Appendix F.
Management Indicator Species Report

MANAGEMENT INDICATOR SPECIES REPORT

TEHACHAPI RENEWABLE TRANSMISSION PROJECT

ANGELES NATIONAL FOREST

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I. Introduction

The purpose of this report is to evaluate and disclose the impacts of the Tehachapi Renewable Transmission Project to the 12 Management Indicator Species (MIS) identified in the Angeles National Forest (ANF) Land and Resource Management Plan (LRMP) (USDA, 2005). This report documents the effects of three alternatives that occur within the ANF: No Action Alternative (Alternative 1); Proposed Action to replace 220-kV transmission line with 500-kV transmission line within 42.25 miles of ROW, utilizing aerial and ground-based construction within the ANF (Alternative 2); and the Maximum Helicopter Construction on the ANF Alternative utilizing the maximum amount of aerial construction within the ANF (Alternative 6). The entire project proposal is to construct and operate a 173-mile 500-kV transmission line between the Tehachapi Wind Resource Area and various substations located in the San Gabriel Valley.

MIS are animal or plant species identified in the ANF LRMP (USDA 2005, Volume 2, Appendix B, Pages 77-79), which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the ANF LRMP directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitats of each MIS affected by such projects, and (2) at the national forest (forest) scale, monitor populations and/or habitat trends of forest MIS, as identified by the LRMP.

I. 1 Direction Regarding the Analysis of Project-Level Effects on MIS

Project-level effects on MIS are analyzed and disclosed as part of the environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of habitat in the analysis area.

These project-level impacts to habitat are then related to national forest population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the terms in the LRMP.

Hence, where the ANF LRMP requires population monitoring or population surveys for an MIS, the project-level effects analysis for that MIS may be informed by available population monitoring data, which are gathered at the forest scale. For certain MIS, the ANF LRMP does not require population monitoring or surveys; for these MIS, project-level MIS effects analysis can be informed by forest-scale habitat monitoring and analysis alone. The ANF LRMP requirements for MIS analyzed for the Tehachapi Renewable Resource Project on National Forest Lands are summarized in Section 3 of this report.

Therefore, adequately analyzing Project effects to MIS, including those Threatened, Endangered, and Sensitive (TES) species that are also MIS, involves the following steps:

- Identifying which MIS have habitat that would be either directly or indirectly affected by the project alternatives, these MIS are potentially affected by the Project;
- Identifying the LRMP forest-level monitoring requirements for this sub-set of forest MIS;
- Analyzing project-level effects on MIS habitats or habitat components for this subset of forest MIS;
- Discussing forest scale habitat and/or population trends for this subset of forest MIS; and
- Relating project-level impacts on MIS habitat to habitat and/or population trends for these MIS at the forest.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (USDA, 2006). This Management

Indicator Species (MIS) Report documents application of the above steps to select and analyze MIS for the Tehachapi Renewable Transmission Project.

I.2 Direction Regarding Monitoring of MIS Population and Habitat Trends at the Forest Scale

Forest scale monitoring requirements for the ANF's MIS are found in the Monitoring Plan of the LRMP (USDA 2005, Volume 2, Appendix B, pages 76-81) and are shown in Table 1.

Habitat Status and Trend

The ANF LRMP (USDA 2005) requires forest scale monitoring of habitat status and trend for select MIS on the ANF; for MIS with habitat potentially affected by the TRTP on NFS lands, these habitat monitoring requirements are summarized in Table 1 of this report. Habitat status is the current amount of habitat for a given MIS on the ANF. Habitat trend is the direction of change in the amount of this habitat between the time the Forest LRMP was approved and the present. The methodology for assessing habitat status and trend is described in detail in the ANF MIS Report (USDA, 2009).

Habitats are the vegetation types (for example, mixed conifer forest) and/or ecosystem components (for example, cliffs or lakes) and any special habitat elements (for example, snags) required by a MIS for breeding, cover, and/or feeding. Required habitat is identified using habitat relationships data or models. For each terrestrial wildlife MIS on the ANF, the habitat relationship models are from the California Wildlife Habitat Relationship (CWHR) System (CDFG, 2005). The CWHR System is considered "a state-of-the-art information system for California's wildlife" and provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid). In the case of MIS that are also federally threatened or endangered or Forest Service sensitive species that have been studied in detail, additional habitat relationships information may be used to augment the CWHR system. Habitat relationships for fish and plant MIS are identified individually. Detailed information on the habitat relationship for MIS on the ANF and on the CWHR System can be found in the ANF MIS Report (USDA, 2009).

MIS habitat trend is monitored using ecological and vegetation data for the ANF. These data include spatial ecological and vegetation layers created from remote-sensing imagery obtained at various points in time, which are verified using photo-imagery, on-the-ground measurements, and tracking of vegetation-changing actions or events (for example, wildland fires).

Population Status and Trend

Population monitoring requirements for the MIS of the ANF are identified in the Monitoring Plan of the LRMP (USDA 2005, Volume 2, Appendix B, pages 76-81). This document requires monitoring of population status and trend for select MIS on the ANF. There are many types of population data, and LRMP identifies the type of population monitoring data required for each MIS. All population monitoring data are collected and/or compiled at the forest scale, consistent with the LRMP. The population monitoring requirements for the MIS with habitat potentially affected by the Tehachapi Renewable Transmission Project are summarized in Table 1 of this report.

Population status is the current condition of the MIS related to the type of population monitoring data (population measure) required in the LRMP for that MIS. Population trend is the direction of change in that population measure over time.

Population data for MIS are collected and consolidated by the ANF in cooperation with State and Federal agency partners (including the California Department of Fish and Game, U.S. Geological Survey, and USDI Fish and Wildlife Service) or conservation partners (including Partners in Flight and various avian joint ventures). Population data includes presence data, which is collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The ANF's MIS monitoring program for species

typically hunted, fished, or trapped was designed to be implemented in cooperation with California Department of Fish and Game (CDFG), consistent with direction in the 1982 Planning Rule to monitor forest-level MIS population trends in cooperation with state fish and wildlife agencies to the extent practicable (36 CFR 219.19(a)(6)). To be biologically meaningful for a wide-ranging MIS, presence data are collected and tracked not only at the forest scale, but also at larger scales, such as range wide, state, southern California province, or important species management units such as Deer Assessment Units. Population data at various scales are important to both assess and provide meaningful context for population status and trend at the Forest scale.

II. Selection of Project Level Management Indicator Species

Management Indicator Species (MIS) for the ANF are identified in the ANF LRMP (USDA 2005, Appendix 2, pages 77-78). The MIS analyzed for the TRTP were selected from this list of 12 MIS identified in the ANF LRMP, as indicated below in Table 1. In addition, Table 1 identifies the associated habitat types (1st column), the reason each MIS was identified in the LRMP (2rd column), the measure of analysis (3rd column), the monitoring method stated (4th column), and discloses whether or not the MIS is potentially affected by the TRTP (5th column).

Table 1. Management Indicator Species for the ANF and Selection of MIS for the Project-Level Analysis for the Tehachapi Renewable Transmission Project

Species and Associated Habitat Type	Issue	Measure	Monitoring Method	Category and Relevance to Project
Mule Deer (All habitat types)	Vegetation diversity and age class mosaics; roads and recreation effects	Trend in abundance and/or habitat condition	Herd composition in cooperation with CDFG; habitat condition	Category 3
Mountain Lion (All habitat types)	Landscape linkages; habitat fragmentation	Trend in distribution, movement, and/or habitat conditions	Studies in cooperation with CDFG, USGS	Category 3
Arroyo Toad (Aquatic and riparian habitats)	Ground disturbance including trampling and compaction; spread of invasive nonnative species; mortality from collision; altered stream flow regimes	Trends in abundance, distribution, and/or habitat conditions	Population abundance and/or habitat condition in selected locations	Category 3
Song Sparrow (Aquatic and riparian habitats)	Ground disturbance including trampling and compaction; spread of invasive nonnative species; mortality from collision; altered stream flow regimes	Trend in abundance and/or habitat condition	Riparian bird species point counts and/or habitat condition	Category 3
Blue Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Valley Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Englemann Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Coulter Pine (Chaparral and conifer ecotone)	Drought/beetle related mortality and lack of fire	Trend in age/size class distribution	FIA data/ aerial photo monitoring	Category 3

Table 1. Management Indicator Species for the ANF and Selection of MIS for the Project-Level Analysis for the Tehachapi Renewable Transmission Project

Species and Associated Habitat Type	Issue	Measure	Monitoring Method	Category and Relevance to Project
Bigcone Douglas Fir (Chaparral and conifer ecotone)	Altered fire regimes (fire severity and/or fire return interval)	Trend in extent of vegetation type	FIA data/ aerial photo monitoring	Category 3
California Spotted Owl (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Occupied territories and/or habitat condition	FS Region 5protocol	Category 3
Black Oak (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Trend in abundance, size class distribution	FIA data	Category 1
White Fir (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Trend in size class distribution	FIA data	Category 1

Category 1: MIS whose habitat is not in or adjacent to the Project area and would not be affected by the Project
Category 2: MIS whose habitat is in or adjacent to the Project area, but would not be either directly or indirectly affected by the Project
Category 3: MIS whose habitat would be either directly or indirectly affected by the Project

Blue oak, valley oak, Englemann oak, black oak, and white fir, identified as Category 1 above, will not be further discussed because habitat factors for these species are not in or adjacent to the project area; therefore, the project will not directly or indirectly affect the habitat for these species and will, therefore, have no impact on forest-level blue oak, valley oak, Englemann oak, black oak, and white fir habitat or population trends.

