands within the ANF (approximately 20.4 miles) including: S11 MP 1.5-3.5, 3.75-18.5, 19.25-20.3, 20.8-21.3, 21.8-22.6, 23.05-24.15, and 24.35-24.55 (in-holdings or other non-Forest properties are located between the mileposts listed).

Segment 6: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L and Section of New Mira Loma – Vincent 500-kV T/L

Segment 6 would consist of the construction of a total of approximately 32 miles of single-circuit 500-kV T/L structures in existing ROW from the Vincent Substation located near Acton to the southern boundary of the ANF (see Final EIR Figures 2.2-1j through 2.2-1k and 2.2-1q through 2.2-1t). Approximately 27 miles of the existing Antelope – Mesa 220-kV T/L structures would be rebuilt with 500-kV single-circuit structures from the Vincent Substation to the southern boundary of the ANF initially energized at 220 kV. In addition, approximately 5 miles of the existing Rio Hondo – Vincent No. 2 220-kV T/L structures would be rebuilt with 500-kV single-circuit structures from the Vincent Substation to the existing “crossover” span (S6 MP 4.8). The existing crossing or “crossover” of the Rio Hondo – Vincent No. 2 220-kV T/L over the Antelope – Mesa 220-kV T/L would be eliminated. The completion of Segment 6 would result in two roughly parallel circuits constructed to 500-kV standards in the existing ROW from the Vincent Substation (S6 MP 0.0) to the southern boundary of the ANF (S6 MP 26.9). The easterly circuit would be the new Rio Hondo – Vincent No. 2 500-kV T/L initially energized at 220 kV (requires 26.9 miles of new 500-kV T/L). The westerly circuit would become a section of the new Mira Loma – Vincent 500-kV T/L (requires only approximately 5 miles of new 500-kV T/L, as the existing structures south of the “crossover span” to the southern boundary of the ANF are currently constructed to 500-kV standards with 500-kV structures). The majority of this segment (approximately 21.85 miles) would be located on NFS lands within the ANF including: S6 MP 1.45-1.7, 2.75-5.3, 5.65-6.7, 6.7-6.95, 7.05-24.8 (in-holdings or other non-Forest properties are located between the mileposts listed).

Construction

Transmission Line Construction

Construction activities for the proposed Project would include establishment of marshalling yards for staging of materials and equipment, and development of access roads and spur roads to reach construction sites. Following this, or in parallel, crews would remove existing transmission lines as specified for Segment 11, and also begin installation of new transmission structures. Construction of new transmission towers would include clearing of footing work locations, installation of foundations using micropile techniques, tower assembly, and tower erection. After towers are in place, crews would proceed with stringing of conductor and overhead ground wires. Construction would be completed with clean-up of construction sites and demobilization of personnel and equipment. The exact method of construction employed and the sequence with which construction tasks occur would be dependent on final engineering, contract award,
conditions of permits, and contractor preference. In general, construction efforts would occur in accordance with accepted construction industry standards. Construction activities would generally be scheduled Monday through Friday during daylight hours (7:00 a.m. to 5:00 p.m.). When different hours or days are necessary, SCE would obtain variances, as necessary, from the ANF. All materials associated with construction efforts would be delivered by truck or helicopter to established marshalling yards. Delivery activities requiring major street use would generally be scheduled to occur during off-peak traffic hours where feasible. Public access to defined areas would be restricted where deemed necessary by land managing agencies to protect public health and safety.

The following sections provide more detailed information about the construction tasks that would be associated with transmission line construction for the TRTP.

**Staging and Support Areas**

**Marshalling and Material Storage Yards**

Marshalling yards are typically large areas (5 to 50 acres) that are located at both ends of a bulk power T/L construction project (Conventional Line Construction and/or Helicopter Supported Line Construction types). On larger projects there could additionally be one or more of these yards located at strategic locations approximately every 25 line miles along the project route. Similarly, material storage yards are typically 5 to 20 acres in size and are used primarily for material storage and staging. Delivery trucks with material (i.e., steel rebar cages, tower steel, TSPs, conductor reels, structure hardware, and other related material) would be delivered and off loaded at these yards. Ideally these yards should be as level as possible and should be located in an uninhabited area free of trees and high voltage power lines. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and/or graded. Preparation of the primary yards would include the application of road base, installation of perimeter fencing, and implementation of SWPPP best management practices. Additionally, it may be necessary to install a temporary fence around the yard for security purposes.

Activities, facilities, equipment, and material which could be present at the marshalling and material storage yards for the duration of the project include, but are not limited to, the following:

A. Employee gathering/reporting area; employees working on the project will drive their personal vehicles to these yards and temporarily park them at the yard for the duration of the work day.

B. Heavy and light (gas or diesel) construction equipment will be used and stored at these yards. The equipment will be fueled, serviced, and will receive any necessary light maintenance, while at these yards.

C. Office trailers of various sizes and portable toilets will be located in these yards. Portable electrical generators (if no electrical power source is available) will be used; telecommunication lines may also be required to support the office trailers.

D. All types of material needed for the construction of the T/L (i.e., tower steel, conductor reels, OPGW and/or ground wire reels, tower bolts, foundation rebar cages, wood guard poles, etc.) will be delivered and stored at these yards until it is ready to be delivered to the structure sites.

E. These yards should be located near water supplies for construction use and dust control as much as 50,000 gallons of water could be used daily.

F. Roll-off dumpsters to gather the construction waste from the project will be located at these yards.
G. Fueling trucks, gas and diesel, will be located at these yards to fuel construction equipment and vehicles each day of construction; the fueling truck tanks could hold from 100 to 1,000+ gallons of fuel.

H. When a portion of the transmission line project is required to be constructed using helicopter support, these yards could also serve as a helicopter support yard for fueling, maintenance, and transporting both material and personnel to and from the structure site locations.

I. Sectionalized tower assembly could also take place at these yards in support of those portions of the transmission line project that are required to be constructed using helicopters support. These sectionalized portions of towers would be flown out of these yards by heavy duty helicopters and delivered to the appropriate structure site location.

Where applicable, the Material Safety Data Sheet (MSDS) for each of the materials and chemicals to be used on the job site would be referenced; SCE and/or its contractor would then follow the recommendations on the MSDS, adhere to the procedures in the Storm Water Pollution Prevention Plan (SWPPP) prepared for the Project, and conform to all applicable laws and regulations regarding the storage and containment of the materials and chemicals to be used during all construction-related activities (SCE, 2007b – DR#1: Q073).

This Project would include several primary marshalling and/or material storage yards that would be selected based on accessibility to construction locations and proximity to transmission line and substation access roads; however, where possible, pre-disturbed areas would be used.

In addition to the primary yards, secondary yards would be established for short-term utilization near construction sites. Where possible, the secondary yards would be sited in areas of previous disturbance along the construction corridors. Locations were selected that are parallel to the existing ROW, near paved roads and preferably on land that has been previously graded or disturbed. Typically, an area approximately 1 to 3 acres would be required for the secondary yards, and they would be located approximately every 5 to 10 miles along the T/L alignment. Once the sites for secondary yards are proposed, biological and cultural resource reviews would be conducted, as well as a visual resource review for sites on NFS lands, before final site selection. Preparation of the secondary yards would include installation of perimeter fencing, and implementation of SWPPP best management practices. Application of road base may also occur, depending on existing ground conditions at the yard site.

In addition to primary and secondary marshalling and/or material storage yards, helicopter staging/support facilities would also be required. In general, the following types of helicopter staging and support facilities are required for installation by helicopter:

**Helicopter LST & TSP Assembly Yards**

The assembly yards are required so that sections of the LSTs can be preassembled prior to delivery to the structure sites. A large heavy-lift helicopter will fly from these yards and transport the preassembled section of the LST to the structure site. Depending on the size and weight of the LST, several round trips will be required from the assembly yard to fully construct each LST. Each assembly yard can support several structure sites and must be located no further away from the structure site locations than is within the safe round trip flight distance limitation of the helicopter(s) being used. The typical safe round trip flight distance for a heavy lift helicopter is a two to three mile radius, depending upon altitude and load. The area required for these assembly yards can range in size and depends on road access and topography. The yards should be as level as possible, and be located strategically throughout the area of helicopter supported construction activity. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and/or graded, including removal of trees in
some instances. Ideally they should be located at a higher elevation than the structure sites they will support because it is safer and more fuel efficient to fly down toward the tower site with heavy loads than it is to fly up to the tower site. Additionally, the assembly yard must be accessible by a road to facilitate the delivery of tower steel, rebar, concrete, construction tools, equipment, and other materials used in the construction of the foundations and the LSTs.

The following activities can take place at helicopter assembly yards:

A. Tower sections would be preassembled using a rough terrain crane to support the steel while air compressor supported impact wrenches are used to torque the bolts in place.
B. Rebar for assembling cages and/or preassembled rebar cages for structure foundations would be delivered then flown out of this yard to each structure site.
C. A concrete batch plant would generate the required concrete to be loaded into a truck or concrete transport bucket that would be attached to a helicopter and flown out to the structure sites.
D. The refueling of the helicopter and necessary light maintenance. A fuel truck and a mechanics truck would be located at these yards.
E. The transportation of personnel, tools, and small equipment by helicopter to and from the yards and the construction sites.
F. Temporary parking for a fuel truck, a mechanics truck, and transport vehicles for personnel.
G. To serve as a safe landing area for the helicopter in case of an emergency.

Helicopter assembly yards or HAYs (referenced herein as helicopter staging areas) have been preliminarily identified by SCE to support the helicopter construction along Segments 6 and 11. These staging areas are shown in the Map and Figure Series for the Final EIS:

**Helicopter Support Yards (SCE, 2008a)**

Helicopter support yards are required when using helicopters for T/L construction because of the limited fuel supply that helicopters are able to carry. These yards must be located no further away from the structure site locations than is within the safe round trip flight distance limitation of the helicopter(s) being used. The typical safe round trip flight distance for a heavy lift helicopter is a two to three mile radius, depending upon altitude and load. These yards range in size from a minimum of 100 foot by 100 foot or larger depending on the size of the helicopter and the activities taking place at the yard. The yards must be accessible by a road, be as level as possible, and be located strategically throughout the area of helicopter supported construction activity. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and/or graded.

Ideally, the support yards are at the same physical location as the assembly yards (described above); this capability reduces the hours of helicopter operation by eliminating the transport time from a support yard to an assembly yard. Due to the preliminary nature of SCE’s design for helicopter construction of towers within the ANF, it has been conservatively assumed that up to two helicopter support yards would be utilized per helicopter staging/support area (11 staging/support areas x 2 = 22 total).

The following activities can take place at these helicopter support yards:

A. The refueling of the helicopter and necessary light maintenance. A fuel truck and a mechanics truck would be located at these yards.
B. The transportation of personnel, tools, and small equipment by helicopter to and from the yards and construction sites.

C. Temporary parking for a fuel truck, a mechanics truck, and transport vehicles for personnel.

D. To serve as a safe landing area for the helicopter in case of an emergency.

**Helicopter Construction Landing Pads**

Helicopter construction landing zones or “pads” are required for those structure sites that are at locations that cannot be accessed by a road. These “pads” are needed to off load personnel, tools, and equipment that are necessary to hand dig the foundations and erect the structure. These “pads” typically require a 40-foot by 40-foot area that should be as level as possible and cleared of vegetation in order to facilitate landing, off loading, and take offs. Ideally, the “pad” would be located in close proximity to the structure site, on the uphill side adjacent to the transverse face. In some areas that have extreme sloping terrains, a portable 25-foot by 25-foot landing pad with adjustable legs could be flown in and placed close to the structure site to be used for helicopter landing, off loading, and take off. Once the project is completed some “pad” areas may remain cleared for transmission line operations and maintenance, while others would be restored and the portable “pad” would be removed.

The following activities can take place at these helicopter construction landing pads:

A. The transportation of personnel to and from the yards to the structure site; at the beginning of the work day a small helicopter would land on the “pad” and personnel would off load from the helicopter and walk a short distance to the structure site, at the end of the work day the helicopter would land on the “pad” to pick up the personnel.

B. The staging area for delivery and pick up of small hand tools and equipment used during construction. On delivery or pick up, the small hand tools and equipment are suspended from the helicopter, lowered to the ground and released or attached to a tether and lifted, the helicopter does not land.

This list represents the fly yards that are anticipated for use for the construction of the TRTP.

<table>
<thead>
<tr>
<th>Table 3-Fly Yards Proposed for use</th>
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<tr>
<td>Aliso Canyon</td>
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<td>Millcreek*</td>
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<td>Rabbit Peak</td>
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<td>Wickiup</td>
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<td>Upper Big T</td>
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<td>Shortcut Station</td>
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<td>Barley Flats</td>
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<td>Camp 16</td>
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<td>Mt. Gleason</td>
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<td>Santa Clara Divide Road</td>
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<td>Maple Canyon</td>
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<tr>
<td>Forest Highway Overlook</td>
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Access and Spur Roads

The major access roads proposed for use under the preferred alternative are the same as those proposed for use under alternative 2 as identified in the Final EIS. The only differences are these outlined below:

- Monte Cristo road (3N23) would not be used for construction of segment 6
- The middle access road on 3N20 near where toad tracks were found would not be used
- The lower end of Lynx Gulch road (4N18.2) would not be used for construction of segment 6
- The lower end of Fall Creek road (3N27) from Big Tujunga Canyon road north to the north side of Big Tujunga Canyon
- The Creek crossing at Aliso Creek (4N24) along segment 11 would not be used
- One section of 2N24 in between the pull sites on Rincon-Red Box road would not be upgraded.

Transmission line roads are classified into two groups: access roads and spur roads. Access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along line ROWs. Spur roads are roads that lead from line access roads and terminate at one or more tower sites.

This Project includes construction on both existing and new ROW. Where construction would take place on existing ROW, it is assumed that most of the existing access roads as well as spur roads would be used. However, it is also assumed that alterations to these roads would be necessary in some locations to accommodate construction activities. This work may include:

- Re-grading and repair of existing access and spur roads to SCE standards and to Forest Service standards within the ANF (as required). These roads would be cleared of vegetation, blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 12 feet and preferably a shoulder width of an additional 2 feet. An average 50-foot radius would be required for turns, resulting in additional road width. Refer to revised Figure 2.2-78 (located at the end of this chapter) for a typical road cross section.

- Drainage structures such as wet crossings, water bars, overside drains, pipe culverts, and concrete bridges (see Map and Figure Series) would be installed or reconstructed to allow for construction traffic usage and prevent erosion and associated road damage due to uncontrolled water flow.

- Slides, washouts, and other slope failures would be repaired and stabilized by installing retaining walls or other means necessary to prevent future failures. The type of structure to be used would be based on specific site conditions.

Within the ANF (Segments 6 and 11), SCE would use, maintain, or improve a complex network of paved and unpaved roads, both Forest Service (FS) system and non-system roads, as well as primary highways that cross NFS lands but are under the jurisdiction of other transportation agencies. This network is shown in the Map and Figure Series for the Final EIS. Roads that require some amount of maintenance or improvement are identified; however, it should be noted that some of the paved access roads identified may also require maintenance or improvement, as discussed above. The locations of these improvements are unknown at this time and would be determined as part of final engineering.

The roads that have been proposed for use, upgrade, or new construction within the ANF have been classified into three categories defined in Forest Service Engineering Manuals: (1) maintenance, (2) reconstruction, and (3) new construction. In this document, the words ‘improve’ or ‘improvement’ are used synonymously with reconstruction for roads within the ANF. Details of these categories can be found in the Traffic and Transportation Section of the Final EIS in addition to a list of roads that are expected to be used for the Project.
While some of these roads are in suitable condition for vehicular use, many would require extensive maintenance or improvement to accommodate large, heavy equipment during construction of the proposed Project. It is difficult to quantify these requirements; therefore, all unpaved roads within the ANF were assumed to need at least some degree of maintenance. It is anticipated that some of the roads constructed or reconstructed to accommodate new construction would be left in place (permanent) to facilitate future access for operations and maintenance purposes. Special Use authorizations for long term use and maintenance of these roads would be issued after construction is completed. The required gates would be installed to restrict general and recreational vehicular access to road ROWs. Construction roads across areas that are not required for future operations and maintenance access would be removed and restored after construction is completed. An example of this type of road would be a road constructed to provide access to a splice location during wire-stringing operations. Support facilities such as helicopter assembly yards and pulling/tensioner/splicing sites may require construction of spur roads to them when they are not accessible from an existing access or spur road.

**Removal of Existing Wire, Structures, and Footings**

Construction of Segment 6 and 11 would require the removal of existing transmission line. Transmission line equipment to be removed includes existing 220-kV and 66-kV towers and poles and associated hardware (i.e., insulators, vibration dampeners, suspension clamps, ground wire clamps, shackles, links, nuts, bolts, washers, cotter pins, insulator weights, and bond wires), as well as the transmission line primary conductor and ground wire.

SCE proposes to remove the existing 220-kV and 66-kV LSTs through the following activities:

**Grading:** Existing access routes would be used to reach tower sites, but some rehabilitation work on these routes may be necessary before removal activities begin. In addition, grading may be necessary to establish crane pads for tower removal.

**Removal Crane:** For each LST, a crane pad of approximately 50 feet by 50 feet would be cleared of vegetation and graded (if the ground is not level) to allow a removal crane to be setup at a distance of 60 feet from the LSTs center line. The crane rail could be located diagonally or longitudinally from the LST structure.

**Footing Removal:** The existing LST footing would be excavated and removed down to a depth of 2 feet. Any footing foundation below 2 feet of depth from the ground surface would remain in place. Holes would be filled and compacted, and then the area would be smoothed to match surrounding grade.

**Steel Removal:** To remove the steel, crews would drive a light duty truck to each footing area. No hazards would remain following tower removal.

**Helicopter Use:** In the event that there are no existing access roads, contractors would hike in to the tower locations. Hiking trails of the minimum width necessary would be cut at ground level to remove dense vegetation to allow for passage. Unless a tower has an existing access road to the tower location it will be removed using helicopters.

As illustrated in Map and Figure Series, approximately one or two small helicopters would be used to transport equipment to tower sites for conductor and associated hardware removal. A large, heavy lift helicopter would be used for removal of the existing 220-kV towers. It is estimated that the small helicopter would generally operate from Monday through Friday for up to 8 hours per day, while the large helicopter would operate approximately 6 to 8 hours per day. The operating area of the helicopters would be limited to helicopter staging areas, material and equipment yards, and positions along the utility corridors that have previously been used for this purpose and/or SCE has determined are safe locations for landing. Additional information regarding helicopter support facilities is provided above under the Support and Staging Areas section.
SCE provided estimates of the minimum and maximum number of helicopter round trips required for removal (wreck-out) by structure type, as follows:

The minimum number of helicopter trips required to wreck out a 220-kV single-circuit tower would be approximately 55 for suspension towers and 64 for dead-end towers, and the maximum estimated number of trips would be 89 for suspension towers and 105 for dead-end towers; and

The minimum number of helicopter trips required to construct a 500-kV single-circuit tower would be approximately 146 for suspension towers and 380 for dead-end towers, and the maximum estimated number of trips would be 194 for suspension towers and 480 for dead-end tower.

Based on the above assumptions, it has been estimated that a minimum of 19,817, and a maximum of 27,724 helicopter round trips would be required to wreck out and construct Segment 6; and a minimum of approximately 11,577 and maximum of 16,185 helicopter trips would be required to wreck out and construct Segment 11. It should be noted that the number of trips would vary due to other factors, such as distance, weather, altitude, site conditions, etc.

SCE proposes to remove the existing 220-kV and 66-kV conductor wire through the following activities:

**Wire Pulling Locations:** Wire-pulling locations are approximately 200 feet by 200 feet (0.92 acre) in size and would be sited approximately every 15,000 feet along the utility corridor, and at dead-end towers and turning points. Revised Figure 2.2-83 (located at the end of this chapter) shows the preliminary wire pulling sites and alternative wire pulling site proposed by SCE within the ANF. It is anticipated that the same locations for installation of the 500-kV lines would be used for removal of existing lines. Wire-pulling equipment would be placed intermittently along utility corridors.

**Breakaway Reels:** The old conductor wire would be wound onto “breakaway” reels as it is removed.

**Pulling Cable:** A 3/8-inch pulling cable would replace the old conductor as it is pulled out, thereby allowing complete control of the conductor during its removal. The 3/8-inch line would then be removed under controlled conditions to minimize ground disturbance, and all wire-pulling equipment would be removed.

**Guard Poles:** Temporary guard poles or guard structures may be installed at transportation, flood control, utility crossings, and at other locations such as parks or near residences to stop the travel of a conductor should it momentarily drop below a conventional stringing height. If required, temporary netting would be installed to protect some types of under-built infrastructure. Please see detailed discussion of guard structure installation in Section 2.2.12.8, below.

**Conductor Disposal:** The conductor would be transported to a marshalling yard for recycling purposes.

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**Tower and Pole Construction**

**Site Preparation**

When possible, the construction of new LSTs and TSPs would occur on former tower sites. When new pads are necessary, the location of each pad would first be graded and/or cleared to provide a reasonable level and vegetation-free surface for footing construction. Sites would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the tower footings. The graded area would be compacted to at least 90 percent relative density, and would be capable of supporting heavy vehicular traffic.

An area of approximately 0.001 acre would be required for the single footing needed for each TSP and approximately 0.003 acre would be required to accommodate the four footings needed for each LST.
In mountainous areas, benching, a technique in which a tracked earth-moving vehicle excavates a terraced access to LST excavations in extremely steep and rugged terrain, may be required to provide access for footing construction, assembly, erection, and wire-stringing activities during line construction. It would be used minimally and for two purposes: 1) To help ensure the safety of personnel during construction activities and 2) To control costs in situations where potentially hazardous, manual excavations would be required.

**Foundations**

Drilled concrete piers are typically the choice for structure foundations. New lattice steel towers would be constructed on four drilled pier concrete footings, while each tubular steel pole would be constructed on a single drilled pier concrete footing. The foundation process would start with the auguring of the holes for each tower or pole. The holes would be bored using truck or track-mounted excavators with various diameter augers to match diameter requirements of the foundation sizes. Lattice steel structures typically require four excavated holes of 3 to 6 feet in diameter and 15 to 30 feet deep. Tubular steel poles typically require one excavated hole of up to 10 feet in diameter and 60 feet deep. On average, each foundation for an LST or TSP would project above the ground approximately 3 feet.

Following excavation of the foundation holes, reinforcing steel and stub angles would be installed and the concrete would then be placed. Steel reinforced cages and stub angles would be assembled at laydown yards and delivered to each structure location by flatbed truck. Typical lattice towers would require 15 to 20 cubic yards of concrete delivered to each structure location for tangent structures, 25 to 30 cubic yards for angle towers, and 100 cubic yards for dead-end towers. Typical tubular steel poles would require 100 cubic yards of concrete at each structure location.

Concrete would be supplied from existing facilities to the extent feasible; however, if concrete supply facilities do not exist in certain areas, temporary concrete batch plants would be set up to supply concrete during foundation construction activities. For example, in Segments 6 and 11, concrete batch plants would need to be established within the ANF, as the concrete must be delivered within approximately 90 minutes to 2 hours (with use of chemicals to slow the reaction time). Concrete batch plants would require an area of approximately 2 acres each, and in general would be located at staging/support areas (primary/secondary marshalling yards and helicopter staging/support areas) (SCE, 2008). Final siting of the concrete batch plants would be determined with the input of the helicopter contractor, affected private landowners, and land management agencies, such as the Forest Service. Concrete batch plant equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos (SCE, 2008). Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers. The transport of concrete would be accomplished with the coordination of radio equipment flagmen and/or pilot cars to control other traffic on the same roadway. Concrete trucks requiring assistance due to excessive grades or loose soils would be attached to dozers or large rubber tired loaders to assist traction of heavy equipment. Concrete would be hauled to tower sites in standard concrete trucks; each truck with a capacity of approximately 8 to 11 cubic yards of concrete; partial truck loads of concrete would be utilized in situations where access issues would prevent the use of a full truck load of concrete.

Footing work would generally be completed using standard “poured-in-place” augured excavation techniques. At the time of construction, elevations would be established; rebar cages set, stub angles and concrete placed, and survey positioning would be verified. Concrete would be sampled at time of pour and tested to verify engineered design strengths were achieved. Typically, on a regular terrain under ideal
circumstances, a single footing crew could be expected to excavate, place steel cages and stub angles, and pour in place concrete for one complete LST every 2 days. A foundation set for each LST would include four footings. The single foundation for a TSP can typically be completed in 3 days. A normally specified SCE concrete mix typically takes approximately 28 calendar days to cure to reach an engineered design strength as verified by compression testing. Once this strength has been achieved, crews would be permitted to commence erection of steel.

Conventional construction techniques would generally be used as described above for new footing installation. In certain cases, equipment and material would be deposited at structure sites using helicopters or by workers on foot, such as at the 33 towers identified for helicopter construction under SCE’s proposed Project, and crews may prepare the footings using hand labor assisted by hydraulic or pneumatic equipment, or other methods. Alternatively, a tracked excavator may be required to dig the foundation holes in conjunction with the proposed helicopter construction. As such, the tracked excavator would need to access the structure site via a temporary trail or overland ‘drive and crush’, neither of which would require any grading; although, some minor brush clearing may be required if the vegetation is too dense to drive across (SCE, 2008j).

This project would use micropile foundations for construction of footings for all towers where SCE, in consultation with the Forest Service, determines that the technique is feasible. Installation of micropiles would require the drilling of several smaller diameter holes (approximately 7-10, 8-inch holes) for each footing, which ultimately would impact a relatively smaller area than conventional footing installations due to the much smaller volume of excavated material. After drilling all the holes, each hole would be flushed with water or air to remove drill cuttings and loose material. Micropiles would then be installed by placing a rebar in each hole with cement grout injected through grout tubes at the lowest point of each micropile, and the hole filled until viscous grout reaches the top of the casing. The micropiles would then be tied together, to act as a single unit foundation, in a reinforced concrete pile cap approximately 4 to 9 feet tall and 1.5 to 6 feet in diameter. Grout could be brought to each tower site dry and mixed at the site, requiring a much reduced amount of concrete required and associated transportation requirements and limitations (delivery within 90 min. to 2 hours).

**Tower and Pole Assembly (Ground-Based Construction)**

For ground-based construction of LSTs, the LSTs would be assembled in laydown areas at each site and then erected and bolted to the foundations. Tower assembly would begin with the hauling and stacking of bundles of steel at tower locations per engineering drawing requirements. This activity requires the use of several tractors with 40-foot floats and an onsite loader. After steel is delivered and stacked, crews would proceed with assembly of leg extensions, body panels, boxed sections and the bridges. The steel work would be completed by a combined erection and torquing crew with a lattice boom or hydraulic crane. The construction crew may opt to install insulators and wire rollers (travelers) at this time. Ground disturbance would generally be limited to the laydown areas, which would typically occupy an area of 200 feet by 200 feet (0.92 acre).

For ground-based construction of TSPs, the steel work would consist of hauling the TSPs in sections to their designated sites using semi-trucks with 40-foot trailers and rough terrain cranes. Due to the size of the TSPs, each pole would require at least two trucks. At the site, the poles would be set on the foundations once the proper cure time for the concrete had been attained. The poles could either be assembled into a complete structure or set one piece at a time by stacking them together. This would depend largely on the terrain and available equipment. Stacking the poles one piece at a time would cause the least amount of ground
disturbance. Laydown areas would be established for the assembly process and would generally occupy an area of 200 feet by 200 feet (0.92 acre) at each location.

**Tower and Pole Erection**

Where road access is available to tower sites, assembled tower sections would be lifted into place with a minimum of 80-ton, all-terrain or rough terrain crane that would move along the ROW (i.e., along access and spur roads) for structure erection purposes.

On Segments 6, and 11 of the TRTP, there would be some structure sites located greater than 50 feet from the nearest road. Therefore, it is anticipated that helicopters may be used for removal of these existing structures and installation of new 500-kV LSTs. SCE provided estimates of the minimum and maximum number of helicopter round trips required for construction by structure type, as follows (SCE, 2008a; SCE 2008c – DR#5: Q5-14):

The minimum number of helicopter trips required to construct a 500-kV single-circuit tower would be approximately 146 for suspension towers and 380 for dead-end towers, and the maximum estimated number of trips would be 194 for suspension towers and 480 for dead-end tower.

Based on the above assumptions, it has been estimated that a minimum of 19,817, and a maximum of 27,724 helicopter round trips would be required to wreck out and construct Segment 6; and a minimum of approximately 11,577 and maximum of 16,185 helicopter trips would be required to wreck out and construct Segment 11. It should be noted that the number of trips would vary due to other factors, such as distance, weather, altitude, site conditions, etc. It should be noted that the number of trips would vary due to other factors, such as distance, weather, altitude, site conditions, etc. As described above

Use of helicopters for installation eliminates land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for steel delivery to structure sites. All construction work in remote work sites would be completed by hand with the assistance of portable compressors, portable hydraulic accumulators, and portable concrete mixers that would be flown into the tower sites. It should be noted, however, that TSPs would generally not be constructed by helicopter, as TSPs for extra-high voltage T/Ls (over 220 kV) are typically too heavy to be transported and erected by helicopter (SCE, 2008a). During helicopter operations, public access to defined areas would be restricted. Temporary road closures, traffic detours, and posted notices and signs would be used to restrict public access to construction areas. This would be in addition to general public access restrictions to protect public health and safety.

**Wire Stringing Operations**

Wire-stringing includes all activities associated with the installation of conductors onto the LSTs and TSPs. This activity includes the installation of primary conductor and ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Insulators and stringing sheaves, such as rollers or travelers, are attached as part of the wire-stringing activity if the work is a part of a reconductoring effort; otherwise they are typically attached during the steel erection process. Wire-stringing activities would be conducted in accordance with SCE specifications, which is similar to the process methods detailed in IEEE Standard 524-1992, Guide to the Installation of Overhead Transmission Line Conductors. A standard wire-stringing plan includes a sequenced program of events starting with determination of wire pulls and wire pull equipment set-up positions. Advanced planning by supervision determines circuit outages, pulling times, and safety protocols needed for ensuring that safe and quick installation of wire is accomplished.

Typically, wire pulls occur every 15,000 feet on flat terrain and every 9,000 feet in mountainous terrain. “Wire pulls” are the length of any given continuous wire installation process between two selected points
along the line. Wire pulls are selected, where possible, based on availability of dead-end LSTs at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setups. In some cases, it may be preferable to select an equipment setup position between two suspension towers. Anchor rods would then be installed to provide dead-ending capability for wire sagging purposes, and also to provide a convenient splicing area. Preliminary stringing (puller/tensioner) and splicing setup areas, specifically within the ANF (Segments 6 and 11), are identified in the Map and Figure Series in the Final EIS.

To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire-stringing activities.

Typically, wire splices occur every 4,500 feet. Splicing is typically performed after the conductor stringing has been completed. Conductor splicing can either be performed on the ground or in the air, depending upon the terrain conditions and the technique used to string and sag the conductor. Typically, the splicing crew would use the designated splice location areas to stage their equipment and perform the tasks necessary to splice the conductors (SCE, 2007b – DR#1: Q080). If splicing is performed in the air, a crane and/or boom truck would be necessary to raise the crew and equipment to the height of the conductors being spliced.

The following four steps describe the wire installation activities proposed by SCE:

**Step 1: Sock Line; Threading:** A helicopter would fly a lightweight sock line from tower to tower, which would be threaded through the wire rollers in order to engage a cam-lock device that would secure the pulling sock in the roller. This threading process would continue between all towers through the rollers of a particular set of spans selected for a conductor pull.

**Step 2: Pulling:** The sock line would be used to pull in the conductor pulling cable. The conductor pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel. A piece of hardware, known as a running board, would be installed to properly feed the conductor into the roller; this device keeps the bundle conductor from wrapping during installation.

**Step 3: Splicing, Sagging, and Dead-ending:** After the conductor is pulled in, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to towers.

**Step 4: Clipping-in, Spacers:** After the conductor is dead-ended, a process called clipping-in is used, which attaches the conductors to all tangent towers. Once the process of clipping-in is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

As noted above, the threading step of wire installation would require helicopter use. While only one small helicopter is needed, two helicopters may be used to shorten the time for this phase. On average, each helicopter would operate 4 hours per day during stringing operations. The operations area of the small helicopter would be limited to helicopter staging areas such as Fox Field and Rio Hondo Substation, locations along the utility corridor that have previously been used for this purpose, and other approved helicopter landing zones. Final siting of staging areas for the TRTP would be conducted with the input of the helicopter contractor, and affected private landowners and land management agencies. The size of each staging area would be dependent upon the size and number of towers to be removed and installed. Staging areas would likely change as work progress along the transmission lines.
Helicopter fueling would occur at staging areas or at a local airport, e.g., Fox Field, using the helicopter contractor’s fuel truck, and would be supervised by the helicopter fuel service provider. The helicopter and fuel truck would stay overnight at a local airport or at a staging area if adequate security is in place.

**Pulling and Splicing Locations**

The dimensions of the area needed for the stringing setups associated with wire installation are variable and depends upon terrain. On average, pulling and splicing equipment set-up sites require an area of 200 feet by 200 feet (0.92 acre); although, the size may vary quite a bit with terrain. In addition, crews can work from within a slightly smaller area when space is limited. These locations require level areas to allow for maneuvering of the equipment. When possible, pulling and splicing locations would be located on existing level areas and existing roads to minimize the need for grading and cleanup. Preliminary wire setup areas (puller/tensioner/splicing), including proposed and alternates, for SCE’s proposed Project within Segments 6 and 11 are identified in the Map and Figure Series.

Each pulling location would include one puller positioned at one end and one tensioner and wire reel stand truck positioned at the other end. Specialized support equipment such as skidders and wire crimping equipment would be strategically positioned to support the operations. The locations for pulling and splicing set-up would be used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each tower, and are necessary as the permanent splices that join the conductor together cannot travel through the rollers. For stringing equipment that cannot be positioned at either side of a dead-end transmission tower, field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension.

The wire setup areas (puller/tensioner/splicing) associated with the project area on the ANF are anticipated to disturb approximately 31 acres. These disturbances would be temporary and the land would be restored to its previous condition following completion of pulling and splicing activities.

**Operations and Maintenance**

Once all elements of the Project are constructed, SCE would operate and maintain all of the components of the Project in accordance with existing SCE procedures and terms and conditions of authorizations. No additional personnel would be required during operations of the new T/L and substation facilities (SCE, 2007b – DR#1: Q006).

Operations and maintenance of the 500-kV and 220-kV T/Ls would involve periodic inspection approximately once per year via helicopter, truck, and/or on foot (to access more remote locations), as required by current SCE Transmission Operations and Maintenance Policies and Procedures (TOM) and as permitted by an Operations and Maintenance Plan approved by the Forest Service (for locations within the ANF). As noted in SCE’s TOM, aerial inspection of overhead transmission lines can be used to enhance the assessment of spacers, conductors and insulators, etc.; however, these inspections do not permit detailed analysis of other components such as foundations, anchors, etc., and therefore cannot be used exclusively to satisfy routine patrol requirements (SCE, 2008m). As such, aerial inspections may be substituted for ground inspection only on alternate years (SCE, 2008m). These policies and procedures are in accordance with the maintenance practices SCE filed with the California Independent System Operator (CAISO), which require that transmission lines be patrolled annually, with more intrusive inspections being performed under abnormal conditions (SCE, 2008n). Routine inspections are inspections that assess the general condition of the transmission facility and are normally conducted by ground patrols, which may be done from a truck, on foot, or by other means. Helicopters are used occasionally for routine work; however, they are primarily used for emergency patrols or infrared scanning. Emergency patrols are performed to ensure that the
transmission facilities do not present a danger to the general public and are not intended to take the place of a routine patrol. Detailed (climbing) inspections, such as checking LSTs for loose steel or worn hardware, are performed on an as-needed basis.

As discussed above, operations and maintenance of the 500-kV and 220-kV transmission lines would involve the use of helicopters. To complete such activities, specifically for those towers installed by helicopter in the ANF, helicopter landing areas throughout the ANF would be needed. SCE has requested that small helicopter landing areas (50-foot by 50-foot) at each of the identified helicopter staging areas not be restored after construction and remain as a permanent features of the Project to support operations and maintenance activities. The specific operation and maintenance needs for these areas will be included in the overall Operations and Maintenance Plan (to be approved by the Forest Service) for the transmission line easement. The only routine maintenance activity for these landing areas would be brush clearance.

