6. POTENTIAL BIOLOGICAL IMPACTS/TAKE ASSESSMENT

This section, together with *Section 5, Other Covered Species*, and Section *7, Conservation Plan for Other Covered Species*, of the Tehachapi Uplands Multiple Species Habitat Conservation Plan (TU MSHCP), provides a complete analysis of the 24 Other Covered Species. This introduction summarizes the content of each section along with the linkages between them.

Section 5 focuses on the natural history of each of the 24 species, including status, distribution, and habitat characteristics, along with literature sources. Specific information is provided regarding the occurrence of the species within Covered Lands, along with the regulatory setting and listing status for each species. *Section 5* also summarizes the data and data sources used for the analysis of the 24 Other Covered Species, including data on vegetation communities, species occurrences, water features and drainages, topography, soils, and imagery. For this TU MSHCP, a model was developed for each of the 24 Other Covered Species to identify and map suitable habitat for the species within Covered Lands using relevant available data. *Section 5* summarizes the habitat suitability analysis process and references *Appendix D* of the TU MSHCP, where a detailed documentation of the model inputs for each species is provided. Maps depicting the model outputs for each species are presented in this section.

This section provides the impact analysis and take assessment for each of the 18 wildlife Other Covered Species and coverage analysis of the six plant Other Covered Species based on the project description and description of Covered Activities included in *Section 2, Plan Description and Activities Covered by Permit*. The impact assessments for the 24 Other Covered Species in this section are both quantitative and qualitative, and a description of the methods used for the impact assessment is included. For the 18 wildlife Other Covered Species, the take assessments first quantify the effects of Covered Activities with respect to reduction or loss of modeled suitable habitat; then available information regarding the size of territories or home ranges is used, as appropriate for a particular Covered Species, to estimate the number of individuals a modeled habitat acreage may support, assuming the modeled habitat is uniformly and fully saturated (e.g., at carrying capacity). This sets the theoretical upper end of the population size in the modeled habitat. This high-end estimate is then revised downward based on the fact that modeled habitat is highly unlikely to be saturated (e.g., based on site-specific surveys showing scattered and/or low-density populations) and other species-specific factors (e.g., concentrations in microhabitat). The revised estimate is the basis for estimating the number of individuals, breeding territories, etc. that could be lost prior to and after implementation of avoidance and minimization measures. For several species, the best estimate that can be made is the loss of a small, but indeterminable number of individuals (e.g., the salamanders). The impacts of the take analyses include a summary of the status and distribution of the species within its range, a summary of the loss and conservation of the species expected to occur with implementation of the TU MSHCP, and a conclusion regarding the overall impacts of the take associated with the TU MSHCP on the species as a whole. The assessment for all Other Covered Species includes

implementation of conservation and avoidance and minimization measures described in greater detail in *Section 7*.

Section 7 presents the conservation plan proposed to be implemented as part of the TU MSHCP, along with the avoidance, minimization, and mitigation measures incorporated in the conservation plan to offset the effects analyzed in *Section 6*. *Section 7* first states conservation goals and objectives for each of the 24 Other Covered Species, including goals for conservation of modeled suitable habitat and management of threats to the species. Avoidance, minimization, and mitigation measures are described. The primary feature of the TU MSHCP to avoid, minimize, and mitigate impacts to Covered Species is the conservation of about 91% of Covered Lands within permanently protected and managed open space. This feature of the plan is described in *Sections 2* and *7* of the TU MSHCP. Monitoring, management, adaptive management, and reporting measures incorporated in the TU MSHCP are described in this section as part of the overall conservation plan. *Section 7* also describes the ways in which take will be measured during implementation of the TU MSHCP in terms of habitat loss, the rationale for use of habitat loss as a measurement for take, and specific quantification of the take authorized by the TU MSHCP.

6.1 EFFECTS OF COVERED ACTIVITIES ANALYSIS METHODS AND ASSUMPTIONS

Methods used to analyze effects on the Covered Species due to Covered Activities are both quantitative and qualitative.

Quantitative methods with respect to modeled suitable habitat for Covered Species include the following:

- Define and map modeled suitable habitat for each of the Covered Species.
- Intersect modeled suitable habitat with commercial and residential Covered Activities with permanent impacts to quantify acreage of affected modeled suitable habitat within these areas.[1]

[1] The percentages of modeled habitat conserved and lost may not sum to 100% for three possible reasons: (1) rounding error; (2) 75% of riparian/wetlands are assumed avoided in development areas, but avoided areas are not included in the open space acreages; and (3) 145 acres in the Lebec/Existing Headquarters Area are not developed but are not included in the open space acreages.

Quantitative methods with respect to Covered Species occurrences include the following:

- Document known occurrences of the particular Covered Species within the Covered Lands.
- Intersect the known occurrences with commercial and residential Covered Activities with permanent impacts.
- Estimate potential additional occurrences, as appropriate, within modeled suitable habitat based on results of previous surveys (e.g., within the Tejon Mountain Village (TMV) Planning Area) and on available life history information in the species accounts for the particular species (e.g., territory size, home range, and typical population densities and spatial distribution patterns).
- Estimate potential impacts to individuals of each species, to the extent feasible, and modeled suitable habitat.
- Estimate the reduction of impacts to Covered Species individuals as a result of applying avoidance and minimization measures, as appropriate.

Qualitative methods with respect to modeled suitable habitat and species occurrences include the following:

- Assess potential effects due to non-permanent Covered Activities based on descriptions of Covered Activities in *Section 2* and known and likely threats to each species as identified in the species accounts in *Sections 4* and *5*.

Following the analysis of the effects on the Covered Species due to Covered Activities, the impacts of any potential incidental take (identified in the analysis of effects of Covered Activities) are analyzed for wildlife Covered Species. This analysis considers the impacts of the Covered Activities on the species overall and across its range, thus species' ranges and subregional ranges are considered for purposes of this analysis.

While take of plants is not prohibited under the Federal Endangered Species Act (FESA) (16 U.S.C. 1531 et seq.), the impacts of the Covered Activities on the plants, as species and across their ranges, are identified and mitigated.

6.2 POTENTIAL TAKE AND IMPACTS TO OTHER COVERED SPECIES

6.2.1 AMPHIBIANS

In addition to impacts from permanent habitat loss, other potential non-permanent effects include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on amphibians include impacts to water quality and dust. Amphibians have permeable, exposed skin and eggs that may readily absorb substances, including toxins, from the environment. Their eggs are laid in water or in moist areas, and their larvae are aquatic for some species. Most amphibians have a two-stage life history that includes at least a portion within wetland habitats or they rely on a moist environment for a portion of their life cycle. Their eggs lack a protective membrane and must be laid in moist settings, thus they are very sensitive to changes in water quality. Because amphibians are intimately tied to an aquatic or more mesic environment, the quality of the water in which they live can affect their growth, development, and survival. Pollutants, runoff of pesticides, waterborne pathogens, and sediment can all affect water quality, and these factors can in turn affect amphibians. Even when living the portion of their life cycle on land, the amphibian's skin is more or less freely permeable to water and to air and has no natural barrier to water loss. Thus, although they do have lungs, a portion of the oxygen that they require is acquired through diffusion through their skin. Dust settling directly on them or within areas where they may become covered with it has the potential to interfere with the oxygen diffusion process. Dust can also transport other compounds that may affect amphibians, and other substances can be tightly bound to dust particles. If settled dust, as sediment, is transported into aquatic ecosystems, these substances can be released and may be toxic to amphibians. Dust can also be bound to pesticides, and, if the dust settles directly on the animal, the chemical can be absorbed directly through their skin.

Long-term (operational) impacts with potential non-permanent effects on amphibians include exotic plant and animal species such as Argentine ant (*Linepithema humile*), urban runoff, lighting effects on habitat occupied by the species, and cattle-related impacts. Once established, some invasive species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native amphibian and reptile populations may be threatened from exotic invasive species of plants and animals, including other reptiles and amphibians. As habitats are changed and plant community organization is modified by exotic species, the relationships between plants and animals may be altered or eliminated. Argentine ants are more aggressive than native ants and have been found to displace the natives and are now widespread throughout California. These ants may also play a role in disrupting and depressing the arthropod community within natural areas, and, therefore, might affect a number of amphibian species (Haas et al. 2002). The potential impacts of urban runoff, as discussed previously, may result in transport of sediment and toxins to which amphibians are

sensitive due to their permeable skin and eggs. Artificial light can affect physiology and behavior of animals, leading to ecological consequences at the population, community, and ecosystem levels. Aquatic ecosystems may be particularly vulnerable to such effects and nocturnally breeding animals, such as frogs and other amphibians, may be especially affected (Baker and Richardson 2006). Cattle-related impacts include grazing and congregating in areas that are used by amphibians, including wetland or aquatic breeding areas and adjacent uplands where amphibians may forage, aestivate, and hibernate. Cattle may trample soils, riparian and wetland vegetation, burrows, or individuals and disturb breeding pools that support egg masses and tadpoles at critical phases of their life cycle. Cattle congregating in wetland and aquatic habitat can also impair water quality (e.g., turbidity, urine, and feces). These impacts may both degrade habitat quality and directly affect amphibian reproductive success and recruitment into the local population.