The MIS whose habitat would be either directly or indirectly affected by the TRTP, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for Project-Level MIS analysis for TRTP are: mule deer, mountain lion, song sparrow, arroyo toad, spotted owl, Coulter pine, and bigcone Douglas fir.

III. LRMP Monitoring Requirements for MIS Selected for Project-Level Analysis

III.1. MIS Monitoring Requirements

The ANF LRMP FEIS, Volume 2, Appendix B (USDA 2005, pgs 72-81) identifies forest scale habitat and population monitoring requirements for the ANF MIS. Habitat and population monitoring requirements for the ANF MIS are described in the ANF MIS Report (USDA 2009) and are summarized in Table 2 for the MIS being analyzed for the TRTP.

Table 2. Forest Scale Habitat and Population Monitoring for Project-Level Selected MIS

Species	Method of habitat and population monitoring
Mule Deer	Trends in mule deer populations are monitored in cooperation with the California Department of Fish and Game as part of their on-going surveys. Information gathered for Deer Assessment Unit (DAU)-7 and Deer Zone D-11 is used to determine trends in deer populations on the ANF.
Mountain Lion	Trends in mountain lion populations are monitored in cooperation with the California Department of Fish and Game. Information gathered by CDFG is used to determine trends in mountain lion populations on the ANF.
Song Sparrow	Summaries of Breeding Bird Survey (BBS) data are used to identify trends for southern California. Results of riparian bird count surveys are also used to identify trends at the Forest level.

Table 2. Forest Scale Habitat and Population Monitoring for Project-Level Selected MIS	
Species	Method of habitat and population monitoring
Arroyo Toad	Population abundance and/or habitat condition in selected locations.
California Spotted Owl	FS Region 5 protocol surveys are used to identify distribution, habitat occupancy, and reproductive success.
Coulter Pine	FIA and aerial photo monitoring
Bigcone Douglas Fir	FIA and GIS

III.2 How MIS Monitoring Requirements are Being Met

Mule Deer. Consistent with LRMP direction, mule deer population status and trend are tracked and monitored in cooperation with the CDFG, the agency responsible for deer herd management within the State of California. The ANF works closely with CDFG to periodically review deer population status on the forest. Population distribution monitoring for mule deer is conducted at a variety of scales: (1) statewide, hunting zone, and herd population monitoring is managed by CDFG using a variety of methods (CDFG 2004) (2) forest-level presence data are collected through tracking actual sightings of deer and through documenting signs of deer occupancy, including pellet groups (scat), tracks, antlers, tree rubs, and beds. The ANF MIS Report (USDA 2009) provides additional information about the methodology for collecting deer data and the results relative to monitoring population trends for mule deer.

Mountain Lion. Consistent with LRMP direction, mountain lion population status and trend are tracked and monitored in cooperation with the CDFG, the agency responsible for management of the mountain lion population in California. The ANF works closely with CDFG to periodically review mountain lion population status on the forest. Population distribution monitoring for mountain lion is conducted at a variety of scales: (1) statewide and county depredation permits monitoring is managed by CDFG using a variety of methods (2) forest-level presence data are collected through tracking actual sightings of mountain lion and through documenting signs of mountain lion occupancy, including scat, tracks, gut piles, and beds. The ANF MIS Report (USDA 2009) provides additional information about the methodology for collecting mountain lion data and the results relative to monitoring population trends for mountain lion.

Song Sparrow. Riparian bird count surveys were conducted on the ANF from 1988-1997. These surveys provided information regarding past trends and baseline information for song sparrow populations that can be used for comparison with future riparian bird count survey results. Riparian bird count surveys on the ANF and the three other southern California National Forests will continue to provide a means for identifying trends in song sparrow populations. The riparian bird count surveys, which span the four southern California National Forests, provide meaningful and scientifically sound data that fulfills the requirements for monitoring song sparrow population trends. Population monitoring for song sparrow is accomplished on a limited scale using (1) population monitoring conducted at many scales in cooperation with the U.S. Geological Survey (USGS), through the Breeding Bird Survey (BBS) Program, including data collected on the ANF, and (2) presence data collected across the forest. The USGS BBS Program provides excellent, standardized data to track status and trend (changes) in the distribution of diurnal avian species, such as the song sparrow, at biologically meaningful scales. The BBS data set, which spans more than 20 years, however, provides meaningful and scientifically sound, spatially explicit presence data that, in combination with presence data collected across the Forest fulfills the required population monitoring. The ANF MIS Report (USDA 2009) provides additional information about the methodology for collecting the BBS data and the results relative to monitoring population trends for the song sparrow.

Arroyo Toad. On the ANF, arroyo toad populations occur along Castaic Creek; along Big Tujunga Creek, including associated lower reaches of Mill, Lynx, and Alder Creeks; and on the desert side of the San Gabriel Mountains along Little Rock Creek. At this time, no estimates exist for the ANF populations. Telemetry

studies have been conducted on the population along Little Rock Creek. Yearly surveys are conducted at each of these three locations to attempt to detect any noticeable changes in toad activity. Specific project related surveys have been and will be conducted as part of this project in appropriate habitat. No additional populations of arroyo toads have been found.

California Spotted Owl. Project level and Forest wide FS R5 protocol surveys are used to monitor California spotted owls on the ANF. These surveys provide information regarding presence/absence and reproductive status. Surveys for spotted owls were initiated on the ANF in the 1990s. Previous survey efforts provide baseline information regarding historic occupancy. Future survey results can be used to identify trends for occupied territories. Specific project related surveys have been and will be conducted as part of this project in appropriate habitat. No additional known locations of spotted owls have been found.

Coulter Pine. Forest Inventory and Analysis (FIA) data provides a measure of the Coulter pine acreage on the ANF. FIA collects information on mortality, growth rates, stand density, and other factors which can be used to identify future stand conditions over the next 10 to 50 years.

Bigcone Douglas Fir. Forest Inventory and Analysis (FIA) data provides a measure of the bigcone Douglas fir acreage on the ANF. FIA collects information on mortality, growth rates, stand density and other factors which can be used to identify future stand conditions over the next 10 to 50 years. For photo-monitoring, the ANF has aerial photos dating back to the 1930s.

IV. Description of the Proposed Project

The Proposed Action and Action Alternatives of the TRTP are to implement an upgrade of a 220kV transmission line to a 500kV transmission line across the ANF (see Figure 1). The total distance of ROW containing transmission lines to be replaced is 42.25 miles. The proposed project (Alternative 2), the Maximum Helicopter Construction on the ANF Alterative (Alternative 6), and the No Action Alternative (Alternative 1) within the ANF, would be located within existing SCE rights-of-way (ROWs) (Figure 1). For analysis purposes, the project is defined as the existing SCE ROWs (between 200 and 500-feet wide) and a 1,000-foot buffer along the proposed transmission line (T/L) route centerlines (C/L), as well as proposed access roads that fall outside of that buffer. In order to construct the project, new towers, lines, and related infrastructure (i.e., access roads, pulling stations, marshalling yards, and helicopter sites) will need to be created. For a detailed project description see Section 2 of the EIS/EIR for the Tehachapi Renewable Transmission Project (Aspen, 2009).

For the purposes of this project analysis, the ground disturbance area that will be impacted by the implementation of this project includes the construction and maintenance activities. These include construction of approximately 164 new towers and removal of the 181 existing 220-kV towers, improvements to existing access roads, construction of spur roads, and work at conductor tensioning/splicing, staging/laydown areas, and helicopter landing pads. The Project is currently expected to require approximately 27 pulling/tensioning/ splicing stations, 33 helicopter landing pads, 3 staging areas, 16 helicopter support yards, and 8 helicopter staging areas, and 87 miles of road improvements and 4 miles of new spur roads on NFS lands (see Table 3).