Recurring maintenance identified in the inspection process would include vegetation management, invasive plant survey and control, insulator washing, insulator replacement, repair of ground wires, tighten/replacement of guy wires, and adjustments to switch mechanisms (SCE, 2008n). Vegetation management includes pruning and removal of trees, where only those trees that require trimming before the next planned trim cycle would be pruned. Pruning shall achieve clearance requirements plus one year’s growth at time of trimming. Tree removal is the preferred method of vegetation management; however, consideration is given with respect to growth rates, species, environmental and regulatory constraints, property owner approval, and budgetary allowances. Vegetation clearances shall comply with regulations included in GO-95 Rule 35 and related appendices and the required clearances specified in the California Public Resources Code, Section 4292. Within the ANF it is assumed an approximately 20-foot radius from each tower footprint would be kept clear of vegetation. Herbicides, nationally approved by the Forest Service, would be used within the ANF within and along areas of Project disturbance (access/spur roads, laydown and assembly areas, helicopter landing sites, etc.) for control of invasive species, subject to all applicable laws and regulations. ANF-approved herbicides include: Chorsulfuron, Clopyralid, Dicamba, Glyphosate (Accord, Rodeo, Roundup, Roundup Pro), Imazapyr (Arsenal, Chopper, Stalker), Picloram, and Triclopyr (Garlon 3A, Garlon 4). The nature and extent of invasive species control would be further defined in an Operations and Maintenance Plan included in the Special Use authorization issued by the Forest Service. SCE would utilize these same herbicides, in consultation with the respective landowner such as the Corps, to control vegetation around transmission structures in other project areas. Wood pole management includes a structural assessment, which includes a visual inspection of all poles and an intrusive inspection on poles more than 20 years old. Chemical treatment of poles is used when appropriate. Insulator washing is to be performed as dictated by local environmental conditions and operating experience. Lines or line sections that have a history of insulator contamination and flashovers due to insulator contamination would be candidates for insulator washing. Insulator replacement would occur as the need is identified during the inspection process and would be scheduled when resources are available and clearances have been given by the CAISO. When a ground wire problem is identified during an inspection, it would be recorded and scheduled for repair. Similarly, loose or worn hardware, guy wires, and switch mechanisms discovered during an inspection would be recorded and scheduled for repair or repaired during the inspection.

Maintenance of Project facilities would generally be performed on an as-needed basis, including maintenance of the access roads to the final widths that would result from the construction of the Project (final widths are expected to range from 12 to 16 feet), and maintenance of erosion/drainage control structures (SCE, 2007b – DR#1: Q006). Existing road permits within the ANF would be amended or updated to address long term access needs following project construction. Preventative maintenance of telecommunications equipment would be scheduled approximately every six months to ensure system
reliability and performance (SCE, 2007b – DR#1: Q006). General operations and maintenance activities within the ANF would occur according to the terms and conditions of the Special Use authorization to be issued by the Forest Service for the Project (see Section 2.6.4 below); however more extensive maintenance determined by an authorized officer to be outside the scope of approved operation and maintenance plans would require additional approvals/permits from the Forest Service. This level of maintenance may include but is not limited to: drainage repairs, replacement of tower components, or additional slope stabilizations measures undertaken after construction. Operation and maintenance activities on the ANF are expected to change little from what is currently occurring.

Table 4. Summary of the Preferred Alternative on NFS Lands

<table>
<thead>
<tr>
<th>Preferred Alternative (Optimized Helicopter in ANF)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Project Construction</strong></td>
</tr>
<tr>
<td>Total length of 500-kV and 220-kV transmission line (T/L) ROW (miles)</td>
</tr>
<tr>
<td>Total number of new transmission structures (not including 66-kV sub-T/Ls)</td>
</tr>
<tr>
<td>Total land disturbance (acres, ±15%) (Construction / Permanent) On NFS lands</td>
</tr>
<tr>
<td><strong>Segment 11: New Mesa – Vincent (via Gould) 500/220-kV T/L</strong></td>
</tr>
<tr>
<td>Segment Length (miles)</td>
</tr>
<tr>
<td>Distance on NFS lands (miles)</td>
</tr>
<tr>
<td>New transmission structures***</td>
</tr>
<tr>
<td>No. on NFS lands</td>
</tr>
<tr>
<td>No. constructed by helicopter</td>
</tr>
<tr>
<td>Helicopter staging areas</td>
</tr>
<tr>
<td>No. on NFS lands</td>
</tr>
<tr>
<td>Total new/improved/maintained roads (±15%)</td>
</tr>
<tr>
<td>On NFS lands (±15%)</td>
</tr>
<tr>
<td>Newly constructed roads on NFS lands (±15%)</td>
</tr>
<tr>
<td><strong>Segment 6: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and Section of New Mira Loma – Vincent 500-kV T/L</strong></td>
</tr>
<tr>
<td>Segment Length (miles)</td>
</tr>
<tr>
<td>Distance on NFS lands (miles)</td>
</tr>
<tr>
<td>New transmission structures***</td>
</tr>
<tr>
<td>No. on NFS lands</td>
</tr>
<tr>
<td>No. constructed by helicopter</td>
</tr>
<tr>
<td>Helicopter staging areas</td>
</tr>
</tbody>
</table>
Table 4. Summary of the Preferred Alternative on NFS Lands

<table>
<thead>
<tr>
<th>Preferred Alternative (Optimized Helicopter in ANF)</th>
<th>No. on NFS lands</th>
<th>Total new/improved/maintained roads (±15%)</th>
<th>On NFS lands (±15%)</th>
<th>Newly constructed roads on NFS lands (±15%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCE #7</td>
<td></td>
<td>~45.6 miles</td>
<td>~43.3 miles</td>
<td>~1.12 miles</td>
</tr>
<tr>
<td>SCE #8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alt 6 #5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Alt 6 #6</td>
<td></td>
<td></td>
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<tr>
<td>Alt 6 #7</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Alt 6 #13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HAY 1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>HAY 4</td>
<td></td>
<td></td>
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<tr>
<td>HAY 6</td>
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<tr>
<td>HAY 8</td>
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<td></td>
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<tr>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 There are a total of 68 structures on NFS lands in Segment 11; where 59 structures are new and 10 are existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L where new 220-kV conductor would be strung on the vacant side of these structures.

Table 5: Disturbance Acreages Summary for the Preferred Alternative

<table>
<thead>
<tr>
<th>Activity</th>
<th>Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towers Constructed by Helicopter</td>
<td>96</td>
</tr>
<tr>
<td>Tower Sites (Acres of disturbance)</td>
<td>89.08 temporary</td>
</tr>
<tr>
<td></td>
<td>50.09 permanent</td>
</tr>
<tr>
<td>Wire Stringing Areas - pulling/tensioning/splicing</td>
<td>30.54 temporary</td>
</tr>
<tr>
<td>(Acres of disturbance)</td>
<td></td>
</tr>
<tr>
<td>Roads, New Spur - miles</td>
<td>0.61 miles permanent</td>
</tr>
<tr>
<td></td>
<td>1.18 acres permanent</td>
</tr>
<tr>
<td>Roads, Reconstruction - miles</td>
<td>15.06 miles permanent</td>
</tr>
<tr>
<td></td>
<td>29.21 acres permanent</td>
</tr>
<tr>
<td>Roads, Maintenance - qty miles ^2 - Impacted area of roads only</td>
<td>54.55 miles * 5 feet disturbance = 33.06 acres temporary</td>
</tr>
<tr>
<td>(Acres of disturbance)</td>
<td></td>
</tr>
<tr>
<td>Staging Areas, Material and Equipment ^2 (Acres of disturbance)</td>
<td>Not calculated*</td>
</tr>
<tr>
<td>Helicopter Staging/Support Areas (Acres of disturbance)</td>
<td>15 areas = 58.72 acres temp.</td>
</tr>
<tr>
<td></td>
<td>0.86 acres permanent</td>
</tr>
<tr>
<td>Helicopter Landing Pads ^6 (Acres of disturbance)</td>
<td>3.53 acres temp.</td>
</tr>
<tr>
<td></td>
<td>2.65 acres perm.</td>
</tr>
<tr>
<td>Helicopter Support Yards ^5 (Acres of disturbance)</td>
<td>6.89 acres temp.</td>
</tr>
<tr>
<td>Misc. Acres of Disturbance ^6 – Acres of disturbance</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Estimated</strong></td>
<td><strong>253.32 Temp/85.1 Perm</strong></td>
</tr>
</tbody>
</table>

^1 - For this exercise, these are assumed to be located at HAYs, off the forest, or in pre-disturbed areas, and therefore are not considered.
**Project Analysis Area and Scope of Analysis**

The project area is defined as the Project ROW plus a 1,000-foot buffer around the ROW up to a 2 mile buffer around the ROW depending on the species. Where access roads or staging areas fall outside of the 1,000-foot corridor, those are included as part of the project area (this generally occurs on the ANF). The Project footprint includes only areas proposed for disturbance, such as tower sites, staging areas, and spur roads.

The area considered in the analysis of the effects to each species associated with the TRTP generally encompasses the project area. However, the analysis area was modified in some cases commensurate with the life history of the species being evaluated. For example, for some plant species the area of potential effects is limited to the actual disturbance areas (tower sites, etc.) and a small buffer around the proposed disturbance site. This buffer considers potential effects from fugitive dust and hydrological alterations from grading or vegetation clearing. For songbirds, a one-mile buffer around the Project was utilized as the analysis area because high mobility and potential disturbance from helicopter use could lead to effects to these species far from the actual Project alignment.

**Applicant-Proposed Measures**

Applicant-proposed measures (APMs) are environmental commitments that were identified by SCE as part of the proposed TRTP Project description. Table 5 presents the APMs that are relevant to the issue area of biological resources.

<table>
<thead>
<tr>
<th>Table 6. Applicant-Proposed Measures – Biological Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APM BIO-1</strong></td>
</tr>
<tr>
<td><strong>APM BIO-2</strong></td>
</tr>
<tr>
<td><strong>APM BIO-3</strong></td>
</tr>
<tr>
<td><strong>APM BIO-4</strong></td>
</tr>
<tr>
<td><strong>APM BIO-5</strong></td>
</tr>
</tbody>
</table>
Table 6. Applicant-Proposed Measures – Biological Resources

| APM BIO-6 | A Worker Environmental Awareness Program (WEAP) would be prepared and all construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would include a review of the special-status species and other sensitive resources that could exist in the Project area, the locations of the sensitive biological resources, their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all personnel trained would be maintained. |
| APM BIO-7 | Where significant and unavoidable impacts on any special-status resources cannot be avoided, SCE would conduct compensatory mitigation as determined by the regulatory agency. |
| APM BIO-8 | SCE would conduct project-wide raptor surveys and remove trees, if necessary, outside of the nesting season (1 February – 31 August). If a tree or pole containing a raptor nest must be removed during the nesting season, or if work is scheduled to take place in close proximity to an active nest on an existing transmission tower or pole, SCE would coordinate with the CDFG and FWS and obtain written concurrence prior to moving the nest. |

Mitigation Measures

The EIR/EIS completed for the TRTP identified several Biological Mitigation Measures that would reduce or avoid impacts to Forest Service Sensitive species. The Mitigation Measures will be adopted as part of the approval process for the project and are identified below.

AQ-1a Implement Construction Fugitive Dust Control Plan. SCE shall develop a Fugitive Dust Emission Control Plan (FDECP) for construction work. The Plan shall be completed prior to construction and approved by the CPUC and FS. This Plan is in addition to any fugitive dust control plan required by the South Coast Air Quality Management District (SCAQMD). Measures to be incorporated into the plan shall include, but are not limited to the following:

- Non-toxic soil binders, equivalent or better in efficiencies than the CARB approved soil binders, shall be applied per manufacturer recommendations to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction to reduce fugitive dust emissions. On NFS lands, SCE shall obtain FS approval of any soil binders to be used.

- Unpaved road travel will be limited to the extent possible by limiting the travel of heavy equipment in and out of the unpaved areas (move from construction site to construction site rather than back to marshalling or staging areas daily); through carpooling/busing construction workers to the maximum feasible extent; and by developing travel routes to each construction site that minimize unpaved road travel to the extent possible, according to USFS or other regulatory agency road use restriction. The FDECP will include a road travel plan applicable for construction sites with unpaved access greater than one mile.

- Water the disturbed areas of the active construction sites at least three times per day and more often if uncontrolled fugitive dust is noted.

- Enclose, cover, water twice daily, and/or apply non-toxic soil binders according to manufacturer’s specifications to exposed piles with a five percent or greater silt content.

- Maintain unpaved road vehicle travel to the lowest practical speeds, and no greater than 15 miles per hour (mph), to reduce fugitive dust emissions.
- All vehicle tires shall be inspected, are to be free of dirt, and washed as necessary prior to entering paved roadways.
- Install wheel washers or wash the wheels of trucks and other heavy equipment where vehicles exit unpaved access to the construction sites.
- Cover all trucks hauling soil and other loose material, or require at least two feet of freeboard.
- Establish a vegetative ground cover (in compliance with biological resources impact mitigation measures) or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites within 21 days after active construction operations have ceased.
- Increase the frequency of watering, if water is used as a soil binder for disturbed surfaces, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 mph.

SCAQMD Rule 403 Best Available Control Measures (BACM) are required to be proposed in the FDECP and implemented when and if the BACM are as strict, or stricter than the control measures listed above. Additionally, mitigation measures provided on the SCAQMD CEQA website Tables XI-A through XI-E (http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html or as updated by SCAQMD) must be implemented in the FDECP were applicable. This mitigation measure covers construction work performed within all three local air quality jurisdictions.

B-1a Provide restoration/compensation for impacts to native vegetation communities. The intent of this mitigation measure is to require SCE to restore disturbed sites to pre-construction conditions or the desired future conditions per the Angeles National Forest (ANF), Land Management Plan (LMP). Prior to construction SCE shall have a qualified biologist, where concurrence on the biologist has been provided by the CPUC and FS, document the community type and acreage of vegetation that would be subject to Project disturbance. Impacts to all oaks and native trees (with >3 inch diameter at breast height [DBH]), with the exception of native conifers, which will be recorded regardless of size, will be documented by identifying the species, number, location, and DBH. On non-Federal lands all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. Tree removal shall not be permitted until replacement trees have been planted or transplanting sites are approved.

For NFS lands, the FS shall prepare a Habitat Restoration and Revegetation Plan in discussion with SCE for the Project, which shall include plans for restoration, enhancement/re-vegetation and/or mitigation banking. For non-Federal lands SCE shall prepare the Habitat Restoration and Revegetation Plan. Both plans shall include at minimum: (a) the location of the mitigation site (off site mitigation may be required); (b) locations and details for top soil storage (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bareroot or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program; j) locations and impacts to all oaks and native trees (over 3 inches DBH), k) locations of temporary or permanent gates, barricades, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the FS (NFS lands only).

SCE shall utilize a CPUC/FS/USACE/State Parks (for Alternative 4 only)-approved locally collected seed mix, locally collected cuttings, bare-root stock, etc. to revegetate areas disturbed by construction activities. All habitats dominated by non-native species prior to Project disturbance shall be revegetated using appropriate native species. FS approval is required for seeding on NFS.
land. The seed mix shall consist of native, locally occurring species collected from local seed sources. Cuttings and bare-root stock shall be of local origin. Restoration shall include the revegetation of stripped or exposed work sites and/or areas to be mitigated with vegetation native to the area. No commercially purchased seeds, stock, etc. will be accepted without the approval of the FS on NFS lands and must be certified to be free of noxious weeds. Revegetation shall include ground cover, grass, shrub, and tree species in order to match disturbed areas to surrounding conditions and to restore or improve wildlife habitat quality to pre-project or higher levels. The Habitat Restoration and Revegetation Plan shall also include a monitoring element. Post seeding and planting monitoring will be yearly from years one to five and every other year from years six to ten, or until the success criteria are met. SCE shall restore temporarily disturbed areas, including existing tower locations that are to be removed by the Project, to pre-construction conditions or the desired future conditions per the LMP. If the survival and cover requirements have not been met, SCE is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned.

The FS will conduct a preconstruction evaluation of the probable impacts to all oaks and native trees in all construction-related disturbance areas. This evaluation shall be incorporated into the Habitat Restoration Plan and shall include the species and number of individuals, their DBH, location and potential impact type. Construction within the driplines of all native trees and oak trees/shrubs, and incidental trimming or damage to trees along the proposed access/spur routes shall not occur until the trees are evaluated by an FS botanist or qualified arborist. This person shall identify appropriate measures to minimize tree loss, such as the placement of fence around the dripline, padding vehicles, minimizing soil removal or addition around driplines, and the placement of matting under the existing dripline during construction activities. On the ANF, if a tree must have any construction-related activities such as equipment or soil staging within the drip zone, root pruning, or excessive branch pruning (greater than 25% in one year), then the tree must be monitored for five years for tree mortality. If any of these identified trees dies during the monitoring period, then the tree must be mitigated at the rate appropriate to the DBH.

The replacement ratios (using rooted plants in liners or direct planting of acorns [for oaks]) for native trees or any oaks which are to be removed shall be as follows: native conifers located in with DBH’s less than 3 inches will be replaced at 2:1; all trees from 3 to 5 inches DBH shall be replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; trees from 24 to 36 inches shall be replaced at 15:1; and all oaks greater than 36 inches shall be replanted at a ratio of 20:1. The replacement ratio for damaged trees shall be 2:1 for trees with DBH less than 12 inches and a 5:1 ratio for trees with DBH greater than 12 inches. The DBHs for scrub oaks will be measured following DFG guidelines. On the ANF any oak or native tree which must be removed or killed as a result of construction or other Project-related activities shall be replaced in kind or mitigated at a comparable value. Compliance shall be evaluated annually for years one to five and bi-annually for years six to ten (years after tree planting). Trees shall be planted at locations acceptable to the landowner or managing agency. All planting locations, procedures, and results shall be evaluated by a qualified arborist and FS botanist. On non-Federal lands all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance.

Permanent impacts on federal lands shall be determined by the appropriate federal manager (FS and USACE) and on non-federal lands shall be determined by the CPUC at the ratios stated below or at a comparable value. On NFS lands impacts will be considered permanent if they are not likely to recover after ten years post-disturbance. Where onsite restoration is planned for mitigation of temporary impacts to vegetation communities, SCE shall identify a Habitat
Restoration Specialist, where concurrence has been provided by the CPUC/FS, to implement the method of restoration outlined by the FS in the Habitat Restoration Plan.

The creation or restoration of habitat shall be monitored annually for years one to five on both FS lands and private/State/USACE lands and bi-annually for years six to ten on FS lands, or until the success criteria are met, after mitigation site construction to assess progress and identify potential problems with the restoration site. Remediation activities (e.g. additional planting, removal of non-native invasive species, or erosion control) shall be taken during the ten-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance criteria after the ten-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the ten-year period until the criteria are met or unless otherwise specified by the CPUC/FS/USACE/State Parks (as appropriate). If a fire occurs in a revegetation area within the ten year monitoring period, SCE shall be responsible for a one-time replacement. If a second fire occurs, no replanting is required, unless the fire is caused by SCE activity. Off-site mitigation for NFS and non-NFS lands may be required if mitigation rates exceed what can be achieved on NFS land. This may be in the form of funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts.

During and after construction, FS-identified entrances to access roads on NFS lands shall be gated or blockaded in some manner and maintained to prevent the unauthorized use of these roads by the general public. Signs prohibiting unauthorized use of the access roads shall be posted on these gates.

<table>
<thead>
<tr>
<th>Table 7. Mitigation Ratios for Impacts to Vegetation Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vegetation Community</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Woodland Vegetation</td>
</tr>
<tr>
<td>Bigcone Douglas Fir-Canyon Oak Forest</td>
</tr>
<tr>
<td>Canyon Oak Forest</td>
</tr>
<tr>
<td>California Bay Forest</td>
</tr>
<tr>
<td>California Walnut Woodland</td>
</tr>
<tr>
<td>Coast Live Oak Woodland</td>
</tr>
<tr>
<td>Coulter Pine Forest</td>
</tr>
<tr>
<td>Joshua Tree Woodland</td>
</tr>
<tr>
<td>Mojavean Pinyon Woodland</td>
</tr>
<tr>
<td>Non-native Woodland</td>
</tr>
<tr>
<td>Yellow Pine Forest (Plantation)</td>
</tr>
<tr>
<td>Shrub-dominated Vegetation</td>
</tr>
<tr>
<td>Big Sagebrush Scrub</td>
</tr>
<tr>
<td>Coastal Sage Scrub</td>
</tr>
<tr>
<td>Desert Saltbush Scrub</td>
</tr>
<tr>
<td>Chamise Chaparral</td>
</tr>
<tr>
<td>Mixed Chaparral</td>
</tr>
<tr>
<td>Scrub Oak Chaparral</td>
</tr>
<tr>
<td>Interior Live Oak Scrub</td>
</tr>
<tr>
<td>Vegetation Community</td>
</tr>
<tr>
<td>----------------------</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Mojave Creosote Bush Scrub</td>
</tr>
<tr>
<td>Mojave Mixed Woody Scrub</td>
</tr>
<tr>
<td>Mojavean Juniper Woodland and Scrub</td>
</tr>
<tr>
<td>Mojavean Pinyon and Juniper Woodland, Recently Burned</td>
</tr>
<tr>
<td>Mulefat Scrub</td>
</tr>
<tr>
<td>Rabbitbrush Scrub</td>
</tr>
<tr>
<td>Restoration – California Buckwheat Scrub</td>
</tr>
<tr>
<td>Riversidean Alluvial Fan Sage Scrub</td>
</tr>
<tr>
<td><strong>Riparian Vegetation</strong></td>
</tr>
<tr>
<td>Desert Wash</td>
</tr>
<tr>
<td>Ruderal Wetland</td>
</tr>
<tr>
<td>Exotic-Giant Reed</td>
</tr>
<tr>
<td>Southern Arroyo Willow Riparian Forest</td>
</tr>
<tr>
<td>Southern Coast Live Oak Riparian Forest</td>
</tr>
<tr>
<td>Southern Cottonwood Willow Riparian Forest</td>
</tr>
<tr>
<td>Southern Sycamore-Alder Riparian Forest</td>
</tr>
<tr>
<td>Southern Willow Scrub</td>
</tr>
<tr>
<td>Sparsely Vegetated Streambed</td>
</tr>
<tr>
<td><strong>Herbaceous Vegetation</strong></td>
</tr>
<tr>
<td>Bunchgrass Grassland</td>
</tr>
<tr>
<td>California Annual Grassland</td>
</tr>
<tr>
<td>Deerweed and Chia Herbaceous Field, Recently Burned</td>
</tr>
<tr>
<td>Desert Bunchgrass Grassland</td>
</tr>
<tr>
<td>Wildflower Field</td>
</tr>
<tr>
<td><strong>Anthropogenic Vegetation</strong></td>
</tr>
<tr>
<td>Agriculture</td>
</tr>
<tr>
<td>Barren/developed</td>
</tr>
<tr>
<td>Ruderal Grassland</td>
</tr>
</tbody>
</table>
Table 7. Mitigation Ratios for Impacts to Vegetation Communities

<table>
<thead>
<tr>
<th>Vegetation Community</th>
<th>Mitigation Ratios – Non-NFS Lands</th>
<th>Mitigation Ratios – NFS/Federal Lands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temporary Impacts</td>
<td>Permanent Impacts</td>
</tr>
</tbody>
</table>

Ratios on Non-NFS Lands may be adjusted based on existing site conditions and disturbance levels with approval of the CPUC. Ratios could range from 0.5 to maximum noted in this Table based on site evaluation.

*Non-native habitats will be reseeded with a native seed mix. Barren areas will be mitigated at a 1:1 ratio if they are determined to support sensitive wildlife (i.e. burrowing owls, etc.)

B-1b **Implement a Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) shall be implemented for construction crews by a qualified biologist(s) provided by SCE, where concurrence has been provided by the CPUC/FS prior to the commencement of construction activities. Training materials and briefings shall include but not be limited to: discussion of the Federal and State Endangered Species Acts, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act; the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS lands and identification of FS sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. The WEAP shall also include the protocol to be followed when road kill is encountered in the work area or along access roads to minimize potential for additional mortality of scavengers, including listed species such as the California condor. On NFS lands, road kill shall be reported to the FS or other applicable agency within 24 hours. On non-NFS lands, road kill shall be reported to the appropriate local animal control agency within 24 hours. Training materials and a course outline shall be provided to the CPUC and FS for review and approval at least 30 days prior to the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (i.e., limited operating periods) will be provided to the environmental monitors and construction crews prior to ground disturbance. SCE shall provide to the CPUC and FS a list of construction personnel who have completed training prior to the start of construction, and this list shall be updated by SCE as required when new personnel start work. No construction worker may work in the field for more than 5 days without participating in the WEAP.

B-1c **Treat cut tree stumps with Sporax.** All stumps of trees (conifers and hardwoods) 3 inches DBH or greater resulting from activities associated with construction of the Project shall be treated with Sporax according to product directions to prevent the spread of annosus root disease. Only licensed applicators shall apply Sporax. Sporax shall not be used during rain events unless otherwise approved by the CPUC/FS/USACE.

B-2 **Implement RCA Treatment Plan.** SCE shall not construct or modify any structure, culvert, or bridge or modify any habitat without the appropriate permits from regulatory agencies. SCE shall not construct or modify any structure, culvert, or bridge or modify any habitat on NFS lands in Riparian Conservation Areas (RCAs) without the authorization of the FS. Vegetation removal or road construction shall not occur in RCAs during the breeding season for nesting birds (February 1-August 15), unless a nesting bird survey determines that there are no nesting birds. SCE shall prepare and implement a FS RCA Treatment Plan for the Project. This Plan shall include the specific activities that will occur at each of the RCA points crossed by the Project including the
amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan shall include timing restrictions for vehicle or equipment passage, restrictions on what activities may occur such as grading, vegetation removal or tree trimming, monitoring requirements, seasonal restrictions, and restoration requirements. This Plan shall be submitted to the FS for approval prior to construction or the grading of any access road. The Plan shall also be submitted to the CPUC for review.

**B-3a Prepare and implement a Weed Control Plan.** SCE shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS lands for pre-construction and construction invasive weed abatement. The long term Weed Control Plan, including monitoring and eradication, will be defined as part of the 50 year Operations and Maintenance Permit. On the ROW easement lands administered by the FS, the Weed Control Plan shall incorporate all appropriate and legal agency-stipulated regulations. The Weed Control Plan shall be submitted to the FS for final authorization of weed control methods, practices, and timing prior to implementation of the Weed Control Plan on public lands. ROW easements located on private lands shall include adaptive provisions such as wheel and equipment washing for the implementation of the Weed Control Plan. The Weed Control Plan shall include the following:

- A pre-construction weed inventory shall be conducted by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC, 2006); and (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the FS as species of priority (for NFS lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated prior to construction according to control methods and practices for invasive weed populations designed in consultation with the FS. The Weed Control Plan shall be updated and utilized for eradication and monitoring post construction.

- Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the FS. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the CPUC/FS, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the FS. In riparian areas only water-safe herbicides shall be used. Herbicides shall not be applied when wind velocities exceed 5 mph. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the FS. The timing of the weed control treatment shall be determined for each plant species in consultation with the FS (on NFS lands) with the goal of controlling populations before they start producing seeds.

- No surfactants will be used in the formulation of any herbicide used on the project, and a benign marker dye will be used to detect the area of application. Herbicide use will be conducted between mid-September and January 31 to avoid the breeding season in known occupied areas for the least Bell’s vireo, southwestern willow flycatcher, western yellow-billed cuckoo, and gnatcatcher, and the spawning season for Santa Ana sucker. In areas known to be occupied by the California red-legged frog, herbicide application would not occur between November 1 and March 31 to avoid the breeding season. To reduce the chance of spillage, work crews will only carry one gallon (3.8 liters) of herbicide into treatment areas
at a time. A qualified botanist/biologist will identify access paths to the treatment areas and check for threatened and endangered plant species prior to herbicide treatment. If listed species are located, they will be flagged and avoided. Number of work crew members and trips to treatment areas will be kept to a minimum. Crew members will avoid wading through streams whenever possible.

- Cut giant reed stalks will be stacked and dried away from streams or wet areas to prevent reinfestation.

For the preconstruction and construction of the Project, measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows.

- On the ANF, from the time construction begins until ten years after construction is complete, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required at all sites impacted by construction (tower pads, staging areas, landing zones, etc.), including access/spur roads disturbed during the Project. Surveying and monitoring for weed infestations shall occur annually for years one to five and bi-annually for years six to ten. Treatment of all identified weed populations shall occur at a minimum of once annually. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that impact site.

- During Project preconstruction and construction, all seeds and straw materials shall be weed-free rice straw, and all gravel and fill material shall be certified weed free by the county Agriculture Commissioners’ Offices. Any deviation from this will be approved by a FS botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the CPUC and FS.

- During Project preconstruction and construction, vehicles and all equipment shall be washed (including wheels, undercarriages, and bumpers) before and after entering FS identified areas. On non-NFS lands vehicles and equipment shall be washed prior to commencing work in off road areas. Vehicles shall be cleaned at existing construction yards or legally operating car washes. SCE shall document that all vehicles have been washed prior to commencing project work. In addition, tools such as chainsaws, hand clippers, pruners, etc. shall be washed before and after entering all Project work areas. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the FS. A written daily log shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the CPUC and FS for inspection at any time and shall be submitted to the CPUC and FS on a monthly basis.

- During Project operation and maintenance activities, clear and dispose of weeds in assembly yards, helicopter landing areas, tower pads, spur roads, staging areas, and any other disturbance areas in a FS-approved method.

**B-3b Remove weed seed sources from construction access routes.** Prior to construction, SCE shall initiate invasive species eradication identified in the following Table. These populations were identified as small and isolated but having the potential to spread aggressively during construction. Post construction, these isolated populations will be included and treated according to the restoration plan. Per the FSM 2080 BMP guideline, SCE shall also remove or reduce sources of weed seed along the travel routes associated with Project construction identified in Figures A-2 through A-4 of Appendix A of the *Biological Specialist Report* (Aspen and H.T. Harvey & Associates, 2009) to prevent the introduction or control the spread of noxious weeds by mowing or other control methods to substantially reduce seed production in these infestations.
during Project construction. Following Project approval and during the time of year when weed species can be observed and identified, SCE shall identify, using a qualified plant ecologist, any other weed seed sources that could contribute to Project-related weed spread on the ANF. The following weed populations, and any other target infestations identified by Project surveys, should be controlled prior to construction. SCE shall initiate eradication of the following weed populations and any other isolated, target infestations discovered during pre-construction surveys along construction routes.

### Table 8. Weed Populations Along Construction Routes*

<table>
<thead>
<tr>
<th>ANF Road Location</th>
<th>Noxious Weeds Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>4N41</td>
<td>Isolated patch of Spanish broom</td>
</tr>
<tr>
<td>3N20</td>
<td>Isolated patches of Spanish broom, Scotch broom, and rockrose</td>
</tr>
<tr>
<td>3N23</td>
<td>Giant reed population in creek adjacent to road</td>
</tr>
<tr>
<td>2N23</td>
<td>Scattered Spanish broom infestations of a range of population sizes and densities. Some of the large populations along these routes observed during Project surveys had been recently brushed for weed control by SCE contractors, but these populations should be rechecked and control efforts reapplied as necessary. Also isolated patches of tree tobacco, rockrose, horehound, and tocalote.</td>
</tr>
<tr>
<td>2N24</td>
<td>Scattered, isolated patches of Spanish broom and rockrose</td>
</tr>
<tr>
<td>2N25.2</td>
<td>Scattered, isolated patches of Spanish broom, rosemary, rockrose, and horehound</td>
</tr>
<tr>
<td>2N30.1</td>
<td>One isolated patch of Spanish broom</td>
</tr>
<tr>
<td>2N30.2</td>
<td>Scattered Spanish broom, bull thistle, tree of heaven, black locust, tocalote, rockrose, eupatory, horehound, smilo grass, and tree tobacco infestations of a range of population sizes and densities.</td>
</tr>
<tr>
<td>3N27 north of Big Tujunga Creek to Mt. Gleason Rd</td>
<td>Scattered, isolated patches of Spanish broom</td>
</tr>
<tr>
<td>2N45</td>
<td>Moderate patch of giant reed and tree of heaven</td>
</tr>
<tr>
<td>2N65.1</td>
<td>Moderate infestation of tree spurge</td>
</tr>
<tr>
<td>2N65.2</td>
<td>Moderate infestation of Spanish broom and thoroughwort</td>
</tr>
<tr>
<td>2N66</td>
<td>Moderate patch of Spanish broom and tree of heaven</td>
</tr>
<tr>
<td>2N75</td>
<td>Moderate patch of Spanish broom</td>
</tr>
<tr>
<td>2N79</td>
<td>Isolated patch of Spanish broom</td>
</tr>
<tr>
<td>1N36</td>
<td>Scattered Spanish broom, bull thistle, tree of heaven, black locust, tocalote, rockrose, Canadian thistle, hairy vetch, smilo grass, and tree tobacco infestations of a range of population sizes and densities.</td>
</tr>
<tr>
<td>Road west out of Shortcut Station</td>
<td>Isolated patches of Spanish broom</td>
</tr>
</tbody>
</table>

*Specific locations are found in Figures A-2 through A-4 of Appendix A of the Biological Specialist Report Noxious Weed Assessment. [Aspen and H.T. Harvey & Associates, 2009]*

### B-3c Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.

Prior to construction and during each year of use for construction at all assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF, weed infested areas should be mowed and/or treated as appropriate for the individual weed species under the guidance of a qualified plant ecologist or restoration ecologist, where concurrence on the ecologist has been provided by the FS. Unless otherwise authorized by the FS, weed control efforts in these areas shall be timed annually to reduce shortpod mustard, tocalote,
and other noxious weed seed production, by mowing or weed-whacking infestations when flowering has just started, but before seeds have been produced. All plant debris shall be disposed of at a FS/CPUC-approved location. Weed control efforts shall commence in early spring (February – March), as indicated annually by a qualified plant ecologist or restoration ecologist in coordination with a FS botanist or Forest Weed Specialist.

B-5  **Conduct pre-construction surveys and monitoring for breeding birds.** SCE shall conduct pre-construction surveys for nesting birds if construction and removal activities are scheduled to occur during the breeding season. Surveys shall be conducted in areas within 500 feet of any area proposed for project disturbance. Surveys for birds shall be conducted for all areas from February 1 to August 15. The required survey dates may be modified based on local conditions (i.e., high altitude locations) with the approval of the CPUC, California Department of Fish and Game (CDFG), USACE, and/or FS. SCE shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The resume of the proposed biologists will be provided to the CPUC, USACE, and FS for concurrence prior to ground disturbance. On NFS lands, the FS shall apply the FS Land Management Plan Standard S18 (Part 3 of the Land Management Plan), which states “Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging.” On both NFS and non-NFS lands, if breeding birds with active nests are found, a biological monitor shall establish a 300-foot buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The 300-foot (660-foot eagle and one-mile helicopter) buffer may be adjusted to reflect existing conditions including ambient noise, topography, and disturbance with the approval of the U.S. Fish and Wildlife Service (FWS), CPUC, USACE, CDFG, or FS, as appropriate. On NFS lands, the FS shall have the authority to define/redefine such buffers. The biological monitors shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. The biological monitors shall be responsible for documenting the results of the surveys and the ongoing monitoring and will provide a copy of the monitoring reports for impact areas to the respective agencies (e.g., On NFS lands documentation will be provided to the Forest Biologist). If for any reason a bird nest must be removed during the nesting season, SCE shall provide written documentation providing concurrence from the FWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the FS. On USACE lands, this will include coordination and written approval by the USACE. SCE shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent.

B-7  **Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.** SCE shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate plants in all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by a qualified plant ecologist/biologist according to protocols established by the FWS, CDFG, FS, and
California Native Plant Society (CNPS). The resume of the proposed biologists will be provided to the CPUC and FS for concurrence prior to ground disturbance. All listed plant species found shall be marked and avoided. If a federally listed plant species cannot be avoided on private land, consultation with FWS will occur.

Prior to site grading, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance including human trampling, erosion, and dust. The size of the buffer depends upon the proposed use of the immediately adjacent lands, and includes consideration of the plant’s ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or Forest botanist. At minimum, the buffer shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) in order to protect and preserve the root systems of the plant. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the FS, USACE, and CPUC. If impacts to listed plants are determined to be unavoidable, the FWS shall be consulted for authorization, through the context of a Biological Opinion.

**B-8b Conduct biological monitoring.** SCE shall provide a qualified biologist with demonstrated expertise with the listed wildlife species likely to occur in the Project area. This person(s) shall monitor all construction activities daily within suitable habitat for listed or sensitive wildlife. The resumes of the proposed biologists will be provided to the CPUC, USACE, and FS for concurrence prior to the onset of ground-disturbing activities.

**B-12 Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms.** On or near the West Fork Cogswell road, SCE will pre-stage a complete hazardous material spill kit(s) capable of containing the largest potential vehicle spill of gasoline, diesel, or other hazardous materials. The kit(s) will be located and maintained in areas accessible to crews in the event a bridge or other road blockage has occurred. Contents of the kit(s) will be approved by the Angeles National Forest. A biological monitor with knowledge of the special-status fishes known to occur in the area will inspect the roadway a minimum of three times a day from October 1 to April 30 and one time a day from May 1 through September 30 during construction, to inspect for leaks, spills, or other debris that may enter the San Gabriel River. Spills on the roadway will be logged and reported to the Angeles National Forest and California Public Utilities Commission monitor weekly and cleaned up immediately. Any spills along this road will be reported to the Angeles National Forest and California Public Utilities Commission within 1 hour.

No loitering, maintenance, refueling, or equipment staging will occur on the West Fork Cogswell road. Prior to vehicle access, metal plates, bridges, or other Angeles National Forest-approved structures will be placed above all wet crossings, if deemed necessary by the Angeles National Forest.

Prior to any work in the San Gabriel River, Big Tujunga River, or their tributaries where flowing or ponded water is present, SCE will conduct surveys for fish and other special-status aquatic organisms. The species noted in the project area will be reported to the Angeles National Forest. No work will be conducted in the flowing portion of the stream and water will be diverted around the work area in a manner that does not restrict the movement of aquatic organisms. Block nets or other barriers may be required, if deemed necessary by the Angeles National Forest, and if fish or other special-status species are present. Block nets will not be used in areas supporting Santa Ana suckers and Santa Ana suckers will not be captured or handled. All activities on Forest Service lands that occur within ponded or flowing water will be coordinated with the Angeles National
Forest. Quarterly, SCE will prepare a report documenting the type and number of species located and any actions taken to relocate or exclude the species for the duration of construction work in the San Gabriel and Big Tujunga rivers. This will be reported to the Angeles National Forest and California Public Utilities Commission no later than 30 days following the completion of work at the San Gabriel or Big Tujunga rivers.