6.2.1.1 TEHACHAPI SLENDER SALAMANDER

6.2.1.1.1 DISCUSSION OF POTENTIALTAKE OF TEHACHAPI SLENDER SALAMANDER

Covered Activities would result in the permanent loss of 143 acres (4%) of modeled suitable habitat for Tehachapi slender salamander (*Batrachoseps stebbinsi*) within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-3*, *Tehachapi Slender Salamander Modeled Suitable Habitat*, and *Appendix D* for a description of methods used to develop the model). As stated in Section 5.2.1.1.1, the Tehachapi slender salamander home range is suspected to be approximately 0.5 acre (USFS 2006a), and the area of Tehachapi slender salamander surface activity probably covers its area of underground activity (Morey 2005). Assuming a home range of 0.5 acre, a uniform, non-overlapping distribution of individuals, and saturation of the entire 143 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to 286 individuals.

This estimate, however, is considered to be high because the Tehachapi slender salamander is not expected to occupy all modeled suitable habitat on Covered Lands. In fact, within modeled suitable habitat, Tehachapi slender salamander likely only occurs within talus or otherwise rocky areas, areas with fallen logs and leaf litter, and potentially dead yuccas (*Yucca* spp.). Specific data for these microhabitat features are not available for Covered Lands and, therefore, were not included in the model to determine the estimate of modeled suitable habitat for the salamander. Focused surveys for the species in modeled suitable habitat in the TMV Planning Area documented the Tehachapi slender salamander in 1 of approximately 77 drainages surveyed, a presence rate of 1.3% in drainages with modeled suitable habitat. However, because the activity patterns of the Tehachapi slender salamander are largely dependent upon temperature range and precipitation patterns, which are erratic in both timing and amount within the species' range (Hansen and Wake 2005; AmphibiaWeb 2008), an occupation rate for modeled suitable habitat

based upon these survey data cannot be used to determine loss estimates of Tehachapi slender salamander individuals. In addition, the literature suggests that the Tehachapi slender salamander does not occur in uniform distributions. Tehachapi slender salamander seems to be limited to localized or clustered populations, with overlapping distributions of individuals, due to the species' specific microhabitat requirements (talus, canyon live oak, north-facing slopes), limited dispersal (Hansen and Wake, pers. comm. 2008), and lack of territorial behavior (USFS 2006a). Because the species likely occurs in clustered or patchy distributions, it is reasonable to assume that the number of individuals likely to be permanently lost is substantially smaller than the estimated 286 individuals that could be lost with the permanent loss of 143 acres of saturated modeled suitable habitat within Covered Lands. However, because of its patchy distribution within its range and because the species' activity patterns are associated with temperature and precipitation, establishing precise population densities and loss estimates of Tehachapi slender salamander individuals cannot be made without extensive population sampling. The expected loss of Tehachapi slender salamander would be a small but indeterminable number. This estimate would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.1.1 of this TU MSHCP, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and construction monitoring. A more precise estimate of the number of individuals permanently lost cannot be made because the success of the avoidance and minimization measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

In addition to the short-term construction-related impacts with potential non-permanent effects on amphibians noted in Section 6.2.1, short-term construction-related impacts with potential non-permanent effects on Tehachapi slender salamander include inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

Other Covered Activities with potential non-permanent effects on Tehachapi slender salamander individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat); ranch operations related to maintenance of culverts and drainages; utility maintenance; film production; and human presence and associated passive and active recreation that could result in habitat degradation, collection, and possible mortality.

Conservation measures to address these threats are provided in Section 7.1.1.1.1.

6.2.1.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TEHACHAPI SLENDER SALAMANDER

The Tehachapi slender salamander is endemic to California, with its known historical range occurring in Kern County. Major known populations are associated with Caliente Creek, Tejon

Canyon, Beartrap Canyon, Pastoria Creek, Monroe Canyon, and Fort Tejon and surrounding tributaries. Because of the relatively small and concentrated range of this species, the impacts of incidental take of Tehachapi slender salamander are analyzed from both a habitat and species perspective within the context of its entire range.

The Tehachapi slender salamander was listed by the State of California as threatened in 1971 but currently is not Federally listed as threatened or endangered (CDFG 2008a). The U.S. Fish and Wildlife Service (USFWS) recently completed its 12-Month Finding to determine whether it should be Federally listed as threatened and concluded, based on the available scientific and commercial literature, that a listing as threatened was not warranted (76 FR 62900).

The Covered Lands are situated within the species' known current range in Southern California. Biologists who surveyed the TMV Planning Area in 2007 detected the species in Monroe Canyon, but the species is also known to occur in Beartrap and Tejon canyons and adjacent to the California aqueduct. The species is expected to occur in Covered Lands in suitable habitat in discrete patches, as observed during the 2007 surveys in the TMV Planning Area.

Covered Activities would result in the permanent loss of 143 acres (4%) of modeled suitable habitat for Tehachapi slender salamander within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat and a uniform distribution, this would amount to a potential loss of habitat supporting up to 286 individuals. However, based on scattered distribution of individuals observed within the TMV Planning Area (i.e., Monroe and Beartrap Canyon) and because not all modeled habitat is expected to be occupied by this species (due to the species association with talus areas), it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 143 acres within Covered Lands is substantially smaller than 286 individuals. The expected loss of Tehachapi slender salamander is a small but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 3,921 acres (96%) of modeled suitable habitat for this species within Covered Lands.

The permanent loss of 4%[2] of modeled suitable habitat within Covered Lands and a small but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities prior to implementation of avoidance and minimization measures would not substantially affect the species' population and distribution on site nor would it substantially affect the species over its larger range in Kern County.

6.2.1.2 WESTERN SPADEFOOT

6.2.1.2.1 DISCUSSION OF POTENTIAL TAKE OF WESTERN SPADEFOOT

Covered Activities would result in the permanent loss of 30 acres (3%) of modeled suitable habitat for western spadefoot (*Spea [Scaphiopus] hammondii*) within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-4* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.1.2.1, the home range of the western spadefoot was estimated in one study at approximately 1 acre (Basey and Sinclear 1980), although opportunistic field observations indicate that they readily move up to at least several hundred meters from breeding sites (NatureServe 2010). Assuming a home range size of 1 acre, a non-overlapping and uniform distribution of individuals, and saturation of the entire 30 acres of modeled suitable habitat, this would amount to a potential loss of up to 30 individuals, not including egg masses and tadpoles (which may occur in the thousands at a single breeding site).

This estimate, however, is considered to be high for several reasons. First, as stated in Section 5.2.1.2.3, presence/absence surveys for western spadefoot in all modeled suitable habitat in the TMV Planning Area portion of the Covered Lands were negative. Second, based on the negative surveys in the TMV Planning Area and the fact that Covered Lands are east of the western spadefoot's known geographic range, the potential for occurrence on Covered Lands is considered to be low below 3,000 feet above mean sea level (amsl) and to be very low above 3,000 feet amsl. Therefore, the overall rate of occupation within modeled suitable habitat on Covered Lands is considered to be low to very low; that is, if the western spadefoot is present on Covered Lands, it is expected to occur in a very sporadic and patchy distribution within modeled suitable habitat. Therefore, the number of individuals expected to be permanently lost with the permanent loss of 30 acres of modeled suitable habitat within Covered Lands would be considerably less than 30 individuals prior to application of avoidance and minimization measures. If the species were present on Covered Lands, with the permanent loss of 30 acres of modeled suitable habitat, it is estimated that a loss of up to 10 adult, sub-adult, or metamorph individuals could occur. It is also estimated that prior to the implementation of the avoidance and

[2] Conservation and impact percentages are rounded to the nearest whole number and may not always sum to 100%. In addition, some small amounts of modeled suitable habitat for a species may not occur in development or conservation areas, in these cases the conservation and impact percentages also would not sum to 100%.

minimization measures, the proposed commercial and residential Covered Activities could result in impacts to one breeding site that could support egg masses and up to thousands of tadpoles. The number of individuals permanently lost could be further reduced with application of the avoidance and minimization measures identified for this species in Section 7.1.1.1.2 of this TU MSHCP, including pre-construction surveys, avoidance of breeding sites (egg masses and tadpoles), capture and relocation of individuals, exclusion fencing, and construction monitoring. The degree to which avoidance and minimization measures would further reduce impacts, however, depends on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Short-term (construction-related) and long-term (operational) impacts with potential non-permanent effects on amphibians, including western spadefoot, are noted in Section 6.2.1. Other Covered Activities with potential non-permanent effects on western spadefoot individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat); ranch operations related to maintenance of culverts and drainages; utility maintenance; film production; and human presence and associated passive and active recreation that could result in habitat degradation, collection, and possible mortality.