Roads on ANF
- Paved Road - to be used
- Maintenance Road
- Reconstruction Road
- New Road
- Private Road
- Forest Service Road - not part of project

Proposed routes
- Segment 6
- Segment 11
- Substations
- Segment Milepost Marker

1" = 1.5 miles
1:95,040
0 1.5 3 Miles

Angeles National Forest
Vincent
Gould
Goodrich
Angeles Forest Highway
Aliso Canyon Road
Alder Creek
Monte Cristo Creek
Mill Creek
Lynx Gulch Road
Big Tujunga Creek
Cogswell Reservoir
West Fork San Gabriel River
Angeles Forest Highway
Upper Big Tujunga Road
Fall Creek
Big Tujunga Rose Nort
Tujunga Canyon Road
210
2

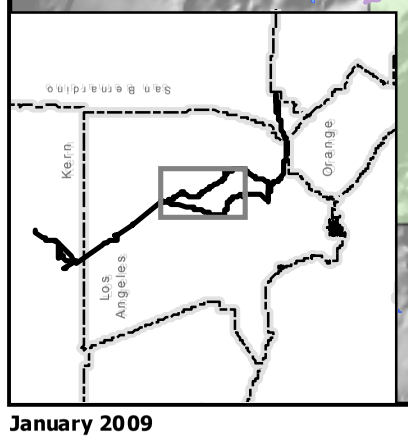


Figure 1

TRTP Alignment on Forest Lands

Aspen Environmental Group

Table 3. Summary of Implementation Activities and Overall Acreage Impacts on the ANF			
Activity	No Action; Alternative 1	Proposed Action; Alternative 2	Maximum Helicopter Construction on the ANF; Alternative 6
Towers Constructed by Helicopter	0	33	143
Tower Sites (Acres of disturbance)	0	164 (60.1)	164 (48.1)
Wire Stringing Areas - pulling/tensioning/splicing [1] (Acres of disturbance)	0	27 (25.4)	27 (25.4)
Roads, New Access/Spur - qty miles[2] (Acres of disturbance)	0	4.2 (8.1)	0.66 (1.3)
Roads, Reconstruction - qty miles [2] (Acres of disturbance)	0	23.0 (44.6)	12.8 (24.9)
Roads, Maintenance - qty miles [2] - Impacted area of roads only (Acres of disturbance)	78 miles. Acreage of upgrades needed unknown	63.8 (38.7)	35.1 (21.3)
Roads, Private - qty miles [2] - Impacted area of roads only (Acres of disturbance)	0	0.15 (0.09)	0.04 (0.03)
Staging Areas, Material and Equipment [3] (Acres of disturbance)	0	3 (20.0)	3 (20.0)
Helicopter Staging/Support Areas (Acres of disturbance)	0	8 (32.0)	10 (40.0)
Landing Pads [4] (Acres of disturbance)	0	33 (1.2)	143 (5.3)
Support Yards [5] (Acres of disturbance)	0	16 (3.7)	20 (4.6)
Misc. Acres of Disturbance [6] – Acres of disturbance	0	37.8	11.7
Total Estimated	Unknown	271.7	202.6
LAND DISTURBANCE RANGE (±15%)	-	230.9 – 312.5	172.2 – 233.0

1 Assume average wire stringing site area of 150'x300' per GIS data

2 Access roads and spur roads would be stabilized for drainage at the end of construction and left serviceable for the maintenance of the power line.

3 Assume material and equipment distributed along the ROW as the work progresses.

4 Assume typical landing pad (40'x40') for every tower constructed by helicopter.

5 Assume 2 small support yards for personnel drop-off/pick-up, emergency landing, etc. per large helicopter staging/support area.

6 Includes guard structures, radius from access road to spur road, etc.

V. Effects of the Proposed Project on Selected MIS

V.1 Mule Deer (*Odocoileus hemionus*)

V.1.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

The ANF LRMP (2005) identifies mule deer as an MIS associated with all habitat types. Habitat management is based upon standards and guidelines in the ANF LRMP (USDA 2005) and the deer herd management plans developed by California Department of Fish and Game and U.S. Forest Service (CDFG 1986 for the Los Angeles Deer Herd). According to the ANF LRMP (USDA, 2005), the objective for mule deer on the ANF is to have well distributed and stable or increasing populations.

Statewide goals for California deer herds are to restore and maintain healthy deer populations, and to provide for high quality diversified use of the deer resource (CDFG 1986). Habitat objectives described in these plans include maintain the quality of deer habitat throughout the herd unit. Management objectives for deer on the ANF are to maintain current estimated deer densities (10 deer/sq. mile), buck:doe ratios (15:100) and fawn recruitment rates (45:100) throughout the herd management unit (CDFG, 1986).

The deer in the Los Angeles herd are non-migratory with relatively small home ranges of less than one square mile (CDFG, 1986). Wilson and Ruff (1999) found home range size of mule deer is 1,236 acres for males and 618 acres for females.

Mule deer are widespread on the ANF and require landscapes with a diverse array of habitat types suitable for providing forage, protective cover, and refuge from predators. Hiding and thermal cover is typically close to the ground and thick enough to camouflage the outline of the deer, without being so dense as to obscure the approach of potential predators. Thermal cover is similar and generally thought to be denser, with the additional property of sheltering deer from the elements. Mule deer prefer habitats within 0.6 mile of a free water source (e.g., creek, pond, river), and habitat manipulations within 0.6 mile from summer water sources may affect the abundance of mule deer populations (Bowyer, 1986).

Mule deer prefer to browse new growth of shrubs, which provides a more easily digestible nutrient source, in addition to forbs and some grasses. Acorns (mast) are an important part of the fall and winter diet. Foraging habitat includes brush, shrubs, forbs, grasses, and trees where deer feed most actively at dawn and dusk.

Ranges of fawn and doe groups are small, varying from 0.4 to 1.9 miles depending upon water availability and topography. In addition to close proximity to water, fawning areas are characterized by low shrubs or small trees suitable for protection of the doe as she gives birth, and dense shrub thickets for sheltering the fawn. Fawning areas must be interspersed with forage, hiding cover, and thermal cover for the doe. Rutting season occurs in autumn, and 1-2 fawns (rarely 3) are born from early April to midsummer, varying geographically, with peak fawning from late April through mid-June.

V.1.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

Mule deer are used by the ANF as an indicator of healthy diverse habitats. Availability of suitable vegetation for fawning, forage and cover in close proximity to water is the most limiting factor for mule deer. The ANF LRMP (USDA, 2005) considers all habitat types as potentially suitable for mule deer. Therefore, the entire project area is considered suitable habitat for mule deer and potentially impacted by the proposed action.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area on NFS lands is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on mule deer includes the entire 10,707 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The project area represents 1.5 percent of the ANF.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to deer habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease both forage and cover habitat. An estimated total of 272 acres of mule deer habitat would be impacted by Alternative 2 within the ANF (Table 3), which constitutes approximately 2.5 percent of the analysis area and 0.04 percent of the total mule deer habitat on the ANF.

Cumulative Effects to Habitat

The spatial scale for the cumulative effects of the TRTP on deer habitat is the analysis area identified above. The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect deer habitat within the analysis area and for this time frame include: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. These activities will lead to an additional decrease of mule deer habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 272 acres of suitable deer habitat in the analysis area, equivalent to a 2.5 percent reduction in habitat across the analysis area. This is 0.04 percent of the current deer habitat in the ANF and is equivalent to 0.2 male deer home ranges or 0.4 female home ranges. Vegetation management activities would provide short-term benefits to habitat for deer and special use permitted activities would continue to be managed to retain sufficient deer habitat. Therefore, the cumulative effects under Alternative 2 would be small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction on the ANF (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV Towers with 164 500-kV Towers and the associated construction and maintenance areas will open up vegetation and decrease both forage and cover habitat. An estimated total of 203 acres of mule deer habitat would be impacted by Alternative 6 within the ANF (Table 3), which constitutes approximately 2 percent of the analysis area and 0.03 percent of the total mule deer habitat on the ANF.

Cumulative Effects to Habitat

The spatial scale for the cumulative effects of the TRTP on deer habitat is the analysis area identified above. The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect deer habitat within the analysis area and for this time frame include: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. These activities will lead to an additional decrease of mule deer habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 203 acres of suitable deer habitat in the analysis area , equivalent to a 2 percent reduction in habitat across the analysis area. This is 0.03 percent of the current deer habitat in the Los Angeles deer herd and is equivalent to 0.16 male deer home ranges and 0.34 female deer home ranges. Vegetation management activities would provide short-term benefits to habitat for deer and special use permitted activities would continue to be managed to retain sufficient deer habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

The ANF LRMP (USDA, 2005) identifies both habitat and population monitoring for mule deer. The sections below summarize the habitat and population status and trend data for mule deer. The information in the sections below is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*
  The population monitoring data collected by the ANF and our federal and state partners at the range-wide, State, bioregional, and Forest scales indicate that the distribution population trend on deer on the ANF is stable. These data are summarized below.