If Santa Ana suckers occur in portions of the creek where construction activities are scheduled to occur, SCE will retain a qualified biologist with a Service permit for the Santa Ana sucker to monitor all construction activities in Santa Ana sucker occupied habitat and assist SCE in the implementation of the monitoring program. The résumés of the proposed biologists will be provided to the California Public Utilities Commission and Angeles National Forest for concurrence. The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed.

B-23 Preserve off-site habitat/management of existing populations of special-status plants. SCE shall conduct rare plant surveys, and implement avoidance/minimization/compensation strategies. SCE shall conduct surveys according to established and accepted protocol during the floristic period appropriate for each of the rare plant species identified with the potential to occur within the Project ROW and within 100 feet of all surface-disturbing activities. The completion of these surveys shall be coordinated with the CPUC and federal land manager. Populations of rare plants shall be flagged and mapped prior to construction. If rare plants are located during the focused surveys, then modification of the placement of structures, access roads, laydown areas, and other ground-disturbing activities would be implemented in order to avoid the plants, if feasible. A report of special-status plants observed shall be prepared and submitted to the CPUC, State Parks (for activities in CHSP associated with Alternative 4), and the federal land manager (FS and USACE). Impacts to non-listed plant species (i.e., FS Sensitive, CNPS List 1,2 and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other FS, USACE, and CPUC approved methods. For FS lands if the ANF determines Project activities will result in the loss of a significant portion of the known individuals of FS Sensitive plant species, and reseeding/transplanting are not feasible options, SCE shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted). The determination of a significant rare plant population loss will be decided by the ANF botanist on a species and location basis, after available literature, research, and overall species distribution are reviewed. If avoidance, reseeding/transplanting, and, preservation of off-site habitat occupied by the impacted species are not found to be possible, the ANF will consider off-site restoration of degraded ANF lands and/or preservation of non-public lands with suitable habitat for the impacted species. The preserved habitat shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified plant ecologist.

All special-status plant species impacted by Project activities shall be documented in an annual report and submitted to the CPUC and federal land manager (FS and USACE). Where reseeding has occurred, SCE shall track the success of the plants during the course of the annual restoration monitoring. This information shall be submitted as part of the annual report to the CPUC and federal land manager (FS and USACE).

B-24 Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures. A qualified biologist shall conduct focused surveys for southwestern pond turtle in the area of Project crossings, including access and spur roads, at Amargosa Creek, Big Tujunga Creek (Segment 6), Alder Creek, Rio Hondo Substation, Whittier Narrows Recreation Area, Aliso Creek, and Tonner Creek. Since Southwestern pond turtles were observed at the San Gabriel River (Segments 6 and 7 and West
Fork/Cogswell Road) and Brea Canyon during reconnaissance surveys conducted in September 2007, the species shall be assumed present at these locations. The resume of the proposed biologists will be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall also occur on access and spur roads where road crossings could affect suitable habitat for this species. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 June. The survey schedule may be adjusted in consultation with the CPUC, FS, and/or USACE, as appropriate, to reflect the existing weather or stream conditions. If southwestern pond turtles are detected in or adjacent to the Project, nesting surveys shall be conducted.

Focused surveys for evidence of southwestern pond turtle nesting shall be conducted in, or adjacent to, the Project when suitable nesting habitat exists within 1,300 feet of occupied habitat in an area where Project-related ground disturbance will occur (i.e., tower sites, access/spur roads, wire setup sites, marshalling yards). If both of those conditions are met, a qualified biologist shall conduct focused, systematic surveys for southwestern pond turtle nesting sites. The survey area shall include all suitable nesting habitat located within 1,300 feet of occupied habitat in which Project-related ground disturbance will occur. This area may be adjusted based on the existing topographical features on a case-by-case basis with the approval of the CPUC, FS, and/or USACE, as appropriate. Surveys will entail searching for evidence of pond turtle nesting, including remnant eggshell fragments, which may be found on the ground following nest depredation.

If a southwestern pond turtle nesting area would be adversely impacted by construction activities, SCE shall avoid the nesting area. If avoidance of the nesting area is determined to be infeasible, the authorized biologist shall coordinate with CDFG, CPUC, FS (on NFS lands), and USACE (on Army Corps lands) to identify if it is possible to relocate the pond turtles. Eggs or hatchlings shall not be moved without the written authorization from the CDFG and FS (on NFS lands).

A qualified biologist with demonstrated expertise with southwestern pond turtles shall monitor construction activities where pond turtles are present or assumed present. The resume of the proposed biologist will be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to the onset of ground-disturbing activities. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to, or within, habitat that supports populations of southwestern pond turtles.

If the installation of fencing is deemed necessary by the authorized biologist, one clearance survey for southwestern pond turtles shall be conducted at the time of the fence installation. Clearance surveys for southwestern pond turtles shall be conducted by the authorized biologist prior to the initiation of construction each day.

B-25 Conduct focused surveys for two-striped garter snakes and implement monitoring, avoidance, and minimization measures. A qualified biologist shall conduct focused surveys for two-striped garter snakes (both on and off NFS lands) where suitable habitat is present and directly impacted by construction, vehicle access, or maintenance. The resume of the proposed biologists will be provided to the CPUC, FS and USACE (as appropriate) for concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 September. The survey schedule may be adjusted in consultation with the CPUC, FS, and/or USACE to reflect the existing weather or stream conditions. If this species is detected in or adjacent to the Project or at any wet fords to be traversed by motorized vehicles as part of Project construction activities, the following minimization measures will be required. SCE shall retain a qualified herpetologist with demonstrated expertise with garter snakes to monitor construction activities. The resume of the proposed biologist will be provided to the CPUC, FS, and USACE
(as appropriate) for concurrence prior to the onset of ground-disturbing activities or vehicular crossings at wet fords. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of the two-striped garter snake and/or south coast garter snake. Clearance surveys for garter snakes shall be conducted by the authorized biologist prior to the initiation of construction each day. Any snakes found within the area of disturbance or potentially affected by the Project will be relocated to the nearest suitable habitat that will not be affected by the Project.

B-27 Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna. A qualified biologist with demonstrated expertise with special-status terrestrial herpetofauna shall monitor all construction activities and assist SCE in the implementation of the monitoring efforts. The resume of the proposed biologist will be provided to the CPUC, USACE, and FS (as appropriate) for concurrence prior to the onset of ground-disturbing activities. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during ground-disturbing activities immediately adjacent to or within habitat that supports populations of the special-status terrestrial herpetofauna. Any special-status terrestrial herpetofauna found within a Project impact area shall be salvaged by the authorized biologist and relocated to suitable habitat outside the impact area. If the installation of exclusion fencing is deemed necessary by the authorized biologist, the authorized biologist will direct the installation of the fence. Clearance surveys for special-status herpetofauna shall be conducted by the authorized biologist prior to the initiation of construction each day.

B-30 Conduct pre- and during construction nest surveys for spotted owls. Prior to tree removal or construction activities within suitable habitat, SCE shall have a qualified biologist conduct FS protocol surveys for the California spotted owl to establish or confirm the location of nests within the Project. The resumes of the proposed biologists shall be provided to the FS and CPUC for concurrence. If nests or breeding pairs are found during the surveys, the limited operating period (LOP) will be applied according to the Forest Plan (Standard 20 – Part 3). No Project-related activities will be allowed within these dates (February 1-August 15) or until chicks have fledged. Where a biological evaluation by a qualified ornithologist determines that a nest site would be shielded from planned activities by topographic or other features that would minimize disturbance, the buffer distance may be reduced upon approval of the FS on NFS lands. In addition, no helicopter overflights shall be authorized without FS approval. If approved minimum altitudes will be 300 feet above a territory at an altitude designated by the FS. This buffer may be adjusted through consultation with the FS and CPUC.

B-33a Maternity colony or hibernaculum surveys for roosting bats. SCE shall conduct surveys for roosting bats within 300 feet of Project activities in areas that contain suitable roosting habitat for bat species prior to ground disturbing activities. Surveys should be sufficient to determine the spatial extent and type of use (maternity or hibernaculum) of roosting habitat within areas that may be impacted by ground disturbing activities. Surveys shall be performed by a qualified bat biologist (i.e., a biologist holding a CDFG collection permit and a Memorandum of Understanding with CDFG allowing the biologist to handle bats). Survey protocols will be developed in coordination with the FS, CDFG, SCE, USACE and CPUC as appropriate. The resume of the biologist shall be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to any Project activities. If active maternity roosts or hibernaculum are found, the area occupied by the roost shall be avoided (i.e., not removed) by the Project during the season of occupancy. If avoidance of the maternity/hibernaculum roost is not possible, the bat biologist shall survey (through the use of radio telemetry or other CDFG/FS/USACE approved methods) for nearby alternative maternity colony/hibernaculum sites. If the bat biologist determines in consultation with and with the approval of the CDFG, FS, USACE (as appropriate), and CPUC
that there are alternative roost sites used by the maternity colony and young are not present within the area proposed for disturbance then SCE will coordinate with the FS, CDFG, USACE and CPUC as appropriate on how to proceed. Measures that may be implemented in order to proceed may include, but are not limited to, providing alternative roosting habitat, exclusion of bats from the roosting site (only will be used when alternative sites are available and active) or other means that will not result in adverse impacts to bats. Mitigation Measure B-33c is required for protection of hibernaculum.

**B-33c Exclude bats prior to demolition of roosts.** If bat hibernacula are found in areas subject to disturbance from the project, the hibernacula will be avoided during hibernation. The individuals may be safely evicted during the appropriate season, under the direction of a qualified bat biologist, upon coordination with the USFS, USACE, CDFG, or CPUC as appropriate. Eviction will occur in the appropriate season in order to minimize the potential for energy loss or mortality. The resume of the bat biologist shall be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to any Project activities. Measures that may be implemented in order to proceed may include, but are not limited to, providing alternative winter roosting habitat.

**H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** SCE shall develop and submit to the CPUC and FS for approval 30 days prior to construction an Erosion Control Plan, and implement Best Management Practices (BMPs), as described below. (Note: The Erosion Control Plan may be part of the same document as the Stormwater Pollution Prevention Plan.) Within the Erosion Control Plan, the applicant shall identify the location of all soil-disturbing activities, including but not limited to new and/or improved access and spur roads, the location of all streams and drainage structures that would be directly affected by soil-disturbing activities (such as stream crossings by access roads), and the location and type of all BMPs that would be installed to protect aquatic resources. The Erosion Control Plan shall include a proposed schedule for the implementation and maintenance of erosion control measures and a description of the erosion control practices, including appropriate design details. As part of the Erosion Control Plan, SCE shall maintain a logbook of all precipitation events within the Project area that produce more than one inch of precipitation within a 24-hour period. The logbook shall contain the date of the precipitation event, the approximate duration of the event, and the amount of precipitation (measured as the largest amount recorded by a rain gage or weather station within one mile of the Project). Additionally, the logbook shall include a narrative evaluation (and/or a numerical evaluation, if required by the FS or other jurisdictional agency) of the erosion-prevention effectiveness of the existing BMPs, as well as a description of any post-storm modifications to those BMPs. The logbook shall be submitted to the CPUC and FS for review within 30 days following the first storm event (after construction has begun) that produces greater than one inch of precipitation within a 24-hour period. SCE shall re-submit the logbook annually after the first storm of the rainy season that produces more than one inch of precipitation within a 24-hour period. The logbook shall be retired 5 years after completion of construction.

In addition to the Erosion Control Plan, the applicant shall submit to the CPUC and the FS evidence of possession of all required permits before engaging in soil-disturbing construction/demolition activities, before entering flowing or ponded water, or before constructing a crossing at flowing or ponded water. Such permits may include, but are not limited to, a Streambed Alteration Agreement from the California Department of Fish and Game, a Clean Water Act (CWA) Section 404 permit from the USACE, a CWA Section 402 NPDES General Permit for Storm Water Discharges Associated with Construction Activities (General Permit) from the applicable Regional Water Quality Control Board(s) (RWQCBs), and/or a CWA Section 401 certification from the applicable RWQCBs. In addition, if construction-related excavation activities on
National Forest System (NFS) lands encounter perched groundwater, triggering the need for dewatering activities to occur in compliance with Applicant-Proposed Measure HYD-6 (Drilling and Construction Site Dewatering Management). SCE shall notify the Forest Service at the onset of dewatering and, upon the completion of dewatering activities at the affected site(s), SCE shall submit to the Forest Service written description of all executed dewatering activities, including steps taken to return encountered groundwater to the subsurface.

H-1b Dry weather construction. Any construction activities within the ANF and/or Chino Hills State Park (CHSP) (CHSP is only included as part of this measure for Alternative 4 [Routes A through D]) shall be scheduled to avoid anticipated precipitation events that are predicted to produce more than one-half inch of precipitation over a 24-hour period, unless expressly authorized by the FS. If an unexpected precipitation event occurs while construction activities are already underway, SCE shall contact the FS and/or State Parks for guidance. The FS and/or State Parks may require cessation of construction activities within their jurisdiction during any precipitation event in order to prevent excessive erosion and to protect aquatic resources. On NFS lands, SCE shall also observe any criteria promulgated by the FS regarding construction during precipitation events. SCE shall provide documentation to the CPUC monitor of all wet-weather coordination with the FS and/or State Parks.

Best Management Practices
Best management practices (BMPs) are applied to reduce impacts of an action to resources of concern. Specific BMPs have not yet been identified for the TRTP, but typical types of BMPs that would be followed for this project include (CalTrans, 2003):

- Temporary soil stabilization through techniques including timing of construction activities, preservation of existing vegetation, soil binders, mulch, and streambank stabilization;
- Temporary sediment control through techniques including silt fence, fiber rolls, gravel bag berm, and sandbag or straw bale barriers;
- Tracking control through techniques including stabilized construction roadways and exit/entrance areas and entrance/outlet tire wash;
- Non-stormwater management including temporary stream crossings; vehicle and equipment cleaning, fueling, and maintenance practices; and concrete curing and finishing practices; and
- Waste management and materials pollution control including stockpile management; spill prevention and control; and management of solid, hazardous, liquid, contaminated soil, concrete, and septic waste.

AFFECTED ENVIRONMENT
The 2005 Forest Plan indicates the mountains and foothills of southern California are home to approximately 9 native species of fish, 18 amphibians, 61 reptiles, 299 birds, 104 mammals, 2,900 vascular plants, and an unknown number of species of invertebrate animals and non-vascular plants. Some of these species are endemic to the ANF, and some have special-status as federally listed threatened, endangered, proposed, candidate, or Forest Service (FS) Sensitive species.

The Affected Environment for biological resources includes the baseline biological conditions of the proposed Project area. Vegetation types within the proposed project are described for the purpose of characterizing the botanical resources and wildlife habitat values. Biotic habitats suitable for the occurrence
of plant and wildlife species of special status (State- and federally listed threatened and endangered species, federal candidate species, California Native Plant Society List species, California Species of Special Concern, and FS Sensitive species) are also described.

The discussion provided in the regional setting and local setting (below) includes the baseline biological conditions for segments 6 and 11 that traverse federal lands.

**Baseline Data Collection Methodology**

This Biological Evaluation provides a description of the methodology used to assess biological resources within the proposed Project. The approach for this process was to utilize all available data related to biological resources to the extent possible, and to independently review, verify, and supplement this data in order to compile a concise and accurate description of the baseline biological conditions. A complete list of species evaluated and considered for analysis within or near the Project area is found in Table 1.

The information presented for the project area impacted by the Station Fire has been developed mainly from the information presented in the USDA Forest Service BAER Reports prepared for botany, wildlife and fish, and invasive weeds (USDA, 2009a; USDA, 2009b; USDA, 2009c). Field surveys were conducted by the Forest Service and SCE to re-evaluate impacts to several special-status plant and wildlife species in the burned areas and to identify any special-status species or resources present in newly identified areas of Project disturbance. These included focused surveys for special-status fish, herpetofauna, birds, bats, and plants that may have been impacted by the fire along Segments 6 and 11, as well as field evaluations of new access and spur roads, helicopter staging areas, helicopter assembly yards (HAYs), and wire setup sites for the presence of special-status species, and Riparian Conservation Areas (RCAs). Because all areas of new disturbance are near the alignment that has already been surveyed, and occur within the same types of habitats, previously unidentified species are not expected to occur in these areas.

The project area consists of the ANF within the San Gabriel Mountains and includes Segment 6 and most of Segment 11 (See Map and Figure Series). Segments 6 and 11 cross rugged portions of the ANF. The San Gabriel Mountains are part of the Transverse Ranges, which lie on an east-west axis. These mountains are characterized by steep, rugged terrain and deep canyons, as well as numerous creeks, streams, and rivers. The ANF extends across most of the San Gabriel Mountains, and constitutes a regionally rare expanse of wildland habitat.

The Project alignment crosses many areas that provide suitable habitat for several FS Sensitive species including the Mt. Gleason Indian Paintbrush, California spotted owl, Santa Ana speckled dace, pallid bat, and San Bernardino mountain kingsnake. It is possible to find California condor, eagles, and other raptor species.

The Station Fire altered the baseline conditions of the Project area and presents new challenges to the management and security of biological resources within the Project area. It is expected that, over time, many of the plant communities will recover their pre-fire functional values, and affected populations may also recover. However, the fire and resulting sedimentation and erosion may cause the extirpation of populations of some species within the project area, including special-status species. In some cases, it may take years to determine the ultimate effect of the fire on a specific population, and certain vegetation communities will require decades to return to pre-fire conditions.

**Special-Status Avian Habitat and Risk Assessment Surveys**

Surveys for special-status bird species were conducted on 18–20 July, 13–16 August, 17–21 September, 25–28 September and 2–4 October 2007. The purpose of these surveys was to identify habitat capable of
supporting special-status bird species, verify data compiled from previous surveys conducted by SCE (2007), and to assess the potential risk for avian collisions as a result of the proposed project. Prior to conducting these surveys, information concerning the known distribution of the species was reviewed as described above, including previous survey data compiled by SCE (2007/2008/2009/2010) for California spotted owl, southwestern willow flycatcher, least Bell’s vireo, and coastal California gnatcatcher. Furthermore, aerial photographs, vegetation maps, and data provided in SCE’s “Road Story” were reviewed, and potential locations of increased risk for avian collisions with transmission lines were identified.

Special-status avian habitat surveys were conducted by driving all segments where roads were passable, and visually inspecting locations in which suitable habitat was present. Particular attention was given to areas with previous records of special-status bird species and to riparian and coastal sage scrub habitats.

Following the identification of locations of increased risk for avian collisions, surveys were also conducted to verify the habitat conditions and the potential risk for avian collisions. The level of potential risk was evaluated based on (1) the location of the proposed lines relative to the geographic features identified below, (2) the numbers and types of birds detected at the sites, (3) avian activity patterns observed (e.g., soaring raptors, flocking water birds), and (4) an assessment of the potential for weather variables such as high winds or fog to increase the risk. Surveys focused on locations where transmission lines crossed or paralleled ridgelines, crossed rivers or mountain passes, and in areas adjacent to freshwater marsh, water, or riparian habitats.

Special-Status Bat Species Surveys

Reconnaissance-level surveys of habitats capable of supporting roosts for special-status bat species were conducted on 17-21 and 25-28 September 2007. Habitats capable of supporting roosts were evaluated in the field by searching for structures, including cavities, crevices, and cracks in trees, fractured rocks (including caves and mines), cliffs, and human structures (buildings, bridges, and dams). Based on the habitat assessments, several sites were re-surveyed from 25-28 September. Sonograms and call characteristics of known species were used to identify bat vocalizations that were recorded within Alternative 2. At each of these sites, potential roosting structures were described and mapped. Table 4 details the locations and dates of special-status bat sampling.

<table>
<thead>
<tr>
<th>Date</th>
<th>Segment</th>
<th>Location in relation to Alternative 2*</th>
<th>Nearest Tower Number</th>
<th>Habitat</th>
<th>Potential Roosting Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/27</td>
<td>6</td>
<td>On site</td>
<td>69</td>
<td>Coulter Pine Forest</td>
<td>Tree cavity</td>
</tr>
<tr>
<td>9/27</td>
<td>6</td>
<td>500 ft Northeast</td>
<td>69</td>
<td>Southern Alder and Willow Riparian Forest</td>
<td>Tree cavity or foliage</td>
</tr>
<tr>
<td>9/27</td>
<td>6</td>
<td>600 ft. Northeast</td>
<td>70</td>
<td>Coulter Pine Forest and Southern Mixed Chaparral</td>
<td>Tree cavity or foliage</td>
</tr>
</tbody>
</table>

* Detectors placed ‘on site’ were within the footprint of the transmission line tower or pulling site.

In addition, one site near Structures 69 and 70 of Segment 6, in the vicinity of Big Tujunga Canyon Creek of ANF was selected for mist net sampling. This site was selected because it provided the most suitable roosting habitat (mature riparian forest with an open understory) identified within Alternative 2. Two mist nets were set up approximately 100 feet apart over Big Tujunga Creek. These nets were continuously monitored for a 3-hour period following sunset. Both nets were located in mature white alder (Alnus rhombifolia) and arroyo willow (Salix lasiolepis) forest with a closed canopy (>75%) and an abundant...
understory of bracken fern (*Pteridium aquilinum*), narrow-leaf willow (*Salix exigua*), and deergrass (*Muhlenbergia rigens*). A larger mist net was placed between an alder and willow riparian forest and the neighboring Coulter pine (*Pinus coulteri*) and canyon live oak (*Quercus chrysolepis*) forest. The canopy closure at this location was approximately 40 percent and the understory included narrow-leaf willow, bracken fern, California coffeeberry (*Rhamnus californica*), California sagebrush (*Artemisia californica*), and chaparral yucca (*Yucca whipplei*). The larger mist net was continuously monitored for a 3-hour period following sunset, during the peak activity of foraging bats (Milne et al. 2004).

**Herpetological Surveys**

Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. Surveys were conducted by driving along the project alignment where passable roads were available, and subsequently employing a random walk visual encounter survey methodology to assess suitable habitat for special-status amphibians and reptiles. These surveys focused on suitable lotic, riparian, and canyon habitats, and locations where the proposed project crossed these habitat types, even if no standing or flowing water was present. Walking surveys were conducted in suitable habitats and adjacent upland areas in accessible portions of the project area. Habitats were visually assessed with the aid of binoculars at inaccessible locations where steep canyons were present. In these cases, the presence/absence of water, the structure of the streambed, and vegetation composition and canopy structure were ascertained to determine the potential occurrence of special-status amphibians and reptiles.

Subsequent focused surveys were conducted at all areas considered to provide suitable habitat for special status amphibians and reptiles on 15-16 and 29 April, 14-15 and 30 May, 2, 4-5, 9-11, 13, 16, 23, 26 June, 24 July, 15 August 2008 as well as in 23 and 29 April, 6, 15, 18, 27-28 May, 1-2, 4, 10-11, 24-25 June, 1 July, 17 and 27 August, and 23 November 2009.

**Wildlife Corridors and Special Linkages**

Linkages and corridors facilitate regional animal movement and are generally centered around waterways, riparian corridors, flood control channels, contiguous habitat, and upland habitat. Drainages generally serve as movement corridors because wildlife can move easily through these areas, and fresh water is available. Corridors also offer wildlife unobstructed terrain for foraging and for dispersal of young individuals. Ridgelines that occur throughout the Project area may also serve as movement corridors.

Within the project area, loss of vegetation due to the Station Fire has likely modified wildlife movement through the removal of dense vegetation, such as late successional chaparral communities. However, it is expected that over time, habitats will recover. Animals will also be expected to utilize access roads for movement throughout the Project area during and after recovery.

Riparian corridors remain a common pathway utilized by many species because they typically provide cover, foraging opportunities, and water. For many species, such as southwestern willow flycatcher or Santa Ana sucker, this is the only habitat type that they utilize. However, as the movements of wildlife species are more intensively studied using radio-tracking devices, there is mounting evidence that some wildlife species do not necessarily restrict their movements to some obvious landscape element, such as a riparian corridor. For example, radio-tracking and tagging studies of newts, California red-legged frogs, and western pond turtles found that long-distance dispersal involved radial or perpendicular linear movements away from a water source with little regard to the orientation of the assumed riparian “movement corridor,” but towards
suitable riparian or upland wintering habitat (Fellers and Kleeman, 2007; Semlitsch, 1998; Reese and Welsh, 1997).

In general the following corridor functions can be utilized when evaluating impacts to wildlife movement corridors:

a. **Movement corridors** are physical connections that allow wildlife to move between patches of suitable habitat. Simberloff et al. (1992) and Beier and Loe (1992) correctly state that, for most species, we do not know what corridor traits (length, width, adjacent land use, etc.) are required for a corridor to be useful. But, as Beier and Loe (1992) also note, the critical features of a movement corridor may not be its physical traits but rather how well a particular piece of land fulfills several functions, including allowing dispersal, plant propagation, genetic interchange, and recolonization following local extirpation.

b. **Dispersal corridors** are relatively narrow, linear landscape features embedded in a dissimilar matrix that links two or more areas of suitable habitat that would otherwise be fragmented and isolated from one another by rugged terrain, changes in vegetation, or human-altered environments. Corridors of habitat are essential to the local and regional population dynamics of a species because they provide physical links for genetic exchange and allow animals to access alternative territories as dictated by fluctuating population densities.

c. **Habitat linkages** are broader connections between two or more habitat areas. This term is commonly used as a synonym for a wildlife corridor (Meffe and Carroll, 1997). Habitat linkages may themselves serve as source areas for food, water, and cover, particularly for small- and medium-size animals.

d. **Travel routes** are usually landscape features, such as ridgelines, drainages, canyons, or riparian corridors within larger natural habitat areas that are used frequently by animals to facilitate movement and provide access to water, food, cover, den sites, or other necessary resources. A travel route is generally preferred by a species because it provides the least amount of topographic resistance in moving from one area to another yet still provides adequate food, water, or cover (Meffe and Carroll, 1997).

e. **Wildlife crossings** are small, narrow areas of limited extent that allow wildlife to bypass an obstacle or barrier. Crossings typically are manmade and include culverts, underpasses, drainage pipes, bridges, and tunnels to provide access past roads, highways, pipelines, or other physical obstacles. Wildlife crossings often represent “choke points” along a movement corridor because useable habitat is physically constricted at the crossing by human-induced changes to the surrounding areas (Meffe and Carroll, 1997).

### The Station Fire

The Station Fire started on August 26, 2009 and burned until October 16, 2009. It burned a total of 161,189 acres, of which 154,431 acres are on NFS lands and 6,758 acres are on non-Forest lands. The fire has burned the majority of Segment 11 and a portion of Segment 6.

The Station Fire not only caused direct mortality of wildlife but eliminated or altered habitat for wildlife species that survived the fire. Some of these species are endemic to the ANF, and some have special status as federally listed threatened, endangered, proposed, candidate, or FS Sensitive species. As a direct result of the fire, baseline conditions including amount of habitat available, types and locations of various habitats, community and ecosystem processes, and the viability and distribution of wildlife populations have changed. For example, many populations, such as the arroyo toad population in Upper Big Tujunga, likely
experienced declines in the fire and may continue to be suppressed in the following years, however it is possible that post fire effects such as scouring and flushing flows from winter storms may increase habitat for this species. In addition, the sedimentation rate will drastically increase in the next several years, and vegetation communities may experience type conversion, which could render some habitats unsuitable for species that were using them prior to the fire. However, for some species, such as the arroyo toad, post-fire scouring flows may also create additional suitable habitat by thinning out dense vegetation, depositing sand, creating braided channels, and resulting in the recruitment of scrubby riparian vegetation often associated with this species’ typical habitat. In general, remaining populations will tend to be more vulnerable to disturbance given increased competition for limited resources and elevated stress levels. Post-fire sedimentation and debris flows are expected to further impact wildlife and habitat; however, this impact will be unrelated to the proposed Project.

It is expected that biological resources will be temporarily affected as a result of fire-related damage and destruction of species and habitats in the Project area. It is expected that, over time, habitats will recover their pre-fire functional values, and affected populations may also recover. However, the fire and resulting sedimentation and erosion may cause the extirpation of populations of some species within the project area, including special-status species. In some cases, it may take years to determine the ultimate effect of the fire on a specific population.

Fire Effects on Wildlife

Wildfire may directly affect animals as a result of direct mortality, loss of suitable habitat or cover, and the loss of food resources (Babbitt and Babbitt, 1951; Rochester et al., 2009; Erwin and Stasiak, 1979; Whelan, 1995; Shaffer and Laudenslayer, 2006). If a shift in vegetation community occurs, for example from chaparral or coastal sage scrub, to a grassland or non-native grass community, species shifts are anticipated (Rochester et al., 2009).

In general, most fires result in direct mortality of animals from exposure to heat or smoke (Biswell 1999, Kramp et al. 1983), typically it only happens when they get cornered by a fire and lack escape routes (Hanes 1988; Wirtz 1974). Birds can fly away from the fire. Mammals escape these fires either by running away from them or by seeking shelter in burrows beneath the ground surface and in crevices of rock outcrops. Reptiles and amphibians, like small mammals, are known to burrow beneath the ground or crevice into rock outcrops in response to fire (Cunningham, 1960; Russell et al., 1999).

Birds are most vulnerable during nesting and fledging periods. In grasslands, fire is often destructive to nesting habitat for songbirds (Renwald 1978). Fire can be devastating to ground-nesting birds because it destroys existing nests, removes protective cover, and temporarily reduces insect populations they feed on. However, for ground nesting species, an abundance of habitat following a burn may provide good nesting and feeding areas (Soutiere and Bolen 1972). A severe fire, such as the Station fire would substantially reduce the number and diversity of tree-foliage-searching and timber gleaning birds (Bock and Lynch 1970). Bock and Lynch (1970) found that species that forage among the needles and twigs of conifers were less common in burned areas than in unburned.

Mammals, depending on size, mobility, and escape response, react to fire in a variety of ways. Ungulates often avoid injury during a fire except for the young that are frequently killed by large fires. Mule deer prefer to forage in open areas over mature stands of chaparral (Biswell 1999). Due to their preference of grass and forbs, mule deer are attracted to early stages of secondary succession (Wirtz 1974). Many believe that mule deer foraging on shrub seedlings and sprouts may have a significant effect on the recovery rate and composition of chaparral (Biswell 1999; Biswell and Gilman 1961; Davis 1967; Kinucan 1965). Deer
numbers increase following a burn compared to unburned areas due to an increase in abundance of succulent shoots of shrubs which results in higher ovulation rates and weight (Biswell 1963).

The intensity, uniformity, size, and duration of a burn plus the juxtaposition and mobility of the animal relative to the soil surface at the time of the passing fire, will determine the survival of small mammals (Buech et al. 1977). Most small mammals escape fires by hiding in burrows or rock crevices, however there is still potential for asphyxiation. There is documentation of the mortality of chipmunks, shrews, woodrats, and mice that were reluctant to leave burning woodpiles and grass stands (Kramp et al. 1983). Mature cotton rats and their young successfully retreated to safe refuge areas (Kramp et al. 1983). Thus, some small animals of limited mobility are capable of avoiding fire. The most common cause of death during a fire is a combination of heat effects and asphyxiation.

Small mammals can greatly benefit from fire in chaparral. Fire opens chaparral and creates generous amounts of herbaceous vegetation, along with the edge effect supplied by the scattered clumps of unburned brush. These features have been shown to encourage an increase in the number of small game species, such as jackrabbits and brush rabbits (Biswell 1999). However, small mammals can decrease dramatically in numbers within a few days following a fire because removal of the protective cover exposes them to predators such as coyotes, house cats, red-tailed and sharp-shinned hawks, common ravens, and great horned owls. These predators are highly mobile and can concentrate on burned areas within a short time.

Some small mammals decrease in numbers the year following a fire (Chew et al. 1959; Cook 1959; Howard et al. 1959; Lawrence 1966; Wirtz 1974). Slow moving mammals that happen to be above ground such as woodrats (Neotoma spp.) may be directly killed. Dusky-footed woodrats (Neotoma fuscipes) were found to disappear following a fire but returned within five years due to their habitat requirement of dense and continuous cover (Quinn 1983). Other small mammal species, such as the Pacific kangaroo rat (Dipodomys agilis) and California mouse (Peromyscus californicus), have been shown to increase greatly in numbers in the first two to four years following chaparral fires (Kramp et al. 1983).

The change in the habitat, such as temporary loss of shelter and food, exposure to surface runways and burrow openings, and increased predation will decrease the overall number and diversity of small mammals following a fire for one to three years, perhaps longer (Cook 1959, Lawrence 1966, Klebenow and Beall 1977, Koehler and Hornocker 1977). Populations of small mammals build up rapidly after the start of new plant growth, and they may shift in species composition from those adapted to open oak-woodland chaparral to open oak woodland savannah (Lawrence 1966). Shifts in species following a fire have been documented in rodents in the California chaparral (Cook 1959, Lawrence 1966).

Amphibians and reptiles have been found to show few changes in terms of recapture post-fire as compared to pre-fire events (Greenberg et al., 1994). This could be an artifact due to the difficulty of detection of amphibians and reptiles, or it may be based on the fact that the majority of detections occur in around riparian or wetlands which tend not to burn completely. Another effect is that large trees in woodlands and forests survive the fire, or as dead trees they continue to serve as refugia for many species (Rochester et al., 2009).

Reptiles apparently often survive fires because evidence of dead individuals is seldom found afterwards (Komarek 1969). Some snakes may detect and avoid fires by means of the heat-sensing pits they use to locate prey. A study showed that caged snakes could survive peak temperatures between 59-63 degrees Celsius when sheltered in burrows and rock crevices with adequate ventilation (Kramp et al. 1983). Western fence lizards (Sceloporus occidentalis) survived a chaparral fire by remaining in the soil beneath rocks (Kahn 1960). Rochester et al. (2009) found that the indirect effects of the fire, such as changes in the habitat suitability and predator-prey dynamics, were largely responsible for the changes observed in the
abundance and distribution of herpetofauna species. Pre- and post-fire surveys conducted in chaparral and coastal sage scrub in 2003 in San Diego County found that western fence lizards were the most abundant lizard both pre- and post-fire; western whiptail (*Aspidoscelis tigris*), coast horned lizard (*Phrynosoma coronatum*), and side-blotched lizard (*Uta stansburiana*) increased post fire in chaparral; whiptail (*Aspidoscelis hyperythra*) and side-blotched lizard increased post-fire in coastal sage scrub; post-fire decreases in chaparral and coastal sage scrub occurred for alligator lizard (*Elgaria multicarinata*), racer (*Coluber constrictor*), common kingsnake (*Lampropelis getula*), gopher snake (*Pituophis catenifer*), and striped racer (*Masticophis lateralis*) (Rochester et al., 2009).

Studies with prescribed fires found no discernible amphibian mortality, most likely due to adaptive behaviors (Komarek 1969). Frogs escaped a backing fire by travelling ahead of the fire, then burying themselves under wet leaves and soil in a small depression (Komarek 1969). Western toads similarly could survive fire by remaining in the soil beneath rocks, entering animal burrows, or by escaping to water; survival in retreats under flammable materials (logs, stumps, and boards) would depend on fire severity and moisture conditions. A review of literature regarding amphibian response to wildfire concluded that responses were highly variable and dependent on species, geographic area, and fire intensity and severity, among other variables, and in general short-term and long-term effects are poorly understood (Pilliod et al., 2003).

**Fire Effects on Aquatic Species**

Aquatic species can often survive fire that burns across a stream area. Residual pools or pockets of water on intermittent streams may evaporate during a fire, thus reducing the amount of habitat aquatic species can survive in. Additionally, loss of stream-side vegetation and increased sediment load into the water may be detrimental to stream fauna by increasing water temperatures which decreases dissolved oxygen contents (Burns 1970, Lyon et al. 1978). Typically, there will be mortality of aquatic species, but the majority of aquatic species should survive the immediate effects of the fire providing they stay within the water.

Wildfires affect stream habitat in three ways: decreased vegetation cover, increased storm runoff, and increased sediment and debris. Storm runoff is dynamic because of topography, precipitation characteristics, vegetation cover, and evapotranspiration. Soil mantle capacity includes infiltration, storage, and transmission of ground water. In a wildfire, vegetation cover and root systems are destroyed which impacts infiltration and storage functions and can cause "hydrophobic" soils. Surface runoff is accelerated, peak runoff events are accelerated, and low summer flows decreases. The net effect is stronger peaks of floodwater (in the spring) and not as much water in the summer (Kaczynske 1994). Loss of summer flow increases summer stream temperatures and decreases stream habitat area and pool depth.

Following wildfires, streams receive a large pulse of small to large organic debris, sediment from silt to boulders, and nutrients including ammonia nitrogen. Complex chemical reactions can occur in the stream and may result in a pulse of biochemical oxygen demand (BOD). The temperature of the stream can also rise dramatically. Increases of several degrees have been recorded in association with wildfires (Kaczynske 1994) and can result in increase incidences of fish diseases (Fish and Rucker 1945). The combination of increased temperature, increased sediments, and lowered dissolved oxygen (from the BOD pulse) often causes direct fish and aquatic insect death (Kaczynske 1994). Increases in turbidity and alterations of water chemistry associated with ash and soils further the impacts.