Conservation measures to address these threats are provided in Section 7.1.1.1.2.

6.2.1.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO WESTERN SPADEFOOT

The western spadefoot is endemic to California and northern Baja California, Mexico. The species ranges from the north end of California's great Central Valley near Redding to the south, east of the Sierras and the deserts, into northwest Baja California (Jennings and Hayes 1994; Stebbins 2003). The Covered Lands are situated just east of the species' known current range in Southern California, and the species was not observed in the TMV Planning Area during surveys in 2007. The impacts of incidental take of western spadefoot are analyzed, from both a habitat and species perspective, within the context of its entire range in California.

The western spadefoot was not detected during surveys in the TMV Planning Area and it is considered to have low potential to occur on Covered Lands below 3,000 feet amsl and very low potential to occur on Covered Lands above 3,000 feet amsl.

Covered Activities would result in the permanent loss of 30 acres (3%) of modeled suitable habitat for western spadefoot within Covered Lands. The negative surveys in 2007 indicate that the western spadefoot has a low to very low potential to occur on Covered Lands, thus the estimate of take of individuals is based on the assumption that if the western spadefoot is present, it occurs in relatively limited locations and in small numbers. Based on factors such as the documented home range size of the species, and likely very patchy distribution of individuals in suitable habitat, if present on site, and application of all avoidance and minimization measures (pre-construction surveys, relocation, construction monitoring), permanent impacts to 30 acres of

modeled suitable habitat would result in an estimated loss of up to 10 adults, sub-adults, or metamorphs. It is also estimated that prior to the implementation of the avoidance and minimization measures, the proposed commercial and residential Covered Activities could result in impacts to one breeding site that could support egg masses and up to thousands of tadpoles.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 1,055 acres (90%) of modeled suitable habitat for this species within Covered Lands. Furthermore, the modeled suitable habitat for the western spadefoot will be preserved within a large, unfragmented open space system, the Covered Lands are east of the species' known current range in Southern California, and this species has a broad range in California, extending from the Central Valley near Redding to the south into northwest Baja California, Mexico, and east of the Sierras in the desert. Therefore, the permanent loss of 3% of modeled suitable habitat within Covered Lands and 10 adults, sub-adults, or metamorphs resulting from permanent habitat loss associated with Covered Activities would not substantially affect the species' population and distribution on site, nor would it substantially affect the species over its much larger range in California.

6.2.1.3 YELLOW-BLOTCHED SALAMANDER

6.2.1.3.1 DISCUSSION OF POTENTIAL TAKE OF YELLOW-BLOTCHED SALAMANDER

Covered Activities would result in the permanent loss of 1,179 acres (3%) of modeled suitable habitat for yellow-blotched salamander (*Ensatina eschscholtzii croceater)* within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-5* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.1.3.1, the home range of the ensatina (of which the yellow-blotched salamander is a subspecies) has been estimated to be up to 1 acre (USFS 2006b). Assuming a home range of 1 acre; a uniform, non-overlapping distribution of individuals; and saturation of the entire 1,179 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to 1,179 individuals.

This estimate, however, is considered to be high because the yellow-blotched salamander is not expected to occupy all modeled suitable habitat on Covered Lands and is not uniformly distributed throughout suitable habitat; however, this species can be locally common where present (Hansen and Wake, pers. comm. 2008). During the survey of the TMV Planning Area, biologists documented 17 yellow-blotched salamander individuals primarily within modeled suitable habitat. However, because the surface activity patterns of the yellow-blotched salamander are highly correlated with surface moisture (Stebbins 1951, 1954), which varies depending on several environmental conditions (such as temperature, precipitation, etc.), an occupation rate for modeled suitable habitat based upon these presence/absence survey data cannot be used to determine loss estimates of yellow-blotched salamander individuals. In

addition, according to Hansen and Wake (pers. comm. 2008), this species does not occur in uniform distributions. Yellow-blotched salamander seems to be limited to localized or clustered populations, due to species-specific microhabitat requirements (typically found under rocks, logs, or other debris, more prevalent in north-facing areas that are shaded, especially near creeks and streams). Because the species likely occurs in clustered or patchy distributions, it is reasonable to assume that the number of individuals likely to be permanently lost is substantially smaller than the estimated 1,179 individuals that could be lost with the permanent loss of 1,179 acres of saturated modeled suitable habitat within Covered Lands. However, because of its patchy distribution within its range and because the species' activity patterns are associated with surface moisture, precise population density and loss estimates of yellow-blotched salamander individuals cannot be made without extensive population sampling. The expected loss of yellow-blotched salamander would be a small but indeterminable number. This estimate would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.1.3 of the TU MSHCP, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and construction monitoring. A more precise estimate of the number of individuals permanently lost cannot be made because the success of the avoidance and minimization measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Short-term (construction-related) and long-term (operational) impacts with potential non-permanent effects on amphibians, including yellow-blotched salamanders, are noted in Section 6.2.1.

Other Covered Activities with potential non-permanent effects on yellow-blotched salamander individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat); ranch operations related to maintenance of culverts and drainages; utility maintenance; film production; and human presence and associated passive and active recreation that could result in habitat degradation, collection, and possible mortality.

Conservation measures to address these threats are provided in Section 7.1.1.1.3.

6.2.1.3.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO YELLOW-BLOTCHED SALAMANDER

The yellow-blotched salamander is endemic to California with its known historical range limited to Ventura and Kern counties. Major known populations are associated with Tehachapi Mountains, Mount Pinos, near Fort Tejon, and near Frazier-Alamo Mountain. Because of the relatively small and concentrated range of this subspecies, the impacts of the incidental take of yellow-blotched salamanders are analyzed, from both a habitat and species perspective, within the context of its entire range.

The yellow-blotched salamander is not listed as threatened by the State of California or USFWS and no critical habitat has been designated.

The Covered Lands generally are situated in the central portion this species' known current range in Southern California. Biologists observed this species during 2007 surveys in the TMV Planning Area (Dudek 2009) and most occurrences were in the southwestern portion of Covered Lands, generally east of Grapevine Peak, in the vicinity of Silver, Monroe, Squirrel, Palos Altos, and Johnson canyons, and along Beartrap Canyon and its tributaries. It is expected to occur throughout Covered Lands in suitable habitat in a similar distribution as observed in the TMV Planning Area.

Covered Activities would result in the permanent loss of 1,179 acres (3%) of modeled suitable habitat for yellow-blotched salamander within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat and a uniform distribution, this would amount to a potential loss of habitat supporting up to 1,179 individuals. However, based on scattered distribution of individuals observed within the TMV Planning Area and because not all modeled habitat is expected to be occupied by this species (due to the species association with microhabitat requirements), it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 1,179 acres within Covered Lands is substantially smaller than 1,179 individuals. The expected loss of yellow-blotched salamander is a small but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 33,988 acres (97%) of modeled suitable habitat for this species within Covered Lands.

The permanent loss of 3% of modeled suitable habitat within Covered Lands and a small but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities prior to implementation of avoidance and minimization measures would not substantially affect the species' population and distribution on site nor would it substantially affect the species over its broader range in Ventura and Kern counties.

6.2.2 BIRDS

In addition to impacts from permanent habitat loss, other potential non-permanent effects to birds include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on birds include dust. Dust has the potential to coat the leaves of the vegetation within which birds nest and forage. It is possible that wind-blown dust might degrade the quality of some habitats occupied by birds and may either change the habitat type or result in choking of the vegetation and thus increase the amount of unvegetated areas (Walker and Everett 1987). Vegetation changes due to dust may extend as far as 10 to 20 meters (33 to 66 feet) from the road (Forman 1995). Dust may also be transported into aquatic ecosystems where it contributes to sedimentation and may negatively affect vegetation communities. The dust coating may also cover the insect prey of insectivorous species, making it more difficult for foliage-gleaning bird species to successfully forage.