  Mule deer are "G5-Secure, N5-Secure, and S5-Secure" ("demonstratably widespread, abundant, and secure") at the global and national scales, as well as in California (NatureServe 2008). Management and monitoring of deer on the ANF is accomplished in cooperation with the State fish and wildlife agency, the California Department of Fish and Game (CDFG), as directed in 26 CFR 219.19(a)(6). As part of the California Deer Management Program, CDFG tracks the status and trend of deer populations, including on the ANF. Deer numbers are monitored by Hunt Zones and Deer Assessment Unites (DAUs), (CDFG 1998, CDFG 2004). These population data indicate that deer populations in Zone D-11 are considered stable to slightly declining since the 1960s and 1970s

(http://www.dfg.ca.gov/wildlife/hunting/deer/docs/cazonemaps/d11zoneinfo2008.pdf). However, the increase in deer in the 1960s and 1970s was during the period of a statewide predator control program (CDFG 1986). Hunting of deer has continued throughout this period; the number of deer tags allowed in the hunt zones is as follows for 2008: D-11 has 5,500 tags, J-13 has 40 tags, A-31 has 1000 tags, and A-32 has 250 tags. The number of tags allotted in 2008 is equivalent to the number of tags in 2007. From 1990-1996, CDFG determined that the population trend in DAU 10, which includes the ANF, is 16,000-24,000 deer and is considered stable (CDFG, 1998; - http://www.dfg.ca.gov/wildlife/hunting/deer/docs/habitatassessment/part4.pdf).

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Forest-wide deer population distribution is stable. The Action Alternatives (Alternative 2 and 6) of the TRTP would result in a slight decrease in forest-wide habitat (0.04 percent of forest-wide habitat for Alternative 2 and 0.03 percent of forest-wide habitat for Alternative 6) for deer. This decrease is equivalent to less than one deer home range; therefore, the slight decrease in habitat may lead to a slight decrease in population numbers especially if the population is at carrying capacity. Based on the small amount of the decrease, the project-level habitat impacts will not decrease the existing stable forest-wide population distribution trend.

Mule deer are known to inhabit the entire forest, consisting of a total of 701,122 acres.

V.2 Mountain Lion (*Puma concolor*)

V.2.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Mountain lion are associated with all habitat types and are affected by changes in landscape linkages and habitat fragmentation. According to the ANF LRMP (USDA, 2005), the objective for mountain lion on the ANF is to have well distributed populations and functional landscape linkages. Due to California State law, mountain lion are only managed by CDFG if a nuisance animal or public threat occurs.

A concern for the long-term health of mountain lion populations on the National Forests of southern California is the loss of landscape connectivity between mountain ranges and large blocks of open space on private land (Dickson et al., 2005). Mountain lions have large home ranges and require extensive areas of riparian vegetation and brushy stages of various habitats, with interspersions of irregular terrain, rocky outcrops, and tree/brush edges. Fragmentation of habitats by the spread of human developments and associated roads, power transmission corridors, and other support facilities, restricts movement and increases associations with humans. These changes are detrimental to mountain lion populations (CDFG, 2005).

Mountain lions are widespread on the forest and are assumed to be present in all habitat types. Deer represent approximately 60 to 80 percent of mountain lion diet, thus mountain lions can be found wherever deer are present (CDFG, 2005).

The mountain lion is the largest carnivore in southern California and requires large core habitat areas, abundant prey, and habitat connectivity between sub-populations. Mountain lion studies over the last 30 years have estimated population densities for different habitat types around the state. These density estimates varied from zero to 10 lions per 100 square miles (CDFG, 2006b).

V.2.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

Availability of adequate prey base and habitat connectivity between subpopulations has been identified as the limiting factors for mountain lion populations. The Forest LRMP (USDA, 2005) considers all habitat types as potentially suitable for the mountain lion. Therefore, the entire Project area is considered suitable habitat and potentially impacted by the proposed action.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on mountain lion includes the entire 10,707 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The project area represents 1.5 percent of the ANF.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to mountain lion habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease cover habitat and forage habitat for the mountain lion's main prey, mule deer. An estimated total of 272 acres of mountain lion habitat would be impacted by Alternative 2 within the ANF (Table 3). This is approximately 2.5 percent of the analysis area and 0.04 percent of the total amount of mountain lion habitat in the ANF. The average home range size of mountain lion is 69,189 and 34,595 acres for males and females, respectively (Wilson and Ruff, 1999).

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on mountain lion habitat is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect mountain lion habitat within the analysis area and for this time frame is: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of

mountain lion habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 272 acres of suitable mountain lion habitat in the analysis area. This is equivalent to 0.004 male mountain lion home ranges and 0.008 female mountain lion home ranges. Vegetation management activities would provide short-term benefits to habitat for mountain lions and special use permitted activities would continue to be managed to retain sufficient mountain lion habitat. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction in the ANF (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease cover habitat and forage habitat for the mountain lion's main prey, mule deer. An estimated total of 203 acres of mountain lion habitat would be impacted by Alternative 6 within the ANF (Table 3). This is approximately 2 percent of the analysis area and 0.03 percent of the total mountain lion habitat on the ANF. The average home range size of mountain lion is 69,189 and 34,595 acres for males and females, respectively (Wilson and Ruff, 1999).

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on mountain lion habitat is the analysis area identified above (10,707). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect mountain lion habitat within the analysis area and for this time frame is: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of mountain lion habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of no more than 203 acres (62 acres permanent) of suitable mountain lion habitat in the analysis area. This is equivalent to 0.003 male and 0.006 female mountain lion home ranges. Vegetation management activities would provide short-term benefits to habitat for mountain lions and special use permitted activities would continue to be managed to retain sufficient mountain lion habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the ANF LRMP (USDA, 2005) identifies studies in cooperation with CDFG and USGS. Trends would be measured in distribution movement and/or habitat conditions. The sections below summarize the habitat and population status and trend data for the mountain lion. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.
- *Population Status and Trend at the Forest Scale*
  The population monitoring data collected by the ANF and our federal and state partners at the range-wide, State, bioregional, and Forest scales indicate that the distribution population trend on mountain lion on the ANF is stable. These data are summarized below.

  Mountain lions are "G5-Secure, N5-Secure, and S5-Secure" ("demonstratably widespread, abundant, and secure") at the global and national scales, as well as in California (NatureServe 2008).

  CDFG is responsible for management of mountain lion populations. Based on records of depredation, attacks on people, and predation on prey populations, it is suspected that the statewide population peaked in 1996, and has been somewhat stable for the past several years (CDFG, 2006b). A total of 31 depredation permits were issued and 10 kills reported for mountain lions in Los Angeles County between 1990 and 2007 (CDFG, 2008). Between 2005 and 2007, there were only 2 depredation permits issued and no kills were reported. Between 2000 and 2005, there were only 7 depredation permits issued for mountain lions within Los Angeles County, in which 4 were killed. From 1990 to 1999, 6 mountain lions were depredated under the 57 depredation permits issued. When hunting for mountain lion was legal in California, 3 depredation permits were issued from 1980 to 1989 and zero mountain lions were taken. No depredation permits were issued from 1972 to 1979.

  CDFG has described the mountain lion population in California as stable and current estimates place this number at up to 6,000 individuals (CDFG, 2007). Further estimates are zero to 10 mountain lions per 100 square miles based on available habitat within the state (CDFG, 2006b). The ANF has some large areas of unfragmented habitat ideal for supporting mountain lion populations. Thus, mountain lion populations within the San Gabriel Mountains are considered stable. Detailed information on these population data is presented in the ANF MIS Report (USDA, 2009).

Mountain lion sign (i.e., tracks, scat, and a recent deer kill) was noted in many portions of the project area. Numerous tracks of multiple age-class cats were identified on many of the project access roads and were associated with many of the small drainages that flow down the steep mountainous terrain that occurs along the ROW. Mountain lion were detected south of Mount Gleason, near Grizzly Flat Road, adjacent to Big Tujunga Creek, and near Mount Wilson.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Forest-wide mountain lion population distribution is stable. The Action Alternatives (Alternative 2 and 6) of the TRTP would result in a slight decrease in forest-wide habitat (0.04 percent of forest-wide habitat for Alternative 2 and 0.03 percent of forest-wide habitat for Alternative 6) for mountain lion. This decrease is equivalent to less than one mountain lion home range; therefore, the slight decrease in habitat is not expected to lead to a decrease in population numbers. Based on the small amount of the decrease, the project-level habitat impacts will not decrease the existing stable forest-wide population distribution trend.

Mountain lions are known to inhabit the entire forest, consisting of a total of 701,122 acres.

V.3 Song Sparrow (*Melospiza melodia*)

V.3.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Song sparrows are associated with aquatic and riparian habitats and are affected by ground disturbance including altered stream flow regimes. According to the Forest LRMP (2005), the objective for song sparrow on the ANF is to have stable or increasing populations and healthy riparian habitat.