Sediment and ash particles clog and irritate fish gills and this can cause direct mortality, or stress and vulnerability to disease, which results in death. These particles smother the spawning gravels or deposit fine materials that smother eggs and prevents emergence of fry. Sediment also decreases the flow of water.
through the gravels, lowering the dissolved oxygen, and increasing the mortality of eggs and alevins (Cooper 1965; Cordone and Kelly 1961; Phillips 1961). Success of spawning and rearing of young is dependent on the ability of aquatic species to locate proper spawning substrate and of the fertilized eggs to survive. Sediment could cover fertilized eggs and kill them if sedimentation occurred after spawning, thereby reducing reproductive success for these species.

Vegetation cover loss results in the loss of canopy and shade, which increases stream temperatures beyond just the hydrologic temperature impact caused by loss of summer flows. Loss of vegetation cover also means a temporary decrease in the input of needles, leaves, and stems that are a large part of the organic food chain. Concentration of nutrients in a stream following a fire can increase algae production which appears to sustain a greater biomass and a more diverse population of insect larvae (Fredriksen 1978).

The extent of potential sedimentation includes lowered water quality, increased turbidity, changes in water chemistry (increases in pH and algae), lowered habitat quality and habitat types, loss of spawning and rearing habitats, lowered productivity of macroinvertebrates, and increase water temperature. These changes may result in direct mortality of aquatic species. Reproductive success is also at risk following wildfires.

**Vegetation**

Twenty-eight vegetation types were mapped within the proposed project area prior to the Station Fire. However, for the purposes of this BE the vegetation communities presented in the Draft EIR/EIS have not been revised post burn; therefore the acreages presented in this BE are consistent with the Draft EIR/EIS. While much of the project area was subject to intense fire and many of the vegetation communities were burned, large areas of habitat remain in their pre burn condition. In addition, for many plant communities it can be reasonably expected that these communities will recover over time to their former pre-functional values. The majority of the Project area consists of Mixed Chaparral. Canyon Oak Forest and Bigcone Douglas Fir-Canyon Oak Forest are the second and third most common vegetation types in the region, respectively. Both of these forests are especially common on the north-facing slopes in the ANF. The next most abundant vegetation type is Chamise Chaparral, followed by two vegetation types that were recently burned (Deerweed/Chia Herbaceous Field, Recently Burned and Mojavean Pinyon and Juniper Woodland, Recently Burned). Coastal vegetation types restricted to the southern slope of the ANF include Southern Coast Live Oak Riparian Forest and Coastal Sage Scrub. These vegetation communities were largely unaffected by the Station Fire. On the drier northern slope, desert vegetation is more common, including Mojave Pinyon Woodland, Mojave Juniper Woodland and Scrub, Desert Wash, and Big Sagebrush Scrub. Several riparian vegetation types are located in deeper canyons along rivers or creeks: Southern Willow Scrub, Southern Sycamore Alder Riparian Woodland, Southern Cottonwood Willow Riparian Forest, and Southern Arroyo Willow Riparian Forest. Nonnative plants dominate three relatively uncommon vegetation types in the Project area: Nonnative Woodland, California Annual Grassland, and Barren/Developed. In addition, most of the access roads within the ANF, particularly near the Angeles Crest Highway and the Angeles Forest Highway, were easily accessed by off-road vehicles prior to the fire and supported large populations of invasive plant species along the road margins. It is expected that nonnative and invasive plant populations will recover quickly in the wake of the fire, and will likely invade additional areas as well (USDA, 2009c). It is also expected that many of the plant communities listed above and described in detail in Appendix H of the Biological Resources Specialist Report for the TRTP will recover from the fire, but at varying degrees. For example, chaparral communities are expected to recover within several years. However, slow-maturing and climax communities such as Bigcone Douglas Fir-Canyon Oak Forest, Mojavean Pinyon and Juniper Woodland, and riparian woodland and forests will take decades or more to
recover from the Station Fire, and will be at risk for type conversion during the recovery process (USDA, 2009a).

Type conversion occurs when a vegetation community experiences a reoccurring or extreme disturbance that causes a shift in dominant species, resulting in a conversion to a different vegetation community. For example, many of the south facing foothill slopes of the San Gabriel Mountains have experienced repeated burns at a higher frequency than historically occurred before large scale human population colonization. This has created a shift from native chaparral/coastal sage scrub vegetation to nonnative grassland in many of these areas (K. VinZant, Forest Service, pers comm.). In the case of the Station Fire, type conversion is expected to occur in parts of the Project area, such as the Mt. Gleason area, as the coniferous forests present there burned at high intensity. The Forest Service predicts that areas such as this will experience a conversion to montane chaparral species and canyon live and scrub oaks over the next five to ten years (USDA, 2009a). However, the main concern following the Station Fire is type conversion caused by nonnative, invasive plants recruiting into and outcompeting native species in recovering burned areas. Desert transition and coastal sage scrub communities are likely to be most vulnerable to this type conversion.

Vegetation Type Mapping

Surveys for the purpose of evaluating the vegetation types within the Project were conducted simultaneously with the reconnaissance-level surveys for special-status plants from 2007 to 2010, described below. The boundaries of vegetation types previously mapped by SCE (2007) along the Project were independently field verified and refined as necessary with the aid of a Toughbook field computer running ArcMap 9.0 and an attached GPS unit. This navigation system enabled the observers to identify their location on the ground relative to the mapped vegetation with a high level of accuracy (usually within 15 feet). The route of Alternative 2 was verified either by vehicle in areas where roads follow the existing right-of-way, or by foot, when possible, in areas without roads. In some remote areas, particularly on the steeper slopes within the ANF, the boundaries or extent of vegetation types were checked visually using binoculars. The dominant and characteristic plant species occurring in each of the mapped vegetation types were recorded during the surveys, and the vegetation alliance (or “series”) represented by the stands of vegetation were identified using the keys provided by Gordon and White (1994) and/or Sawyer and Keeler-Wolf (1995).

The vegetation maps supplied by SCE (2007, 2010) generally classified the vegetation types within the Project according to the nomenclature of Holland (1986). The widely-used Holland classification system is a qualitative system that lacks keys or specific criteria for the identification of stands of vegetation. The system has now been largely replaced by the quantitative, hierarchical, and floristically based International Vegetation Classification System (IVCS; Grossman et al. 1998), which has become the standard accepted by the majority of the state and federal agencies in California including CDFG, USFS, and the National Parks Service. While the majority of the Holland (1986) vegetation types used by SCE (2007, 2010) were retained for the final vegetation map, a crosswalk to the corresponding IVCS types identified using Gordon and White (1994) and/or Sawyer and Keeler-Wolf (1995) is provided in Table 3. Some of the Holland chaparral vegetation types in the original vegetation map were not retained in the final map. Details regarding the mapped vegetation types are presented in Appendices G and H of the Biological Specialist Report (HT Harvey and Aspen 2008).

Information used in preparing this section was derived from the following data sources:

Aerial photographs, Geographic Information Systems (GIS) data, United States Geological Survey (USGS) topographic maps, the California Native Plant Society (CNPS) Inventory, and the California Natural Diversity Database (CNDDB)
Previously prepared reports and regional planning documents (general plan policies, Habitat Conservation Plans [HCPs], and Environmental Impact Reports [EIRs])

The PEA and SCE’s associated technical reports and data (including vegetation mapping and special-status species locations and survey data)

Reconnaissance-level botanical surveys conducted on 10–22 June, 15–18 July, 17–21 September, and 1–5 October 2007 (HT Harvey and Aspen)

Focused botanical surveys of the proposed right-of-way and tower locations completed by Aspen, HT Harvey, and AMEC in the spring and summer 2008

Focused surveys of access roads for Segment 6 on the ANF conducted in May, 2009 (HT Harvey, AMEC, and FS)

Focused surveys of all Project impact areas burned during Station Fire, access roads on Segment 11, and previously located rare plant locations on the ANF conducted in May, June 2010

Local botanical experts were consulted for information regarding several taxa

California Department of Fish and Game California Natural Diversity Database, 2007, 2008 and 2009

Species known to occur within the planning area, based on historic range and field observations

Species likely to occur within the planning area, based on the distribution of the species and known habitat suitability

Species that could be affected by the Proposed Action, because of their presence in areas adjacent to the project area

**Wildlife**

The mountains and foothills of southern California are home to roughly 400 wildlife species, many of these occurring on the ANF. Some of these are wide-ranging mammals, including black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and mule deer (*Odocoileus hemionus*). These species utilize a variety of habitats throughout the year for breeding, denning, and foraging. Other mammals that occur on the ANF include coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), California ground squirrel (*S. beecheyi*), western gray squirrel (*Sciurus griseus*), and Botta’s pocket gopher (*Thomomys bottae*). The diverse assemblage of vegetation communities on the ANF provides suitable breeding, nesting, and foraging habitat for a relatively exhaustive number of bird species, including Steller’s jay (*Cyanocitta stelleri*), wrentit (*Chamaea fasciata*), mountain chickadee (*Poecile gambeli*), acorn woodpecker (*Melanerpes formicivorus*), and dark-eyed junco (*Junco hyemalis*). Red-tailed hawk (*Buteo jamaicensis*), common raven (*Corvus corax*), turkey vulture (*Cathartes aura*), and Cooper’s hawk (*Accipiter cooperii*) are also relatively common in the area. Among the reptile species commonly occurring on the ANF are side-blotched lizard (*Uta stansburiana*), sagebrush lizard (*S. graciosus*), western fence lizard (*S. occidentalis*), and southern alligator lizard (*Elgaria multicarinata*). Many perennial and intermittent drainages occur on the ANF and provide suitable breeding habitat for several amphibian species, including Pacific tree frog (*Pseudacris hypochondriaca [regilla]*) California tree frog (*P. cadaverina*), Monterey ensatina (*Ensatina eschscholtzii eschscholtzii*), and coast range newt (*Taricha torosa torosa*).

The Station Fire not only caused direct mortality of wildlife but temporarily eliminated or altered habitat for wildlife species that survived the fire. As a direct result of the fire, baseline conditions including amount of habitat available; the types and locations of various habitats and their microclimates; community and ecosystem processes; the availability of refugia; and the viability and distribution of wildlife populations have changed. For example, because of the scale and magnitude of the fire many populations of slow moving or fossorial wildlife were unable to find refugia and escape the fire. This also included many large...
mammals including deer and bear. These and other species likely experienced declines in the fire and may continue to be suppressed in the following years pending the recovery of vegetation. In addition, ash and sediment has the potential to drastically increase in the next several years adversely affecting riparian and aquatic species. Further vegetation communities may experience type conversion, which could render some habitats unsuitable for native species that were using them prior to the fire. However, for some species post-fire recovery can increase access to foraging and breeding sites. In general, remaining populations will tend to be more vulnerable to disturbance given increased competition for limited resources and elevated stress levels. Post-fire sedimentation and debris flows are expected to further impact wildlife and habitat; however, this impact will be unrelated to the proposed Project.

Wildlife Movement
The project area traverses an area dominated by steep, mountainous ridgelines and deep valleys. From a wildlife movement perspective, the ANF can be considered a large block of continuous open space surrounded by transitional ecotones, including the arid desert regions to the north and the highly developed San Gabriel Valley and Los Angeles Basin to the south. As a result, the ANF provides expansive habitat for wildlife movement and represents a broad, regional linkage between the San Bernardino Mountains to the east and the Santa Susana and Sierra Madre Mountains to the west. Subsequently, the FS has placed program emphasis, with respect to wildlife management, on minimizing the effects of urbanization, including protecting core areas such that these areas will continue to conserve biodiversity in an interconnected regional open space network. Additionally, habitat loss and fragmentation will be reduced through conserving and managing habitat linkages within, and where possible between, the national forests and other public and privately conserved lands (USDA, 2005).

Some of the areas that support important linkages and corridors on the ANF include: the Mount Wilson/Monrovia Peak area, which contains the region’s largest and most continuous stands of bigcone Douglas fir, a productive habitat for spotted owl; the three forks (West, North, and East) of the Upper San Gabriel River, which provide suitable riparian and aquatic habitat linkages throughout much of their courses; the Mojave Front Country, which provides a transitional linkage between the desert habitats in the north with the mountainous regions of the ANF; and, Big Tujunga Canyon, which serves as an important corridor for wildlife movement between the southern front country of the ANF to areas upstream along Big Tujunga Creek. Continuous stands of native vegetation communities within these areas provide necessary habitat for a variety of species, including migratory stopovers for songbirds, dispersal habitat for locally rare species like southwestern pond turtle, and breeding, nesting, and foraging habitat for raptors. In several areas throughout the ANF, steep topography and dense vegetation facilitate wildlife movement through riparian corridors. Additionally, it appears that large mammals, such as black bear, mountain lion, and mule deer, routinely use existing access roads as links between habitat patches and as possible microhabitats for foraging. This is evident in the significant amount of visual signs that were detected over the course of various surveys. Mountain lion and black bear tracks and scat were identified along access roads on numerous occasions in areas including Upper Big Tujunga Creek, Shortcut Saddle, and the West Fork San Gabriel River, and, a mountain lion kill was detected adjacent to an access road just north of Aliso Canyon. In addition, a mountain lion was sighted along the West Fork of the San Gabriel River, less than five miles west of segment 6, while accessing spotted owl survey sites (Mike San Miguel, pers. comm.). Black bears of multiple age classes were also observed on access roads in Monrovia Canyon and along Lynx Gulch. Various age classes of mule deer were also observed along several access roads throughout the forest and it is evident that they forage on plant species that occur along the road edges.
The ANF constitutes important continuous open space which supports the migratory and dispersal requirements for a number of wildlife species. However, various barriers that limit wildlife movement currently exist in many areas throughout the forest. These include major roadways, such as Angeles Crest, Angeles Forest, and San Gabriel Canyon Highways; existing utility corridors; a complex network of access roads, OHV roads, and trails; and, dams and reservoirs, such as Big Tujunga and Cogswell. Use of existing access roads to support construction will likely be the largest single factor affecting wildlife movement on the ANF.

The Station Fire initially opened up barriers to movement, such as dense chaparral. However, animals will still be expected to utilize access roads for movement throughout the Project area, especially as vegetation recovery occurs. There will likely be a short-term decrease in wildlife density in the Project area due to displacement; however, wildlife density in general should increase by the time construction is initiated in this area, and the potential for Project construction to disturb wildlife should remain similar to what was described in the Draft EIR/EIS.

**SPECIES ACCOUNTS**

**Special-Status Plants**

Focused botanical surveys of Alternative 2 were conducted during June, July, August, September, October, November, and December, 2007. Additional focused surveys were conducted during February, March, April, May, June, and July, 2008; May, June, and July 2009; and April, May, June of 2010. The purpose of these surveys was to verify data compiled from previous surveys conducted by SCE(2007), document and evaluate the vegetation types present, and to determine the potential occurrence of special-status plants. Map 1(Appendix A) gives the exact location of all the Sensitive plant species populations located in the Project area.

**San Gabriel Manzanita (Arctostaphylos gabrieliensis)**

**Regulatory Status:** San Gabriel Manzanita is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** This species is endemic to Los Angeles County and known only from the Mill Creek Summit Divide in the San Gabriel Mountains (CNPS 2007). CNDDB (2007) records one occurrence of the species within the Pacifico Mountain USGS quadrangle. The Consortium of California Herbaria (CCH) (2007) also lists an occurrence within the Pacifico Mountain USGS quadrangle.

**Habitat Requirements and Natural History:** Suitable habitats for this species may include Chamise Chaparral, Mixed Chaparral, and Scrub Oak Chaparral. It is typically found growing in rocky chaparral habitats at elevations around 5,000 feet.

**Threats:** Current threats identified for this species on NFS lands include non-native plant competition, wildfire suppression activities, and fuels reduction projects.

**Potential for Occurrence within the Project Area:** Focused floristic surveys were conducted between June-December, 2007 and February-July, 2008. San Gabriel Manzanita was observed on Segment 6 and 11 within the Project area during surveys. Segment 6 runs through Mill Creek Summit Divide, which is the type locality of this species, and where the majority of the occurrences were discovered. Approximately 40 populations were located on Segment 6 from half a mile north of Mill Creek Summit south to Upper Big Tujunga road. Approximately 20 populations of San Gabriel Manzanita were located along Segment 11, just south and north of Mt. Gleason Road.
**Slender Mariposa Lily (Calochortus clavatus var. gracilis)**

**Regulatory Status:** Slender mariposa lily is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** Slender mariposa lily is endemic to the southern foothills and canyons of the San Gabriel Mountains (Allan et al. 1995) and the western Transverse Range, from near Liebre Mountain (near the Ventura County line) east to Claremont (near the San Bernardino County line). About 10 occurrences are reported from the Angeles National Forest, including the West Fork San Gabriel River, Bichota Canyon, and San Francisquito Canyon (California Natural Diversity Database 2004).

**Habitat Requirements and Natural History:** Slender mariposa lily can be found in chaparral, coastal scrub and valley and foothill grassland habitats within an elevation of 360-1,000 meters (1,200-3,300 feet).

**Threats:** Specific threats to slender mariposa lily on National Forest Lands include non-native plant competition, illegal OHV activity, soil compaction from projects involving heavy equipment, horticultural collectors, grazing, development, trail construction, dam construction, flooding, erosion, wildfire, fire suppression activities, type conversions, gravel mining, and trampling. Most nonfederal occurrences are threatened by landfill expansion, residential development projects, and sand and gravel mining.

**Potential for Occurrence within the Project Area:** Approximately 30 populations of slender mariposa lily were found along the West Fork of the San Gabriel road (2N25) during surveys of 2010.

**Calochortus palmeri var. palmeri (Palmer’s Mariposa Lily)**

**Regulatory Status:** Palmer’s mariposa lily is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** This species is known to occur in the San Gabriel Mountains on the Waterman Mountain Quadrangle. In 1983, a population was located at Mile Marker 50.50 on Highway 2, across from the Devil’s Canyon Trailhead (CNDDB 1994), but was not seen in 2000 (Krueger, Pers. Obs. 2000).

**Habitat Requirements and Natural History:** Habitat for *Calochortus palmeri var. palmeri* is in chaparral, meadows, and Yellow Pine Forests. This species is often associated with meadows and vernaly moist (mesic) places between 3500-7500 feet. Life form is a bulbiferous perennial herb. Flowering occurs from May to July (Hickman 1993; Munz 1974; Skinner and Pavlik 1994).

**Threats:** Threats to this species include grazing, biocides, flooding, trampling, erosion, development, and off-highway vehicle use.

**Potential for Occurrence within the Project Area:** Six populations of *Calochortus palmeri var. palmeri* were located along 3N21, an access road to the Chilao helicopter site.

**Plummer’s Mariposa Lily (Calochortus plummerae)**

**Regulatory Status:** Plummer’s mariposa lily is designated by the Regional Forester as a Forest Service sensitive species.
Range and Distribution: There are roughly nine known occurrences on the ANF, including Lone Pine Canyon, Sevaine Road near Lytle Creek, and near Grapevine Spring in the San Gabriel Mountains.

Habitat Requirements and Natural History: Plummer’s mariposa lily is typically found on rocky, granitic soils, or on gravelly alluvium, in chaparral and coastal sage scrub habitats. This species may also occur, to a lesser extent, in grasslands, alluvial fan sage scrub, oak woodland, and Ponderosa pine woodland. Its elevation range extends from 100 – 1,700 meters (325 – 5,580 feet) and its blooming period is between May and July.

Threats: Threats to this species include development projects, trail construction and maintenance, fire suppression, habitat conversion, trampling, and sand and gravel mining.

Potential for Occurrence within the Project Area: Within the Project area approximately 40 populations of Plummer’s mariposa lily were observed. In Segment 6 populations were found along West Fork Cogswell Road, Rincon Red Box Road, 4N18 around Shortcut Station, and within 200 feet of several towers. In Segment 11 populations were found along 2N76, 3N27, around Maple Canyon, and within 200 feet of several towers. Suitable habitat for this species is present in several locations.

Canbya candida (Pygmy Poppy)

Regulatory Status: Pygmy poppy is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: Canbya candida occurs in Pinon Hills along Highway 138 (CNDDB 1998). This species is known from Kern, Los Angeles, and San Bernardino Counties. Specific quadrangle for the Angeles National Forest is Mescal Creek (Skinner and Pavlik 1994).

Habitat Requirements and Natural History: Habitat for this species is sandy areas in Creosote bush scrub, Joshua tree woodland, and Mojavean desert scrub from 2000 to 4000 feet elevation. Life form is an annual herb that blooms from March to June (Hickman 1993; Munz 1974; Skinner and Pavlik 1994).

Threats: Canbya candida is threatened by development and competition with nonnative plant species (California Native Plant Society 2001). Potential threats include significant ground disturbance from recreational activities, road and trail maintenance and construction, small scale gold mining and associated dispersed use, and ongoing development of the major utility and transportation corridor through Cajon Pass. Too frequent fire with an increasing prevalence of cheatgrass, and the effects of fire suppression are also threats. Poor knowledge of this species distribution is also a threat.

Potential for Occurrence within the Project Area: While the generic habitat requirements for pygmy poppy are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability pygmy poppy has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.
**Castilleja gleasonii (Mt. Gleason’s Paintbrush)**

**Regulatory Status:** Mt. Gleason paintbrush is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Castilleja gleasonii* known locations occur from Mt. Gleason and Messenger Flats to Chilao Flats. Specific locations include Mt. Gleason Road, Mendenhall Ridge, Horse Flats, South Fork Little Rock, and Pacifico Mountain (CNDDB 1996). In 1996, large populations were sighted from Mt. Pacifico, Horse Flats, and Chilao Flats (Krueger Pers. Obs. 1996). This species is known from the following quadrangles: Acton, Condor Peak, and Chilao Flat.

**Habitat Requirements and Natural History:** *Castilleja gleasonii* is usually found in areas of open yellow pine woodland (e.g., ponderosa pine, Jeffrey pine, and Coulter pine [*Pinus ponderosa*, *P. jeffreyi*, *P. coulteri*]) with a well-developed shrub or subshrub understory (Mistretta and Brown 1987). It can also be found growing with bigcone spruce (*Pseudotsuga macrocarpa*), white fir (*Abies concolor*), Parry’s manzanita (*Arctostaphylos parryana*) and chaparral whitethorn (*Ceanothus leucodermis*) (Stephenson and Calcarone 1999).

**Threats:** Threats to *Castilleja gleasonii* are vehicles, mechanical equipment, developed recreation, biocides (herbicides and insecticides), site preparation of plantations and reforestation (Skinner and Pavlik 1994; USDA Forest Service 1987a).

**Potential for Occurrence within the Project Area:** Approximately seven populations of *Castilleja gleasonii* were located along the Santa Clara Divide road (3N17) in the Mount Gleason area.

**Castilleja plagiotoma (Mojave Indian paintbrush)**

**Regulatory Status:** Mojave Indian paintbrush is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Castilleja plagiotoma* occurs from Kern to San Bernardino counties in the southern Sierra Nevada, the southern San Joaquin Valley, the interior South Coast Ranges, the Transverse Ranges, and the Mojave Desert (California Native Plant Society 2001, Chuang and Heckard 1993). BLM lands adjacent to the San Bernardino National Forest, particularly the Ord Mountains and Juniper Flats areas, contain important habitat for this species.

**Habitat Requirements and Natural History:** *Castilleja plagiotoma* grows primarily on *Artemisia tridentata* in alluvial soils in sagebrush scrub, Joshua tree woodlands, pinyon woodlands, and lower montane coniferous forest at elevations of 975–8,125 feet (300–2,500 meters) (California Native Plant Society 2001). *Castilleja plagiotoma* is also known to use *Eriogonum fasiculatum* var. *polifolium*, *Chrysothamnus nauseosus* (Mistretta 1994), *Ericameria linearifolia* (Sanders 1995) and *Salvia dorrii* (Swinney 1995) as host plants. In the San Bernardino Mountains, *Castilleja plagiotoma* occurs on pebble plain habitat at Little Pine Flats where it occurs in association with *Arabis parishii*, *Dudleya abramsii* ssp. *affinis*, and *Eriogonum kennedyi* var. *kennedyi*. The species also occurs on dry flats, desert slopes, and along the northern base of the San Gabriel Mountains (Chuang and Heckard 1993).

**Threats:** *Castilleja plagiotoma* is threatened by road and trail maintenance and recreational activities (USDA Forest Service 2002a).
Potential for Occurrence within the Project Area: Approximately six populations of *Castilleja plagiotoma* were located along the access road to the Chilao helicopter site (3N14). One population was also identified along the northern portion of 4N24, where it acts as an access road between Segments 6 and 11.

**Chorizanthe parryi var. parryi (Parry’s Spineflower)**

**Regulatory Status:** Parry’s spineflower is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Chorizanthe parryi var. parryi* occurs on alluvial fans and terraces in San Bernardino, Riverside, Los Angeles, and Orange counties. Occurrence locations include the Santa Ana River Wash, Mill Creek, San Gorgonio Pass, Arroyo Seco in the San Gabriel Mountains, Devil Canyon, Cajon Wash, Millard Canyon, Wildwood Canyon, and the vicinities of Colton, Winchester, and Murrieta (California Natural Diversity Database 2004).

**Habitat Requirements and Natural History:** *Chorizanthe parryi var. parryi* occurs in valley-floor and foothill habitats between 100 and 3,700 feet in elevation, and occasionally up to 5,600 feet (Hickman 1993). The plant is found in dry, sandy or gravelly soils in washes, alluvial benches, and in foothill microhabitats with unconsolidated soils and low vegetation cover. *Chorizanthe parryi var. parryi* most commonly occurs in openings in coastal sage scrub, chaparral, alluvial fan scrub, and the ecotone between chaparral and oak woodland. Species that are frequently associated with *Chorizanthe parryi var. parryi* are *Artemisia californica*, *Eriogonum fasciculatum*, *Pectocarya* sp., and *Encelia farinosa*.

**Threats:** On National Forest System lands, there are no known occurrences of *Chorizanthe parryi var. parryi*, and threats from Forest uses are unknown. Occurrences on private land are threatened by vehicular use, proposed development, altered flood regime, and sand and gravel mining operations.

**Potential for Occurrence within the Project Area:** While the generic habitat requirements for Parry’s spineflower are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability Parry’s spineflower has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

**San Gabriel River Dudleya (Dudleya cymosa var. crebrifolia)**

**Regulatory Status:** San Gabriel River dudleya is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Dudleya cymosa* ssp. *crebrifolia* is known from a single occurrence in Fish Canyon in the San Gabriel Mountains (California Natural Diversity Database 2004). The known occurrence of this taxon is entirely within the ANF, constituting about a one-mile stretch along the walls of Fish Canyon (CNDDB 2004).

**Habitat Requirements and Natural History:** *Dudleya cymosa* ssp. *crebrifolia* grows on granite cliffs and outcrops within sage scrub and chaparral between 1000 and 1500 feet (CNDDB 2004, Nakai 1987).

**Threats:** Any *Dudleya cymosa* ssp. *crebrifolia* on adjacent private land has likely been extirpated by mining of decomposed granite, which has removed the canyon walls from the ANF boundary to the foot of the mountain. If any plants have survived this mine, they would be at risk of loss by expansion of raveling of slopes made more unstable by mining. There is a trail up Fish Canyon that attracts limited
recreation use. However, the steep canyon wall habitat for this species makes substantial impacts of recreation very unlikely.

Potential for Occurrence within the Project Area: Four populations of Dudleya cymosa ssp. Crebrifolia have been located along access roads to Segment 6. Three populations are along the Sawpit Truck Trail (2N30) and one is along the West Fork Cogswell Road (2N25).

San Gabriel Mountain Dudleya (Dudleya densiflora)

Regulatory Status: San Gabriel mountain dudleya is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: Dudleya densiflora is known from six occurrences in three groups along the San Gabriel River at Fish Canyon, Roberts Canyon, and the mouth of the San Gabriel River canyon (CNDDB 2004). Surveys in 1989 identified additional potential habitat in the current geographic range of this species, but these areas are inaccessible due to the steep terrain and dense vegetation (Mistretta and Brown 1989).

Habitat Requirements and Natural History: Like many Dudleya species, Dudleya densiflora grows on granitic substrates on cliffs, from crevices in rocks, and on steep canyon walls (CNDDB 2004). It occurs at elevations of 800-2,000 feet (240-600 meters) in chaparral, coastal scrub, mixed evergreen woodland, and riparian woodland (Mistretta and Brown 1989, CNDDB 2004).

Threats: Threats to this species include mining, development (CNPS 2001), and possibly unauthorized collecting.

Potential for Occurrence within the Project Area: During surveys in 2008 a population of Dudleya densiflora was located along a roadcut of the Van Tassel Truck Trail, an access road for Segment 6.

Dudleya multicaulis (Many-stemmed Dudleya)

Regulatory Status: Many-stemmed dudleya is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: Dudleya multicaulis, Many-stemmed dudleya, is known from coastal and foothill areas of Los Angeles, Orange, San Bernardino, western Riverside, and San Diego counties (Bartel 1993, California Natural Diversity Database 2004). There are several occurrences recorded adjacent to the Angeles National Forest near San Dimas (California Natural Diversity Database 2004).

Habitat Requirements and Natural History: Dudleya multicaulis occurs in clay soil and Cretaceous marine sediment in barrens, rocky places, or thinly vegetated openings in chaparral, coastal scrub, and valley and foothill grasslands at elevations of 50–2,590 feet (15–790 meters) (Bartel 1993, California Native Plant Society 2001). Majority of the population are associated with coastal sage or open coastal sage scrub. It is usually found in openings on dry, stony soils, often with high clay content (Stephenson and Calcarone 1999). Associated species include Harpagonella palmeri, Allium munzii, Fritillaria biflora, Lupinus bicolor, Nassella pulchra, Eriogonum fasciculatum, Artemisia californica, and Juniperus californica.

Threats: Many of the Dudleya multicaulis occurrences on private lands and in road corridors are threatened primarily by road construction and maintenance. Other threats include fire suppression
activities, mining, grazing, dumping, and recreation activities (trampling) (California Natural Diversity Database 2004). Some occurrences are also threatened by nonnative species invasion such as *Brassica nigra* (California Natural Diversity Database 2004). Most occurrences are located on private lands with potential for development. Potential threats to the populations on the Cleveland National Forest include off-highway vehicle use, grazing, and recreation (USDA Forest Service 1998).

**Potential for Occurrence within the Project Area:** While the generic habitat requirements for *Dudleya multicaulis* are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability *Dudleya multicaulis* has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

*Galium grande* (*San Gabriel Bedstraw*)

**Regulatory Status:** San Gabriel bedstraw is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** Eight of the nine recorded *Galium grande* occurrences are on the Angeles National Forest (CNDDB 2004). The California Natural Diversity Database (2004) lists occurrences near Chantry Flat and Sand, Sawpit, Monrovia, and Fish Canyons.

**Habitat Requirements and Natural History:** *Galium grande* occupies chaparral, open broad-leaved upland forests, cismontane woodlands, and lower montane conifer forests at elevations of 1,400-5,000 feet (425–1,525 meters) (California Native Plant Society 2001).

**Threats:** Threats to this species include trail and road use/maintenance, firebreak maintenance, and fuels and vegetation treatments.

**Potential for Occurrence within the Project Area:** One population of this species was observed immediately adjacent to Segment 6, along the Monrovia Canyon Truck Trail between White Saddle and Mt. Bliss. Suitable habitat also occurs along portions of Van Tassel Truck Trail and Sawpit Truck Trail.

*Galium johnstonii* (*Johnston’s Bedstraw*)

**Regulatory Status:** Johnston’s bedstraw is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Galium johnstonii* is endemic to the San Gabriel, San Bernardino, and San Jacinto mountains of Los Angeles, San Bernardino, and Riverside counties (Dempster 1993, Reiser 1994, California Native Plant Society 2001). The CalFlora database (2000) contains several records for *Galium johnstonii*, totaling 19 general locations, all of which are on National Forest System lands. Most of these are on the Angeles National Forest.

**Habitat Requirements and Natural History:** *Galium johnstonii* occurs on dry rocky slopes in open mixed hardwood and conifer forest and Jeffrey pine forest at elevations of 5,070–7,475 feet (1,550–2,280 meters) (California Native Plant Society 2001). On Santa Rosa Peak, *Galium johnstonii* grows in partial shade beneath conifers (Reiser 1994).

**Threats:** More information is needed for this species on National Forest System lands, especially for populations near trails and other areas with high visitor activity. Specific threats to this species have not
yet been identified; however, vulnerability of Galium johnstonii populations on National Forest System lands appears to be low (USDA Forest Service 2003).

Potential for Occurrence within the Project Area: Approximately 10 populations of Johnston’s bedstraw were identified along the northern-most portion of FS road 4N24, an access road for Segment 11.

**Urn-flowered Alumroot (Heuchera elegans)**

**Regulatory Status:** Urn-flowered alumroot is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** In the Angeles National Forest, *Heuchera elegans* is known from Martins Camp near Mt. Wilson, Mt. Lowe, Occidental Peak, Little Tujunga and Pacoima Canyons, and Mount Disappointment. There is an occurrence at Ontario Peak in the Cucamonga Wilderness that straddles the border between the Angeles and San Bernardino national forests. In total, there are 55 records of this species from the San Gabriel Mountains.

**Habitat Requirements and Natural History:** *Heuchera elegans* inhabits rocky areas in lower and upper montane coniferous forest between 4000- 8500 feet (Elvander 1993). Montane coniferous forest is well distributed within the ANF; however, suitable rocky areas within this habitat are more narrowly distributed.

**Threats:** Threats to this species include trampling by off-trail hikers, but these impacts are probably minor and limited to the habitat immediately adjacent to trails (CNDDDB 2002; USDA Forest Service 2002a), and, collection by the nursery trade, as *Heuchera* in general becomes increasingly popular with alpine and rock-garden plant collectors.

Potential for Occurrence within the Project Area: The species was observed immediately adjacent to Segment 6 access road 4N18, just north of Monte Cristo Creek and 2N24, just south of the West Fork of the San Gabriel River.

**Horkelia cuneata ssp.puberula (Mesa’s Horkelia)**

**Regulatory Status:** Mesa’s horkelia is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Horkelia cuneata ssp. puberula* is known from Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura Counties. University and Jepson Herbaria have seven voucheried specimens from Los Angeles County with location references of North Pomona, Garvanza, Claremont, Glendora, the mountains, and Arrow Highway prior to 1932.

**Habitat Requirements and Natural History:** *Horkelia cuneata ssp. puberula* occupies sandy or gravelly areas in chaparral, cismontane woodland, and coastal scrub. The elevation range of this subspecies is 230 to 2,660 feet (70-810 meters) (California Native Plant Society 2001).

**Threats:** This taxon is threatened by development on private lands along the coast and inland valleys, mesas, and hills of southern California. (California Native Plant Society 2001). Many historical occurrences have been extirpated [only eight of the 37 quads that are listed for *Horkelia cuneata* ssp.

Potential for Occurrence within the Project Area: While the generic habitat requirements for mesa horkelia are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability mesa horkelia has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

San Gabriel Mountains Sunflower (Hulsea vestita ssp. gabrieliensis)

Regulatory Status: San Gabriel Mountains sunflower is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: Hulsea vestita ssp. gabrieliensis occurs in the mountains of Los Angeles, San Bernardino, and Ventura counties (California Native Plant Society 2001; CalFlora 2002; Magney 2002; Wilken 2002; Rancho Santa Ana Botanic Garden 2002). The 33 occurrences from Los Angeles County and the single occurrence from San Bernardino County are all found in the San Gabriel Mountains. Locations range from Magic Mountain in the west, Mt. San Antonio in the east, Santiago Canyon in the north, and Tujunga Canyon in the south. In Ventura County, two occurrences of Hulsea vestita ssp. Gabrielensis are known from the summit of Frazier Mountain and near Alamo Mountain (Wilken pers.comm.; Magney 2002). Most occurrences of Hulsea vestita ssp. gabrieliensis occur on the Angeles National Forest (ANF). Locations include Pacifico Mountain, Mt. Gleason, Mt. Williamson, Charlton Flats, Tujunga Canyon, Mt. San Antonio, Mill Creek Summit, Mt. Hillyer, Upper Chilao Campground, Mt. Baden-Powell, Arrastre Canyon, Granite Mountain, Bear Divide Station, Bad Canyon, Magic Mountain, Santiago Canyon, and Mt. Waterman (Rancho Santa Ana Botanic Garden 2002).

Habitat Requirements and Natural History: Hulsea vestita ssp. gabrieliensis is found in rocky soils in open areas of montane coniferous forest between 1,500 and 2,500 meters (Wilken 1993). In the San Gabriel Mountains, occurrences grow in fine or coarse granitic loam soils (Rancho Santa Ana Botanic Garden 2002). Several occurrences exist on north or northwest-facing slopes, and several occurrences are near summits. The taxon appears to tolerate both full sun and partial shade. Associated plant communities include Jeffrey pine forest (Pinus jeffreyi) and Coulter pine forest (Pinus coulteri). The plant may also be associated with Cordylanthus nevinii (Rancho Santa Ana Botanic Garden 2002).

Threats: Threats to occurrences of Hulsea vestita ssp. gabrieliensis in the San Gabriel Mountains include trail and road maintenance and construction, dispersed recreation, and other Forest Service uses and management activities.

Potential for Occurrence within the Project Area: Within the Project area approximately 15 populations of Hulsea vestita ssp. gabrieliensis were observed. In Segment 6 populations were found along 4N18, the Shortcut Edison road, and the helicopter pad at Chilao. In Segment 11 populations were found along the northern portion of 3N27 and the Santa Clara Divide Road in the Mount Gleason area.