Long-term (operational) impacts with potential non-permanent effects on birds include exotic plant and animal species and urban runoff on habitat occupied by the species. Invasion of non-native plants has been found to modify the structure and composition of riparian vegetation as well as other vegetation communities. This has been found to have negative effects on birds by reducing the structural and compositional diversity of the vegetation (Fleishman et al. 2003). As noted previously, some invasive plant species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native bird populations may be threatened from exotic invasive species of animals, including other birds, such as European starling (*Sturnus vulgaris*), which often evict native bird species from their nest cavities (Zeiner et al. 1990b). As noted previously, as community organization is modified by exotic species, the native community relationships may be altered or eliminated. The potential impacts of urban runoff may include an increase in flooding or inundation, which could result in conversion of more upland forest habitats to marshland habitats, thus resulting in loss of habitat for forest-dwelling bird species (Franco et al. 2008). Birds that occur in aquatic ecosystems or utilize resources in aquatic ecosystems may be exposed to toxic substances in runoff similar to amphibians as described in Section 6.2.1.

6.2.2.1 AMERICAN PEREGRINE FALCON

6.2.2.1.1 DISCUSSION OF POTENTIAL TAKE OF AMERICAN PEREGRINE FALCON

Covered Activities would result in the permanent loss of 2,742 acres (10%) of modeled suitable habitat for American peregrine falcon (*Falco peregrinus anatum)* within Covered Lands, including 2,741 acres (10%) of foraging habitat and 1 acre (less than 1%) of breeding habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-6* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.1.1, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of California (Zeiner et al. 1990b), as well as in much of the western and southwestern regions of the United States; it is also an uncommon breeder and winter migrant in northern Mexico. Through 2007 in California, approximately 274 nesting sites were documented as “active”

(i.e., used at least once since 1975) in 40 counties spanning the length of the state (Comrack and Logsdon 2007, Table 1).

This species was observed foraging on a single occasion in the TMV Planning Area in 2007 and was not observed to be breeding. The loss of 1 acre of breeding habitat, therefore, would not directly affect, and is not likely to indirectly affect a breeding site because this species is expected to use the Covered Lands only as a stopover during migration periods or possibly as an occasional winter visitor; no breeding is expected to occur within Covered Lands.

In addition to the short-term construction-related impact with potential non-permanent effects on birds noted in Section 6.2.2, a short-term construction-related impact with potential non-permanent effects on American peregrine falcon includes impacts to water quality.

Long-term (operational) impacts with potential non-permanent effects on birds, including the American peregrine falcon, are mentioned in Section 6.2.2.

Other Covered Activities with potential non-permanent effects on American peregrine falcon individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading riparian/wetland foraging and wintering habitat), ranch operations related to maintenance of roads, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the American peregrine falcon is a California Fully Protected species, avoidance and mitigation measures identified in Section 7.1.1.2.1 of this TU MSHCP are designed to avoid lethal take. Measures related to commercial and residential Covered Activities include pre-grading construction surveys, establishment of a 0.25-mile protection zone around active nests, if found, and monitoring of construction activities. Measures for long-term operational Covered Activities include pre-activity surveys in breeding habitat and establishment of a 1,000-foot protection zone around active nest sites, if found; public education and regulation of recreation through the Public Access Plan; baseline surveys to inform management; pre-disturbance surveys prior to installation of infrastructure and trails, and contractor education, staking and temporary construction fencing, if found; and siting of new public access trails in consultation with the project biologist.

6.2.2.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO AMERICAN PEREGRINE FALCON

As stated in Section 6.2.2.1.1, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of California, as well as in western Oregon, the southwest, and Central Plains region of the United States. It is absent from desert areas (Zeiner et al. 1990b). In California, active nests have been documented along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. Wintering migrants can be seen

inland throughout the Central Valley, in the western Sierra Nevada, along the coast, and occasionally on the Channel Islands (Zeiner et al. 1990b). Spring and fall migrants of the American peregrine falcon occur along the coast and in the western Sierra Nevada Mountains (Brown 1999). As a transient species, this species may occur almost anywhere that suitable habitat is present (Garrett and Dunn 1981). For this reason, the scale for analyzing the impacts of incidental take of the American peregrine falcon considers the broad migration and wintering range of the species throughout the western, southwestern, and Central Plains regions of the United States. Where it nests, nesting densities vary and are generally dependent upon availability of prey (Thelander 1977). Throughout California, breeding densities of American peregrine falcons have ranged from upwards of one pair per 300,000 acres to one pair per 92,000 acres in relatively undisturbed habitats (Thelander 1977).

American peregrine falcons have only been observed during the fall in the portions of the Covered Lands that have been surveyed, and no current or historical nest sites have been reported to occur within Covered Lands. It is expected that the American peregrine falcon uses the Covered Lands only as a stopover during migration periods or possibly as an occasional winter visitor. However, approximately 79 acres of modeled breeding (cliff-type) habitat occur on Covered Lands, and though the American peregrine falcon is not expected to nest on Covered Lands, the possibility of this species nesting on site cannot be dismissed. Even at the higher breeding density cited above, however, and assuming that undisturbed areas adjacent to the Covered Lands would also be used by this species, Covered Lands likely could support at most one breeding pair of American peregrine falcons.

Covered Activities would result in the permanent loss of 2,742 acres (10%) of modeled suitable habitat for American peregrine falcon within Covered Lands, including 2,741 acres (10%) of modeled foraging habitat and 1 acre (less than 1%) of modeled breeding habitat. No lethal take of individuals would occur.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 23,862 acres (89%) of modeled foraging habitat and 79 acres (99%) of modeled breeding habitat for this species within Covered Lands.

With a maximum of one breeding pair potentially occurring within the Covered Lands, this high level of on-site conservation of modeled suitable habitat, and the large extent of undisturbed habitat adjacent to the Covered Lands that could be used by a breeding pair of American peregrine falcon as well as for foraging, the capacity of the Covered Lands to support a breeding pair would not be substantially reduced. Implementation of avoidance and minimization measures, including pre-construction and pre-activity surveys for nesting American peregrine falcons and establishment of a 0.25-mile protection zone if nesting is observed, will ensure that no lethal take of the species occurs as a result of Covered Activities. Further, the loss of suitable

breeding and foraging habitat would not adversely affect the estimated 274 nesting sites that were documented as "active" in California as of 2007 (Comrack and Logsdon 2007).

No data are available regarding densities of American peregrine falcons on wintering or migratory stopover sites. However, the 23,862 acres of modeled foraging habitat that would be conserved, including most of the wetland habitat and all of the aquatic habitat associated with Castac Lake, will be available for migrating and wintering American peregrine falcon. Furthermore, the modeled foraging habitat for migrant and wintering American peregrine falcon will be preserved in a large, unfragmented open space system, and this species migrates and winters throughout California (except for the deserts). Therefore, the loss of 2,741 acres (10%) of modeled foraging habitat for migrating and wintering American peregrine falcon within Covered Lands would not substantially affect this species' use of Covered Lands during migration and wintering nor would it substantially affect the species within its broader migration and wintering range throughout the western/southwestern United States and northern Mexico.

6.2.2.2 BALD EAGLE

6.2.2.2.1 DISCUSSION OF POTENTIAL TAKE OF BALD EAGLE

Covered Activities would result in the permanent loss of 839 acres (43%) of modeled suitable habitat for bald eagle (*Haliaeetus leucocephalus*) within Covered Lands, including 834 acres (58%) of modeled wintering habitat and 5 acres (less than 1%) of modeled foraging habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-7* and *Appendix D* for description of methods used to develop the model). No suitable breeding habitat was modeled for the bald eagle because it has a low potential to breed on Covered Lands. As stated in Section 5.2.2.1.1, the bald eagle is fairly common as a local winter migrant at a few favored inland waters in Southern California, with the largest numbers occurring at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and along the Colorado River (Zeiner et al. 1990b). In California, breeding populations of bald eagles are now restricted mostly to Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties (Polite and Pratt 1999). Recent breeding attempts on the mainland south of Santa Barbara County (e.g., Silverwood Lake, Lake Skinner, and Lake Perris) have been unsuccessful (Cleary-Rose, pers. comm. 2002). Individuals that breed in California may make only local winter movements in search of food.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on bald eagle include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on bald eagle include lighting effects.