The song sparrow is a permanent resident of coastal scrub and riparian brush over much of the lower elevation areas of the San Gabriel Mountains. Over 90 percent of song sparrow nests are found in riparian vegetation (Big Sur Ornithology Lab, 2000). Song sparrow distribution is defined by the presence of water through the breeding season, becoming less abundant or scarce where undergrowth is reduced along ephemeral streams (Roberson and Tenney, 1993). Marshall (1948) concluded that song sparrows main requirements are a source of water (which in the case of coastal or dune scrub may mean constant moisture from fog, dew, or seepage), moderately dense vegetation, plenty of light, and exposed ground or leaf litter for foraging. The importance of small red alder trees for song sparrows (significant positive correlation between nest success and number of trees within 11.3 m of the nest) within the Golden Gate NRA suggests the importance of early successional, non-willow riparian habitat for this species (Gardali and others, 1998). In San Diego County, they have been documented nesting in gardens, nurseries, and weedy areas, and may occupy territories as small as 0.05 acres (Unitt, 2005). Within forests, home range size varies between 0.2 and 0.6 acre, but averages 0.3 acre (Zeiner et al., 1990).

V.3.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

The primary threat to song sparrows and other riparian birds is the destruction of riparian habitat and loss of water (USDA, 2005). Acres of suitable habitat are used to assess the effects of the proposed action and alternatives on song sparrow habitat.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on song sparrow includes only the riparian habitat of 154 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

Approximately 154 acres of the 10,707-acre analysis area (1.4 percent) are suitable habitat for song sparrow.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to song sparrow habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 0.67 acres of suitable song sparrow habitat would be impacted by Alternative 2 within the ANF, which constitutes 0.4 percent of suitable song sparrow habitat in the analysis area and 0.015 percent of total song sparrow habitat on the ANF. The average home range for song sparrow is 0.3 acre, but can vary between 0.2 and 0.6 acre (Zeiner et al., 1990).

Table 4. Alternative 2 Impacts to Song Sparrow Habitat

CalVeg Type		Amount Impacted by Alt. 2	Amount Available on Forest	Percent (%) Impacted
NR	Riparian Mixed Hardwood Alliance	0.03	2514	0.001
QB	California Bay Alliance	0.05	628	0.008
QE	White Alder Alliance	0.59	1000	0.059
QO	Willow Alliance	0	193	0
QP	California Sycamore Alliance	0	105	0
QX	Black Cottonwood Alliance	0	109	0
	TOTAL	0.67	4549	0.015
	Percent of Total Forest	9.5×10^{-5}	0.649	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on song sparrow habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect song sparrow habitat within the analysis area and for this time frame include: invasive species encroachment, water withdrawal, and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of song sparrow habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion:

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 0.67 acres of suitable song sparrow habitat in the analysis area, equivalent to a 0.4 percent reduction in habitat across the analysis area. This is 0.015 percent of the current song sparrow habitat on the ANF and is equivalent to approximately 2.2 song sparrow home ranges. Invasive species encroachment is a continuing threat to the species. Water withdrawals and increased recreation use within the riparian areas where song sparrows breed and forage would continue to be managed to retain sufficient song sparrow habitat. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction on the ANF Alternative (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 0.07 acres of suitable song sparrow habitat would be impacted by Alternative 6 within the ANF, which constitutes 0.05 percent of suitable song sparrow habitat in the analysis area and 0.002 percent of total song sparrow habitat on the ANF. The average home range for song sparrow is 0.3 acre, but can vary between 0.2 and 0.6 acre (Zeiner et al., 1990).

Table 5. Alternative 6 Impacts to Song Sparrow Habitat

CalVeg Type		Amount Impacted by Alt. 6	Amount Available on Forest	Percent (%) Impacted
NR	Riparian Mixed Hardwood Alliance	0	2514	0
QB	California Bay Alliance	0	628	0
QE	White Alder Alliance	0.07	1000	0.007
QO	Willow Alliance	0	193	0
QP	California Sycamore Alliance	0	105	0
QX	Black Cottonwood Alliance	0	109	0
	TOTAL	0.07	4549	0.002
	Percent of Total Forest	9.98×10^{-8}	0.6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on song sparrow habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect song sparrow habitat within the analysis area and for this time frame are: water withdrawal and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of suitable song sparrow nesting habitat in the analysis area, although the acreage of disturbance related to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 0.07 acres of suitable song sparrow habitat in the analysis area, equivalent to 0.05 percent reduction in habitat across the analysis area. This is 0.002 percent of the current song sparrow habitat and is equivalent to 0.2 song sparrow home ranges. Invasive species encroachment is a continuing threat to song sparrows. Water withdrawals and increased recreation use within the riparian areas where song sparrows breed and forage would continue to be managed to retain sufficient song sparrow habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

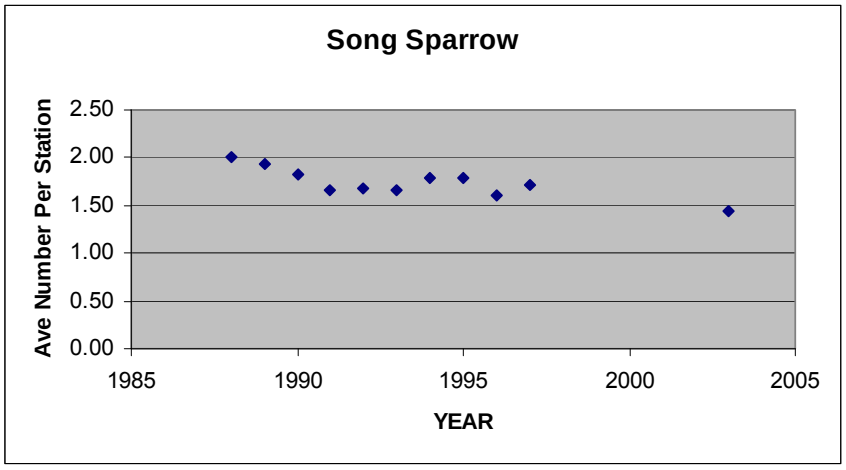
Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the ANF LRMP (USDA, 2005) identifies riparian bird species point counts and/or habitat conditions as acceptable methodologies. Trends would be measured according to abundance and/or habitat condition. The sections below summarize the habitat and population status and trend data for the song sparrow. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.
- *Population Status and Trend at the Forest Scale*
  Song sparrows are well represented on all four southern California National Forests; they were recorded at 197 out of 206 stations during the 1988-1997 and 2003 riparian bird count surveys. In any one year, song sparrows were detected at 46 percent of the survey stations. This species is one of a few that were numerous enough to estimate trends with good confidence.

  Negative trends in song sparrow abundance were determined from this monitoring. This negative trend was consistent with California BBS trends as well as trends for other species in the riparian bird count studies for southern California forests. Breeding Bird Survey (BBS) data indicate an average of 0.15 percent per year decline in song sparrow abundance in the state of California (1966 to 2005), although this trend was not significant (Saurer et al., 2006). Data from the national forest point count study in Southern California indicates that song sparrow abundance significantly declined by approximately 0.5 percent per year (during 1988 to 1996; Stephenson and Calcarone, 1999). The BBS data also indicates a decline of 0.8 percent per year in Southern California, although this trend was not statistically significant (Sauer et al., 2006). The following graph illustrates song sparrow detections on the ANF during the riparian bird count surveys conducted from 1988-1997. Detailed information on this population data is presented in the ANF MIS Report (USDA, 2009).

Song Sparrow Results for Angeles National Forest



Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The Action Alternatives (Alternative 2 and 6) of the TRTP would result in a slight decrease in forest-wide habitat (0.015 percent of forest-wide habitat for Alternative 2 and 0.002 percent of forest-wide habitat for Alternative 6) for song sparrow. This decrease is equivalent to 2.2 and 0.2 song sparrow home ranges, respectively; therefore, the slight decrease in habitat would not likely lead to a decrease in population numbers. Based on the small decrease in habitat, the project-level habitat impacts will not modify the existing declining forest-wide population distribution trend.

V.4 Arroyo Toad (*Bufo californicus*)

V.4.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Arroyo toad are associated with aquatic habitats for breeding and are affected by altered stream flow regimes, predatory nonnative species (e.g., bullfrogs, bluegill, largemouth bass, crayfish), reductions in native ant populations by Argentine ants, habitat alteration from tamarisk and arundo, increased siltation, and trampling by humans, vehicles, and livestock.

Arroyo toads are a low elevation species with occurrence below 4,400 feet (Stephenson and Calcarone, 1999). This species requires overflow pools adjacent to the inflow channel of streams that are generally third order or greater during the breeding season. Preferred breeding habitat consists of shallow pools with sandy to gravelly bottoms, surrounded by sparse woody vegetation. Regular disturbance in the form of flooding is required to maintain areas of sparsely vegetated, sandy stream channels and terraces, which are used by adults and subadults for foraging and burrowing (USFWS, 2005). Arroyo toads have been found in upland habitat up to 3,600 feet from the nearest suitable aquatic habitat (Holland and Sisk, 2001). Upland habitats used by arroyo toads include coastal sage scrub, chaparral, oak woodland, grassland, riparian, and agricultural habitats (Griffin, 1999; USFWS, 2005).