California Satintail (Imperata brevifolia)

Regulatory Status: California satintail is designated by the Regional Forester as a Forest Service sensitive species.
Range and Distribution: California satintail is known from Butte, Lake, Tulare, Fresno, Inyo, Riverside, San Bernardino, Los Angeles, and Ventura counties. On the ANF it has been located in the San Dimas Experimental Forest and Big Tujunga Canyon.

Habitat Requirements and Natural History: California satintail is found in calcareous seeps, hot springs, and disturbed wet areas, generally at elevations ranging from 300 to 1500 m.

Threats: Threats to California satintail include dispersed recreation (trails), road maintenance, and invasion of alien (non-native) species.

Potential for Occurrence within the Project Area: While the generic habitat requirements for California satintail are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability California satintail has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

Fragrant Pitcher Sage (Lepechinia fragrans)

Regulatory Status: Fragrant pitcher sage is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: There are about 12 occurrences of Lepechinia fragrans on or near the Angeles and San Bernardino National Forests. Occurrences range from Red Mountain (northeast of San Francisquito Canyon) east to Cucamonga Canyon.

Habitat Requirements and Natural History: Occurrences of Lepechinia fragrans are found in canyon chaparral between 20 meters and 1,310 meters (CNPS 2001). Potential habitat for Lepechinia fragrans is widely scattered at low elevations (below 5,000 feet) the San Gabriel Mountains (SBNF and ANF), the portion of the ANF north of Castaic and Pyramid lakes. Associated species include Adenostoma fasciculatum, Arctostaphylos sp., Ceanothus sp., and Cercocarpus betuloides (Holland 1986).

Threats: Threats to this species include alteration of natural fire regime, habitat loss and degradation from fuels and vegetation treatments, and road and trail use and maintenance.

Potential for Occurrence within the Project Area: Within the Project area approximately 40 populations of Lepechinia fragrans were observed. In Segment 6 ~20 populations were found along Rincon Redbox Road (2N24). In Segment 11 ~20 populations were found around the Maple Canyon marshalling yard, along Grizzly Flats Road (2N79), Mount Lukens Road (2N76), the ridgeline just northeast of CCC Ridge Road, and at several tower sites.

Linanthus concinnus (San Gabriel Linanthus)

Regulatory Status: San Gabriel linanthus is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: Linanthus concinnus is endemic to the San Gabriel Mountains in Los Angeles and San Bernardino Counties. The known range of Linanthus concinnus is approximately 30 miles wide and 15 miles long, limited to the San Gabriel Mountains, from Mount Lowe east to Timber Mountain and
as far north as Largo Vista. The type specimen was collected from the eastern edge of the species' range from Lytle Creek Canyon at 6000 feet in 1900 by H. M. Hall and deposited in the UC herbarium as Hall 1443 (USDA Forest Service 2003). The majority of the occurrences are located on Forest Service lands. All but two occurrences in Health Canyon are located on ANF lands, with a portion of the Timber Mountain occurrence also on adjacent SBNF lands. The rediscovered occurrence at Lytle Creek Canyon is also on the SBNF. The two occurrences in Health Canyon are located on what appears to be private property (USDA Forest Service 2003).

Habitat Requirements and Natural History: Based on data gathered at known localities in the 2003 surveys and historical information as described in the 2003 report, the habitat this species prefers is typically in sunny opening of mixed chaparral to mixed conifer forest between 5000 feet and 8500 feet (1520m and 2590 m) elevation, from canyon live oak-interior live oak chaparral to sugar pine-jeffrey pine-white fir forest. Plants are found occasionally on shallow slopes of ridgetops to more commonly on steep to moderate, loose rocky slopes; generally on south-facing to west- and east-facing slopes. Plants are most commonly associated with Mesozoic granitic rocks of tonalite and diorite, granite and adamellite, or granodiorite; occasionally on pre- Cretaceous metamorphic of pelona schist or mylonite; and rarely on pre-Cretaceous metasedimentary rocks. Plants are found most commonly on soils of rock outcrop-Lithic Xerorthents-Rubble land association; occasionally on soils of Typic Xerorthents-Haploxerolls-Typic Xerchrepts complex, or Waterman-Springdale-Pacifico families complex; and more rarely on soils of Stukel-Sur-Winthrop families complex, Xerorthents-Green Bluff family-Rock outcrop complex, or Bakeoven-Sur families complex.

Threats: Threats to this species include recreational activities and road and trail maintenance (Skinner and Pavlik 1994).

Potential for Occurrence within the Project Area: Two populations of *Linanthus concinnus* were located in Segment 11, one along 4N41 and one around the Mill Creek Summit Station.

*Lupinus peirsonii* (Peirson’s Lupine)

Regulatory Status: Peirson’s lupine is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: Peirson’s lupine is endemic to the upper coniferous regions of the San Gabriel Mountains. The range of Peirson’s lupine is from Big Rock Creek, Mt Baden-Powell, Devil’s Punchbowl and Dawson’s Saddle (RSA herbarium records). Peirson’s lupine occurs on the Los Padres National Forest northeast of Lopez Lake (CNDDB Occurrence #19). Several occurrences are reported from the vicinity of the Arroyo Grande Ranger Station and one from 4 miles north of Pozo, but they are on private property adjacent to National Forest Service System lands (California Natural Diversity Database 2004).

Habitat Requirements and Natural History: Peirson’s lupine grows on sandy or sandstone-derived soils in chaparral and in open grassy areas in foothill oak woodlands (coast live oak) at elevations below 1,500 feet (460 meters). Plants typically grow in sandy soils associated with the Santa Margarita formation, but one occurrence is found on limestone soil.

Threats: Threats to Peirson’s lupine include dispersed recreation (trails), road maintenance, and invasion of alien (non-native) species.

Potential for Occurrence within the Project Area: While the generic habitat requirements for Peirson’s lupine are present in the project area, it was not detected during any of the four years of field surveys. Due
to the lack of detection and marginal habitat suitability Peirson’s lupine has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

**Monardella macrantha ssp. hallii (Hall’s monardella)**

_**Regulatory Status:**_ Hall’s monardella is designated by the Regional Forester as a Forest Service sensitive species.


_Habitat Requirements and Natural History:_ *Monardella macrantha* ssp. *hallii* occupies valley-foothill grassland, chaparral, cismontane woodland, broad-leaved upland forest, and lower montane conifer forest between elevations of 2,400-7,200 feet (731-2,194 meters) (California Native Plant Society 2001). It grows in rocky places and in openings in the vegetation such as near rocky rubble and boulders where shrub cover is limited.

_**Threats:**_ *Monardella macrantha* ssp. *hallii* may be threatened by trampling from hikers and other recreationists (Reiser 1994). However, this taxon may be somewhat tolerant to disturbance and fire may positively affect the populations. Some populations exhibited higher densities after fire. Another occurrence was observed with individuals growing in disturbed areas. The decreased competition from other plants may promote plant growth (USDA Forest Service 2002). Hybridization may also pose a threat to this species unrelated to Forest Service actions.

_**Potential for Occurrence within the Project Area:**_ While the generic habitat requirements for Hall’s monardella are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability Hall’s monardella has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

**Monardella viridis ssp. saxicola (Rock Monardella)**

_**Regulatory Status:**_ Rock monardella is designated by the Regional Forester as a Forest Service sensitive species.


_Habitat Requirements and Natural History:_ *Monardella viridis* ssp. *saxicola* grows on dry rocky soils in sunny exposed places, including partially shaded gravelly benches and burned areas within chaparral, and in open areas of yellow pine forest, at elevations of 1,640–5,900 feet (500–1,800 meters) (Jokerst 1993, Stephenson and Calcarone 1999).

_**Threats:**_ The plant is vulnerable to road-maintenance activities and disturbances that lead to type conversion of its habitat (Stephenson and Calcarone 1999). At least one occurrence is located on private lands and may be vulnerable to development projects (California Native Plant Society 2001).
Potential for Occurrence within the Project Area: While the generic habitat requirements for rock monardella are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability rock monardella has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

**Short-joint Beavertail (Opuntia basilaris var. brachyclada)**

**Regulatory Status:** Short-joint beavertail is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** There are 56 total occurrences of *Opuntia basilaris* var. *brachyclada* (California Natural Diversity Database 2004): 30 are on the Angeles National Forest and seven are on the San Bernardino National Forest. It occurs from Quigley Canyon east-northeast to the Anaverde Valley west of Palmdale. From there, it appears to more or less follow the San Andreas rift zone to the Cajon Pass, although it departs somewhat from the rift zone near Mill Creek Summit within the Angeles National Forest. It occurs mostly at elevations between 3,000-6,500 ft. (900-2,000m). *Opuntia basilaris* var. *brachyclada* is reported in the Anaverde Valley just west of Palmdale, and from there it follows the San Andreas rift zone in the Angeles National Forest southeast to Largo Vista.

**Habitat Requirements and Natural History:** *Opuntia basilaris* var. *brachyclada* is known to occur in chaparral, Joshua tree woodland, Mojave Desert scrub, and pinyon-juniper woodland communities at elevations of 3,000-6,500 ft. (900-2,000 m). Within the Angeles National Forest, it is associated with *Adenostoma fasciculatum*, *Ceanothus crassifolius*, *Ceanothus greggii* var. *vestitus*, *Yucca whipplei* ssp. *caespitosa*, *Platanus racemosa*, *Ceanothus leucodermis*, *Arctostaphylos glauca*, *Rhus ovata*, *Garrya veitchii*, *Artemisia tridentata*, *Sambucus mexicanus*, *Chrysothamnus nauseosus*, and *Eriodictyon trichocalyx*. It has been reported from a variety of soils, from sandy to rocky, in open stream beds, alluvial fans, and on rocky slopes (CNDDB 2004).

**Threats:** Threats to this species include mechanical destruction/removal by off-highway vehicles, residential construction, and horticultural collection activities.

Potential for Occurrence within the Project Area: Approximately 25 populations of *Opuntia basilaris* var. *brachyclada* were located in the Project area. This variety was identified within 200 feet of four tower locations along Segments 6 and three tower locations, a spur road of Segment 11, and access roads to Segment 6. It was also found in ~10 places along the roadcut of 4N24 north and south of Aliso Canyon road and alongside the Monte Cristo Road in two places.

**Orobanche valida ssp. valida (Rock Creek Broomrape)**

**Regulatory Status:** Rock Creek broomrape is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Orobanche valida* ssp. *valida* occurs on the Los Padres and Angeles National Forests (California Natural Diversity Database 2004). Plants occur in the San Gabriel Mountains at Lookout Mountain and along the South Fork of Big Rock Creek. In addition, surveys in 1994 and 1995 found six new localities in the eastern San Gabriel Mountains.

Only a portion of the potential habitat for this taxon has been surveyed, and it seems likely that additional occurrences will be found in the western San Gabriel Mountains and at other locations in the Castaic and
southern Los Padres regions (Stephenson and Calcarone 1999) and perhaps in the eastern Sierra Nevada foothills of Owens Valley.

**Habitat Requirements and Natural History:** *Orobanche valida* ssp. *valida* is found on coarse, well-drained soils in fairly open chaparral and pinyonjuniper woodlands at elevations of 4,100–6,600 feet (1,250–2,010 meters) (California Native Plant Society 2001). Substrates are often granitic in origin, but some occurrences are found on sedimentary rocks as well (Mistretta and Brown 1997). On the Angeles National Forest, *Orobanche valida* ssp. *valida* is found on both coastal and desert slopes (Mistretta and Brown 1997). Associates include *Garrya veatchii*, *G. flavescens*, *Cercocarpus betuloides*, *Eriodictyon trichocalyx* var. *trichocalyx*, *Eriogonum fasciculatum* var. *polifolium*, *Yucca whipplei*, *Quercus chrysolepis*, *Q. johnntuckeri*, *Ceanothus leucodermis*, *Calystegia malacophylla*, and *Melica imperfecta*. Pinyon (*Pinus monophylla*) is sometimes nearby.

**Threats:** Threats to *Orobanche valida* ssp. *valida* include dispersed recreation (trails), road maintenance, and invasion of alien (non-native) species (USDA Forest Service 1996a).

**Potential for Occurrence within the Project Area:** One population of *Orobanche valida* ssp. *valida* was located along the Rincon Redbox Road (2N24), an access road for Segment 6.

**Sidalcea hickmanii** ssp. *parishii* (Parish’s Checkerblooem)

**Regulatory Status:** Parish’s checkerblooem is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Sidalcea hickmanii* ssp. *parishii* is known from the outer South Coast Ranges, the Western Transverse Ranges, and the San Bernardino Mountains (Hill 1993). The California Natural Diversity Database (2004) lists 15 occurrences in the La Panza Range and the San Rafael, Sierra Madre, and San Bernardino Mountains.

**Habitat Requirements and Natural History:** *Sidalcea hickmanii* ssp. *parishii* grows in chaparral, cismontane woodland, and montane conifer habitat at elevations of 3,300–8,200 feet (1,000–2,500 meters) (California Native Plant Society 2001). Habitat for *Sidalcea hickmanii* ssp. *parishii* varies over time in response to wildfire and the post-fire response of the vegetation. Dense, mature stands of chaparral and woodland are generally unsuitable for *Sidalcea hickmanii* ssp. *parishii* until after wildfire has removed the bulk of the competing vegetation. *Sidalcea hickmanii* ssp. *parishii* may remain on-site after vegetative recovery has occurred but only in open areas – areas that are usually subject to some sort of periodic disturbance other than fire.

**Threats:** Threats to this species include urbanization, grazing, and road maintenance (Hickman 1993; Skinner and Pavlik 1994).

**Potential for Occurrence within the Project Area:** While the generic habitat requirements for Parish’s checkerblooem are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability Parish’s checkerblooem has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.
**Sidotheca caryophylloides** *(Chickweed starry puncturebract)*

**Regulatory Status:** Chickweed starry puncturebract is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** *Sidotheca caryophylloides* is endemic to the southern high Sierra Nevada, Transverse Ranges, and San Jacinto Mountains (Hickman 1993).

**Habitat Requirements and Natural History:** *Sidotheca caryophylloides* grows on sandy soils in montane conifer forests at elevations of 3,900–8,500 feet (1,200–2,600 meters) (California Native Plant Society 2001). This species mostly occurs in yellow pine forest (Munz 1974).

**Threats:** *Sidotheca caryophylloides* has a sparse known distribution and exhibits high annual variability; as a result, this species may be vulnerable to stochastic events resulting in occurrence extirpation. The primary threats to this species habitat are fuels and vegetation management and vehicle travel off of designated system roads.

**Potential for Occurrence within the Project Area:** Four populations of *Sidotheca caryophylloides* were discovered along access roads for Segment 6, Lynx Gulch (4N18) and Upper Big Tujunga Road (3N19).

**Symphyotrichium defoliatum** *(San Bernardino aster)*

**Regulatory Status:** San Bernardino aster is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** San Bernardino aster is known from San Diego, Riverside, San Bernardino, Orange, Los Angeles, Ventura, San Luis Obispo, Santa Barbara counties. Historic occurrences are known from the Prairie Fork of the San Gabriel River.

**Habitat Requirements and Natural History:** San Bernardino aster can be found in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and valley and foothill grassland habitats within vernally mesic areas near ditches, and streams. It grows at elevations between 7 and 6,693 ft., and flowers from July to November.

**Threats:** Threats to San Bernardino aster include dispersed recreation (trails), road maintenance, and invasion of alien (non-native) species.

**Potential for Occurrence within the Project Area:** While the generic habitat requirements for San Bernardino aster are present in the project area, it was not detected during any of the four years of field surveys. Due to the lack of detection and marginal habitat suitability San Bernardino aster has a low potential to occur in the project area. Since focused surveys have not detected this species, it is dropped from further consideration.

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**Special Status Wildlife**

**Bald Eagle** *(Haliaeetus leucocephalus)*

**Regulatory Status:** The bald eagle is designated as a Forest Service sensitive species by the Regional Forester.
Range and Distribution: The bald eagle occurs throughout most of North America. Historically, Bald eagles bred throughout the mountains of coastal California. Breeding populations currently exist on the Los Padres and San Bernardino National Forests. Bald Eagles have not nested within or adjacent to the Angeles National Forest in Los Angeles County for at least 30 years. A Bald Eagle was sighted in a riparian area on the Tejon Ranch on August 24, 1994 (Bautista and Brown, Pers. Obs.). Bald Eagles are occasionally seen on or near the Santa Clara/Mojave Rivers Ranger District during the winter, but apparently none are resident. On the Angeles National Forest bald eagles have been observed at Littlerock reservoir in 2007 (L. Welch, District Biologist, pers. comm.). The largest wintering population of bald eagle in southern California is at Big Bear Lake in the San Bernardino Mountains. It has been successfully reintroduced as a breeding species on Santa Catalina Island after becoming extirpated from the Channel Islands in the 1950’s.

Habitat Requirements and Natural History: Fairly common as a winter migrant at a few favored inland waters in Southern California (Zeiner et al. 1990a). This species requires large bodies of water, or free-flowing rivers with abundant fish, and adjacent snags or other perches (Zeiner et al. 1990a). Perches high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water (Zeiner et al. 1990a). Bald eagles are active diurnally and yearlong. Bald eagles are primarily fish eaters; however, they are opportunistic and will utilize avian and mammalian prey and carrion if readily available, especially in the nonbreeding season (Evans 1982; Zeiner et al. 1990a). Swoops from hunting perches, or soaring flight, to pluck fish from water (Evans 1982; Zeiner et al. 1990a). Roosts communally in winter in dense, sheltered, remote conifer stands (Zeiner et al. 1990a). Eagle nests are characteristically large, ranging from a minimum of 3 feet in width and depth to 16 feet deep and 10 feet across; size and shape are determined partly by the supporting branches (Evans 1982). Where suitable nest trees are scarce, nests are placed on ridges, cliffs, and on sea stacks (Evans 1982). Nest is located 50-200 feet above ground, usually below tree crown (Zeiner et al. 1990a) and nests are usually located near a permanent water source (Zeiner et al. 1990a). In southern California, nesting most often occurs in large trees near water, but occasionally nests are on cliffs or the ground. Bald eagles engage in courtship flights consisting of the pair souring together for long periods of time at great heights (Evans 1982). Occasionally they will lock talons and somersault downward several hundred feet (Evans 1982). Breeds February through July; but may start as early as November (Zeiner et al. 1990a). Clutch size is 1-3 (Evans 1982; Zeiner et al. 1990a). Incubation is usually 34-36 days (Evans 1982; Zeiner et al. 1990a) and fledging occurs at 10-12 weeks (Evans 1982). Semi-altricial young hatch asynchronously (Zeiner et al. 1990a). Bald eagles are monogamous, and breeds first at 4-5 years (Zeiner et al. 1990a). Bald eagles are considered long-lived, with the oldest living Bald eagle was reported near Haines, Alaska as 28 years old (Schempf 1997). In captivity, Bald eagles may live 40 or more years (USDI - Fish and Wildlife Service 1999).

Occasionally raccoons, bobcats, crows, and under unusual circumstances, gulls prey on eggs and small young, forcing the adults away from the nest (Evans 1982). Organochlorine (DDE) interferes with normal calcium metabolism, resulting in thin-shelled eggs, which cannot withstand normal incubation (Evans 1982). Dieldrin, PCB’s, and mercury have been linked to embryonic and early chick mortality (Evans 1982). High concentrations of dieldrin and DDT are known to result in mortality of bald eagles (Evans 1982).

Threats: Illegal shooting remains the greatest single known cause source of bald eagle mortality (Evans 1982). Roughly half of all recorded bald eagle deaths are a direct result of shooting (Evans 1982). Other causes of mortality include impact injuries (usually powerline or tower), electrocution, trapping injuries (eagles caught in "sight bait" sets for fur bearers), automobile or train accidents, and poisoning from contaminated coyotes or other carcasses (Evans 1982).

Territories have been abandoned after disturbance from logging, recreational developments, and other human activities near nests (Zeiner et al. 1990a). Recreational use of lakes and extensive shoreline
development have reduced feeding habitat (Evans 1982). Usually does not begin nesting if human disturbance is evident (Zeiner et al. 1990a).

There are three primary threats to bald eagle populations on or near National Forest System lands in southern California: (1) disturbance to perch and potential nest areas from recreational activities (e.g., boating, fishing, and hiking); (2) loss of perching and nesting habitat to development (mostly residential); and (3) collision with electrical or communication transmission lines (USDA Forest Service 2000, U.S. Fish and Wildlife Service 2001).

Potential for Occurrence Within the Project Area: Potential habitat on the ANF includes Big Tujunga Reservoir, Santa Anita Reservoir, Monrovia Reservoir, Crystal Lake, Cogswell Reservoir, Morris Reservoir, San Gabriel Reservoir, San Dimas Reservoir, and San Antonio Reservoir. Large streams such as the Arroyo Seco, Winter Creek, Eaton Canyon, Santa Anita Canyon, Monrovia, San Gabriel, and San Antonio have both a low prey base (fish population) and/or high amounts of human activity which make these areas less suitable for Bald eagles. Habitat present at Pyramid Lake and Lake Hughes is considered marginal due to limited snags near these bodies of water.

Optimal survey period for southern California is late November to mid March. Surveys for special-status bird species were conducted on 18–20 July, 13–16 August, 17–21 September, 25–28 September, and 2–4 October 2007. This species was not detected in the project area on the ANF although they are known to occur just south of the ANF and some foraging and nesting habitat is available.

California Spotted Owl (Strix occidentalis occidentalis)

Regulatory Status: The California spotted owl is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: California spotted owls occur predominately on National Forest System lands in all the major mountain ranges on the four southern California national forests (although some ranges support very few pairs) (Beck and Gould 1992). They are found at elevations from below 1,000 feet (305 meters) along the Monterey coast to approximately 8,500 feet (2,590 meters) in the San Bernardino Mountains (Stephenson 1991). This is a territorial species with large acreage requirements; spotted owls in southern California are clustered in disjunct mountain and foothill areas where suitable habitat exists. Large areas of unsuitable habitat surround these clusters (Stephenson and Calcarone 1999).

Habitat Requirements and Natural History: In southern California, California spotted owls occur within four general but distinct forest types: riparian/hardwood forest, live oak/bigcone Douglas-fir forest, mixed conifer forest, and redwood/California laurel forest (Verner et al. 1992). With the exception of redwood forest, which is limited in distribution to the Los Padres National Forest, these forest types generally occur on all four southern California national forests (USDA Forest Service 1994). The California spotted owl is strongly associated with forests that have a complex multi-layered structure, large-diameter trees, and high canopy closure (Bias and Gutiérrez 1992; Gutiérrez et al. 1995). Nest stands often have a well-developed hardwood understory (e.g., canyon live oak [Quercus chrysolepis]) and a conifer overstory. This is a territorial species with large acreage requirements; spotted owls in southern California are clustered in disjunct mountain and foothill areas where suitable habitat exists. Large areas of unsuitable habitat surround these clusters (Stephenson and Calcarone 1999).

Verner et al. (1992) provides a complete description of suitable spotted owl habitat. In the mountains of Southern California, spotted owls occur in mixed conifer, live oak/big cone Douglas fir, and riparian/hardwood habitat types. Nesting habitat typically has greater than 70% canopy cover with a
mixture of tree sizes and at least 2 canopy layers, and large trees are usually present. Foraging habitat is similar to nesting habitat, but also includes more open stands with canopy closure as low as 40-50%. Choice of habitat is closely related to thermoregulatory needs since the spotted owl is intolerant of high temperatures (Zeiner et al. 1990a). Spotted owls are nocturnal and active yearlong. They are not migratory, although some individuals may move downslope in winter. Woodrats are the dominant prey of spotted owls in hardwood habitats however they also feed on mice, voles, rabbits, small birds, bats, and large arthropods. They usually nest in trees or cavities of snags, or in the broken tops of large trees. Females incubate and brood the young while the male feeds the female and young (Zeiner et al 1990a).

**Threats:** California spotted owls face a wide range of threats in southern California. These include unnatural fuel build-up, resulting from fire suppression, and consequent wildland fire; fuels management activities such as thinning, mortality removal, and prescribed fire; woodcutting for fuelwood, sawlogs, hazard tree removal, and postfire salvage; water diversion and groundwater extraction; tree mortality due to forest pests and diseases; drought; air pollution; forest fragmentation due to land ownership patterns; mining activities; and human disturbance related to special uses, roads, and recreation.

**Potential for occurrence within the Project Area:** California spotted owls are considered to be present within and near the project area. Surveys have been conducted along portions of the project area from 1987-2010. Specific locations of observations can be found in the 1994 Angeles National Forest Spotted Owl Inventory Report (Angeles National Forest 1994) and subsequent Forest Records on file at the Supervisor’s office. Beginning in 1989 surveys were conducted using the protocol in place at the time. These protocols are as follows;

Recent protocol surveys for California Spotted Owls were conducted for this project on the ANF by AMEC Earth and Environmental Inc. on 14, 15, 17, and 28-30 April, 12-13 and 15 May, 2-5 and 23-26 June, 14-15 and 17-18 July 2008 and April 9-10, 13, 15-17, 20, 27, 29, May 5, 11-12, 18, 20-21, June 5, 8, 15, 22, July 7-8, 16-17, 27, and August 2, 4, 10 2009. Protocol surveys were conducted by Bonterra Environmental on the ANF along segment 6 and 11 on 10, 12,17, 19-21, 24-25, 27-28 May, 1, 2, 8, 15 June, 13, 29 July, and 1, 5, 15 August 2010. California spotted owls were detected in areas supporting Canyon Oak Forest and Bigcone Douglas-fir Forest habitats along portions of segments 6 and 11. Specifically owls have been identified near Mount Gleason Road near one of the proposed helicopter staging areas, however this area was severely impacted by the Station fire and there is no remaining suitable habitat near the project area; south of Big Tujunga Creek along Big Tujunga Road, however this area was also affected by the Station fire and remaining habitat is patchy in areas and likely will not support spotted owls; and at numerous locations along the primary access road for segment 6(Shortcut trail 2N23). This road runs south from State Highway 2 to portions of Segment 6 just west of the San Gabriel Wilderness Area. This area supports the largest concentrations of owls within the Angeles National Forest and the habitat remains intact after the Station fire and is considered to be the most ideal and most utilized habitat on the ANF.

**Townsend’s Big-eared Bat (Corynorhinus townsendii)**

**Regulatory Status:** The Townsend’s Big-eared bat is designated by the Regional Forester as a Forest Service sensitive species.
Range and Distribution: Townsend's big-eared bat occurs throughout the western United States, including California, Nevada, Idaho, Oregon, and Washington, from near sea level to elevations well above 10,367 feet (3,160 meters) (Nagorsen and Brigham 1993, Pearson and others 1952). In California, they are found from sea level along the coast to 6000 feet elevation in the Sierra Nevada Mountains (Dalquest 1947, Pearson and others 1952, Pierson and Rainey 1998). During 1996-1998, bat surveys were conducted at 76 sites located throughout the four forests of southern California. These surveys were in partnership with the Biological Resources Discipline within the U.S. Geological Survey. Townsend's big-eared bats were found at six of 76 sites on southern California National Forest System lands. None were found on the ANF.

Habitat Requirements and Natural History: The distribution of this species is strongly correlated with the availability of suitable caves and cave analogues (mines, rock shelters, tunnels, building) for roosting. Population centers occur in areas dominated by exposed, cavity forming rock and/or historic mining areas (Sherwin 1998). Abandoned mines are particularly important as roost sites in areas where there are not suitable caves (Stephenson and Calcarone 1999). A high degree of site fidelity (more than 80 percent) has been noted for this species (Humphrey and Kunz 1976, Pierson and others 1999).

Townsend's big-eared bat can be found in a variety of habitats throughout California, from the moist coastal redwoods to the mid-elevation mixed conifers to the dry deserts, but are most commonly associated with desert scrub, mixed conifer, pinyon-juniper, and pine forest. Within these communities, these bats are most commonly associated with limestone caves, mines, lava tubes, buildings and tunnels (Dalquest 1947, 1948; Dobkin and others 1995; Graham 1966; Kunz and Martin 1982; Pearson and others 1952; Pierson and Rainey 1991). During hibernation, Townsend's big-eared bats typically prefer habitats with relatively cold (but above freezing) temperatures in quiet, undisturbed places. These areas are often in the more interior, thermally stable portions of caves and mines (Barbour and Davis 1969, Dalquest 1947, Humphrey and Kunz 1976, Pearson and others 1952, Zeiner and others 1990). Hibernating bats are often found in ceiling pockets (Pierson and Rainey 1991). In central California, solitary males and small clusters of females are also known to hibernate in buildings (Kunz and Martin 1982, Pearson and others 1952). Females may roost in colder hibernacula than males (Pearson and others 1952). During spring and summer, females establish maternity colonies in the warm parts of caves, mines, and buildings (Dalquest 1948, Pearson and others 1952, Pierson and Rainey 1991, Twente 1955). In California, some maternity roosts may reach 86 ° F (30 ° C) (Pierson and Rainey 1991). Favored roost locations for the females and young are often in a ceiling pocket or along the walls just inside the roost entrance (Pierson and Rainey 1991). This makes them very vulnerable to disturbance. Interior dimensions are an important factor in roost selection. The majority of the roosts examined in California were at least 100 feet long with a ceiling height of 4 feet (Pierson and others 1991). The proximity of good foraging habitat also appears to be a determining factor in roost selection. In a recent survey in the Panamint Mountains, mines with suitable temperatures were occupied by maternity colonies only if they were within two miles of a canyon with water (Brown 2002). Night roosts may include buildings or other structures (e.g., bridges, tunnels, and mines) (Philpott 1997, Pierson and Rainey 1998).

Female Townsend's big-eared bats form maternity colonies in early spring, usually returning to the same site every year. In maternity colonies, females form tight clusters to preserve body heat. In California, maternity colonies have been found to contain 17–40 adult females (Philpott 1997). They give birth to a single offspring in late spring or early summer after a gestation period of approximately 3 months (Pearson and others 1952). Timing varies by temperature and latitude (Brown 2002, Kunz and Martin 1982). In California, young are born over a 3–5 week period beginning in late May. Townsend's big-eared bats are large at birth, weighing approximately 25 percent of the mother's postpartum mass (Kunz and Martin 1982). The young grow rapidly, reaching adult size in approximately 1 month, and are capable of flight in 2.5–3 weeks. They are fully weaned by 6 weeks (Pearson and others 1952). Maternity colonies disperse in the fall, and mating occurs in the fall and winter. The peak copulation period occurs in
November–February, although some females apparently mate earlier, before arriving at hibernacula (Kunz and Martin 1982). Females store sperm, and ovulation does not occur until early spring (Pearson and others 1952). Ovulation may occur either before or after females leave hibernation. Female Townsend's big-eared bats are sexually mature in their first autumn. However, the sex organs of males do not mature until the second year; accordingly, males are not reproductively active their first year.

Nursery colonies start to disperse in August about the time the young are weaned, and break up altogether in September and October (Pearson and others 1952, Tipton 1983). Adult females that have lost their young depart earlier than lactating females. Young males tend to leave earlier than young females (Barbour and Davis 1969). This species displays high site fidelity and will return to the same roosts year after year.

Townsend's big-eared bat is a year-round resident in California (Philpott 1997). It is not known to move over long distances (Barbour and Davis 1969, Humphrey and Kunz 1976, Pearson and others 1952, Pierson and others 1999). The longest known seasonal movement in California is 20 miles (32.2 kilometers) (Pearson and others 1952, Pierson and others 1999). Townsend's big-eared bats emerge from the roost approximately 45 minutes after sunset (Clark and others 1993, Pierson and others 1999). Netting studies indicate two peak activity periods during the night (Cockrum and Cross 1964, Pierson and others 1999). Seasonal activity includes three basic periods: 1) fall swarming and copulation; 2) winter hibernation; and 3) spring and summer gestation, birth, and pup rearing. Seasonal activity may involve use of multiple sites. Hibernating bats are known to change their location within the cave or even move to another cave in response to temperature changes or disturbance.

Townsend's big-eared bat feeds primarily on small moths, but also takes other insects including flies, lacewings, dung beetles, and sawflies (Kunz and Martin 1982). This bat flies slowly and is highly maneuverable, foraging both above and within forest canopies (Findley and others 1972, Hayward and Davis 1964, Pierson and others 1999). Townsend's big-eared bat has been observed gleaning insects from vegetation (Howell 1920); however, the extent to which this foraging strategy is used is unknown (Pierson and others 1999).

Threats: In general, declines of bat populations can often be attributed to roost site disturbance, loss of foraging habitat and loss of roost sites. Many bats are shy and highly vulnerable to disturbances at roost sites. Disturbance at roost sites can lead to short and long term abandonment. Roost sites are lost as abandoned mines collapse or are destroyed to provide for human safety. Loss of roost sites reduces the distribution and often the number of bats to fewer sites. This makes remaining populations even more susceptible to potential impacts and greater loss of individuals or populations at the local or regional level. The availability of roost sites provided by tree and shrub bark or foliage has been reduced by timber harvest and urbanization. Dam construction and water impoundments for water storage and flood control have resulted in losses of roosting habitat in rocky canyons. Generally, bats have high site fidelity to winter and maternity roosts. Low reproductive potential, high longevity and high roost fidelity make populations highly sensitive to roost threats. Local extirpation may possibly occur as a result of roost disturbance (Hermanson and O'Shea 1983, Orr 1954, O'Shea and Vaughan 1977, Philpott 1997). Disturbance that arouses a bat during their winter hibernation will cause loss of accumulated fat reserves and possible starvation. Loss of roost sites reduces the distribution and often the number of bats to fewer sites. This makes remaining populations even more susceptible to potential impacts and greater loss of individuals or populations at the local or regional level. The availability of roost sites provided by tree and shrub bark or foliage has been reduced by timber harvest and urbanization. Dam construction and water impoundments for water storage and flood control have resulted in losses of roosting habitat in rocky canyons.

Pesticide use may pose a threat to bats. Bats that primarily consume insects may be exposed to home and agricultural pesticides. Pesticides and other chemicals may accumulate within predators and lead to
sickness or death. Activities such as timber harvesting, vegetation treatments, recreational caving, mine reclamation, renewed mining, highway projects, bridge replacement, building demolition, and pest control are considered conservation management issues for this species (Philpott 1997). All of these activities could result in the loss of roost sites or generate disturbance leading to roost abandonment. Foraging habitat can be impacted by activities such as livestock grazing, vegetation treatments and water extraction that would lead to the loss of a water source or riparian habitat.

The Townsend's big-eared bat is most critically threatened by human disturbance at major maternity roosts. Such threats include vandalism, recreational use of caves and mines, renewed mining; closure and sealing of abandoned mines (naturally or for hazard abatement); and possibly the use of nonspecific pesticides. These bats are extremely intolerant to human disturbance and due to their open roosting near an entrance; simple entry into a maternity roost can result in the abandonment of the site (Pierson and Rainey 1991). Hibernating bats are also very vulnerable to disturbance. During hibernation, Townsend's big-eared bats may lose more than half their autumn weight, a more extreme loss than in most other bats. This species rouses readily from hibernation in response to temperature changes or disturbance. Arousal and movement during winter consumes a lot of stored energy and contributes to weight loss, making it more difficult for bats to survive the winter. 

Potential for occurrence within the Project Area: The Townsend's big-eared bat is found or suspected on all four forests, but population status and trends are not known. Suitable foraging and roosting habitat is present within the project area. Reconnaissance-level surveys of habitats capable of supporting roosts for special-status bat species were conducted on 17-21 and 25-28 September 2007 and 14-15 July, 2008. Based on the habitat assessment, 10 sites were re-surveyed from 25-28 September 2007 and 14 July 2008 using acoustical Anabat II ultrasonic bat detectors connected to a Z-Caim recorder (Titley Electronics, Ballina, N.S.W. Australia). This species was detected near Barley Flats Road. In addition, surveys for bats conducted along the West Fork of the San Gabriel River on 9, 17 July 2010 did not detect any Townsend's Big-eared bats.

**Pallid Bat (Antrozous pallida)**

*Regulatory Status:* The Pallid bat is designated by the Regional Forester as a Forest Service sensitive species.

*Range and Distribution:* Throughout California, the Pallid bat is usually found in low to middle elevation habitats below 6000 feet (Barbour and Davis 1969; Philpott 1997), however, the species has been found up to 10,000 feet in the Sierra Nevadas (Sherwin Pers. Comm. 1998). Populations have declined in California within the desert areas, in areas of urban expansion, and where oak woodlands have been lost (Miner and Brown 1996). 

*Habitat Requirements and Natural History:* Pallid bats are found in a variety of habitats, including rocky canyons, open farmland, scattered desert scrub, grassland, shrubland, woodland, and mixed conifer forest (Barbour and Davis 1967; Hermanson and O'Shea 1983; Orr 1954; Philpott 1997). Pallid bats are most common in open, dry habitats that contain rocky areas for roosting. They are a yearlong resident in most of their range and hibernate in winter near their summer roost (Zeiner et al. 1990b). Occasional forays may be made in winter for food and water (Philpott 1997).

Pallid bats roost in rock crevices, mines, caves, tree hollows, and a variety of anthropogenic structures (Hermanson and O'Shea 1983). Pallid bats frequently use buildings, bridges and culverts in California (Tactarian 2001). Tree roosting has been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and bole cavities in oaks (Sherwin Pers. Comm. 1998). Cavities in broken branches of black oak are very important and there is a strong association with black oak for roosting.
Night roosts are usually more open sites and may include open buildings, porches, mines, caves, and under bridges (Barbour and Davis 1969; Philpott 1997; Sherwin Pers. Comm. 1988; Pierson 1996). Roosting sites are usually selected near the entrance to the roost in twilight rather than in total darkness. The site must protect bats from high temperatures, as this species is intolerant of roosts in excess of 104 degrees Fahrenheit (40 degrees Celsius) (Philpott 1997). Pallid bats are also very sensitive to roost site disturbance (Barbour and Davis 1969; Burt and Grossenheider 1980; Philpott 1997; Zeiner et al. 1990b). They are intolerant to disturbance and may abandon a roost when molested, not to return for years. They also often shift about among daytime roosts without apparent provocation (Barbour and Davis 1969).