Other Covered Activities with potential non-permanent effects on bald eagle individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading suitable riparian woodland, riparian/wetland, and wetland habitat), ranch operations related to maintenance of roads, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the bald eagle is a California Fully Protected species and a species covered by the Federal Bald and Golden Eagle Protection Act (BGEPA), avoidance and minimization measures proposed in Section 7.1.1.2.2 of this TU MSHCP are designed to protect diurnal perches and high-quality roost trees for bald eagle so as to preserve productivity for bald eagles wintering in the area, to avoid lethal take, and to prevent disturbance to individuals (there is no breeding on site and therefore no nests).

6.2.2.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO BALD EAGLE

The bald eagle breeds throughout Canada and portions of the United States, and winters throughout the United States and portions of Canada and Mexico. According to Buehler (2000), there is a wintering population of over 20,000 individuals in North America. These individuals are dispersed across the United States, Canada, and northern Mexico, but most spend the winter in large expanses of waterfowl-rich landscapes, such as northeastern California, the Great Lakes states, northern Rockies states, and pothole regions. This species has been delisted by the Federal government due to population increases, but it is still listed by the State of California. No critical habitat or recovery Plans are in effect for the bald eagle. It is still covered by the BGEPA.

The Covered Lands are within the known current range of the bald eagle. However, it is not known to breed within Southern California outside of the Channel Islands, though a few nest-building attempts have been observed at isolated lakes in Riverside County and elsewhere. Wintering individuals have been occasionally noted at various bays, lakes, and estuaries in Southern California, but known major wintering sites are situated around the Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and Colorado River areas.

Because of its broad North American distribution and wide-ranging migration patterns, the scale for analyzing the impacts of incidental take of the bald eagle considers the entire wintering range of the species.

Covered Activities would result in the permanent loss of 839 acres (43%) of modeled suitable habitat for bald eagle within Covered Lands, including 834 acres (58%) of modeled wintering habitat and 5 acres (less than 1%) of modeled foraging habitat. No lethal take under FESA or BGEPA of bald eagle individuals would occur as a result of habitat loss, and conservation measures are included to protect diurnal perches and high-quality roost trees for bald eagle so as to preserve productivity for bald eagles wintering in the area.

Specifically, implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 604 acres (42%) of modeled wintering habitat (including perching and roosting habitat) and 499 acres (96%) of modeled foraging habitat for this species within Covered Lands. Other protection measures in the conservation plan include avoidance of habitat disturbances during construction activities that could result in direct disturbance or injury to individuals, reducing impacts of cattle grazing on riparian habitat, distributing educational information to minimize human recreation disturbances, and establishing seasonal setbacks from roost and perch areas. These measures, together with the preservation of winter foraging, roosting, and perch habitat within Covered Lands would, pursuant to the BGEPA, further the eagle conservation goals of BGEPA and provide a net conservation benefit to the species consistent with the goal of stabilizing or increasing breeding populations.

The bald eagle was observed during the winter in the TMV Planning Area in association with Castac Lake, but no wintering congregations were observed. This suggests that the Covered Lands, while providing suitable wintering and foraging habitat for the bald eagle, are not extensively used by the species. To offset the loss of the 834 acres of modeled wintering habitat within Covered Lands, avoidance, minimization, and mitigation measures will be implemented to reduce direct and indirect impacts to wintering bald eagles, including preserving and enhancing preferred diurnal perches and high-quality roost trees associated with Castac Lake and restricting human activity within 500 feet of such roost sites between late October and March.

Preservation of 96% of modeled foraging and 42% of modeled wintering habitat, along with the avoidance, minimization, and mitigation measures, will provide adequate habitat to support the small number of wintering bald eagles expected to use the Covered Lands in the future. These habitats will be preserved within a large, unfragmented open space system. In addition, the bald eagle has an extremely broad range, breeding throughout Canada and portions of the United States, and wintering throughout the United States and portions of Canada and Mexico. In the context of the broad winter distribution of this species throughout North America and the estimated wintering population of 20,000 individuals (Buehler 2000), the loss of 834 acres of modeled wintering habitat and 5 acres of modeled foraging habitat within Covered Lands would not substantially affect this species' use of the Covered Lands as wintering habitat nor would it substantially affect the species within its broader wintering range. Further, under BGEPA, habitat loss does not equate to a take because BGEPA is not a habitat management law, and with the measures described below, no lethal take or "disturbance" of bald eagle individuals would occur as a result of Covered Activities.

6.2.2.3 BURROWING OWL

6.2.2.3.1 DISCUSSION OF POTENTIAL TAKE OF BURROWING OWL

Covered Activities would result in the permanent loss of 3,037 acres (9%) of modeled suitable habitat for burrowing owl (*Athene cunicularia)* within Covered Lands, including 2,485 acres

(10%) of modeled breeding/foraging habitat and 552 acres (7%) of modeled secondary breeding/foraging habitat,[3] based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-8* and *Appendix D* for description of methods used to develop the model). It is estimated that permanent habitat loss associated with Covered Activities could impact up to one active burrow if the burrowing owl were to nest or winter on Covered Lands in the future.

The burrowing owl has a high potential to winter within suitable habitat on non-surveyed portions of Covered Lands but a low potential to breed on site. As stated in Section 5.2.2.3.2, during various surveys conducted in portions of the Covered Lands, one migrant burrowing owl was observed near Tunis Ridge in non-native grassland at approximately 4,900 feet amsl (Dudek 2009). No burrowing owl breeding observations have been made during surveys in any portion of the Covered Lands (Dudek 2009). In addition, there are various California Natural Diversity Database (CNDDB) occurrences in the vicinity of the Covered Lands but none in the Covered Lands (CDFG 2007c).

With application of avoidance and minimization measures identified in Section 7.1.1.2.3 of this TU MSHCP, no burrowing owl individuals would be permanently lost in association with the permanent loss of 3,037 acres of modeled suitable habitat within Covered Lands. These avoidance and minimization measures include pre-construction surveys, California Department of Fish and Wildlife (CDFW)-approved burrow closure methods for non-nesting individuals, avoidance of active nest burrows in project disturbance zones, and 300-foot setbacks from nests established in proximity to project disturbance zones prior to initiation of construction activities.

No short-term construction-related impacts with potential non-permanent effects are expected to affect burrowing owls.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on burrowing owl include lighting effects.

Other Covered Activities with potential non-permanent effects on burrowing owl individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing in, trampling, and otherwise degrading primary and secondary breeding/foraging habitat), ranch operations related to maintenance of roads, utility maintenance, film production, exotic plant and animal species (e.g., pet cats and dogs), lighting effects, and human presence and associated passive and active recreation that could result in habitat degradation.

[3] Secondary habitat may not be adequate to meet all or most life history requirements of the species; typically secondary habitat itself is not adequate to support a species.

Conservation measures to address these threats are provided in Section 7.1.1.2.3.

6.2.2.3.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO BURROWING OWL

The western burrowing owl occurs from southern interior British Columbia, southern Alberta, southern Saskatchewan, and southern Manitoba, south through eastern Washington, central Oregon, and California to Baja California, east to western Minnesota, northwestern Iowa, eastern Nebraska, central Kansas, Oklahoma, eastern Texas, and Louisiana, the southern portion of Florida, and south to central Mexico. In many parts of the United States, the western burrowing owl's breeding range has been reduced, and it has been extirpated from certain areas, including western Minnesota, eastern North Dakota, Nebraska, and Oklahoma (Bates 2006), but the species is still widely distributed in western North America (Gervais et al. 2008). The winter range is much the same as the species' breeding range, but the majority of western burrowing owls that breed in Canada and the northern United States are believed to migrate south during September and October and north from March into the first week of May. Therefore, individuals observed in southern portions of the range during the winter may include both resident and migratory individuals (Haug et al. 1993). The subspecies occurring in Florida and Southern California are predominantly non-migratory (Thomsen 1971). The western burrowing owls in northern California are believed to migrate (Coulombe 1971).

Within Covered Lands, the burrowing owl was observed once during protocol surveys in the winter in 2007 in a lower elevation area in the northern portion of the site (Dudek 2009). Because of the relatively high elevation of the Covered Lands, the potential for the burrowing owl to breed on site is low, but cannot be completely dismissed.

Covered Activities would result in the permanent loss of 3,037 acres (9%) of modeled suitable habitat for burrowing owl within Covered Lands, including 2,485 acres (10%) of modeled breeding/foraging habitat and 552 acres (7%) of modeled secondary breeding/foraging habitat.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 22,406 acres (90%) of modeled breeding/foraging habitat and 7,521 acres (93%) of modeled secondary breeding/foraging habitat for this species within Covered Lands.