V.4.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

Acres of suitable aquatic and riparian habitats is used to assess the effects of the proposed action and alternatives on arroyo toad habitat.

Analysis Area for Project-level Effects Analysis

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on arroyo toad includes the entire 10,707 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area

Approximately 507 acres of the 10,707-acre analysis area (4.7 percent) are suitable habitat for arroyo toad.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat . Since there are no direct or indirect effects, there would be no cumulative effects to arroyo toad habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will compact soils and result in the loss of breeding, forage, and cover habitat. An estimated total of 7 acres of suitable arroyo toad habitat would be impacted by Alternative 2 within the ANF, which constitutes 1.4 percent of suitable arroyo toad habitat in the analysis area and 0.02 percent of total arroyo toad habitat on the ANF. The average home range for arroyo toads can vary considerably depending on geographic location, resources, microhabitat conditions, and sex of the individual. For example, Sweet (1993) found that on the Los Padres NF, males tend to travel about 2–3 km along the stream edge but often become more sedentary as they reach large size. Adult female toads are highly sedentary, with an activity area usually 100 m in diameter. Therefore average home range size for this species would need to be determined based on ANF populations and cross-analyzed with demographic data to present a reasonable estimate.

There are a total of 3 populations of arroyo toad on the ANF. Alternative 2 would impact one population (See Table 6).

Table 6. Alternative 2 Impacts to Arroyo Toad Habitat

Arroyo Toad Habitat Model on Forest	Amount/Number Impacted by Alternative 2	Amount/Number Available on Forest	Percent (%) Impacted
Arroyo Toad Habitat	7 acres (0.001% of total Forest)	29,464 acres (4% of total Forest)	0.02
# of known populations (include current and historic)	1	3	33

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on arroyo toad habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect arroyo toad habitat within the analysis area and for this time frame include impacts such as: invasive species encroachment, water withdrawal, and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of arroyo toad habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion:

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 7 acres of suitable arroyo toad habitat in the analysis area, equivalent to 1.4 percent reduction in habitat across the analysis area. This is 0.02 percent of the current arroyo toad habitat on the ANF. Invasive species encroachment has not been studied for this species on the ANF. Water withdrawals and increased recreation use within the riparian areas

where arroyo toads breed and forage would continue to be managed to retain sufficient arroyo toad habitat. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction on the ANF Alternative (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will compact soils and result in the loss of breeding, forage, and cover habitat. An estimated total of 17 acres of suitable arroyo toad habitat would be impacted by Alternative 6 within the ANF, which constitutes 3.4 percent of suitable arroyo toad habitat in the analysis area and 0.06 percent of total arroyo toad habitat on the ANF. The average home range for arroyo toads can vary considerably depending on geographic location, resources, microhabitat conditions, and sex of the individual. For example, Sweet (1993) found that on the Los Padres NF, males tend to travel about 2–3 km along the stream edge but often become more sedentary as they reach large size. Adult female toads are highly sedentary, with an activity area usually 100 m in diameter. Therefore average home range size for this species would need to be determined based on ANF populations and cross-analyzed with demographic data to present a reasonable estimate.

There are a total of 3 populations of arroyo toad on the ANF. Alternative 2 would impact one population (see Table 7).

Table 7. Alternative 6 Impacts to Arroyo Toad Habitat

Arroyo Toad Habitat Model on Forest	Amount/Number Impacted by Alternative 6	Amount/Number Available on Forest	Percent (%) Impacted
Arroyo Toad Habitat	17 acres (0.002% of total Forest)	29,464 acres (4% of total Forest)	0.06
Number of known populations	1	3	33

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on arroyo toad habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect arroyo toad habitat within the analysis area and for this time frame include impacts such as: invasive species encroachment, water withdrawal, and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of arroyo toad habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion:

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of a minimum of 17 acres of suitable arroyo toad habitat in the analysis area, equivalent to a 3.4 percent reduction in habitat across the analysis area. This is 0.06 percent of the current arroyo toad habitat on the ANF. Invasive species encroachment has not been studied for this species on the ANF. Water withdrawals and increased recreation use within the riparian areas

where arroyo toads breed and forage would continue to be managed to retain sufficient arroyo toad habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest and Regional Scale

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*

  Approximately six percent of known occupied arroyo toad habitat occurs within the ANF, including Castaic Creek, Big Tujunga Creek, Arroyo Seco Creek, Little Rock Creek, and the lower reaches of Mill and Alder Creeks (Stephenson and Calcarone, 1999). No complete data set exists, nor is there an estimate of size of any of these populations. Detailed information on these populations' data is presented in the ANF MIS Report (USDA 2009).

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The effects of the Action Alternatives (Alternatives 2 and 6) of the TRTP will result in a small decrease in forest-wide habitat for arroyo toad (0.02 percent of the forest-wide habitat in Alternative 2 and 0.06 percent of the forest-wide habitat in Alternative 6). The spatial arrangement of the habitat loss is such that no one home range would be expected to be made unsuitable. Therefore, the TRTP will not alter or contribute to the existing forest-wide habitat or population trend.

V.5 California Spotted Owl (*Strix occidentalis occidentalis*)

V.5.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

California spotted owls are associated with mixed conifer forests and are affected by altered fire regimes (fire severity and/or fire return interval). According to the Forest LRMP (2005), the objective for the California spotted owl on the ANF is maintain/increase numbers and distribution.

Spotted owls are found in mature forests, typically where there is a dense, multi-layered canopy and are frequently linked to riparian areas. They use a wide range of wooded and forested habitats and nest stands often have a well-developed hardwood understory. However, some high-elevation territories (above 6,500 feet) consist primarily or solely of conifers and some low-elevation territories (below 3,000 feet) are found in pure hardwood stands. At lower elevations, they occur in coast live oak, alder, and sycamore woodlands along riparian areas. At higher elevations, they occur in mixed conifer/hardwood forests, and are often associated with big cone Douglas fir and black oak.

Territory sizes vary widely depending on habitat type. Territories are typically largest in the high-elevation, conifer dominated sites. California spotted owls are a territorial species with large acreage requirements (at least 300 acres of mature forest per pair), spotted owls in southern California are clustered in disjunct mountain and foothill areas where suitable habitat exists. These clusters are often surrounded by large areas of unsuitable habitat (Stephenson and Calcarone, 1999).

California spotted owls are permanent residents. Nests may be 20-50 feet or more above the ground. Spotted owls rely on natural cavities or on nests built by other birds or squirrels. Breeding begins in February or March. Nestlings are seen by April or May, with fledging in June or July. Clutch size ranges from 1-4, usually 2 (Zeiner et al., 1990).

Roosting areas are generally in dense shade, near water (Zeiner et al., 1990). Any tree species may be used as a roost. Spotted owls typically roost on a horizontal branch throughout much of the day. They often roost in pairs, or an adult owl may roost near its young.

The California spotted owl breeds and roosts in forests and woodlands with mature trees and snags, dense canopies (≥70 percent canopy closure), multiple canopy layers, and downed woody debris (Verner et al., 1992a).

V.5.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

The greatest threat to this species on NFS lands is the loss of habitat and subsequent population loss due to large stand-replacement wildfires. Acres of suitable habitat are used to assess the effects of the proposed action and alternatives on California spotted owl habitat.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed Project on California spotted owl includes only the 1,849 acres of suitable habitat associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

Approximately 1,849 acres of the 10,707-acre analysis area (17 percent) are suitable habitat for California spotted owl.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to spotted owl habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 43.1 acres of California spotted owl habitat would be impacted by Alternative 2 within the ANF, which constitutes 2.3 percent of spotted owl habitat in the analysis area and 0.03 percent of total California spotted owl habitat on the ANF (Tables 8 and 9).