The Pallid bat is very maneuverable on the ground and commonly feeds on large ground-dwelling arthropods. Common prey is Jerusalem crickets, longhorn beetles, and scorpions, but will also forage at low heights of 0.5 - 2.5 meters above the ground on large moths and grasshoppers (Barbour and Davis 1969; Burt and Grossenheider 1980; Philpott 1997; Zeiner et al. 1990b).

Pallid bats are a gregarious species, often roosting in colonies of 20 to several hundred individuals. Pregnant females gather in summer maternity colonies of up to several hundred females, but generally fewer than 100 (Brown 1996). Males are typically absent from maternal colonies, or living in clusters of males separated from females in caves, mines, or buildings (Barbour and Davis 1969). Mating occurs in October after summer colonies have disbanded (Barbour and Davis 1969). Breeding probably occurs sporadically throughout the winter, at least until the later part of February. As with several other species of bats, live sperm can be retained in the uterus of the female through the winter and fertilize ova as they are released. Gestation period is estimated as 53-71 days (Barbour and Davis 1969). Parturition occurs between May and July with typically two young born (Barbour and Davis 1969; Burt and Grossenheider 1980; Zeiner et al. 1990b). Young are weaned in mid to late August with maternity bands disbanding between August and October (Barbour and Davis 1969; Burt and Grossenheider 1980; Sherwin Pers. Comm. 1998).

**Threats:** Threats to this species include loss of foraging habitat due to urban expansion and loss or conversion of broad, flat, sparsely vegetated habitats; pest control and eradication of bats roosting in urban buildings; and loss of roosting habitat due to mine reclamation, renewed mining, bridge replacement, and the renovation or destruction of buildings.

**Potential for occurrence within the Project Area:** During 1996-1998, bat surveys were conducted at 76 sites located throughout the four forests of southern California. These surveys were in partnership with the Biological Resources Discipline within the U.S. Geological Survey. Pallid bats were found at seven of the 76 sites (four sites on Los Padres National Forest, three sites on Angeles National Forest), at elevations of 1,100–6,600 feet (335–2,012 meters) (Stephenson and Calcarone 1999).

Reconnaissance-level surveys of habitats capable of supporting roosts for special-status bat species were conducted on 17-21 and 25-28 September 2007 and 14-15 July, 2008. Based on the habitat assessment, 10 sites were re-surveyed from 25-28 September 2007 and 14 July 2008 using acoustical Anabat II ultrasonic bat detectors connected to a Z-Caim recorder (Titley Electronics, Ballina, N.S.W. Australia). Five pallid bats were located in artificial “bat houses” under a bridge about 325 yards northwest of Alternative 6 helicopter site 3 near Aliso Canyon. Suitable roosting habitat for pallid bats was observed in one location along Segment 6 during reconnaissance-level surveys in 2007. This site was approximately 900 feet west of Upper Big Tujunga Canyon Road and 0.8 miles north of the Angeles Crest Highway. A single night of preliminary acoustical monitors failed to detect this species at this site, comprising Coulter pine forest and southern alder and willow riparian forest habitat within Upper Big Tujunga Canyon.
In addition, surveys for bats were conducted in the west fork of the San Gabriel River on 9, 17 July 2010 and this species was observed.

**Western Red Bat (Lasiurus blossevillii)**

*Regulatory Status:* The western red bat is designated by the Regional Forester as a Forest Service sensitive species.

*Range and Distribution:* The Western red bat occurs throughout California in elevations up to 3000 feet and excluding desert habitats (Tatum Pers. Comm. 1998). Populations are scattered and considered rare throughout the state (Philpott 1997). The species is found primarily in riparian and wooded habitats, particularly in willows, cottonwoods, and sycamores (Bolster 1998; Burt and Grossenheider 1980, Harvey et al. 1999).

*Habitat Requirements and Natural History:* Red bats are highly migratorial between their summer and winter range, although migratory patterns are not well documented and winter behavior is poorly understood. However, it is known to winter in the San Francisco area and to the south, and has been observed hibernating in leaf litter (Brown 1996). The timing of migration for males and females seem to differ, although groups tend to migrate together (Bolster 1998). During warm days in winter when the temperature rises to 66 degrees F or above, L. borealis arouse from hibernation and feed. At this season they fly in late afternoon often before sunset. They respond to subfreezing temperatures by increasing their metabolism just enough to maintain the body temperature above the critical low limit of 23 degrees F (-5 degrees C) (Barbour and Davis 1969).

Western red bat are typically solitary (Barbour and Davis 1969; Burt and Grossenheider 1980). Roosting has been observed in caves, but generally these bats roost singly within tree foliage or shrubs, and often along edge habitat adjacent to streams and open fields. Colonies are not formed. Roost sites are generally hidden from view from all directions except from below. The lack of obstruction from below allows the bat to drop downward for flight. Roost sites usually have dark ground cover to minimize solar reflection, have nearby vegetation to reduce wind and dust, and are generally located on the south or southwest side of a tree (Barbour and Davis 1969; Bolster 1998).

Foraging is generally at high altitudes over the tree canopy and begins one to two hours after sunset. Detects flying insects by echolocation and captures them in flight with a wingtip or occasionally the interfemoral membrane (Barbour and Davis 1969). Although solitary roosters, Red bats forage in close association with one another in summer. Food items consist of a wide variety of flying insects including homopterans, coleopterans, hymenopterans, dipterans, and lepidopterons (Barbour and Davis 1969; Bolster 1998; Burt and Grossenheider 1980), and are apparently based on size rather than type (Brown 1996).

*Threats:* Forest activities that could impact western red bats include livestock grazing, vegetation treatments and water extraction that would lead to the loss of a water source or riparian habitat. Conversion or loss of riparian habitat and other broad-leafed deciduous forests and woodlands are thought to be contributing to a suspected long-term population decline for this species (Arizona Game and Fish Department 1999). Disruption of habitat connectivity by development is believed to adversely affect this species (Szewczak pers. comm.). Agricultural spraying, water impoundments, fire, and predation (particularly by jays) are also of concern (Philpott 1997). There is also concern about controlled burns during cool weather when this species roosts in leaf litter.

*Potential for occurrence within the Project Area:* There are no CNDDB (2007) records for the western red bat in the project area, although historically this species was considered common in the San Gabriel
Mountains of California (Krutzsch 1948; Vaughan 1954). Reconnaissance-level surveys of habitats capable of supporting roosts for special-status bat species were conducted on 17-21 and 25-28 September 2007 and 14-15 July, 2008. Based on the habitat assessment, 10 sites were re-surveyed from 25-28 September 2007 and 14 July 2008 using acoustical Anabat II ultrasonic bat detectors connected to a Z-Caim recorder (Titley Electronics, Ballina, N.S.W. Australia). Suitable roosting habitat for the western red bat was observed in Upper Big Tujunga Canyon, approximately 900 feet west of Upper Big Tujunga Canyon Road and 0.8 miles north of the Angeles Crest Highway. One night of preliminary acoustical monitoring failed to detect this species within this site, composed of mature Coulter Pine Forest and Southern Alder and Willow Riparian Forest.

San Gabriel Mountains (Nelson’s) Bighorn Sheep (*Ovis canadensis nelsoni*)

*Regulatory Status:* The San Gabriel Mountains bighorn sheep is designated by the Regional Forester as a Forest Service sensitive species.

*Range and Distribution:* Bighorn sheep (*Ovis canadensis*) range from high-elevation alpine meadows in the Rocky Mountains and Sierra Nevada south to the low-elevation desert mountain ranges in the southwest United States and northern Mexico (Shackelton 1985). Nelson's bighorn sheep occur from northwest Arizona into Utah, Nevada, and southeastern California. In southern California this subspecies inhabits the eastern San Gabriel Mountains, the eastern San Bernardino Mountains, the southern part of the Los Padres National Forest (Stephenson and Calcarone 1999), and the Peninsular Ranges south to Santa Rosalia, Baja California (U.S. Fish and Wildlife Service 2000a).

Populations of Nelson's bighorn sheep are found in four areas on National Forest System lands in southern California. Only one occurs on the ANF; the population in the San Gabriel Mountains is concentrated primarily in the Bear Creek drainage; the upper East Fork of the San Gabriel River and Cattle Canyon (both in the Sheep Mountain Wilderness); San Antonio Canyon; Cucamonga Canyon; and the South and Middle Forks of Lytle Creek (Stephenson and Calcarone 1999).

*Habitat Requirements and Natural History:* Desert bighorn sheep inhabit dry, relatively barren, desert mountain ranges throughout North America. Escape terrain is identified as the single most important habitat component for bighorn sheep in these mountains. Escape terrain is defined as steep slopes (80 percent or steeper) with abundant rock outcrops and sparse shrub cover (canopy cover of 30 percent or less). Nelson's bighorn sheep in the San Gabriel Mountains occur at elevations of 3,000-10,064 feet (914-3,068 meters [i.e., to the summit of Mount San Antonio]). During the winter and spring, Nelson's bighorn sheep occur primarily in escarpment chaparral in the lower canyons at 3,000-6,000 feet (914-1,829 meters).

The breeding season of Nelson's bighorn sheep generally begins in November with the rutting season. Following a six month gestation period, ewes give birth to single lambs (occasionally twins) from late April through early July. During the first few weeks after giving birth, ewes remain alone with their lambs in steep terrain until they join a nursery group. Lambs are weaned at 1–7 months, and juveniles remain with the ewes until they reach sexual maturity (U.S. Fish and Wildlife Service 2000b). Rams are believed to be sexually mature at 6 months of age (U.S. Fish and Wildlife Service 2000a). In the San Gabriel Mountains, the duration of the rut was from mid-September to late December with a peak in late October through the first half of November (De Forge 1980). During the height of the rutting period, mature rams seemed to have little fear of humans and made movements up to 2.5 miles to find ewes.

Bighorn sheep migrate between winter and summer ranges, generally moving downslope in winter and spending summer in alpine habitats. Water restricts movement of the species during hot summer months (Zeiner and others 1990). In general, bighorn sheep feed in the early morning, at midday, and in the
evening, lying down and chewing their cud at other times, and bedding down for the evening. Foraging and bedding spots may be used for years (McMahon 1985). Daily foraging and resting cycles also vary depending on forage quality (U.S. Fish and Wildlife Service 2000a). Seasonal activity depends on availability of water, forage, and escape cover. Typically, bighorn sheep congregate near dependable water sources from May through October, when temperatures are highest. This aggregation of individuals also corresponds with breeding activities. Young bighorn sheep learn locations of escape terrain, water sources, and lambing habitat from older individuals in the group (U.S. Fish and Wildlife Service 2000b).

**Threats:** On National Forest System lands in southern California, the primary factors affecting San Gabriel Mountains bighorn sheep populations are human disturbance, vegetation condition, water availability, and predation. Additional developments such as recreation areas, mining, and roads within the range of the San Gabriel Mountains bighorn sheep all have the potential to remove habitat or reduce habitat quality. Additionally, policies that encourage fire exclusion may result in vegetation conditions that are less suitable for browse and reduce the amount of open, escape terrain. All populations of the San Gabriel Mountains bighorn sheep within the analysis area are vulnerable to stochastic or natural events due to isolation and small numbers.

**Potential for occurrence within the Project Area:** San Gabriel Mountains bighorn sheep in the San Gabriel Mountains occur at elevations of 3,000-10,064 feet (914-3,068 meters [i.e., to the summit of Mount San Antonio]). During the winter and spring, San Gabriel Mountains bighorn sheep occur primarily in escarpment chaparral in the lower canyons at 3,000-6,000 feet (914-1,829 meters). This species is known to occur from San Gabriel Wilderness area south to the West Fork San Gabriel River. Populations in the San Gabriel Mountains are concentrated primarily in the Bear Creek drainage; the upper East Fork of the San Gabriel River and Cattle Canyon (both in the Sheep Mountain Wilderness); San Antonio Canyon; Cucamonga Canyon; and the South and Middle Forks of Lytle Creek (Stephenson and Calcarone 1999). Additionally, a single sighting has been reported from Santa Anita Canyon.

Reconnaissance-level surveys were conducted on 17-21 and 25-28 September 2007 for habitats capable of supporting special-status mammal species. This species was not detected during these surveys.

**San Gabriel Mountains Slender Salamander (Batrachocephs gabrieli)**

**Regulatory Status:** The San Gabriel Mountains slender salamander is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** This species is known from only a few localities, all in the eastern San Gabriel Mountains: Pine Flats near Crystal Lake and Rockbound Canyon in the upper San Gabriel River watershed (Wake 1996) and in Cow Saddle (Goodman Pers. Comm. 1998). *Batrachocephs* salamanders have also been found in San Antonio Canyon and Lytle Creek in the San Gabriel Mountains (Stephenson and Calcarone 1999). It appears that only those populations from the upper San Gabriel River watershed belong to *Batrachocephs gabrieli*, although a final taxonomy has not been formally proposed. The other populations, ranging from the vicinity of Mount Baldy east to Waterman Canyon, probably represent a new, as yet undescribed species (Jockusch and Wake 2002). Each of these sites are small, each approximately 1 hectare in size, and the elevation between these sites ranges from 3800 to 7785 feet.

**Habitat Requirements and Natural History:** San Gabriel Mountain slender salamander has been found on northwest-facing talus slopes (scree) or near water in mixed hardwood-conifer forest habitats containing oaks (*Quercus* spp.), pines (*Pinus* spp.), big cone Douglas-fir (*Pseudotsuga macrocarpa*), white fir (*Abies concolor*), California laurel (*Umbellularia californica*), Oregon big-leaf maple (*Acer macrophyllum*), and incense cedar (*Calocedrus decurrens*) (Wake 1996). The known elevational range of this salamander is
3,800–7,780 feet (1,158–2,372 meters) (Wake 1996). When active near the surface, San Gabriel Mountain slender salamander typically occurs in talus and under large rocks, rotting logs, downed tree limbs, and bark. Specimens have been collected within 50 feet (15 meters) of a stream (Wake 1996).

The San Gabriel Mountain slender salamander belongs to the largest family of salamanders, the plethodontids. Members of this family are called lungless salamanders, as they have no lungs and instead breathe through their skin. All western species of this family are terrestrial they rarely enter water and lay their eggs in moist places on the land (Stebbins 1985). These salamanders have free-living larva; the young emerge fully formed (Ibid.). Furthermore, this species belongs to the genus of salamanders known as the slender salamanders. This is a relatively newly described group of salamanders; the number of species has grown from only two in 1966 to at least twelve currently. Many of the newer species, including the San Gabriel Mountain slender salamander, have very limited distributions.

The San Gabriel Mountain slender salamander has been found living in the same area as the arboreal salamander, Monterey Salamander, Black-bellied slender salamander. Near surface activity for this salamander is most likely restricted to the winter and early spring months. Drier conditions probably drive these salamanders deeper into the talus slope (Wake 1996).

**Threats:** Threats to this species include loss of habitat (talus slopes and downed woody material) by anthropogenic or natural causes as well as recreation related disturbance.

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**Foothill Yellow-legged Frog (Rana boylii)**

**Regulatory Status:** The Foothill yellow-legged frog is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** Although the species still occurs on many streams along the northern California coast and Sierra Nevada Mountains, it has become extremely rare in the south (Jennings and Hayes 1994). Historically, the range of the foothill yellow-legged frog extended south to the north and east forks of the San Gabriel River on the Angeles National Forest. Foothill yellow-legged frogs have not been observed in or south of the southern Los Padres National Forest ranges since 1978. The last sighting was near Frenchman's Flat along Piru Creek in 1977 (Jennings and Hayes 1994).

**Habitat Requirements and Natural History:** The Foothill yellow-legged frog is found in or near rocky streams under 7000 feet elevation (Stebbins 1985). They are nearly always found within a few feet of water. Foothill yellow-legged frogs are frequently found in moving but not swiftly flowing water (Stebbins 1954). Habitat types include valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, wet meadow type, and mixed chaparral. Foothill yellow-legged frogs are most abundant in streams with a mixture of all sizes of rock and gravel substrates and some type of low overhanging vegetation at the edge of the watercourse (Jennings 1988). This species is rare or absent in sandy streams (Jennings 1988). The species is most common along streams with rocky bottoms but has also been found along streams with mud bottoms (Stebbins 1951).
When frightened, the Foothill yellow-legged frog dives to the bottom and takes refuge among stones, silt, or vegetation (Stebbins 1985). This species is rarely encountered far from permanent water (Zeiner et al. 1988). Adults often bask on exposed rock surfaces near streams. Terrestrial individuals are primarily diurnal. Frogs may be active all year in the warmest localities, but may become inactive or hibernate in colder areas and always within a few feet of water (Zeiner et al. 1988). Adults eat both aquatic and terrestrial invertebrates. Tadpoles probably graze on algae and diatoms along rocky stream bottoms (Zeiner et al. 1988). Foothill yellow-legged frogs breed from mid-March to early June after the high water of the stream subsides, and usually lasting about two weeks (Stebbins 1985). Egg clusters of 200 to 300 (range 100 to 1100) are attached to gravel or rocks in moving water near stream margins and hatch in about five days (Zeiner et al. 1988). Tadpoles reach maximum sizes of 50 to 55 mm (2.2 inches) and transform in two to four months (Zeiner et al. 1988).

Garter snakes feed heavily on tadpoles and adults (Zeiner et al. 1988). Foothill yellow-legged frogs have been eliminated from 75% of their historic range (Jennings 1993a). Species decline is attributed to predators, habitat destruction, organochlorine biocides (pesticides, fungicides, and herbicides), and the introduction of non-native species (predation and competition).

**Threats:** Threats to this species include exotic predators such as bullfrogs (Moyle 1973), poor timing of water releases from upstream reservoirs that scour eggs from oviposition substrates, and decreased waterflows that can force adult frogs into permanent pools where they may be more susceptible to predation.

**Potential for occurrence within the Project Area:** Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. This species was not detected during these surveys.

**Southwestern Pond Turtle (Clemmys (Actinemys) marmorata pallida)**

**Regulatory Status:** The southwestern pond turtle is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** The southern Pacific pond turtle is found from south of San Francisco Bay to northern Baja California. This subspecies intergrades with northwestern pond turtles (C. m. marmorata) over a large area in central California (Bury 1970, Stebbins 1985). Historically, western (Pacific) pond turtles occurred throughout most of the west coast of North America, primarily west of the Cascade-Sierra crest, from western British Columbia to northern Baja California (Ernst and others 1994). Currently, there are records of isolated populations occurring in Afton Canyon in the Mojave Desert and in the Amargosa River in Los Angeles County (Lovitch 1999).

On National Forest System lands in southern California, Southwestern pond turtles are considerably more abundant northwest of the Santa Clara River. South of the Santa Clara River, Southwestern pond turtle populations have declined substantially in both size and number (Brattstrom and Messer 1988; Holland 1991). They still occur at more than 50 sites, but most of these contain few individuals; only 6–8 sites contain populations of 30 or more individuals (Holland 1991). There is one large population in the West Fork of the San Gabriel River below Cogswell Reservoir on the Angeles National Forest. Other, smaller populations on the Angeles National Forest occur in upper Castaic Creek, Aliso Canyon, Pacoima Creek, Little Tujunga Creek, Big Tujunga Creek, Alder Creek, the East Fork of the San Gabriel River, and possibly Big Dalton Creek.

**Habitat Requirements and Natural History:** The Southwestern pond turtle is associated with permanent or nearly permanent water below 6500 feet elevation. They are found in rivers, streams, lakes, ponds,
wetlands, reservoirs, and brackish estuarine waters. They are also found less commonly in abandoned gravel pits, stock ponds, and sewage treatment plants; however, individuals occurring in such habitats are likely displaced individuals and do not represent viable populations (Holland 1994; Jennings and Hayes 1994). Basking sites such as partially submerged logs, rocks, open mud banks, or mats of floating vegetation are required (Stebbins 1985). This species will slip from a basking site into the water at the approach of predators or humans. Southwestern pond turtles overwinter in both aquatic and terrestrial habitats. Aquatic refugia consist of rocks, logs, mud, submerged vegetation and undercut areas along a bank. Terrestrial overwintering habitat consists of burrows in leaf litter or soil. The presence of a duff layer seems to be a general characteristic of its overwintering habitat. Upland nesting sites must be dry and often have high clay or silt fraction.

Most activity is diurnal but some crepuscular and nocturnal activity has been observed. Southwestern pond turtle is considered omnivorous. Aquatic plant materials, including plant lilies, beetles, and worms, even carrion have been reported among their food (Nussbaum et al. 1983, Stebbins 1985; Zeiner et al. 1988). Sexual maturity is attained in about eight years. Egg laying of 3-11 eggs occurs from March to August and incubation lasts from 73 to 80 days (Ernst and Barbour 1972, Stebbins 1985; Zeiner et al. 1988). Nests have been observed in many soil types from sandy to very hard. Soil must be at least 4 inches deep for nesting. Nussbaum et al. (1983) found females may move up to 325 feet from water to find a suitable nesting site whereas Holland (1994) found gravid females have been reported to nest more than 1,300 feet away from the nearest aquatic habitat. Along large slow-moving streams, eggs are deposited in nests constructed in sandy banks. Along foothill streams, females may climb hillsides, sometimes subjected to rapid death by desiccation if exposed to hot, dry conditions. Hibernation in colder areas is passed underwater in bottom mud. Individuals are active all year where climates are warmer, but hibernate during cold periods elsewhere. Pond turtles may also make overland movements up to one mile between areas of aquatic habitat (Bury 1972). Long distance movements may be in response to drying of local bodies of water or other factors.

Hatchlings and juveniles are preyed upon by a variety of vertebrate predators including certain fishes, bullfrogs, garter snakes, wading birds, and some mammals (Zeiner et al. 1988).

**Threats:** This species has been eliminated from 30-40% of its historic range in California (Jennings 1993a). Species decline is attributed to hunting, trapping, predation, OHV usage, and habitat loss. The primary threat to this species is loss of suitable habitat as availability of persistent, pooled water along low-elevation streams has been greatly reduced as the result of habitat destruction associated with agricultural activities, urbanization, flood control and water diversion projects. Other threats include introduced predatory fish, bullfrogs, and collecting.

**Potential for occurrence within the Project Area:** Surveys for the Southwestern pond turtle have been conducted in the West Fork of the San Gabriel River below Cogswell Dam. Over 140 individuals were being monitored for survival (Goodman Pers. Comm. 1993). Pond turtles were moved from below Morris Dam on the San Gabriel River to above Cogswell Dam on the Upper West Fork San Gabriel River (Krueger, Pers. Comm. District Records). Surveys in 1999 were able to locate a Southwestern pond turtle in Upper Big Tujunga. Past records show the Southwestern pond turtle was present in Millard Creek and Picoima Creek (CNDDB 1994). Other areas that have documented Southwestern pond turtle are Elizabeth Lake, Fish Creek, and Piru Creek (CNDDB 1996). In 1999, pond turtles were sighted in Upper Big Tujunga Canyon (Tierra Madre 1999). In 2001, Western Pond turtles were identified in Upper Big Tujunga and San Francisquito Canyon (PCR 2001).

Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. This species was detected along portions of Upper Big
Tujunga Creek and West Fork San Gabriel River. In addition this species has been observed in Upper Big Tujunga Creek and Aliso Creek by Bonterra Consultants in 2010 and AMEC in 2009.

**San Diego Horned Lizard (Phrynosoma coronatum blainvillii)**

*Regulatory Status:* The San Diego horned lizard is designated by the Regional Forester as a Forest Service sensitive species.

*Range and Distribution:* The San Diego horned lizard (*Phrynosoma coronatum blainvillii*) is endemic to southern California and northern Baja California, México. In California, this species is distributed predominately throughout cismontane regions of the Transverse Ranges in Kern, Los Angeles, Santa Barbara, San Bernardino, and Ventura Counties, southward to the Peninsular Ranges in Orange, Riverside, and San Diego Counties (Brattstrom 1997, Jennings 1988, Jennings and Hayes 1994, Pickwell 1972, Reeve 1952, Schmidt 1953, Smith 1946, Van Denburgh 1922).

Historically, *Phrynosoma c. blainvillei* was distributed from the Transverse Ranges in Kern, Los Angeles, Santa Barbara, and Ventura Counties southward through the Peninsular Ranges of southern California to Baja California (Jennings 1988). It is distributed throughout the foothills and coastal plains from the Los Angeles area to northern Baja California. On the northern part of its range in the Mojave desert, the San Diego horned lizard occurs from the Antelope Valley California Poppy State Reserve eastward along the base of the San Gabriel and San Bernardino Mountains to Joshua Tree National Park (Brattstrom 1997, Jennings and Hayes 1994). The known elevation range of this species is from 10 meters at the El Segundo dunes (Los Angeles County) to approximately 2,130 meters at Tahquitz Meadow, on San Jacinto Mountain, in Riverside County. *Phrynosoma c. blainvillei* is thought to intergrade with *P.c. frontale* in extreme southern Kern county and northern Santa Barbara, Ventura, and Los Angeles counties (Jennings 1988, Montanucci 1968, Reeve 1952).

*Habitat Requirements and Natural History:* Horned lizards occur in a wide variety of habitats, including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian scrub, and coniferous forest, but are present in these habitats only if a defined set of habitat features are present: loose soils with a high sand/fine gravel fraction, suitable food resources, and sparse or clumped patches of vegetation with a sparse canopy that allows for basking and predator avoidance (Stebbins 1954; Banta and Morafka 1968; Montanucci 1968; Howard 1974; Jennings 1987; Jennings and Hayes 1994). It is found at elevations ranging from approximately 33 feet (10 meters) at the El Segundo dunes (Los Angeles County) to approximately 7,000 feet at Tahquitz Meadow on Mt. San Jacinto (Riverside County).

San Diego coast horned lizard is diurnal, although nocturnal activity may occur. Predators and extreme heat are avoided by horned lizards by burrowing into loose soil (Jennings and Hayes 1994). The cryptic coloration of the species, and its ability to change colors to match the substrate, provide effective camouflage from most predators (Schwenkmeyer 1999; Zeiner et al. 1988). Periods of inactivity (fall and winter) and winter hibernation are spent burrowed into the soil under surface objects such as logs or rocks, in mammal burrows, or in crevices. Horned lizards forage on the ground in open areas, usually between shrubs and often near ant nests. Ants are a primary food item and consist from 50-90% of their diet, except Argentine ants are not eaten (Jennings and Hayes 1994; Stebbins 1985). Other insects include termites, wasps, grasshoppers, flies, caterpillars, and beetles (Jennings and Hayes 1994; Zeiner et al. 1988). Reproductive season depends on the local conditions, 6-16 eggs (average 11 eggs) are laid from April to June, and hatchlings emerge two months later (Goldberg 1983; Stebbins 1985). Eggs are laid in nests constructed by females in loose soil. The Coast horned lizard is apparently unique among lizards in using a belly-to-belly position during copulation (Zeiner et al. 1988). Individuals attain sexual maturity at 2-3 years. There is little data on longevity, but it is thought that individuals may live 8 years or longer (Jennings and Hayes 1994).
Threats: Leopard lizards, Sidewinders, Striped whipsnakes, and other snakes, Loggerhead shrikes, and hawks have been reported as predators of Horned lizards (Zeiner et al. 1988). This subspecies is thought to be absent from 45% of its former home range in Southern California due to habitat loss and overcollecting for the pet trade (Jennings and Hayes 1994). The San Diego Coast horned lizard’s specialized diet, high degree of philopatry, and restrictive habitat requirements make it particularly vulnerable to urban development, highways, and agriculture. Exotic Argentine ants are eliminating the food base (native insects) of this species in urban areas (Jennings and Hayes 1994).

Potential for occurrence within the Project Area: Suitable habitat is present within the project area and this region is within the known range of this species. The California Natural Diversity Data Base (1994; CNDDB 1996) shows many sightings from throughout the Forest dating back to the early 1900’s. Many of these sightings are currently unverified due to the loss of habitat and lack of surveys. In the amphibian and reptile survey of Santiago Canyon, San Diego coast horned lizards were sighted (Stewart 1993). Surveys from selective riparian areas in 1994 have sightings of the San Diego coast horned lizard in the East Fork San Gabriel River and Crystal Lake (Jennings 1995). San Diego coast horned lizards were observed on a firebreak near Mt. Disappointment and Browns Flat (Krueger, Pers. Obs. District Records).

Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. This species has been observed along both segments of the project during herpetological surveys conducted in 2008, 2009 and 2010.

California Legless Lizard (Anniella pulchra pulchra)

Regulatory Status: The California legless lizard is designated by the Regional Forester as a Forest Service sensitive species.

Range and Distribution: The species ranges from Contra Costa County, California, south through parts of the San Joaquin Valley (possibly to the edge of the Sierra Nevada Mountains), and south along the coastal zone of Baja California Norte, Mexico. This lizard has been recorded on the East and South Los Coronados and Todos Santos Islands off the coast of Baja California (Jennings and Hayes 1994).

Habitat Requirements and Natural History: California legless lizards occur to 6600 feet and are common in coastal dune, valley-foothill, chaparral, and coastal scrub types. Cover consists of rocks, logs, loose soil, and leaf litter for protection (Fisher and Case 1997; Jennings and Hayes 1994; Stebbins 1985; Zeiner et al. 1988). Legless lizards are often found where substrates are slightly moist. Moisture is an essential habitat requirement for thermal regulation, and animals may die if they are unable to reach a moist substrate (Zeiner et al. 1988). Soil moisture may limit these lizards at the extent of their range (Bury and Balgooyen 1976). The California legless lizard shows a preference for low temperatures, and is usually encountered at temperatures of 8-28 degrees Centigrade in the field. In the laboratory study on temperature preferences, Bury and Balgooyen (1976) found that lizards preferred a temperature range of 11-30 degrees Centigrade, and about 90% of the lizards selected temperatures of 20-28 degrees Centigrade. Individuals are probably active all year with only brief periods of winter inactivity although some undergo winter hibernation (Jennings and Hayes 1994). Legless lizards are insectivorous and feed primarily on insect larvae, especially those of microlepidopterons and beetles. It also eats small adult insects, beetles, termites, and spiders. This lizard usually forages at the base of shrubs or other vegetation either on the surface or just below it in leaf litter or sandy soil (Stebbins 1985; Zeiner et al. 1988). Prey is ambushed from a concealed location in leaf litter (Jennings and Hayes 1994). Breeding occurs in early spring through July. Eggs have been observed in the oviducts of females from July through October. Gestation is approximately 4 months. Live birth of one to four young occurs from September to November (Goldberg and Miller 1985; Stebbins 1985; Zeiner et al. 1988). Lizards reach sexual maturity
at 2 to 3 years and females may not reproduce every year. Captive animals have lived for nearly 6 years (Jennings and Hayes 1994).

**Threats:** Potential problems associated with invasive nonnative plants include reductions in soil moisture and reduced prey populations. Changes in soil salinity, soil chemistry, and soil structure may also pose problems for California legless lizard populations (Jennings and Hays 1994). Potential threats to local populations may include catastrophic wildland fire that destroys the desert shrub, duff and leaf litter with which the species is associated and the use of off-highway vehicles in areas occupied by the species (Freel pers. comm.).

**Potential for occurrence within the Project Area:** Suitable habitat is limited along the project area. In 1992, one lizard was found along the rocks adjacent to the West Fork San Gabriel River (Krueger Pers. Obs. 1992). CNDDB records indicate a legless lizard was observed just to the north of the forest boundary along the project alignment.

**Coastal Rosy Boa (Lichanura [Charina] trivirgata roseofusca)**

**Regulatory Status:** The coastal rosy boa is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** This subspecies occurs from the foothills of the San Gabriel and San Bernardino Mountains south through San Diego County into Sierra San Pedro Martir, Baja California. Coastal rosy boa is known to occur in suitable habitat on the Angeles, Cleveland, and San Bernardino National Forests (Fisher and Case 1997; Klauber 1931). In the San Jacinto region of the San Bernardino National Forest, this subspecies is only known to occur in the Lower Sonoran life zone (Atsatt 1913).

**Habitat Requirements and Natural History:** Coastal rosy boa generally occurs below 4500 feet but has been recorded at 6800 feet in the San Gabriel Mountains (Lind 1998; Stebbins 1985). It inhabits desert and chaparral habitats but is more commonly seen in rocky chaparral covered hillsides (Zeiner et al. 1988). Rosy boas prefer areas with moderate to dense vegetation and rocky cover. It may be found under rocks, in rock crevices, or in boulder piles (Klauber 1931). Vegetation types associated with these habitats include California sage, buckwheat, chamise chaparral, and ceanothus/manzanita chaparral. Coastal rosy boas are often found near permanent or intermittent streams (Stebbins 1985). The Rosy boa is a secretive species that is most often seen in late spring and early summer. Individuals may be crepuscular but most are nocturnal (Klauber 1931). When disturbed, it may roll into a ball to protect itself from predators (Behler and King 1988). The diet consists of small rodents, birds, and lizards (Klauber 1931; Zeiner et al. 1988). Mating occurs in May or June. Coastal rosy boas are live bearing with 6-10 young born in October and November (Stebbins 1985) and a quiet protective area must be required (Zeiner et al. 1988). The record longevity for a captive animal is 18.5 years (Behler and King 1988).

This snake is heavy-bodied and probably a desirable prey item for owls, Roadrunners, other avian predators, Coyotes, Kit foxes, and other mammalian predators. It probably competes with the Western Pacific rattlesnake (Crotalus viridis) in coastal areas and several other species of snakes (Zeiner et al. 1988). Coastal rosy boa may be declining due to loss of habitat and overcollecting, particularly in coastal areas where it was once common (Fisher and Case 1997).

**Threats:** One primary threat to this species on the ANF is likely a recent increase in poaching, precipitated by its popularity in the pet trade (Fisher 2000) and evidenced by the amount of websites shown by an Internet search. Additional threats include habitat loss, roads, increased fire frequency, and urban light pollution (Fisher and Case 1997).
Potential for occurrence within the Project Area: Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. Although no coastal rosy boas were found during 2008, 2009 or 2010 surveys, suitable habitat exists within the project area and it is likely that this species occurs there.

San Bernardino Ringneck Snake (*Diadophis punctatus modestus*)

**Regulatory Status:** The San Bernardino ringneck snake is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** This subspecies occurs from southern Ventura and Los Angeles Counties, east into San Bernardino County, and south to Orange and Riverside Counties in California. Ringneck snakes may be restricted to the Pacific slopes throughout their range. The Los Padres, Angeles, and San Bernardino National Forests are within the range of San Bernardino ringneck snake and are likely to have suitable habitat for this species.

**Habitat Requirements and Natural History:** The San Bernardino ringneck snake occurs below 7000 feet and is most common in open, relatively rocky areas within valley-foothill, mixed chaparral, and annual grass habitats (Zeiner et al. 1988). Rocks, logs, woodpiles, stable talus, leaf litter, and small holes in the ground provide cover. These snakes tend to avoid moving through open or barren areas by restricting movements to areas of surface litter or herbaceous vegetation (Zeiner et al. 1988). Ringneck snakes tend to be diurnal or crepuscular, although nocturnal behavior during warmer periods is expected. Ringneck snakes forage on the surface and under surface objects taking earthworms, salamanders, treefrogs, small lizards, and small snakes. Slender salamanders (*Batrachoseps*) are often suggested as important prey items (Stebbins 1985; Zeiner et al. 1988). Eggs are laid from April to July in loose aerated soil, in stabilized talus, or in rotting logs. About three eggs are laid and hatching occurs from August to October (Zeiner et al. 1988). This species reaches sexual maturity at 2-3 years and may be relatively long-lived (Zeiner et al. 1988).

In the coldest areas, Ringneck snakes aggregate at dens for winter hibernation, but in coastal regions, periods of winter inactivity are passed under surface objects or in other suitable refuges. Ringneck snakes make annual movements to and away from known hibernacula (Zeiner et al. 1988).

**Threats:** Ringneck snakes are probably taken as prey by a few other snakes, diurnal birds, and possibly by some small mammals (Zeiner et al. 1988).

San Bernardino Mountain Kingsnake (*Lampropeltis zonata parvirubra*)

**Regulatory Status:** The San Bernardino mountain kingsnake is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** This California endemic is restricted to the San Gabriel, San Bernardino, and San Jacinto Mountains of Southern California. The Los Padres, Angeles, and San Bernardino National Forests are within the range of San Bernardino mountain kingsnake and are likely to have suitable habitat for this species.

* Potential for occurrence within the Project Area: One sighting occurred within the Sheep Mountain Wilderness Area. Although it was dead, it is believed to occur within many riparian canyons of the San Gabriel Mountains (Jennings 1995). One live individual was found within the Arroyo Seco. Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. This species was detected along portions of the Arroyo Seco.

In the coldest areas, Kingsnakes aggregate at dens for winter hibernation, but in coastal regions, periods of winter inactivity are passed under surface objects or in other suitable refuges. Kingsnakes make annual movements to and away from known hibernacula (Zeiner et al. 1988).

**Threats:** Kingsnakes are probably taken as prey by a few other snakes, diurnal birds, and possibly by some small mammals (Zeiner et al. 1988).