With this substantial level of preservation within a large, unfragmented open space system, adequate modeled breeding/foraging habitat would be conserved in Covered Lands to support the small wintering population of the burrowing owl anticipated to use the site in the future. Additional avoidance and minimization measures will be implemented to ensure that active breeding burrows are not disturbed by Covered Activities, including pre-construction and pre-activity surveys and avoidance of active nest burrows. Active wintering burrows will be evacuated using CDFW-approved burrow closure procedures. Furthermore, this species is broadly distributed throughout western North America, from Canada south to Central America. Within California, the burrowing owl occurs throughout the state except for the high mountains and humid, forested areas of

northwestern California. The main breeding population centers for the species are in the Imperial and Central valleys, where very large breeding populations remain in agricultural areas on private lands (Gervais et al. 2008).

With this level of conservation and avoidance/minimization measures, the loss of 2,485 acres (10%) of modeled breeding/foraging habitat and 552 acres (7%) of modeled secondary breeding/foraging habitat within Covered Lands, and up to one active burrow if the burrowing owl were to nest or winter in the project area in the future, would not substantially reduce the burrowing owl's use of Covered Lands and would not substantially affect the species within its broad migration/wintering and breeding range within California and its much larger range within western North and Central America.

6.2.2.4 GOLDEN EAGLE

6.2.2.4.1 DISCUSSION OF POTENTIAL TAKE OF GOLDEN EAGLE

Covered Activities would result in the permanent loss of 7,698 acres (7%) of modeled suitable habitat for golden eagle (*Aquila chrysaetos)* within Covered Lands, including 2,045 acres (6%) of modeled breeding/foraging habitat, 3,040 acres (9%) of modeled foraging habitat, and 2,613 acres (5%) of modeled primary breeding habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-9* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.4.1, golden eagle home range size, which is probably the same as the territory (Zeiner et al. 1990b), has been estimated to average 5,709 acres in Utah (Smith and Murphy 1973) and 8,092 acres in southwestern Idaho (Collopy and Edwards 1989). Radiotelemetry studies of golden eagles in the Snake River Birds of Prey National Conservation Area in Idaho, however, demonstrated that home ranges can be seasonally quite variable, ranging from 0.7 square mile (469 acres) to 32 square miles (20,575 acres) during the breeding season and from 5 square miles (3,384 acres) to 656 square miles (419,900 acres) during the non-breeding season (Marzluff et al. 1997). Because of the relatively large prey base on Tejon Ranch and the relative close proximity of the three known active nests within the TMV Planning Area, it is assumed that the home range sizes of nesting pairs on the ranch are at the lower end of the home range estimates provided in the literature and may possibly be similar to the average sizes noted by Smith and Murphy (1973) and Collopy and Edwards (1989); i.e., from 5,000 to 8,000 acres in size, and possibly smaller.

Three active nests were observed in the TMV Planning Area in 2007, which supports 23,344 acres of modeled suitable habitat for the golden eagle. Assuming exclusive territories, this represents about 7,781 acres of available suitable habitat per nest site. Based on documented home range sizes of this species and the density of nesting pairs observed in the TMV Planning Area, and assuming saturation of all modeled suitable habitat, the permanent loss of 7,698 acres of modeled suitable habitat within Covered Lands represent the potential loss of habitat possibly supporting one nesting pair. However, as discussed below, no actual lethal take under the FESA

or BGEPA of golden eagle individuals would occur as a result of habitat loss, and conservation measures are included to conserve substantial breeding and foraging habitat so as to preserve productivity for golden eagles in the area.

Human activity would increase as a result of development-related Covered Activities in proximity to golden eagle nest sites and foraging areas, resulting in long-term indirect effects to golden eagle. Breeding golden eagles appear to be quite sensitive to human presence; see Section 7.1.1.2.4 for detailed avoidance and minimization measures in the goals and objectives for golden eagle.

In addition to the short-term construction-related impacts and long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on golden eagle include lighting effects.

Other Covered Activities with the potential to cause non-permanent effects on golden eagle individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading primary breeding, breeding/foraging, and foraging habitat), ranch operations related to maintenance of roads, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the golden eagle is a California Fully Protected species and a species covered by the Federal BGEPA, avoidance and minimization measures proposed in Section 7.1.1.2.4 of this TU MSHCP are designed to conserve substantial areas of suitable nest and foraging habitat so as to preserve productivity and territory integrity for golden eagles in the area, to avoid lethal take, and to prevent disturbance to individuals or their nests. To date, three active primary nest sites have been identified. Prior to grading for the backbone infrastructure, surveys (which will inform the site constraints planning effort for potential development sites) would be conducted during the breeding season within 1.0 mile of construction areas to determine the status of those previously identified nests and to identify any associated recently established alternate nests by existing eagle pairs, or recently constructed nests by new golden eagle pairs. All active primary and alternate nests will be preserved.

If new golden eagle nests of new eagle pairs are located, a nest-specific analysis will be prepared to identify the primary nest and establish its viewshed (the “Viewshed”). Based on the known behavior of golden eagles to construct alternate tree nests within relatively close proximity to each other, often within the same stand or grove of trees, alternate nest sites will generally be protected by the same viewshed analysis as applied to primary active nests. Regardless, because suitable nest habitat for alternate nest sites exist within the viewshed of the primary nest (as evidenced by the three known existing nest sites), even if alternate nests do not occur within the existing established viewshed areas of known primary nests, adequate nesting and foraging habitat would be preserved within the viewshed protection areas for those primary nests such that the integrity of the existing

eagle nest territories are expected to be preserved and continue to be active. Further, active alternate nests will not be removed and avoidance and minimization measures for primary and alternate nests apply as set forth in Section 7.1.1.2.4.

6.2.2.4.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO GOLDEN EAGLE

The golden eagle primarily occurs in the western regions of North America and breeds locally from Alaska southward to northern Baja California, Mexico, northern central Mexico, and eastward to the western Great Plains. Although recent population estimates are lacking, Olendorff et al. (1981) estimated over 63,000 wintering individuals in 16 western states. Braun et al. (1975) estimated over 100,000 individuals in North America in the 1970s. Estimates of breeding pairs in two western states include 1,200 in Nevada (Herron et al. 1985) and 500 in California (Thelander 1974). Because there are no defined discrete "core" populations of golden eagles in California and suitable habitat for this species is more or less contiguous between California and neighboring areas, the scale for analyzing impacts of the take of golden eagle, from both a habitat and species perspective, includes the entire range of the species in the western United States.

Surveys in the TMV Planning Area documented four golden eagle nest sites, three of which were active in 2007 (Dudek 2009). Numerous foraging and soaring observations were also made during the 2007 surveys. Based on these surveys, the golden eagle is expected to occur throughout Covered Lands in suitable habitat.

Covered Activities would result in the permanent loss of 7,698 acres (7%) of modeled suitable habitat for golden eagle within Covered Lands, including 2,045 acres (6%) of modeled breeding/foraging habitat, 3,040 acres (9%) of modeled foraging habitat, and 2,613 acres (5%) of modeled primary breeding habitat. Based on documented home range sizes of this species, on the density of nesting pairs observed in the TMV Planning Area, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat potentially supporting one nesting pair. Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 45,357 acres (95%) of modeled primary breeding habitat, 30,972 acres (94%) of modeled breeding/foraging habitat, and 30,791 acres (91%) of modeled foraging habitat for this species within Covered Lands. Assuming that home range sizes of nesting golden eagles on the ranch are, as discussed previously, at the lower end of range size estimates given in the literature (i.e., 5,000 to 8,000 acres), the conservation of 30,972 acres of modeled breeding/foraging habitat and 30,791 acres of modeled foraging habitat is considered more than adequate to support the three known active nest territories within the TMV Planning Area, as well as several additional territories that may occur within Covered Lands. Assuming home ranges of 5,000 to 8,000 acres, conservation of 61,763 acres of modeled breeding/foraging and modeled foraging habitat could support an estimated 8 to 12 pairs on Covered Lands. No lethal take of golden eagle under the FESA, Migratory Bird Treaty Act (MBTA), or BGEPA would occur. All known active golden eagle nest sites on site would be conserved.