Table 8. Alternative 2 Impacts to California Spotted Owls			
Description	Number Impacted by Alternative 2	Total Known Available on Forest	Percent (%) Impacted
Number of Spotted Owls (current and historic)	5	60	8.3
PACs	14	9555	0.15

Table 9. Alternative 2 Impacts to California Spotted Owl Habitat				
CalVeg Type		Amount Impacted by Alternative 2	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	6.9	41370	0.02
EP	Eastside Pine Alliance	0	9817	0
MF	Mixed Conifer-Fir Alliance	0	20266	0
MP	Mixed Conifer – Pine Alliance	0	12761	0
PP	Ponderosa Pine Alliance	0	620	0
PD	Gray Pine Alliance	0	286	0
PC	Coulter Pine Alliance	7.7	4464	0.17
NX	Interior Mixed Hardwood Alliance	1.5	773	0.19
QC	Canyon Live Oak Alliance	26.3	49049	0.05
QE	White Alder Alliance	0.6	1000	0.06
QK	Black Oak Alliance	0	1166	0
QF	Fremont Cottonwood Alliance	0.06	456	0.01
QW	Interior Live Oak Alliance	0	72	0
QL	Valley Oak Alliance	0	116	0
QX	Black Cottonwood Alliance	0	109	0
QB	California Bay Alliance	0.05	628	0.008
	TOTAL	43.1	142,953	0.03
	Percent of Total Forest	0.006	20	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on California spotted owl habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect California spotted owl habitat within the analysis area and for this time frame include the following impacts: fuels reduction and disease/drought damage to trees.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of California spotted owl habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 43.1 acres of suitable California spotted owl nesting, roosting, and foraging habitat in the analysis area, equivalent to 2.3 percent reduction in habitat across the analysis area. This is 0.03 percent of the current California spotted owl habitat on the ANF. Vegetation management activities would provide short-term benefits to nesting, roosting, and

foraging habitat for California spotted owls. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Wildfire and past and planned vegetation treatments on the ANF have affected and will continue to affect California spotted owls. However, planned projects will include protective measures consistent with the Southern California National Forests California Spotted Owl Conservation Strategy (USDA 2004), thus effectively reducing the degree and duration of potential impacts to spotted owls within these areas.

Maximum Helicopter Construction on the ANF Alternative (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 35.7 acres of California spotted owl habitat would be impacted by Alternative 6 within the ANF, which constitutes 1.9 percent of California spotted owl habitat in the analysis area and 0.02 percent of total California spotted owl habitat on the ANF (Tables 10 and 11).

Table 10. Alternative 6 Impacts to California Spotted Owls

Description	Number Impacted by Alternative 6	Total Known Available on Forest	Percent (%) Impacted
Spotted Owls (current and historic)	5	60	8.3
PACs	14	9555	0.15

Table 11. Alternative 6 Impacts to California Spotted Owl Habitat

CalVeg Type		Amount Impacted by Alternative 6	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	5.2	41370	0.01
EP	Eastside Pine Alliance	0	9817	0
MF	Mixed Conifer-Fir Alliance	0	20266	0
MP	Mixed Conifer – Pine Alliance	0	12761	0
PP	Ponderosa Pine Alliance	0.6	620	0.10
PD	Gray Pine Alliance	0	286	0
PC	Coulter Pine Alliance	10.1	4464	0.23
NX	Interior Mixed Hardwood Alliance	0.7	773	0.09
QC	Canyon Live Oak Alliance	19.1	49049	0.04
QE	White Alder Alliance	0.1	1000	0.01
QK	Black Oak Alliance	0	1166	0
QF	Fremont Cottonwood Alliance	0	456	0
QW	Interior Live Oak Alliance	0	72	0
QL	Valley Oak Alliance	0	116	0
QX	Black Cottonwood Alliance	0	109	0
QB	California Bay Alliance	0	628	0
	TOTAL	35.7	142,953	0.02
	Percent of Total Forest	0.005	20	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on California spotted owl habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which

there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect California spotted owl habitat within the analysis area and for this time frame include the following impacts: fuels reduction and disease/drought damage to trees.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of California spotted owl habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 35.7 acres of suitable California spotted owl nesting, roosting, and foraging habitat in the analysis area, equivalent to a 1.9 percent reduction in habitat across the analysis area. This is 0.02 percent of the current California spotted owl habitat on the ANF. Vegetation management activities would provide short-term benefits to nesting, roosting, and foraging habitat for California spotted owls. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Wildfire and past and planned vegetation treatments on the ANF have affected and will continue to affect California spotted owls. However, planned projects will include protective measures consistent with the Southern California National Forests California Spotted Owl Conservation Strategy (USDA 2004), thus effectively reducing the degree and duration of potential impacts to spotted owls within these areas.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest LRMP (USDA, 2005) identifies use of the FS R5 protocol as the appropriate tool. Monitoring will provide information regarding occupied territories and/or habitat conditions. The California spotted owl and its habitat will be monitored to answer the question, "Are mature, large diameter, high canopy cover stands with densely-shaded understories being maintained in sufficient distribution, quantity and quality to provide habitat for the California spotted owl and other interior forest species?" The sections below summarize the habitat and population status and trend data for the California spotted owl. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*
  On the Angeles National Forest, California spotted owl surveys have been conducted by two efforts, one for general presence/absence in suitable habitat, and the other for specific projects. Not all areas of the Forest have been surveyed to determine presence/absence of spotted owls. A cumulative total of 64 territories within the Angeles National Forest have been documented as historically occupied (USFWS, 2006). Since presence/absence surveys were predominant, and no estimation of nesting or nesting success was verified, population status could not be determined.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The action Alternatives (Alternatives 2 and 6) of the TRTP would result in little impact to the forest-wide habitat (0.03 percent of forest-wide habitat for Alternative 2 and 0.02 percent of forest-wide habitat for Alternative 6) for California spotted owls. Therefore, the project-level habitat impacts will not alter or contribute to the existing forest-wide population trends for the California spotted owl.

V.6 Coulter Pine (*Pinus coulteri*)

V.6.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Coulter pine is associated with the chaparral/conifer ecotone and is affected by drought/beetle related mortality and fire suppression. According to the Forest LRMP (2005), the objective for Coulter pine on the ANF is to maintain Coulter pine stands.

Fire management is crucial to the maintenance of Coulter pine-dominated vegetation. Fire kills Coulter pine trees but stimulates their closed cones, held on the trees for years, to open up and release seeds. Long fire return intervals and drought-related mortality in some Coulter pine-chaparral stands have resulted in the death of overstory trees without subsequent fire to release seeds, creating concern for the ecological health of this ecosystem.

Coulter pine is a medium-sized evergreen tree that typically attains a height of 30 to 85 feet and diameter at breast height of 12 to 30 inches at maturity (Stuart and Sawyer, 2001). This species occurs on dry, rocky slopes and ridges between 500 to 7,000 feet elevation, and it is often intermixed with chaparral and lower montane woodlands and forests (Stuart and Sawyer, 2001). Mature trees prefer exposed environments on south-facing slopes and are highly drought tolerant (Barbour et al., 1993). Individual trees are relatively short-lived with an average life span of approximately 100 years (Stuart and Sawyer, 2001).

Coulter pines growing in chaparral or among canyon live oaks or Sargent cypress (*Cupressus sargentii*) have cones that are tightly sealed with resin. Heat from fire is required to break this seal and facilitate release of the seeds within the cone (serotiny; Stuart and Sawyer, 2001). In contrast, Coulter pines growing among coast live oak (*Quercus agrifolia*) typically bear cones that open at maturity and do not require fire for seed release (Borchert, 1985). Some individual trees may produce both closed (serotinous) and open cones (Barbour et al., 1993). On burned sites, Coulter pine readily establishes from seed, and seedling establishment is usually greatest during the first post-fire year (Borchert, 1985).

V.6.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis

An altered fire regime (fire severity and/or fire return interval) and drought-related bark beetle mortality are the primary factors affecting the abundance and distribution of Coulter pine. Acres of Coulter pine habitat within the project area will be used to assess the effects of the proposed project.

Analysis Area for Project-level Effects Analysis

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect,

and cumulative effects of the proposed project on Coulter pine includes only the habitat of 176 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The analysis area (176 acres) represents less than 4 percent of the total amount of Coulter pine habitat within the ANF.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to Coulter pine from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease Coulter pine habitat. An estimated total of 7.7 acres of Coulter pine would be impacted by Alternative 2 within the ANF, which constitutes 4.4 percent of Coulter pine in the analysis area and 0.17 percent of the total Coulter pine habitat on the ANF (Table 12).

Table 12. Alternative 2 Impacts to Coulter Pine Habitat

CalVeg Type		Amount Impacted by Alternative 2	Amount Available on Forest	Percent (%) Impacted
PC	Coulter Pine Alliance	7.7	4464	0.17
	Percent of Total Forest	0.001	0.6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on Coulter pine is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect Coulter pine within the analysis area and for this time frame include: altered fire regimes (fire severity and/or fire return interval) and drought-related mortality.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of Coulter pine habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 7.7 acres of Coulter pine in the analysis area. This is equivalent to 0.17 percent of all Coulter pine within the ANF. Vegetation

management activities would provide short-term benefits to Coulter pine. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

FS Proposed Action (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease Coulter pine habitat. An estimated total of 10.1 acres of Coulter pine habitat would be impacted by Alternative 6 within the ANF, which constitutes 5.7 percent of Coulter pine in the analysis area and 0.23 percent of the total Coulter pine habitat on the ANF (Table 13).