Potential for occurrence within the Project Area: One sighting occurred within the Sheep Mountain Wilderness Area. Although it was dead, it is believed to occur within many riparian canyons of the San Gabriel Mountains (Jennings 1995). One live individual was found within the Arroyo Seco. Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. This species was detected along portions of the Arroyo Seco.
Forests are within the range of the San Bernardino mountain kingsnake and are likely to have suitable habitat for the species (Stebbins 1985).

**Habitat Requirements and Natural History:** The San Bernardino mountain kingsnake exists in coniferous forests, woodlands, and chaparral to 9000 feet (Stebbins 1985). This species is most common in the vicinity of rocks or boulders near streams, lakes, and wet meadows (Zweifel 1952). Diurnal and crepuscular activity occurs mid-March to mid-October (Stebbins 1985; Zeiner et al. 1988). It may be nocturnal some parts of the year, typically in warmer times (Jennings and Hayes 1994). Mountain kingsnakes take cover in rocks, rotting logs, and dense shrubs. Rocks or rocky outcrops appear to be an important habitat element, providing suitable hibernation, refuge sites, and food resources (Jennings and Hayes 1994). Diet includes lizards (especially Fence lizards and Skinks), smaller snakes, nesting birds and bird eggs, and smaller mammals (Jennings and Hayes 1994; Zeiner et al. 1988). Mating occurs from March to May; 3-8 eggs are laid in June and July, and hatching occurs from June to October (Stebbins 1985; Zeiner et al. 1988). Probable lays eggs in loose, well-aerated soil under rocks or other surface objects within decaying logs (Zeiner et al. 1988). Individuals probably reach sexual maturity at 4-5 years. In captivity, Mountain kingsnakes may live up to 12 years (Jennings and Hayes 1994).

Predatory birds such as hawks and occasionally owls probably take adults and young. Adults, young, and egg clutches are taken by mammals such as Skunks and Raccoons (Zeiner et al. 1988). Populations appear to be threatened by collection and logging (Zeiner et al. 1988). Overcollecting this taxon and destruction of local habitats by dismantling of outcrops, and shredding of logs and stumps by overzealous collectors are thought to be the reason for this taxon's decline (Jennings and Hayes 1994).

**Threats:** Threats to this species on the ANF include poaching by collectors and the destruction of microhabitat caused by poachers (e.g., dismantling rock outcrops and shredding down logs) (Jennings and Hayes 1994).

**Potential for occurrence within the Project Area:** Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. This species was detected along portions of the West Fork San Gabriel River and the Arroyo Seco. Although no San Bernardino Mountain kingsnakes were found during 2008 surveys, suitable habitat exists throughout the project area (Stebbins 1985). This species has been observed in several locations within the ANF in the recent past including the West Fork of the San Gabriel River, and in the Arroyo Seco (Jennings and Hayes 1994; USGS 2007). Surveys in 2009 found this species in Big Tujunga at the road crossing of 3N27. There are documented sightings of Mountain kingsnake on the road to Switzers Picnic Area from Highway 2. Other documented sightings for this species have occurred at Mt. Baldy Ski Area and West Fork San Gabriel River (Berkley and Krueger, Pers. Obs. District Records).

**Two-striped Garter Snake (Thamnophis hamondii)**

**Regulatory Status:** The two-striped garter snake is designated by the Regional Forester as a Forest Service sensitive species.

**Range and Distribution:** This species ranges through the South Coast, Transverse, and Peninsular ranges from the vicinity of Salinas and Cantua Creek, south to La Presa, Baja, California, Mexico. This species is also present on Santa Catalina Island, California, as well as occurring on several perennial, desert slope streams such as the Mojave River, San Bernardino County (Stebbins 1985; Jennings and Hayes 1994).

The ANF is within the known range and supports suitable habitat for two-striped garter snake (Fisher and Case, 1997; Lind, 1998). In the San Gabriel Mountains, it has been documented in Cajon Wash, Lytle Creek, Bear Gulch, Big Rock Creek, Chileno Creek, and Little Rock Creek (Brown pers. comm.). It has
also been found in the forks and tributaries of the San Gabriel River drainage, Fish and Castaic Creeks, Alder and Big Tujunga Creeks, Pacoima Creek, Big Dalton and San Dimas Canyons, and most likely other nearby drainages (Wales, pers comm.).

In the survey of the San Gabriel Wilderness Area, the Two-striped garter snake "was frequently observed in riparian habitats during the study" (Jennings 1993b). In the survey of the Sheep Mountain Wilderness Area, this snake "was infrequently observed in riparian habitats along the East Fork San Gabriel River" (Jennings 1995). In the amphibian and reptile survey of Santiago Canyon, Two-striped garter snakes were found (Stewart 1993). Two-striped garter snakes have been found in San Dimas Canyon (Krueger, Pers. Obs. District Records), in the West Fork San Gabriel River (Goodman, Pers. Obs. 1993), East and North Forks San Gabriel River (Jennings 1995, US Army Corps of Engineers 1994). Surveys in 1996 found Two-striped garter snakes in Castaic Creek, Upper Big Tujunga, and Alder Creek. Surveys in 1998 and 1999 found Two-striped garter snakes in Alder Creek (Krueger, Pers. Obs. 1998 and 1999). In 2001, Two-striped garter snakes were observed in Upper Big Tujunga (PCR 2001).

Habitat Requirements and Natural History: This species commonly inhabits perennial and intermittent streams having rocky beds bordered by willow thickets or other dense vegetation. It also inhabits large sandy riverbeds, such as the Santa Clara River (Ventura County), if a strip of riparian vegetation is present along the stream course. This taxon also utilizes stock ponds and other artificially created aquatic habitats (e.g. Lake Hemet, Riverside County) if a dense riparian border of emergent vegetation, amphibian and fish prey is present. If flooding, overgrazing, burning, or mechanical alteration removes dense riparian vegetation, this species is infrequent in such habitats. Limited data indicate that small mammal burrows are used as over wintering sites (Jennings and Hayes 1994).

The life history of this species is poorly known. It is highly aquatic and is rarely seen far from water. It emerges from hibernation in the spring although it may be active on warm winter days. It is active at temperatures ranging from 19-32 degrees Centigrade (Jennings and Hayes 1994).

This species feeds primarily on fish, fish eggs, and tadpoles. It will eat bullfrog larvae and metamorphs if other food is absent. It also eats earthworms and larval California newts (Jennings and Hayes 1994).

Breeding occurs in the spring and females’ bear 1-25 live young (typically 12) in the fall. Neonates are observed in late August through September. Individuals of the species probably reach sexual maturity in 2-3 years. In captivity, individuals have lived 7-10 years (Jennings and Hayes 1994).

Suitable habitat for this species can be found in or near a permanent water source and is mostly aquatic. This snake is most often active at dusk or night, but daytime encounters are reported (Stebbins 1985).

Threats: The primary current threat to this species on NFS lands is disturbance related to recreational activities.

Potential for occurrence within the Project Area: Reconnaissance-level field surveys were conducted on 24-29 September 2007 for habitat capable of supporting special-status amphibians and reptiles. This species was detected along portions of Upper Big Tujunga and Alder Creeks. This species has been observed in Eaton Canyon, Upper Big Tujunga, Aliso Canyon, Alder Creek and Lynx Gulch.

Arroyo Chub (Gila orcutti)

Regulatory Status: The arroyo chub is designated by the Regional Forester as a Forest Service sensitive species.
Range and Distribution: Arroyo chubs are native to the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita River and to Malibu and San Juan Creeks (Moyle et al. 1995; Swift et al. 1993). They are now absent from most of their range. They are present in Big Tujunga Canyon, Picoima Creek above Picoima Reservoir, and in Sepulveda Flood Control Basin in the Los Angeles River Drainage; upper San Gabriel River drainage; and middle Santa Ana River tributaries between Riverside and the Orange County line; and Santa Margarita River and its tributary, De Luz Creek, Trabuco Creek below O’Neill Park, and San Juan Creek (San Juan Creek drainage); and Malibu Creek (CNDDB 1998; Moyle et al. 1995; Swift et al. 1993).

Arroyo chubs have been introduced to a number of streams. An introduction to Deep Creek (Mohave River) in the 1930’s found that Arroyo chubs hybridize with Mohave Tui chubs (Gila bicolor mohavensis)(Swift et al. 1993). References to abundant minnows in Big Bear Lake are thought to be an introduction of Arroyo chubs in 1922, since during this time Arroyo chubs were placed into reservoirs with trout plants or with mosquitofish (Swift et al. 1993). Fish introduced into the Cuyama drainage hybridize with Hesperoleucas symmetricus (Swift et al. 1993).

Habitat Requirements and Natural History: Arroyo chubs are found in slow moving or backwater sections of warm to cool streams (10-24 degrees Centigrade) with mud or sand substrates (Moyle et al. 1995; Moyle 1976; Page and Burr 1991). Depths are typically greater than 40 cm (Moyle et al. 1995). Laboratory studies indicate that the Arroyo chub is physiologically adapted to survive hypoxic conditions and the wide temperature fluctuations common in south coastal streams (Moyle et al. 1995). Chubs are omnivorous, feeding on algae, insects, and small crustaceans. However, most of the stomach contents consist of algae (Moyle et al. 1995; Moyle 1976). Arroyo chubs are also known to feed extensively on the roots of a floating water fern (Azolla) infested with nematodes (Moyle et al. 1995).

Arroyo chubs are fractional spawners that breed more or less continuously from February through August, although most spawning takes place in June and July. Most spawning occurs in pools or in quiet edge water, at temperatures of 14-22 degrees Centigrade (Moyle et al. 1995). The embryos adhere to the bottom and hatch in 4 days at 24 degrees Centigrade. The fry spend their first days after hatching clinging to the substrate but rise to the surface once the yolk sac has been absorbed. The next 3-4 months are spent in quiet water, in the water column and usually among vegetation or other flooded cover. Arroyo chubs rarely live beyond 4 years (Moyle et al. 1995).

Red Shinners have been introduced into a number of Arroyo chub streams and may competitively exclude chubs from many areas. Chubs generally decline when shinners become abundant (Moyle et al. 1995). Other reason for decline is that Arroyo chubs do best in lower gradient streams, which have largely disappeared due to urbanization (Swift et al. 1993).

Threats: Water management actions leading to stream diversions, stream dewatering, flow fluctuations, and channelization are the primary threat to this species (Loe, pers. comm., Mizuno pers. comm.). Many of the stream segments downstream of National Forest System lands have been dewatered, resulting in isolation and no connection to any downstream populations (Loe, pers. comm.). Other threats include the introduction of nonnative species, including other minnows, bass, sunfish, and catfish, resulting in competition and predation on arroyo chub, sometimes to the exclusion of the native fish, and, hybridization with Mojave tui chub and California roach has resulted in genetic impurities (Moyle et al. 1995; Moyle 2002).

Potential for occurrence within the Project Area: Recent surveys have found arroyo chubs in San Francisquito Creek (Warburton and Fisher 2002, Warburton et al. 2003) and Warm Springs Creek, a tributary to Lake Elizabeth -- which is a tributary to the Santa Clara River (Wales, pers. comm.). The arroyo chub has also been found in Warm Springs Creek, which is a tributary to Lake Elizabeth Creek in
2002 (Wales, pers. comm.). U.S. Geological Survey, as part of the unarmored threespine stickleback monitoring program, observed the arroyo chub in San Francisquito Creek during the 2001 monitoring effort. The largest population is considered to be in the West Fork of the San Gabriel River (Wells and Diana 1975).

The arroyo chub is known to occur on the Angeles National Forest, in Pacoima Creek; Big Tujunga Creek; the west, east, and north forks of the San Gabriel River; Cattle Canyon; and Bear Creek. The Santa Ana speckled dace's range has diminished dramatically to a few headwaters of the San Gabriel, Los Angeles, and Santa Ana Rivers. Loss of habitat is attributable to urbanization, water diversions, and introduction of nonnative species (Moyle et al. 1995). The largest remaining population of Santa Ana speckled dace is on the Angeles National Forest on lower reaches of the east, north, and west forks of the San Gabriel River, including Cattle Canyon, Bear Creek, and Fish Canyon (Swift et al. 1993). Other reported occurrences include Pacoima Creek, Little Tujunga Creek, and Big Tujunga Creek, but more recent information indicates these populations may now be extirpated (Moyle et al. 1995). Arroyo chub were detected in West Fork of the San Gabriel River. This species is also known to occur and suitable habitat exists along portions of Big Tujunga Creek in the project area, although they were not detected during recent surveys conducted by CDFG, (J. O’Brien, Associate Fisheries Biologist, CDFG, pers. comm.).

**Santa Ana Speckled Dace (Rhinichthys osculus ssp. 8)**

*Regulatory Status:* The yellow-blotched salamander is designated by the Regional Forester as a Forest Service sensitive species.

*Range and Distribution:* The Santa Ana speckled dace was once distributed throughout the upland portions of the Santa Ana, San Gabriel, and Los Angeles River Systems, but was rare in the lowlands (Moyle et al. 1995). In all three drainages, the species occurred farther down on the Los Angeles Plain (Moyle et al. 1995). Later, a few widely scattered populations were documented, but they all disappeared around 1950 (Moyle et al. 1995). Records indicated a population in North Hollywood (Los Angeles River) indicating that speckled dace existed across the Los Angeles basin (Swift et al. 1993). Currently, the Santa Ana speckled dace can be found in very limited numbers in all forks of the San Gabriel River, Big Tujunga Creek (Los Angeles River), and in the headwaters of the Santa Ana River (Moyle et al. 1995).

The largest remaining population of Santa Ana speckled dace is on the Angeles National Forest on lower reaches of the east, north, and west forks of the San Gabriel River, including Cattle Canyon, Bear Creek, and Fish Canyon (Swift et al. 1993). Other reported occurrences include Pacoima Creek, Little Tujunga Creek, and Big Tujunga Creek, but more recent information indicates these populations may now be extirpated (Moyle et al. 1995).

*Habitat Requirements and Natural History:* Santa Ana speckled dace inhabits a number of stream and channel types, small springs, brooks, and pools in intermittent streams and large rivers. In general, this species requires abundant cover and well oxygenated clear water flowing over shallow cobble and gravel riffles (Moyle 2002, Wells and others 1975). The preferred summer water temperature is 63 °F–68 °F (17 °C–20 °C). In 1990, Deinstadt and others provided a detailed description of speckled dace habitat in the West Fork of the San Gabriel River. In addition, Haglund and Baskin (2002) conducted field investigations within the San Gabriel River Off-Highway Vehicle (OHV) Area, West Fork of the San Gabriel River and described specific habitat preferences for various life stages of these dace. Within the OHV area, adult Santa Ana speckled dace show a preference for gravel substrate and a lesser preference for cobble substrate, a preference for flowing habitats (riffle, run, glide), and variability in depth preference (Haglund and Baskin 2002). Juveniles show a preference for sand and gravel, pool and riffle
habitat (Haglund and Baskin 2002). In this same 2002 study, fry were found exclusively in edgewater habitat over silt at depths of less than 17 cm where there was no measurable flow (Haglund and Baskin 2002).

Maturation is most likely to occur by two years. Spawning takes place throughout the summer and peaks during June and July (Moyle 2002). Rising water temperatures and flows in intermittent streams may induce spawning (Riverside County Integrated Project 2000). Spawning occurs over rocks and gravel, where the larvae remain until emerging and moving to warm shallow areas in the stream (Moyle 2002).

Speckled dace appear to be moderately tolerant of high water temperatures and low dissolved oxygen. Recruitment success can be low during high-flow years. They are highly successful at colonizing habitat disturbed by high flows (Riverside County Integrated Project 2000).

Movement depends on habitat conditions. Flooding contributes to the downstream dispersal of the species (Riverside County Integrated Project 2000).

Santa Ana speckled dace generally feed on small benthic invertebrates such as larvae of hydropsychid caddisflies, baetid mayflies, and chironomid and simulid midges (Moyle 2002).

Threats: Surveys are needed to better determine the current distribution and abundance of Santa Ana speckled dace. The primary need of the current restricted populations is permanent, year-round surface water. Some populations (e.g., Silverado Canyon) suffered severe losses or extirpation during the drought in the late 1980s. Habitat degradation and the establishment of red shiners in Big Tujunga Canyon are cited as causes of Santa Ana speckled dace decline. There is some evidence that the Santa Ana speckled dace populations in the San Gabriel River OHV Area are inversely related to the abundance of largemouth bass (Haglund and Baskin 2002). The West, North, and East Forks of the San Gabriel River are identified as the best remaining habitat areas for Santa Ana speckled dace (Moyle and others 1995). Although the data set was not very robust and there were too many variables during these field studies on the West Fork of the San Gabriel River, there was no evidence that the intensity of the OHV use in the San Gabriel River OHV Area has any relationship to the fish populations (Haglund and Baskin 2002). Water management actions leading to stream diversions, stream dewatering, flow fluctuations, and channelization are the primary threat to this species (Loe pers. comm., Mizuno pers. comm.). Many of the stream segments downstream of National Forest System lands have been dewatered, resulting in isolation and no connection to any downstream populations (Loe pers. comm.).

Potential for occurrence within the Project Area: This species was detected in West Fork and Upper West Fork of the San Gabriel River. It is also known from portions of the Santa Ana River, Aliso Creek, and several unnamed tributaries that drain into the Santa Ana River. Although not detected during recent surveys conducted by CDFG, this species is known to occur and suitable habitat occurs along portions of Big Tujunga Creek in the project area.

EFFECTS ANALYSIS AND DETERMINATION STATEMENTS

Cumulative Effects Analysis Methodology
For reasonably foreseeable future actions, the Angeles National Forest Schedule of Proposed Actions was reviewed (June 2010). Cumulative effects of these projects will be analyzed within the Analysis Area, defined for each species.

“In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one can not reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects.

Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.”

The cumulative effects analysis in this (EA or EIS) is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

“CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decisionmaking. (40 CFR 1508.7)”

For these reasons, the analysis of past actions in this section is based on current environmental conditions.
**Special Status Plants**

The following plant species are known to occur in the project area:


**Direct Effects.** Direct mortality to Sensitive plant species could occur from construction activities that remove vegetation, grade soils, or cause sedimentation, including tower pad preparation, clearing helicopter staging areas, and the construction, grading, and widening of new spur roads and existing access roads. These impacts include trampling or crushing from heavy equipment, vehicles, and foot traffic and alterations to the native seed bank due to soil compaction and modifications to existing hydrological conditions such that the capability of the habitat to support special-status species is impaired.

Special status plant species were identified at several locations including at or near tower sites, at spur road locations, and along access roads. Table 1 contains a list of FS Sensitive species within the ANF. Map 1 (Appendix A) delineates the locations of Forest Sensitive plants identified in the project area.

Four years of surveys (2007-2010) detected the 17 different Forest Sensitive plant species listed above in the Project area. All 17 of these plant species were associated with Project access roads and could be subject to disturbance from road widening and grading activities. For the most part it will be possible to avoid these roadside populations, as many of them were located more than 5 feet from either side of the access road, and many of the access roads will not require road widening. San Gabriel manzanita, Plummer’s mariposa lily, San Gabriel bedstraw, Johnston’s bedstraw, San Gabriel Mountains sunflower, fragrant pitcher sage, San Gabriel linanthus, short-joint beavertail, and chickweed starry puncturebract were located within 200 feet of towers, new spur roads, helicopter staging areas, or pull sites. In some locations these species could be avoided by flagging prior to construction, however, it is likely that at many of the locations construction activities may result in the loss of entire populations or individuals of these sensitive plants. After analyzing the GIS information for the rare plant surveys it is estimated that 20 populations of San Gabriel manzanita, 20 Plummer’s mariposa lily, 1 San Gabriel bedstraw, 5 Johnston’s bedstraw, 2 San Gabriel Mountains sunflower, 5 fragrant pitcher sage, 2 San Gabriel linanthus, 15 short-joint beavertail, and 3 chickweed starry puncturebract populations have a high potential to be impacted by construction activities from the Project. As mentioned above, it is less probable that populations of slender mariposa lily, Palmer’s mariposa lily, Mt. Gleason paintbrush, Mojave Indian paintbrush, San Gabriel River dudleya, San Gabriel Mountain dudleya, urn-flowered alumroot, and Rock Creek broomrape will be directly impacted as they are only known to occur along existing access roads, and can more likely be avoided.

While not all the rare plants identified in the project area would be subject to construction related disturbance; there remains the potential for the loss or mortality to some rare plants. Some of these species are slightly more common in the region and include Plummer’s mariposa lily, short joint beavertail cactus, and San Gabriel Mountains sunflower. These plants are considered to be more common in the ANF and are less susceptible to loss on a forest wide level. However, other species including San Gabriel river dudleya, San Gabriel Mountains dudleya, San Gabriel bedstraw, and Rock Creek broomrape are of a more limited distribution and may be more susceptible to regional loss. However, as described above, many of the plant species identified in the project area could likely be avoided or reduced through the implementation of project minimization measures.
Measures incorporated into the project would limit the type and amount of work in riparian areas, provide for the control of exotic weeds, provide off-site mitigation for impacted lands, limit the effects of road grading and soil compaction, and minimize the risk of wildland fire. In addition, restoration of damaged areas would occur subsequent to completion of construction. Further by conducting pre-project reconnaissance surveys, limiting work around identified areas supporting these species, using best management practices, and the maintenance of buffer zones around these species, effects of the proposed action on these species will be minimized. When impacts to non-listed special-status plant species are unavoidable, impacts shall be compensated through reseeding (with locally collected seed stock), or other FS approved methods. If the ANF determines Project activities will result in the loss of a significant portion of the known individuals of FS Sensitive plant species, and reseeding/transplanting are not feasible options, existing off-site occupied habitat that is not already part of the public lands will be preserved in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted). The determination of a significant rare plant population loss will be decided by the ANF botanist on a species and location basis, after available literature, research, and overall species distribution are reviewed. If avoidance, reseeding/transplanting, and preservation of off-site habitat occupied by the impacted species are not found to be possible, the ANF will consider off-site restoration of degraded ANF lands and/or preservation of non-public lands with suitable habitat for the impacted species.

**Indirect Effects.** Indirect effects could include the disruption of native seed banks through soil alterations, the accumulation of fugitive dust, increased erosion and sediment transport, the colonization of non-native, invasive plant species, an increase in unauthorized off-highway vehicle (OHV) traffic.

Excessive dust can decrease or limit plant survivorship by decreasing photosynthetic output, reducing transpiration, and adversely affecting reproductive success. Soil compaction, erosion, and sedimentation resulting from Project activities can also indirectly impact these species. Grading for new access or spur roads can alter the surface hydrology in an area and affect plant communities by reducing access to sheet flow during rain events. Opening of the vegetation canopy will result in increased solar exposure causing an increase in soil temperatures. There is also potential for loss of carbon, an important soil component derived from woody debris. This combined with increased nitrate leaching will reduce levels of charged minerals such as calcium, magnesium, and potassium further decreasing soil productivity. Where some woody debris is left, there would be lower losses of soil productivity. The Proposed Action includes two mitigation measures to help control these potential impacts: “Implement Construction Fugitive Dust Control Plan (AQ-1a)” and “Provide restoration/compensation for impacts to native vegetation communities (B-1)”.

Ground-disturbing activities that would occur during the construction of the proposed Project can also result in the indirect effect of the proliferation and spread of non-native invasive plants to new areas. Because noxious weeds can permanently degrade rare plant and animal habitats, their proliferation as a result of Project activities could adversely affect sensitive plant species if they are present. Some invasive plant horticultural varieties do not spread rapidly while others may aggressively colonize surrounding areas. For example, tocolote and slender wild oats form dense thickets that exclude all other plants, including native plants such as slender mariposa lilies. Due to their growth habitats, they both overshadow surrounding vegetation and they prevent seeds from germinating because they outcompete native plants for use of water, soil and sunlight. As the non-natives spread they displace native vegetation in the surrounding areas. In addition, some exotic plant species change soil characteristics. For example, Eucalyptus and Tamarisk sp. are allelopathic. This changes the soil chemistry and inhibits seed germination for all species including native species. In some cases, nonnative plants can also lead to an increased fire hazard because of their flammability or growth habits. The Proposed Action includes two mitigation measures to help control these potential impacts: “Provide restoration/compensation for
impacts to native vegetation communities (B-1)” and “Prepare and implement a Weed Control Plan (B3”).

Removal of vegetative barriers and creation of new and/or improved roads during the Project may invite illegal off-highway motorized vehicle use from roads and adjacent private property. Removal of natural barriers may result in currently inaccessible terrain becoming easily accessible. Increased use, especially by motorized vehicles, may result in further impacts including increased erosion problems, increased levels of sediment deposition in drainages and riparian areas, losses of native vegetation, soil compaction, etc. The Proposed Action includes a measure to help control those potential impacts: A combination of natural barriers (rocks, logs, etc.), screening, fencing, etc. may be used to prevent/discourage illegal vehicle activity during and after the project treatment. Field staff would monitor the area and if/when problem areas arise, remedial and preventative actions would be taken as appropriate. Coordination with adjacent landowners, public education, and signing will be used as appropriate.

Cumulative Effects. There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. While certain construction activities of the Project such as tower building, wire pulling, and tower assembly are short-term and have most likely temporary effects on biological resources, other Project activities such as access road widening and spur road creation, are permanent and have long term effects on biological resources. The long term effects associated with these more permanent impacts are degradation of native vegetation habitat from increased non-native plant colonization, soil compaction, erosion, unauthorized OHV use, and susceptibility to wildfire from increased access and weed invasion. Even though SCE would implement components in the project description to avoid impacts to sensitive species through the implementation of project minimization and avoidance measures some of the impacts (i.e. spur roads and widened access roads) associated with the proposed construction activities would be considered long-term and would likely substantially affect native vegetation resources. The Project would therefore, contribute cumulatively to projects occurring after the completion of the proposed action.

Although the extent of damage to biological resources associated with the Station Fire is not yet fully known, it is reasonable to assume that resources throughout the ANF portion of the Project have been damaged by the fire. It is also assumed that post-fire restoration and rehabilitation will occur in various areas throughout the Project area, which will likely include the replanting of several thousand acres of trees Forest-wide.

Project impacts to some Forest Service Sensitive species may be of a greater magnitude post-fire, but mitigation measures remain sufficient to minimize effects to these species. Likewise, for the majority of Forest Service Sensitive species, cumulative impacts would remain similar.

Determination. It is my determination that implementation of the Project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the San Gabriel manzanita, Slender mariposa lily, Palmer’s mariposa lily, Plummer’s mariposa lily, Mt. Gleason paintbrush, Mojave Indian paintbrush, San Gabriel River dudleya, San Gabriel Mountain dudleya, San Gabriel bedstraw,
Johnston’s bedstraw, San Gabriel Mountains sunflower, urn-flowered alumroot, fragrant pitcher sage, San Gabriel linanthus, short-joint beavertail, Rock Creek broomrape, and chickweed starry puncturebract.

The will affect, but not likely to result in a loss of viability or a trend toward federal listing determination was based on the incorporation of mitigation measures into the project that would limit the type and amount of work in riparian areas, provide for the control of exotic weeds, and limit the effects of road grading and soil compaction. In addition, restoration of damaged areas would occur subsequent to completion of construction. Further by conducting pre-project reconnaissance surveys, limiting work around identified areas supporting these species, using best management practices, and the maintenance of buffer zones around these species, effects of the proposed action on these species will be minimized.

**Special Status Wildlife**

**Bald Eagle (Haliaeetus leucocephalus)**

The analysis area for the bald eagle was considered to be 2 miles from the project boundary. This is based on a 1 mile distance for line of sight and or noise disturbance from a heavy helicopter from the 1 mile buffer of potential helicopter use around the project area.

*Direct Effects:* Direct impacts to bald eagles include loss of suitable nesting sites from roadside clearing of large trees, mortality due to collisions with overhead transmission lines, disturbance as a result of increased noise levels from heavy equipment and helicopter operations and increased human presence.

Although bald eagles have not been recorded nesting on the ANF, limited suitable habitat occurs within the project area, particularly in the area of Cogswell reservoir, however this project will not remove any suitable nesting habitat near Cogswell reservoir so direct impacts to nesting bald eagle habitat are not anticipated. Additionally, construction related activities within or adjacent to suitable nesting habitat could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment if bald eagles are present, however no bald eagles have been documented nesting within the project area so these impacts are not anticipated. This species has been confirmed wintering on the ANF at Littlerock Reservoir, approximately five miles northeast of the area where Segment 6 enters the northern boundary the ANF (L. Welch, District Biologist, pers. comm.). In southern California, bald eagles primarily winter adjacent to large reservoirs and inland waters (Garrett and Dunn 1981). These areas also provide wide-ranging foraging habitat for this species as it typically obtains food sources around aquatic habitats. In some areas, such as Big Tujunga reservoir and Cogswell reservoir, access roads and/or tower locations are located in, or adjacent to, suitable wintering and foraging habitat for bald eagles. As a result if bald eagles were to winter near these reservoirs then there may be the potential that disturbance related impacts from road work/traffic and helicopter operations may disturb wintering individuals, however, no bald eagles are known to winter at either of these reservoirs at this time so no impacts are anticipated.

Should bald eagles be present in the project area or begin to occupy the project area in the future they could be subject to mortality as a result of collisions with the transmission lines. This impact would be minimized by the installing flight diverters (i.e. swan wrapping) or some other product that would effectively divert the birds flight path in order to minimized the potential for collisions for raptors or other bird species along sections of the transmission line that are determined to be a high risk for collisions.

*Indirect Effects:* Indirect impacts could include disruption of breeding activity due to post-construction facilitated human use of new or improved spur and access roads. However, SCE will gate or rehabilitate
unwanted access/spur roads post construction so increased access that might facilitate disruption of breeding or roosting birds on NFS lands is not anticipated to occur.

**Cumulative Effects:** There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As the project activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic maintenance would terminate upon completion of the transmission line. Fuels management projects conducted by the ANF also have the potential to affect this species by reducing brush in areas used as foraging for bald eagles. SCE would also implement components in the project description to avoid impacts to eagles by the use of limited operating periods during the nesting season. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, Alternative 2 would not contribute cumulatively to projects occurring after the completion of the proposed action.

**Determination:** It is my determination that the proposed project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the bald eagle.

The proposed project would not impede any of the conservation guidelines proposed for bald eagle. Limitations on the flight paths of helicopters would avoid potential nesting areas and known populations of this species if any are identified in the future. The completion of preconstruction surveys and monitoring would reduce or avoid effects to bald eagle should they be present in or adjacent to the project area.

**California Spotted Owl (Strix occidentalis occidentalis)**

The analysis area for the spotted owl is a 2 miles radius around the project boundary. This is based on a 1 mile distance for noise disturbance from helicopter operations which will likely occur within 1 mile of the project alignment.

**Direct Effect:** Direct impacts to spotted owls include the potential loss of habitat and nesting sites from roadside clearing of large trees, vegetation clearance from pullsites, access/spur roads, tower locations, flyyards or other disturbance areas. Spotted owls would also likely experience disturbance as a result of increase traffic on access and spur roads increased noise levels from heavy equipment and helicopter operations increased human presence, and exposure to fugitive dust during the construction phase of the project. In many areas, both access roads and tower locations cross occupied habitat including known nesting areas. Several of the towers in this area will require helicopter construction techniques for demolition and erection.

Data collected as of 2010 indicate that there are approximately 14 Protected Activity Centers (PACS) in or adjacent to the project area. Construction within a PAC or occupied habitat or immediately adjacent to occupied habitat during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. As the rugged terrain in many sections of the ANF limits vehicle
access to many tower locations, helicopters would be required for both demolition and construction of numerous towers. Helicopter construction proposed in the vicinity of occupied spotted owl habitat would introduce a substantial amount of noise, vibration, dust, visual disturbance, and air turbulence. These factors could disrupt breeding activity and ultimately lead to avoidance of breeding altogether, or the failure of an already established nest. However implementation of Limited Operating Periods as identified in the LMP are expected to mitigate these impacts. Construction outside of nesting season will likely impact spotted owl movements during the day and may impact feeding behavior. It is possible the noise associated with the project will alter the daily movements of owls and may result in missed feeding opportunities. In addition, altered movement patterns could result in owls being displaced into adjacent less suitable habitats that may not offer the same habitat components such as thermal regulation sites and prey base.

Delaney et al. (1999) studied the effects of helicopter noise on Mexican spotted owls in New Mexico and found that spotted owl flushes (flight responses) increased with decreasing distance and increasing sound level. Further, they found that owls flushed more in response to chain saw noise than helicopter noise. However, they note that helicopters would have elicited a greater response from owls if the exposure times were increased through slow maneuvers such as hovering, which would occur during construction of the proposed project. Owl flushing rates were the same in the breeding season and the non-breeding season, although owls did not flush when chicks were in the nest. Finally, the authors found no significant difference in reproductive success between owls exposed to helicopter and chain saw noise and those who were not exposed to these noise sources, but the population sizes were small enough that the authors may not have been able to detect an effect on reproduction. However, flushed owls are likely more prone to predation, stress, and repeated activity during the breeding season that could lower reproductive success. Another study by Tempel and Gutierrez (2003) used fecal corticosterone (a stress hormone) as a measure of physiological stress response in California spotted owls exposed to chain saw noise. They found no detectable increase in fecal corticosterone levels in owls exposed to a chain saw operating 100 meters away. However, they note that chronic and intense noise such as timber harvest and road construction was not examined during the study and may lead to increased stress response in owls. While these studies suggest that spotted owls can tolerate some degree of anthropogenic noise disturbance, the construction of the proposed project would introduce chronic noise sources that could be closer in proximity to breeding and non-breeding owls than the noise sources in these studies.

The greatest threat to this species on NFS lands is the loss of habitat and subsequent population loss due to large stand-replacement wildfires. As proposed the project would not interfere or impede any of the conservation guidelines proposed for spotted owls. Measures incorporated into the project would minimize risk of wildland fire and the spread of invasive nonnative plants due to construction activities. Avoidance of nest sites would be achieved through the use of limited operating periods (LOP). The LOP would prohibit activities within approximately ¼ mile of the nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15) unless surveys confirm that California spotted owls are not nesting. Limitations on the removal of vegetation and the restoration/mitigation of disturbed habitats would minimize impacts to habitat utilized by this species. Limiting nighttime vehicle travel on Forest roads would reduce conflicts with species that forage on the ground.

In a worst-case scenario, the loss of 43.1 acres of suitable habitat along Segments 6 and 11 would constitute the loss of 14 percent of a home range for a single pair of spotted owls. However, it is unlikely that all of the impacts associated with one segment would occur within the territory of a single pair of owls. This loss of habitat alone spread over two segments will not contribute to a substantial loss of habitat for an owl or pair of owls. Furthermore, California spotted owls typically inhabit heterogeneous home ranges that include unsuitable habitats such as grassland and chaparral. Most of the vegetation that would be removed near spotted owl habitat consists of chaparral, which is not utilized for nesting or roosting. Patches of non-
forested vegetation do not preclude owls from nesting in adjacent forests in southern California (Smith et al. 2002). However, the expansion of access roads and the grading of new spur roads would result in the removal of mature oaks, bay, and conifer trees depending on the location of the road. In addition, because California spotted owl nest sites are limited, and home range size varies greatly on the ANF, the loss of a nest tree, even outside of the breeding season, would represent an adverse effect to the species.

Operational impacts could include collisions with transmission lines and disturbance due to increased human presence as a result of public use of new or improved spur and access roads. Corona noise associated with the operation of the proposed Project could potentially disrupt breeding spotted owls. However, extensive research has not been conducted on the effects of corona noise on wildlife. Impacts related to corona noise are discussed further under Impact B-41.

Indirect Effects: Indirect impacts could include the alteration of prey base due to localized ground disturbance, loss of habitat due to the colonization of noxious weeds, habitat degradation due to fugitive dust impacts on local plant populations and a disruption of future breeding activity due to facilitated use of new or improved spur and access roads by the public.

Cumulative Effects: There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As Alternative 2 activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic maintenance would terminate upon completion of the transmission line. Fuels management projects conducted by the ANF also have the potential to affect this species by reducing brush in areas used as foraging for spotted owls. SCE would also implement components in the project description to avoid impacts to owls by the use of limited operating periods during the nesting season. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, Alternative 2 would not contribute cumulatively to projects occurring after the completion of the proposed action.

Determination: It is my determination that implementation of this project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the California spotted owl. Measures incorporated into the project such as mitigation measures B-1a, B-1b, B-3a, B-30, and AQ-1a would minimize risk of wildland fire and the spread of invasive nonnative plants due to construction activities. Additionally, implementation of a Worker Environmental Awareness training would educate workers in the area to the species and the impacts that this project has on this species. Avoidance of nest sites would be achieved through the use of limited operating periods (LOP) as outlined in the ANF LMP. The LOP would prohibit activities within approximately ¼ mile of the nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15) unless surveys confirm that California spotted owls are not nesting. Limitations on the removal of vegetation and the restoration/mitigation of disturbed habitats would minimize impacts to habitat utilized by this species. Limiting nighttime vehicle travel on Forest roads would reduce conflicts with species that forage on the ground. Reducing fugitive dust would reduce impacts to local habitats used by spotted owls. Installing
gates or other structures/features that reduce the potential of unauthorized use of access/spur roads would reduce the potential for long term impacts due to increase traffic and human use.

Townsend’s Big-eared Bat (Corynorhinus townsendii), Pallid Bat (Antrozous pallida), Western Red Bat (Lasiurus blossevillii)

Analysis area for bats is 1 miles from the project boundary. This is based on a 1 mile distance for noise disturbance and rotor wash from use of a heavy helicopter.