With this substantial conservation of modeled primary breeding, breeding/foraging, and foraging habitat in a large, unfragmented open space system, adequate modeled habitat would be conserved in Covered Lands to continue to support breeding pairs of the golden eagle on site. In addition, specific avoidance and minimization measures will be implemented to address the potential that active nest sites are disturbed or abandoned. These measures include development and disturbance setbacks from all known active eagle nests; surveys for newly established eagle nests (including active alternate nests); development of a pre-construction viewshed analysis on all newly located nests within 1.0 mile of anticipated grading activity; implementation of viewshed setbacks and protocols to avoid direct and indirect impacts to existing/known active nests and any newly established active nests (including active alternative nests) and associated foraging habitat; lighting directed away from suitable nesting/foraging habitat; reduction of cattle-related impacts on nesting/foraging habitat; and the distribution of educational information to avoid/minimize recreational impacts. These measures, together with the preservation of the vast majority of modeled primary breeding/foraging habitat for golden eagles within Covered Lands, are, pursuant to BGEPA, compatible with the preservation of golden eagles and consistent with the goal of maintaining stable breeding populations. Further, under BGEPA, habitat loss or loss of future breeding potential does not equate to a take because BGEPA is not a habitat management law, and with the measures described, no lethal take or "disturbance" of bald eagle individuals would occur as a result of Covered Activities.

The golden eagle occurs throughout western North America, from Alaska to northern Mexico, with an estimated number of up to 100,000 individuals (Braun et al. 1975; Olendorff et al. 1981). This species occurs throughout California, occupying all but the Central Valley, southeastern desert region, and Los Angeles basin. Therefore, as a result of the conservation and avoidance/minimization measures, the presence and use of the Covered Lands by the golden eagle will not be substantially reduced by the Covered Activities nor would they substantially reduce the species within its broader range in California and the western United States.

6.2.2.5 LEAST BELL'S VIREO

6.2.2.5.1 DISCUSSION OF POTENTIAL TAKE OF LEAST BELL'S VIREO

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for least Bell's vireo (*Vireo bellii pusillus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-10* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.5.1, least Bell's vireo territory ranges in size from 0.5 to 7.4 acres (Kus 1992), with most averaging between 0.7 and 2.5 acres (USFWS 1998). Assuming a territory size of 2 acres, a uniform, non-overlapping distribution of individuals, and saturation of the entire 8 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to two active breeding territories.

This estimate is considered to be high for two main reasons. First, as stated in Section 5.2.2.5.3, protocol survey results for the least Bell's vireo in suitable habitat within the TMV Planning Area were negative, indicating that this species, if present, does not occur on the Covered Lands at a saturation level. Second, vegetation mapping in 2007 for the TMV Planning Area, as described in Section 5.1, as well as the protocol surveys for the species, did not identify substantial polygons of modeled suitable habitat containing the type of vegetation structure that typically supports breeding populations of the least Bell's vireo (see Section 5.2.2.5.2). Thus, the estimate that two active breeding territories within the 8 acres of permanently lost modeled suitable habitat would be affected is considered to be high. A more reasonable estimate would be to assume that the 8 acres to be permanently lost could support one or two active least Bell's vireo breeding territories because not all modeled suitable habitat is expected to be occupied for the reasons given above. Also, because the riparian vegetation on the Covered Lands does not have the typical structure required by the least Bell's vireo, it is likely that if the species occurs on site, its territories would be larger than 2 acres. The potential impact to up to two active breeding territories by Covered Activities would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.5 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting vireos are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on least Bell's vireo include impacts to water quality and noise levels.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on least Bell's vireo include lighting effects.

Other Covered Activities with potential non-permanent effects on least Bell's vireo individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.5.

6.2.2.5.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO LEAST BELL'S VIREO

The least Bell's vireo is nearly endemic to California, with its known historical range extending from northern Baja California, Mexico, north to the Sacramento and San Joaquin valleys west of the Sierra Nevada. With the exception of a few scattered locations, breeding populations of the least Bell's vireo currently occur in Southern California south of the Tehachapi Mountains, and

is not known to presently occur in Kern County. According to the USFWS (2006), there are about 3,000 territories within 9 California counties. Major breeding populations occur along the Santa Clara, Santa Ana, Santa Margarita, San Luis Rey, and Tijuana rivers. The Covered Lands are situated just north of its known current range in Southern California.

Critical habitat is designated for vireo in occupied areas identified as essential to supporting the recovery of the species. No critical habitat for vireo is designated within or adjacent to the Covered Lands.

Protocol surveys for the least Bell's vireo conducted in the TMV Planning Area in 2007 were negative and the potential for the species to nest on Covered Lands is considered to be low. However, modeled breeding habitat occurs on site and the potential for the species to nest on Covered Lands in the future cannot be dismissed.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for least Bell's vireo within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled breeding/foraging habitat, this would amount to a potential loss of habitat supporting up to four active breeding territories. However, based on the negative survey results within a portion of the Covered Lands, current distribution data, and because not all modeled habitat is expected to be occupied by this species, it is estimated that there could be modeled habitat loss resulting in the loss of no more than one or two active breeding territories prior to implementation of avoidance and minimization measures. The potential impacts to active nests and breeding territories would be further reduced with the application of all avoidance and minimization measures (pre-construction surveys, avoidance and setbacks to protect breeding vireos).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 582 acres (95%) of modeled breeding/foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging habitat would be conserved on site within a large, unfragmented open space system to support any future breeding least Bell's vireo. In addition, this species' breeding range is broad, extending from Sacramento and the San Joaquin Valley south to northern Baja California, Mexico, with the vast majority of breeding locations in Southern California. Rangewide, the loss of a maximum of two active breeding territories prior to implementation of avoidance and minimization measures represents about 0.07% of the estimated 2,968 breeding territories (USFWS 2006). The permanent loss of 1% of modeled breeding/foraging habitat for least Bell's vireo within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within its breeding range.

6.2.2.6 LITTLE WILLOW FLYCATCHER

6.2.2.6.1 DISCUSSION OF POTENTIAL TAKE OF LITTLE WILLOW FLYCATCHER

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled foraging/winter stopover habitat for little willow flycatcher (*Empidonax traillii brewsteri*) within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-11* and *Appendix D* for description of methods used to develop the model). The little willow flycatcher is not expected to breed on Covered Lands, thus no impacts would occur to breeding pairs. As stated in Section 5.2.2.6.1, the little willow flycatcher breeds in California from Tulare County north along the western side of the Sierra Nevada and Cascades, extending to the coast in northern California. It is a rare to locally uncommon summer resident from 1,969 to 8,005 feet amsl, and a common spring (mid-May to early June) and fall (mid-August to early September) migrant at lower elevations throughout the state, exclusive of the north coast (Zeiner et al. 1990b). Most of the remaining breeding populations occur in isolated mountain meadows of the Sierra Nevada and Cascades (Sanders and Flett 1989). Also, as stated in Section 5.2.2.6.3, foraging willow flycatchers were observed in the TMV Planning Area during protocol surveys for southwestern willow flycatcher and least Bell's vireo (Dudek 2009). These individuals were determined to most likely be little willow flycatchers due to the timing of the observations; they were observed during the first two protocol survey periods in 2007 but were absent during the third protocol survey period, indicating that they were using the site during migration. No willow flycatchers were observed nesting in the TMV Planning Area and none are expected to nest on Covered Lands.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on little willow flycatcher include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on little willow flycatcher include lighting effects.

Other Covered Activities with potential non-permanent effects on little willow flycatcher individuals and/or modeled foraging/winter stopover habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading foraging/winter stopover habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.6.

6.2.2.6.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO LITTLE WILLOW FLYCATCHER

The little willow flycatcher breeds in California from Tulare County north along the western side of the Sierra Nevada and Cascades, extending to the coast in northern California (Craig and Williams 1998), but migrates across Southern California. Due to the lack of information in the CNDDB regarding the little willow flycatcher, the closest known breeding population of the little willow flycatcher to the Covered Lands is assumed to be just north in Tulare County, along the western side of the Sierra Nevada approximately 60 miles north of the Covered Lands. Current information suggests that there may be as few as 100 breeding territories of little willow flycatchers within the entire range of the species (based on information provided in Craig and Williams 1998), and is used as the index for the magnitude of the number of individuals that may migrate through the Covered Lands.

Several foraging willow flycatchers were observed during the first two site visits during protocol surveys for the southwestern willow flycatcher conducted in 2007 in the TMV Planning Area. About 11 individuals were observed during the first protocol survey and fewer individuals were observed during the second protocol survey. Willow flycatchers were absent during the third protocol survey and no willow flycatchers were observed nesting. The willow flycatchers observed on site are assumed to be the little willow flycatcher subspecies. For this reason, impacts are considered in the context of effects on suitable foraging/winter stopover habitat for several individuals. With only up to 100 breeding pairs of little willow flycatcher overall, it is unlikely that substantially more than the maximum of 11 individuals observed in 2007 would occur on site unless there was a dramatic increase in the breeding population.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled foraging/winter stopover habitat for little willow flycatcher within Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled foraging/winter stopover habitat for this species within Covered Lands.