Table 13. Alternative 6 Impacts to Coulter Pine Habitat

CalVeg Type		Amount Impacted by Alternative 6	Amount Available on Forest	Percent (%) Impacted
PC	Coulter Pine Alliance	10.1	4464	0.23
	Percent of Total Forest	0.001	0.6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on Coulter pine is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect Coulter pine within the analysis area and for this time frame include: altered fire regimes (fire severity and/or fire return interval) and drought-related mortality.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of Coulter pine habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 10.1 acres of Coulter pine in the analysis area. This is equivalent to 0.23 percent of all Coulter pine within the ANF. Vegetation management activities would provide short-term benefits to Coulter pine. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest LRMP (USDA, 2005) identifies analysis of FIA data and photo monitoring as acceptable methodologies. Trends would be measured in extent of vegetation type. More information on habitat and vegetation type trends can be found in the ANF MIS Report (USDA, 2009).

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*

  This species is primarily distributed from the Transverse and Peninsular Ranges of Southern California and Sierra San Pedro de Matir in northern Baja California through the Central Coast Range as far north as Mount Diablo.

  There are an estimated total of 840,473 Coulter pine trees greater than or equal to 5 inches in diameter at breast height in the Transverse and Peninsular Ranges (Walker et al., 2006). Approximately 44.7 percent of these (375,546 trees) died as a result of bark beetle mortality during the 1998 to 2003 drought. Coulter pine mortality was disproportionately greater in the larger diameter-size classes, with trees in the smallest classes (<9 inches in diameter) suffering the least mortality (21 percent) and those in the largest size class (≥ 17 inches in diameter) experiencing the greatest mortality (74 percent, Walker et al., 2006). There is concern that Coulter pine forests in the Transverse and Peninsular Ranges may be heavily impacted by recent droughts (Walker et al., 2006) and, along with other evergreen coniferous forests, subject to future declines with climate change (Lenihan et al., 2006).

  A total of 4,464 acres of Coulter pine forest occur within the ANF and 100,078 acres within California (CDFG, 2005).

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for Coulter Pine

The action Alternatives (Alternatives 2 and 6) of the TRTP would result in little impact to the forest-wide habitat (0.17 percent of forest-wide habitat for Alternative 2 and 0.23 percent of forest wide habitat for Alternative 6) for Coulter pine. Therefore, the project-level habitat impacts will not alter or contribute to the existing forest-wide trends for the Coulter pine.

V.7 Bigcone Douglas Fir (*Pseudotsuga macrocarpa*)

V.7.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Bigcone Douglas fir is associated with the chaparral/conifer ecotone and is affected by altered fire regimes (fire severity and/or fire return interval). According to the Forest LRMP (2005), the objective for bigcone Douglas fir on the ANF is to maintain bigcone Douglas fir stands.

Bigcone Douglas fir seeds germinate in mineral soil, and seedlings require canopy shade and small openings for successful establishment. Consequently, if a stand is lost to a crown fire, regeneration may first require the establishment of canyon live oak, after which viable bigcone Douglas fir seeds must disperse to the site from disjunct stands, existing seed banks, or from individuals surviving the fire (Stephenson and Calcarone, 1999).

Bigcone Douglas fir is a small to medium-sized evergreen tree, averaging approximately 60 feet tall and 30 inches in diameter (Stuart and Sawyer 2001). This species occurs in the Transverse and Peninsular ranges of Southern California, primarily between 2,000 and 6,000 feet elevation (USDA, 1990; Stuart and Sawyer, 2001). It is found on cool and moist north-facing slopes of canyon bottoms at lower elevations but switches to

warmer, south-facing slopes at higher elevations (USDA, 1990), often on steep and variable topography (Bolton and Vogl, 1969). Bigcone Douglas fir is capable of becoming established on soils too dry for other conifers (USDA, 1990) and is commonly found intermixed with chaparral (Stuart and Sawyer, 2001). Suitable soils for the species include metasedimentary parent materials (sandstone and schist), granitics, and contact zones where the parent material was primarily granitic (McDonald and Littrell, 1976). The oldest recorded tree is over 600 years old (Stuart and Sawyer, 2001).

Fire frequency and intensity greatly influence the extent and composition of bigcone Douglas fir stands (McDonald and Littrell, 1976). In general, repeated fires kill bigcone Douglas fir, leaving only oaks or chaparral. Less frequent but more intensive fires eliminate bigcone Douglas fir regeneration, limiting survivorship to a few scattered, large trees. When fires are infrequent and lower in intensity, stands with several size and age classes develop, producing a mixed-age structure stand (McDonald and Littrell, 1976). In the absence of fires, multi-aged stands also develop but at the cost of increased fuel risk for future catastrophic fires that may eliminate stands of bigcone Douglas fir. Following large fires in the eastern Transverse Range, nearly 60 percent of trees escaped defoliation and 15 percent sprouted later, for a survival rate of 75 percent (Minnich, 1980).

4.74b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

Acres of bigcone Douglas fir within the project area will be used to assess the effects of the proposed project.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on bigcone Douglas fir includes only the 598 acres of habitat associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The habitat in the analysis area (598 acres) represents less than 1.5 percent of the total amount of bigcone Douglas fir habitat within the ANF.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat . Since there are no direct or indirect effects, there would be no cumulative effects to bigcone Douglas fir from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Bigcone Douglas Fir

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease bigcone Douglas fir habitat. An estimated total of 6.9 acres of bigcone Douglas fir would be impacted by Alternative 2 within the ANF, which constitutes 1.2 percent of bigcone Douglas fir in the analysis area and 0.02 percent of total bigcone Douglas fir on the ANF (Table 14).

Table 14. Alternative 2 Impacts to Bigcone Douglas Fir Habitat				
CalVeg Type		Amount Impacted by Alternative 2	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	6.9	41370	0.02
	Percent of Total Forest	0.001	6	

Cumulative Effects for Bigcone Douglas Fir

The spatial scale for the cumulative effects of the TRTP on bigcone Douglas fir is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect bigcone Douglas fir within the analysis area and for this time frame include: fuels management and shrub encroachment.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of bigcone Douglas fir habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 6.9 acres of bigcone Douglas fir in the analysis area. This is equivalent to 0.02 percent of all bigcone Douglas fir within the ANF. Vegetation management activities would provide short-term benefits to bigcone Douglas fir. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

FS Proposed Action (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease bigcone Douglas fir habitat. An estimated total of 5.2 acres of bigcone Douglas fir would be impacted by Alternative 6 within the ANF, which constitutes 0.9 percent of bigcone Douglas fir in the analysis area and 0.01 percent of total bigcone Douglas fir on the ANF (Table 15).

Table 15. Alternative 6 Impacts to Bigcone Douglas Fir Habitat				
CalVeg Type		Amount Impacted by Alternative 6	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	5.2	41370	0.01
	Percent of Total Forest	0.0007	6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on bigcone Douglas fir is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect bigcone Douglas fir within the analysis area and for this time frame is: fuels management and shrub encroachment.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of bigcone Douglas fir habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 5.2 acres of bigcone Douglas fir in the analysis area. This is equivalent to 0.01 percent of all bigcone Douglas fir within the ANF. Vegetation management activities would provide short-term benefits to bigcone Douglas fir. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest LRMP (USDA, 2005) identifies analysis of FIA data and photo monitoring as acceptable methodologies. Trends would be measured in extent of vegetation type. Aerial photos of the Forest were last obtained in 2004. The proposed schedule includes updating photos every five years. Photo interpretation makes it possible to track changes in stand size, shape and density. The sections below summarize the habitat and population status and trend data for bigcone Douglas fir. This information is drawn from the detailed information on habitat and vegetation type trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*
  Not utilized as the primary monitoring tool for bigcone Douglas fir on the ANF.

There are an estimated total of 90,797 bigcone Douglas fir trees greater than or equal to 5 inches in diameter at breast height in the Transverse and Peninsular Ranges (Walker et al., 2006). Approximately 54.2 percent of these (49,243 trees) died as a result of bark beetle mortality during the 1998 to 2003 drought, making this one of the most highly impacted conifer species in the region. There is concern that bigcone Douglas fir trees in the Transverse and Peninsular Ranges may be heavily impacted by recent droughts (Walker et al., 2006) and, along with other evergreen coniferous forests, subject to future declines with climate change (Lenihan et al., 2006).

A total of 41,370 acres of Bigcone Douglas Fir-Canyon Oak Forest occur in the ANF.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for Bigcone Douglas Fir

The action Alternatives (Alternatives 2 and 6) of the TRTP would result in little impact to the forest-wide habitat (0.02 percent of forest-wide habitat for Alternative 2 and 0.01 percent of forest wide habitat for Alternative 6) for bigcone Douglas fir. Therefore, the project-level habitat impacts will not alter or contribute to the existing forest-wide trends for the bigcone Douglas fir.

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