Direct Effects: Potential impacts to these species include mortality of individuals during construction activities, permanent loss of habitat due to removal of towers, construction of permanent structures (e.g., new towers or access roads) or other construction activities (removal of roosting habitat at pulling and assembly sites), and temporary disturbance during construction (noise, air turbulence, dust, and ground vibrations from helicopters and construction equipment).

During construction it is possible that tree roosting or dispersed roosting bats may be subject to mortality from road work or vegetation removal. In addition, bats that forage near the ground, such as the pallid bat, would also be subject to crushing, resulting in mortality or injury by vehicles driving at dusk, dawn, or during the night.

The project area includes numerous locations that constitute suitable bat foraging and roosting habitat, including rock outcroppings, mine shafts, hollow trees, dense forests, and abandoned water tanks. The disruption of foraging is not expected to pose a substantial risk to bat species in the project area as riparian areas would largely be avoided during the evening when bats are active. However, some riparian areas would be affected and vegetation would be impacted by the construction of this project. This would result in loss of some foraging habitat for these species. Construction activities associated with project implementation could substantially reduce active roosts for special-status bat species. If active hibernacula and maternity roosts cannot be avoided, impacts would be negative. Due to the sensitive nature of these species to human disturbance, roost protection is vitally important for bats. Roost protection measures as described in mitigation measure 33 will be implemented as necessary.

Construction-related activities, which would generate noise, traffic, and diesel fumes, could result in the altered behavior patterns or abandonment of roosting locations and subsequent mortality to adult bats or pups if any bats were present in the project area.

Impacts to bats during operation of and maintenance include disturbance by vehicles and individuals utilizing new or improved access and spur roads, corona noise, the spread of noxious weeds, and the potential for collision with transmission lines.

Measures incorporated into the project would minimize risk of wildland fire and the spread of invasive nonnative plants due to construction activities. Limitations on the removal of riparian and upland vegetation and the restoration of disturbed habitats would minimize impacts to drainages, and restoration of damaged areas would occur subsequent to completion of construction. The completion of surveys and monitoring according to mitigation measure 33 would reduce or avoid effects to maternity/hibernaculum colonies. Limiting nighttime vehicle travel on Forest roads would reduce conflicts with species that forage on the ground.

Indirect Effects: Indirect effects could include increased traffic, dust, and human presence in the project area that could result in bats altering behavior patterns or abandoning their roosts or maternal colonies. For example, Townsend’s big-eared bat is known to abandon young when subject to disturbance.
**Cumulative Effects:** There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission lines. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As the proposed project activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic maintenance would terminate upon completion of the transmission line. Grading of access roads and in edge areas is likely an important factor in the decline of this species. SCE would also implement components in the project description to avoid impacts to sensitive species through the implementation of project minimization and avoidance measures. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, the proposed project would not contribute cumulatively to projects occurring after the completion of the proposed action.

**Determination:** It is my determination that Alternative 2 may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the Townsend’s big-eared bat, pallid bat, and western red bat.

Measures incorporated into the project such as mitigation measure B-1a, B-1b, B-2, B-3a and B-33 would minimize the risk of wildland fire and the spread of invasive nonnative plants due to construction activities as well as impacts to roosting bat species.

San Gabriel Mountains (Nelson’s) Bighorn Sheep (*Ovis canadensis nelsoni*)

Analysis area for San Gabriel Mountains bighorn sheep is 2 miles from the project boundary. This is based on a 1 mile distance for noise disturbance and rotor wash from use of a heavy helicopter beyond the area the helicopter would fly.

**Direct Effects:** Direct impacts to San Gabriel Mountains bighorn sheep include human disturbance during construction and the loss of foraging or lambing habitat.

This species occurs near the project area to the northeast of segment 6. The closest portion of the project area would be the Cogswell access road along the West Fork of the San Gabriel River and portions of Segment 6 between Newcomb’s Pass and the Angeles National Highway. San Gabriel Mountains bighorn sheep are considered sensitive to the presence of humans, particularly to high levels of human activity in their line of sight, and may abandon habitat due to human encroachment in these areas (Light and Weaver 1973). Construction activities have the potential to disrupt foraging behavior and force animals to leave the area. Bighorn sheep in the vicinity of segment 6 may be disturbed or displaces as a result of the construction/helicopter noise, however these effects would be temporary and limited to the construction phase of the project. Disturbances associated with construction could also result in reduced reproductive success or mortality of young bighorn sheep as a result of abandonment.

Census data collected since the early 1980s indicates that the San Gabriel Mountains bighorn sheep population in the San Gabriel Mountains has declined substantially over the last 25 years, from a high of 500 in 1979 to fewer than 100 in 2002. Factors believed responsible for this decline include fire exclusion.
in a large portion of the sheep's range, unusually high mountain lion predation and human encroachment (Holl 2002; Holl and Bleich 1983; Holl et al. 2001; Torres et al. 1996). Any project activities that result in adverse effects to reproductive success could have long term effects on the survival of this species. However, the project area is several miles from any known lambing areas for this species. Extensive use of helicopters in areas occupied by bighorn sheep could also result in substantial effects to this species. As population centers for this species do not occur in the proximity of the project area and helicopters would avoid known locations for this species; effects to bighorn sheep and potential lambing areas are anticipated to be minimal. It is possible that sheep could be within sight of helicopter operations near Cogswell reservoir, however the helicopter flight paths will be limited to the segment and the flyyard proposed south of Cogswell reservoir, so it is unlikely the flights will fly closer that 1-2 miles of any sheep in the area. The flight paths of helicopters would avoid key lambing areas and known populations of this species. The completion of preconstruction surveys and avoidance and monitoring would reduce or avoid effects to bighorn sheep should they occur in or adjacent to the project area.

Indirect Effects: Indirect impacts may result from road improvements which may encourage access to formerly remote areas for recreational activities such as ORV use, fishing, hiking and camping within the range of the San Gabriel Mountains bighorn sheep from human disturbance. The spread of noxious or invasive weeds to remote areas may also reduce foraging opportunities.

Cumulative Effects: There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. The management of ski areas has occurred in or adjacent to sheep habitat. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including skiing, hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As project activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic maintenance would terminate upon completion of the transmission line. Fuels management projects conducted by the ANF also have the potential to affect this species by reducing browse and foraging opportunities. SCE would implement components in the project description to avoid impacts to sensitive wildlife. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, the proposed project would not contribute cumulatively to projects occurring after the completion of the proposed action.

Determination: It is my determination that the proposed project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for San Gabriel Mountains Bighorn sheep.

San Gabriel Mountains Slender Salamander (Batrachocephs gabrieli)

Analysis area for San Gabriel Mountain Slender Salamander and Yellow Blotched Salamander is 1 miles from the project boundary. This is based on a 1 mile distance for noise disturbance and rotor wash from use of a heavy helicopter.

Direct Effects: Direct effects could include mechanical crushing and habitat loss via removal of talus or downed tree limbs. Other direct effects to these species include degradation of water quality through
siltation caused by vehicles using wet ford stream crossings; removal of vegetation; and grading tower pads, staging areas, helicopter pads, and pulling sites.

Direct effects to San Gabriel Mountains slender salamander could occur from construction activity as a result of mechanical crushing, loss of breeding sites, and human trampling. Disturbance would be associated with the removal of vegetation, excavation of soil, and the construction of the new road bed and stream crossing and any associated diversion of water flows. Construction related activities may also introduce toxins and sediments into the aquatic system or in areas where these species reproduce. Toxic chemicals subject to spillage and runoff include, but are not limited to, engine fuels (e.g., gasoline and diesel); motor oil; hydraulic fluid; and various other oils, greases, and solvents.

Sediment transport from upslope areas subject to grading and earth movement could result in degradation to adjacent habitat utilized by these species. All models of sedimentation based on project implementation indicate limited increases in sedimentation are anticipated (see Hydrology section of the Final EIS). However, with the implementation of erosion control best management practices the potential effects of sediments to areas supporting these species would be negligible.

Measures incorporated into the project would minimize risk of wildland fire and the spread of invasive nonnative plants due to construction activities. During construction and subsequent emergency use of the roadway, all vehicles would stay on the established roads. Limitations on the removal of riparian and upland vegetation and the restoration of disturbed habitats would minimize impacts to drainages, and restoration of damaged areas would occur subsequent to completion of construction. In addition, due to the limited extent of the known populations in relation to the proposed project area, no direct impacts are anticipated for this species.

Indirect Effects: Indirect effects could include compaction of soils, temporary impacts to water quality, the spread of noxious or invasive weeds, or changes to topography and water flow within creeks and drainages. However, due to the limited extent of the known populations in relation to the proposed project area, no indirect impacts are anticipated for this species.

Determination: It is my determination that project activities may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability for the yellow-blotched salamander or San Gabriel Mountain slender salamander.

Mitigation measures (B-1a, B-1b, B-3a, B-27, AQ-1a) incorporated into the project such as preconstruction clearance surveys, and rehabilitation of disturbed areas, weed monitoring are removal would minimize risk to individuals and would reduce the risk of spread of invasive plants due to construction activities. During construction and subsequent emergency use of the roadway, all vehicles would stay on the established roads.

Foothill Yellow-legged Frog (*Rana boylii*)

Analysis area for Foothill yellow-legged frog is 1 miles from the project boundary. This is based on a 1 mile distance for noise disturbance and rotor wash from use of a heavy helicopter.
**Direct Effects:** Direct effects to foothill yellow-legged frog could include mortality due to crushing by heavy equipment and vehicles, water quality degradation caused by increased sedimentation, erosion, or accidental chemical spills. Runoff into aquatic habitats during rain events could introduce silt and spills of toxic chemicals into the creeks. Silt can adhere to the egg masses and interrupt gas exchange, while toxic chemicals may poison inhabitants of aquatic habitats.

Direct effects to yellow-legged frogs could include mechanical crushing from equipment or foot traffic as these frogs tend to seek refugia under rocks, downed woody debris, and bank undercuts; loss of breeding pools, larval pools or refugia; temporary disruption of foraging areas or basking sites; and the dislodging or destruction of egg masses. Breeding, foraging, and basking could be disrupted or curtailed due to construction noise, human disturbance, vehicle lighting, or ground vibration from equipment. Habitat loss and disturbance would be associated with the temporary removal of vegetation at riparian areas, grading of new and existing access and spur roads, excavation of tower footings, diversion of water flow, and preparation and use of stringing and pulling areas and staging areas.

Disturbance of soil during construction could result in erosion and lowered water quality through increased turbidity and accelerated sediment deposition into local streams. In particular, road construction for both temporary and permanent roadways has the potential to cause soil instability, resulting in erosion and sedimentation, which could potentially degrade surrounding water quality. For aquatic species the degradation of water quality through increased sedimentation can smother egg masses and juveniles or result in decreased water oxygen levels. Anoxic stress is known to cause a decrease in performance and physiological functions in frogs and in extreme cases mortality (Rose and Drotman, 1967). The water quality impact of road construction and improvement is of particular concern in areas that cross stream channels or traverse steep slopes. For example, many portions of Segment 6 and 11 are located on steep gradients above known water sources. Sediment could be transported to these drainages without the implementation of erosion control measures, however with the implementation of BMPs for erosion control, project related sedimentation is expected to be negligible (see Hydrology section in Final EIS).

Amphibian species have been found to be very susceptible to changes in water pH. Alterations of water chemistry have been demonstrated to affect reproductive success and can result in mortality. The effects of potential sedimentation include lower water quality, increased turbidity, changes in water chemistry (increased pH and algae), lowered habitat quality and habitat types, loss of breeding habitats, lowered productivity or macroinvertebrates, and increased water temperature.

Construction activity required to upgrade road crossings within riparian areas may directly affect this species by causing sedimentation that could smother eggs or larval animals. While it is likely that road construction would involve the repair or maintenance of stream crossings, this work would not be conducted during or after rain events when flows are expected to be higher than usual from the additional runoff.

The use of herbicides would occur during construction and operation of Alternative 2 and could be detrimental to amphibian species (Relyea, 2005). Amphibians are particularly vulnerable to environmental contaminants because they have semi-permeable skin which absorbs materials from both the terrestrial and aquatic environments in which they live. Due to the inverse relationship of body weight to surface area, when small animals are exposed to pesticides they will generally receive a higher dose, in terms of body weight, than large animals will receive for a given type of exposure (Durkin, 2007). Herbicides containing added surfactants are particularly dangerous for aquatic species. Surfactants are materials added to enhance the ability of the herbicide to adhere to the treated surface and have been shown to adversely affect aquatic life, including fish and amphibians. Herbicides such as Triclopyr are known to cause immobility or mortality to tadpoles. Atrazine, one of the most common herbicides in the world, is known to cause malformation of sexual organs and feminization of male frogs (Hayes, 2003).
Herbicides are applied in liquid formulations and are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles.

Surfactants are used in herbicide formulations to increase the absorption of the herbicide by lowering the surface tension of the targeted plants. Since herbicides are used to kill plants, using a surfactant to make it more effective is a moot point. Inerts are used to improve the performance of a herbicide, and are ‘confidential business information’ of the chemical companies, and analysis of these herbicides is therefore impossible. Dyes may be used in herbicide treatments to show where the herbicide has been administered. Its effect on non-target terrestrial and aquatic species is unknown; however, its use has not resulted in any known problems. Using dyes can be an aid to making sure that only the target species is treated, and it has been recommended that dyes be used in the administering of herbicides.

Leaks, spills, and improper storage and handling of containers are the source of most herbicide related groundwater contamination. These impacts will be mitigated with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of herbicide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater than precipitation. Overland flow occurs infrequently on most forest land because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution.

Disturbance of soil during construction could result in soil erosion and lowered water quality through increased turbidity and accelerated sediment deposition into local streams. In particular, road construction for both temporary and permanent roadways has the potential to cause soil instability resulting in erosion and sedimentation, which could potentially degrade surrounding water quality. For aquatic species the degradation of water quality through increased sedimentation can smother egg masses and juveniles or result in decreased water oxygen levels. The water quality impact of road construction and improvement is of particular concern in areas that cross stream channel or traverses steep slopes. For example, many portions of Segment 6 and 11 are located on steep gradients above known water sources. Sediment could be transported to these drainages without the implementation of erosion control measures.

Construction activity required to upgrade road crossings within riparian areas may also directly affect this species by smothering eggs or larval animals. While it is likely that road construction would involve the repair or maintenance of stream crossings, this work would not be conducted during periods of high flow and this species is thought to have been extirpated in the ANF. As this species is not expected to occur in the project area, impacts to mountain yellow-legged frog are not expected to occur.

Nonetheless the implementation of conservation measures would ensure that effects to this species are reduced or avoided. Implementation of Alternative 2 would not impede any of the conservation guidelines proposed for these species. Measures incorporated into the project would minimize risk of wildland fire, limit the type and amount of work in riparian areas, and provide for the control of exotic weeds in the project area. In addition, restoration of damaged areas would occur subsequent to completion of construction. As the project includes new and improvement of existing roads in some loss of riparian
habitat would occur however this is expected to be minimal. Implementation of Alternative 2 would not affect the foothill yellow-legged frog, as this species is not present in Alternative 2 area.

**Indirect Effects:** Indirect effects include loss of suitable breeding habitat, changes in water temperature and light regimes due to removal of riparian and aquatic vegetation, and decreased water quality due to sedimentation and erosion. Post-construction impacts would be similar due to an increase in human presence as a result of facilitated public use of new and improved spur roads and access roads. Increased human use is often associated with the introduction of non-native species which are known to can prey upon and compete for limited resources including food and reproductive sites. Indirect impacts could also occur from clearing and grading for new tower locations. The removal of vegetation from these areas could result in erosion and downstream transport of sediment into habitat that occurs downhill from these areas. Sedimentation can degrade habitat and harm eggs by adhering to their surface and disrupting gas exchange.

Indirect effects to this species could include loss of suitable breeding habitat, changes in water temperature and light regimes due to removal of riparian and aquatic vegetation, and decreased water quality due to sedimentation and erosion. Post-construction impacts would be similar due to an increase in human presence as a result of facilitated public use of new and improved spur roads and access roads.

Indirect effects could occur by the removal of vegetation from clearing and grading for new tower locations, access and spur roads, pulling and stringing locations, and staging areas. The removal of vegetation could result in erosion and downstream transport of sediment into habitat that occurs downhill from these areas. However, the sediment modeling performed indicates that the amount of project related sedimentation is negligible (see Hydrology section of Final EIS) Diversion or modification of water flows, increased downstream sediment transport, or the establishment of nonnative and invasive species could indirectly affect yellow-legged frogs. Other indirect effects could result from fuel, lubricant, or concrete spills into the water.

The removal of exotic species, both plants and wildlife (components of Mitigation Measures B-3a, B-3b, B-3c, and B-8a) would have some potential to decrease predation and competition for yellow-legged frogs.

**Cumulative Effects:** There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highways and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As project related activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic operations maintenance would terminate upon completion of the transmission line. While the project would require permanent modification to streams or rivers that could support this species (i.e. West Fork of the San Gabriel River) the project would not result in the creation of physical barriers or substantially modify potential breeding habitat. SCE would also implement components in the project description to avoid impacts to sensitive species through the implementation of project minimization and avoidance measures. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, the proposed project would not contribute cumulatively to projects occurring after the completion of the proposed action.
**Determination:** It is my determination that implementation of the proposed action may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the foothill yellow-legged frog.

Mitigation measures (B-1a, B-1b, B-3a, B-27, AQ-1a) incorporated into the project would minimize impacts as a result of the project, by restoring disturbed habitats, implementing an RCA treatment plan and a weed control plan as well as conducting pre-construction clearance surveys.

**Southwestern Pond Turtle (Clemmys (Actinemys) marmorata pallida)**

Analysis area for Southwestern Pond Turtle is 1 miles from the project boundary. This is based on a 1 mile distance for noise disturbance and rotor wash from use of a heavy helicopter.

**Direct Effects:** Direct effects to southwestern pond turtle may occur from construction activity as a result of mechanical crushing, loss of nesting, breeding or basking sites, and human trampling. There is one large population in the West Fork of the San Gabriel River below Cogswell Reservoir on the Angeles National Forest. Other, smaller populations on the Angeles National Forest occur in upper Castaic Creek, Aliso Canyon, Pacoima Creek, Little Tujunga Creek, Big Tujunga Creek, Alder Creek, the East Fork of the San Gabriel River, and possibly Big Dalton Creek.

Construction activities will impact a number of small creeks and drainages, large reservoirs, and other suitable habitat for this species. If turtles are present within these areas then they could be subject to disruption of basking activity.

Impacts associated with removal of vegetation, excavation of footings, road use, grading, construction and maintenance, and tower construction adjacent to areas that support this species could include injury or mortality from crushing.

Since southwestern pond turtles often nest communally, damage or destruction of a nesting area could result in injury or mortality to a large number of incubating eggs or hatchling turtles and could disrupt egg-laying activities of adult female turtles. Southwestern pond turtles increase their activity when water temperatures consistently reach 15°C and may be active year round in southern and central California (Holland 1985). Direct impacts to southwestern pond turtles could also result from temporary degradation of water quality, fugitive dust, temporary loss of upland nesting sites and foraging habitat, disruption of breeding activity, or disturbance of basking sites. Juvenile southwestern pond turtles typically move from nesting sites in adjacent upland or riparian areas to the stream in the spring (Buskirk 1991). Hatchlings are very small, often less than one inch, and may be inadvertently trampled during project construction. In addition, access to zooplankton, an important hatchling food source, may be disrupted if water quality were to be severely degraded by project construction.

Operational impacts include risk of mortality by vehicles and disturbance on access roads due to increased use by the public and maintenance personnel. Other operational impacts include removal and trimming of vegetation during maintenance activities.

Populations of this species that occur in the West Fork of the San Gabriel River would not be directly affected by project construction activities as the tower sites are located upstream of the Cogswell Reservoir. However, access to the Project could occur along a paved section of road that parallels the West Fork of the San Gabriel River from Highway 39 to the dam at Cogswell Reservoir. This road is
located immediately adjacent to the river for several miles and is consistently within the riparian canopy. Numerous small ephemeral and intermittent drainages are also present in the canyon and provide tributary flow into the river along this section of the San Gabriel River. In some areas these drainages cross the access road as Arizona crossings or small culverts. Vehicle access through these areas when supporting flowing water could result in mortality to young or dispersing turtles. Use of this access road could result in accidental spills, increased turbidity due to vehicles using wet crossings, and potentially altering light regimes from the trimming and/or removal of some riparian vegetation to accommodate large vehicle passage. As described above disturbance from vehicle traffic may result in disturbance to pond turtles at basking sites along this access road.

Construction activities conducted at the two perennial waterways (i.e. Big Tujunga and the West Fork of the San Gabriel River) where this species may occur could result in either direct mortality or adverse effects from sediment or chemical leaks.

Sediment transport from upslope areas subject to grading and earth movement to water supporting southwestern pond turtles that could result in a degradation of water quality are not expected to result in direct or indirect effects to this species. Data from the hydrologic and sediment transport analysis (Please see Hydrology section of the Final EIS) conducted for this project indicate that even under the most extreme erosion caused by the project the downstream contribution of sediments to areas supporting this species would be negligible. This total is well within the natural variation that occurs within any given storm event and would not result in a large contribution of sediment or result in levels of turbidity above natural storm events. With the implementation of best management practices to control erosion the total sediment load would be further reduced by 30 to 50 percent.

To reduce potential threats to this species the ANF has identified a series of conservation practices should be considered when constructing projects on NFS lands. These are identified above (Section 8. Sensitive Species Analyzed) and measures to reduce the effects of water diversion and other activities on aquatic resources. As part of the proposed project SCE would implement a series of minimization measures that would reduce or avoid effects to these species. These would include the completion of pre-construction surveys for pond turtles and potential nesting areas; the avoidance of wet crossings by the construction of diversions during bridge construction and the bridging of small tributaries drainages that may support juvenile turtles; and the maintenance of adequate instream flows. In addition, SCE would implement measures to reduce off-site sediment transport during road and bridge construction and take action to reduce the potential for wildfires.

At the completion of construction road access along Cogswell access road (San Gabriel River) would be restricted and public vehicle use of the roadway would not occur. Vehicle access would remain on the San Gabriel River at Shortcut road which would remain open to permitted recreational vehicle use; however, the road crossing upgrade that would be constructed is expected to reduce potential effects to upstream movement by providing increased passage opportunities by removing current barriers. This would reduce long term effects to these species from both sediment transport and potential mortality from vehicles. By implementation of these measures, and mitigation measures B-1a, B-1b, B-3a, B-12, and B-24 effects to this species will be minimized.

*Indirect Effects:* Indirect effects to southwestern pond turtle could result from alteration of habitat as a result of non-native species that could degrade the quality of habitat. This could contribute to degradation of water quality over time due to increased siltation and sedimentation, and the spread of noxious weeds. However, these impacts are not anticipated due to the planned implementation of mitigation measures B-1a, B-1b, B-3a, B-12, and B-24.
Cumulative Effects: There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As Alternative 2 activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic maintenance would terminate upon completion of the transmission line. While the project would require permanent modification to streams or rivers that could support this species (i.e., Big Tujunga and the West Fork of the San Gabriel River) the project would not result in the creation of physical barriers or substantially modify potential breeding habitat. SCE would also implement components in the project description to avoid impacts to sensitive species through the implementation of project minimization and avoidance measures. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, the proposed project would not contribute cumulatively to projects occurring after the completion of the proposed action.

Determination: It is my determination that the proposed project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the southwestern pond turtle.

Implementation of a series of minimization measures (B-1a, B-1b, B-3a, B-12, and B-24) would reduce or avoid effects to this species. These would include the completion of pre-construction surveys for pond turtles and potential nesting areas; the avoidance of wet crossings by the construction of diversions during bridge construction and the bridging of small tributaries drainages that may support juvenile turtles; and the maintenance of adequate instream flows. In addition, SCE would implement measures to reduce off-site sediment transport during road and bridge construction and take action to reduce the potential for wildfires.


Analysis area for these species is 1 mile from the project boundary. This is based on a 1 mile distance for noise disturbance and rotor wash from use of a heavy helicopter.

Direct Effects: These species are known to occur in the project area, are widely distributed on National Forest System lands or potential habitat is present within the project area. As a result, direct effects to these species may include mortality or injury from mechanical crushing from equipment or foot traffic; loss of nesting, breeding or basking sites and the loss of habitat from the placement of permanent structures.

Construction of the project would likely result in direct mortality to some or all of these species from vehicle use on access roads; mechanical crushing during tower site preparation, grading of spur roads, and preparation of staging and stringing/pulling locations. Road upgrades and work in or adjacent to riparian
areas and stream crossings would also result in the potential for mortality to these species. Furthermore, Project implementation would likely result in small, but localized, loss of habitat for these species due to the placement tower structures and/or roads.

Species strongly associated with water would be subject to degradation of water quality through siltation caused by vehicles using wet ford stream crossings; removal of vegetation; and grading of tower pads, staging areas, helicopter pads, and pulling sites.

Some species may be difficult to detect unless one is actively searching for it because some are rarely seen on the surface, but are usually found under rocks, logs, or leaf litter and others are cryptic and rely on their cryptic nature to escape predation. Therefore these species would be vulnerable to crushing from vehicular and foot traffic.

Measures incorporated into the project would minimize risk of wildland fire, limit the type and amount of work in riparian areas, provide for the control of exotic weeds, and maintain downed logs and snags in the project area. In addition, restoration of damaged areas would occur subsequent to completion of construction. As the project includes new and improvement of existing roads in some loss of habitat would occur however the removal of downed logs and snags is not expected to occur.

**Indirect Effects:** Indirect effects include compaction of soils, temporary impacts to water quality, the spread of noxious or invasive species, changes to environmental factors that may affect prey items, or changes to topography and water flow within creeks and drainages. One indirect impact to some species would be the continued elimination of its food base by exotic ants. Argentine ants colonize around disturbed soils associated with building foundations, roads and landfills, and expand into adjacent areas, eliminating native ant colonies (Ward 1987). Changes in soil salinity, soil chemistry, and soil structure may also pose problems for California legless lizard populations (Jennings and Hays 1994). In addition road improvements may encourage the use of off-highway vehicles in areas occupied by these species (Freel pers. comm.). Increased poaching may occur from upgraded roads or spur road construction. Roads may also pose as barrier to migration and dispersal routes for some species or they may result in increased mortalities from road traffic.

**Cumulative Effects:** There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As the project activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic maintenance would terminate upon completion of the transmission line. Grading of access roads and in edge areas is likely an important factor in the decline of this species. SCE would also implement components in the project description to avoid impacts to sensitive species through the implementation of project minimization and avoidance measures. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, the project would not contribute cumulatively to projects occurring after the completion of the proposed action.
**Determination:** It is my determination project activities may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability for the California legless lizard, Coast horned lizard, two-striped garter snake, San Bernardino ringneck snake, San Bernardino Mountain kingsnake, and Rosy boa.

Mitigation measures such as B-1a, B1-b, B-3a, B-27 and AQ-1a incorporated into the project would minimize risk of wildland fire and the spread of invasive nonnative plants due to construction activities. During construction and subsequent emergency use of the roadway, all vehicles would stay on the established road. Limitations on the removal of riparian and upland vegetation and the restoration of disturbed habitats would minimize impacts to drainages, and restoration of damaged areas would occur subsequent to completion of construction. The completion of preconstruction surveys and monitoring may salvage or avoid effects to these species at specific tower locations. Cleaning vehicles prior to entering the ANF would also reduce the potential for the spread of Argentine ants.

**Arroyo Chub** (*Gila orcutti*), **Santa Ana Speckled Dace** (*Rhinichthys osculus ssp. 8*)

Analysis area for Arroyo chub and Santa Ana speckled dace is the project boundary.

**Direct Effects:** On Big Tujunga Creek these species are expected to occur downstream of the dam and would not be directly affected by activities conducted at the Big Tujunga Crossing upgrade. However, portions of Big Tujunga Creek are located downstream of potential tower locations where sediment could reach the creek if Best Management Practices were not employed. However, implementation of BMPs would reduce the potential amount of instream sedimentation to a negligible amount (see Hydrology section in the Final EIS). Populations of arroyo chub and Santa Ana speckled dace that occur in the West Fork of the San Gabriel River would not be directly affected by project construction activities as the tower sites are located upstream of the Cogswell Reservoir. However, access to the Project would occur along a paved section of road that parallels the West Fork of the San Gabriel River from Highway 39 to the dam at Cogswell Reservoir. This road is located immediately adjacent to the river for several miles and is consistently within the riparian canopy. Numerous small ephemeral and intermittent drainages are also present in the canyon and provide tributary flow into the river along this section of the San Gabriel River. In some areas these drainages cross the access road as Arizona crossings or small culverts.

Direct impacts to arroyo chub and Santa Ana speckled dace could include mortality due to crushing by heavy equipment and vehicles and water quality degradation caused by increased sedimentation, erosion, or accidental chemical spills. Runoff into aquatic habitats during rain events could introduce silt and spills of toxic chemicals. Silt can adhere to the eggs of fishes and interrupt gas exchange, while toxic chemicals may poison inhabitants of aquatic habitats, disrupt gill functions, or kill egg masses. In addition, accidental spills of chemicals into water supporting this species could result in a reduction in the amount of algae, detritus, and small invertebrates that are consumed by these species.

Vegetation removal, such as for tower construction or road widening, affects stream habitats in three ways: decreased vegetative cover, increased storm runoff, and increased sediment and debris. Decreased vegetative cover can result in an increase in water temperature and a decrease in the input of organic materials such as leaves, needles, etc. Removal of vegetation reduces available refugia for aquatic organisms. Storm runoff is dynamic and is affected by topography, precipitation characteristics, vegetation cover, and evapotranspiration. When vegetation is removed, surface runoff is accelerated, peak runoff events are accelerated, and low summer flows are decreased. The net effect is stronger peaks of floodwater and lower volumes of water in the summer. Loss of summer flow increases summer stream temperatures and decreases stream habitat area and pool depth.
After vegetation removal, such as land clearing, streams receive a large pulse of small to large organic debris, sediment from silt to boulders, and nutrients including ammonia and nitrogen. This may lead to a series of complex chemical reactions in the stream that result in a pulse of biochemical oxygen demand (BOD). The temperature of the stream can rise dramatically. Increases of several degrees have been recorded in association with wildfires. The combination of increased temperature, increased sediments, and lowered dissolved oxygen (from the BOD pulse) is often a direct cause of death to fish and aquatic insects.

The effects of potential sedimentation to the environment (depending on the extent) include: lowered water quality, increased turbidity, changes in water chemistry (increases in pH and algae), lowered habitat quality and habitat types, loss of spawning and rearing habitats, lowered productivity of macroinvertebrates, and increased water temperatures. Lowered productivity of macroinvertebrates can decrease the amount of available food for Arroyo chub and Santa Ana speckled dace. In addition, these changes may result in a direct kill of an individual sucker.

Sediment transport from upslope areas subject to grading and earth movement to water supporting arroyo chub and Santa Ana speckled dace that could result in a degradation of water quality are not expected to result in direct or indirect effects to these species. Data from the hydrologic and sediment transport analysis conducted for this project indicate that even under the most extreme erosion caused by the project the downstream contribution of sediments to areas supporting this species would be negligible. This contribution is well within the natural variation that occurs within any given storm event and would not result in a large contribution of sediment or result in levels of turbidity above natural storm events. With the implementation of best management practices to control erosion the total sediment load would be further reduced by 30 to 50 percent.

Construction related activities may introduce toxins and sediments into the aquatic system. Toxic chemicals subject to spillage and runoff include, but are not limited to, herbicides, engine fuels (e.g., gasoline and diesel); motor oil, hydraulic fluid; and various other oils, greases, and solvents.

The use of herbicides to control nonnative and invasive plant species could result in the poisoning of the Arroyo chub and Santa Ana speckled dace should herbicides be used near or upstream of water supporting this species, especially if herbicides that are not approved for use near water are utilized. For example, Triclopyr is one herbicide that could be used during the course of construction and maintenance and operations for the TRTP. This herbicide is known to cause decreased body size in fish at high concentrations, and lethargic behavior at low doses (USDA, 2009). Herbicides could enter water through direct overspray as well as through percolation, runoff, sediment transport, and wind erosion.

Herbicides applied in liquid formulations are sprayed on foliage of the target vegetation. In some cases soil may be a major receptor and contamination can occur by chemicals leaching through the soil to the groundwater and ultimately reaching the aquatic environment. This method of introduction usually poses the least amount of risk to the aquatic environment because chemicals typically disappear from the ground surface by either plant uptake of the chemical, volatilization, and natural decomposition of the active ingredients or adsorption of the herbicide by soil particles.

Leaks, spills, and improper storage and handling of containers are the source of most herbicide related groundwater contamination. These impacts can easily be mitigated with proper training of personnel and proper storage and disposal of chemicals. Risk from an accidental spill of herbicide into a water body on the Forest is considered low.

Another mode of herbicide entry to the aquatic system includes overland flow from precipitation events. Risk varies depending on soil composition and timing and intensity of precipitation events after application. Risk tends to be lower on well-vegetated forests and rangeland where soil infiltration is typically greater.
than precipitation. Overland flow occurs infrequently on most forest land because the infiltration capacity of the forest floor and soil is usually far greater than the rate of precipitation. Aquatic organisms are more at risk of negative impacts from herbicides in small perennial streams, or during late season when flow is reduced, due to their limited capability for dilution.

Upon the completion of construction, road access at the Big Tujunga Creek crossing and on the Cogswell access road (San Gabriel River) would be restricted and public vehicle use of the roadway would not occur. Vehicle access would remain on the San Gabriel River at Shortcut road which would remain open to permitted recreational vehicle use; however, the road crossing upgrade that would be constructed is expected to reduce potential effects to upstream movement by providing increased passage opportunities by removing current barriers. This would reduce long term effects to these species from both sediment transport and potential mortality from vehicles. By implementation of these measures effects to these species will be minimized.

**Indirect Effects:** Indirect impacts could occur from vegetation removal. The effects of vegetation removal during construction can have effects after construction is complete, even if restoration occurs, as it can be several years before restored vegetation is mature enough to provide the same ecosystem functions as pre-construction vegetation conditions. Vegetation provides physical functions that help control soil erosion during rains. Vegetation intercepts rainfall and reduces the impact energy of rain drops (Spittler 1995). Leaf litter mulches the ground surface, providing temporary water storage, slope roughness, and energy absorption. Structural support of loose material is provided. Roots of the vegetation reinforce the soil and increase the natural slope stability. Vegetation creates the conditions necessary for soil communities that provide soil structure (Spittler 1995). Sheet and rill erosion occur when runoff flows over a bare surface. As the volume and velocity of flow increases, the size and quantity of sediment that can be transported increases. The principal factors that contribute to debris torrent mobilization are: available sediment source; steep side slopes; bare soil; development of water repellent soils; and high volume (intensity/duration) rain storms (Spittler 1995).

The removal of vegetation from these construction areas could also result in erosion and downstream transport of sediment into habitat that occurs downhill from these areas. Indirect effects of downstream sediment transport could include post-construction degradation of suitable breeding and spawning habitat due to changes in water temperature and light regimes related to removal of riparian and aquatic vegetation, and decreased water quality due to ongoing sedimentation and erosion. Runoff could include erosional silt and spills of toxic chemicals that may be washed into aquatic habitats during rain events. Mud from vehicles working on off-road sections may be transported into the creek at road crossings and result in micro plumes of heavily silt laden waters that could smother egg masses or juvenile fish that occur along shallow edge areas of the creek.

**Cumulative Effects:** There are a variety of ongoing and historic Forest projects that have occurred or are occurring in the project region. Historic activities conducted in the region include major electrical utility corridors, road building, fire fighting, and routine improvements to existing facilities such as repairs to fences, pipelines, government facilities, and water storage reservoirs. Ongoing activities in the region would include operation and maintenance of the Big Tujunga Dam and reservoir, Cogswell Dam and reservoir, periodic maintenance of the Angeles National Highway and other roadways, fire remediation of recent forest fires, ongoing fuels management activities, storm-related road repairs, slope stabilization, and road maintenance to existing SCE transmission towers. Recreational activities including hiking, mountain biking, camping, hunting, off highway vehicle use, and routine agency access on forest roads may also result in potential impacts to these species in the general project region. As the project activities are short-term, effects on biological resources would most likely be temporary, and with the exception of periodic maintenance would terminate upon completion of the transmission line. While the project would require permanent modification to streams or rivers supporting these species (i.e., Big Tujunga and the
West Fork of the San Gabriel River) the project would not result in the creation of physical barriers to fish passage. SCE would also implement components in the project description to avoid impacts to sensitive species through the implementation of project minimization and avoidance measures. Since impacts associated with the proposed construction activities would be considered short-term and would not substantially affect environmental resources, the project would not contribute cumulatively to projects occurring after the completion of the proposed action.

**Determination:** It is my determination that the project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the arroyo chub and Santa Ana speckled dace.

A series of minimization measures will be implemented that would reduce or avoid negative effects to these species from the project. These would include mitigation measures (B-1a, B-1b, B-2, B-3a, B-8b, H-1a, H-1b, B-12) that require resoration of native vegetation, implement RCA treatment plan and a weed control plan, dry weather construction, biological monitoring and the completion of pre-construction surveys for sensitive fish; the avoidance of wet crossings by the construction of diversions during bridge construction and the bridging of small tributaries drainages that may support fish; maintain adequate instream flows to provide passage and prevent the construction of barriers that would impede fish passage. In addition, SCE would implement measures to reduce off-site sediment transport during road and bridge construction.
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