This level of conservation would provide adequate foraging/winter stopover habitat for the little willow flycatcher in a large, unfragmented open space system to support the several individuals expected to use the Covered Lands during migration each spring. In addition, this subspecies, which nests just north of Tulare County west of the Sierra Nevada, migrates across Southern California. The Covered Lands, therefore, are not a critical stopover site for migrating individuals. Based on 2007 surveys, it is estimated that approximately 10 to 15 individuals typically use the site at any given time during migration and these levels are not expected to be substantially reduced by the 1% reduction of modeled foraging/winter stopover habitat within Covered Lands. Further, the little willow flycatcher within its range would not be substantially

affected because of its broad migration pattern and because its breeding habitat is located north of Tulare County.

6.2.2.7 PURPLE MARTIN

6.2.2.7.1 DISCUSSION OF POTENTIAL TAKE OF PURPLE MARTIN

Covered Activities would result in the permanent loss of 4,762 acres (6%) of modeled breeding/foraging habitat for purple martin (*Progne subis)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-12* and *Appendix D* for description of methods used to develop the model). Surveys of the TMV Planning Area yielded an estimate of 5 to 10 purple martin breeding pairs in a total of 16,848 acres of modeled suitable habitat; that is, a range of 1,685 to 3,370 acres per active territory/breeding pair. Assuming a similar density and distribution of active territories/breeding pairs on the 85,870 acres of modeled breeding/foraging habitat on Covered Lands, Covered Lands could support 25 to 50 breeding pairs. This estimate is consistent with a recent estimate of 100 to 200 pairs in the Tehachapi Mountains (Airola and Williams 2008). In 1982, the southern Tejon Ranch/Grapevine area supported between approximately 40 and 100 pairs of purple martins (Airola and Williams 2008). At a range of 1,685 to 3,370 acres per pair, it is estimated that one to three active nest sites would be permanently lost with the permanent loss of 4,762 acres of modeled breeding/foraging habitat within Covered Lands. The potential impact to individuals and active nests affected by Covered Activities would be avoided with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.7 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting purple martins are observed.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on purple martin include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on purple martin include lighting effects.

Other Covered Activities with potential non-permanent effects on purple martin individuals and/or modeled breeding/foraging habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.7.

6.2.2.7.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO PURPLE MARTIN

The purple martin primarily occurs from British Columbia in the north, east to Nova Scotia, and south to Baja California, central Mexico, and the Gulf Coast. Although the species' winter range is not well known, the species primarily winters in Amazonia and south-central Brazil (AOU 1998). The western population of purple martin, which is the basis for this impacts of take analysis, and as described by the Western Purple Martin Working Group (2005), includes breeding purple martins in California, Oregon, Washington, and British Columbia. The current population estimate for the western population of purple martins is approximately 3,500 pairs, which includes approximately 1,300 pairs in California (Western Purple Martin Working Group 2005).

Approximately 5 to 10 pairs of purple martins were observed in the TMV Planning Area in 2007, and it is expected to occur in suitable habitat throughout Covered Lands.

Covered Activities would result in the permanent loss of 4,762 acres (6%) of modeled breeding/foraging habitat for purple martin within Covered Lands. Assuming a similar density and distribution of active territories on Covered Lands as was observed in the TMV Planning Area, Covered Lands could support 25 to 50 breeding territories/pairs. It is estimated that one or two active nest sites could be permanently lost prior to application of avoidance and minimization measures to protect individuals and active nests. After application of all avoidance and minimization measures (pre-construction surveys, avoidance during breeding season), there would be no permanent loss of purple martin individuals or active nests.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 81,015 acres (94%) of modeled breeding/foraging habitat for this species within Covered Lands.

This level of conservation would provide adequate modeled breeding/foraging habitat in a large, unfragmented open space system for an estimated 23 to 48 breeding territories/pairs of purple martins on Covered Lands (e.g., there were 5 to 10 pairs within the TMV Planning Area alone). This species has a large breeding range in North America and an estimated breeding population in the western states of California, Oregon, and Washington and British Columbia of 3,500 pairs, with 1,300 pairs in California (Western Purple Martin Working Group 2005; Airola and Williams 2008). Therefore, the loss of no more than three active nest sites would not substantially affect the purple martin's presence on Covered Lands. Further, the loss of no more than three active nests represents about 0.2% of the estimated 1,300 pairs in California and about 0.09% of the estimated 3,500 pairs in the western population. The permanent loss of 6% of modeled breeding/foraging habitat for the purple martin within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within California or within the western population.

6.2.2.8 SOUTHWESTERN WILLOW FLYCATCHER

6.2.2.8.1 DISCUSSION OF POTENTIAL TAKE OF SOUTHWESTERN WILLOW FLYCATCHER

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for southwestern willow flycatcher (*Empidonax traillii extimus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-13* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.8.1, southwestern willow flycatcher territory sizes range from 0.25 to 5.7 acres, with most territories ranging from 0.5 to 1.2 acres (USFWS 2002c). In addition, flycatchers often cluster their territories into small portions within a riparian site and major portions of the site may be occupied irregularly or not at all (USFWS 2002c). Assuming a territory size of 1 acre, a uniform, non-overlapping distribution of individuals, and saturation of the entire 8 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to eight territories.

This estimate is considered to be high for two main reasons. First, as stated in Section 5.2.2.8.3, protocol survey results for the southwestern willow flycatcher in suitable habitat within the TMV Planning Area were negative, indicating that this species, if present, does not occur on the Covered Lands at a saturation level. Also, as noted above, this species also tends to cluster its territories in small portions of a riparian site. Second, vegetation mapping in 2007 for the TMV Planning Area, as described in Section 5.1, as well as the protocol surveys for the species, did not identify substantial polygons of modeled breeding/foraging habitat containing the type of vegetation structure that typically supports breeding populations of the southwestern willow flycatcher (see Section 5.2.2.8.2). Thus, the estimate that eight territories within the 8 acres of permanently lost modeled breeding/foraging habitat would be affected is considered to be high. A more reasonable estimate would be to assume that the 8 acres to be permanently lost could support one or two breeding territories of southwestern willow flycatcher because not all modeled breeding/foraging habitat is expected to be occupied for the reasons given above. Also, because the riparian vegetation on the Covered Lands does not have the typical structure required by the southwestern willow flycatcher, it is likely that if the species occurs on site, its territories would be larger than 1 acre. The potential impact to up to two active breeding territories by Covered Activities would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.8 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting southwestern willow flycatchers are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on southwestern willow flycatcher include impacts to water quality and noise levels.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on southwestern willow flycatcher include lighting effects.

Other Covered Activities with potential non-permanent effects on southwestern willow flycatcher individuals and/or modeled breeding/foraging habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.8.

6.2.2.8.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO SOUTHWESTERN WILLOW FLYCATCHER

The southwestern willow flycatcher breeding range includes Southern California, southern Nevada, Arizona, and New Mexico (Garrett and Dunn 1981). Its breeding distribution is relatively small, isolated, and broadly scattered (USFWS 2002c). Based on the most recent estimate for breeding sites and territories, there were approximately 1,299 documented territories rangewide and approximately 172 territories in California (Durst et al. 2008). Critical habitat is designated for southwestern willow flycatcher in occupied areas identified as essential to supporting the recovery of the species. No critical habitat for southwestern willow flycatcher is designated within or adjacent to the Covered Lands.

Several foraging willow flycatchers were observed during the first two site visits during protocol surveys for the southwestern willow flycatcher conducted in 2007 in the TMV Planning Area (Dudek 2009). About 11 individuals were observed during the first protocol survey and fewer individuals were observed during the second protocol survey. Willow flycatchers were absent during the third protocol survey and no willow flycatchers were observed nesting. For this reason, the willow flycatchers observed on site are assumed to be the little willow flycatcher subspecies and not the southwestern willow flycatcher subspecies. The potential for southwestern willow flycatcher to nest on site is considered to be low, but its potential to nest on site in the future cannot be dismissed.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for southwestern willow flycatcher within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled

breeding/foraging habitat, this would amount to a potential loss of modeled breeding/foraging habitat supporting up to eight breeding territories. However, based on the negative survey results within a portion of the Covered Lands, current distribution data for this species, and because not all modeled breeding/foraging habitat is expected to be occupied by this species, it is estimated that there could be habitat loss potentially supporting no more than one or two active breeding territories of southwestern willow flycatcher, if they occurred within Covered Lands, prior to implementation of avoidance and minimization measures. The impacts to nest sites and breeding territories would be further reduced with the application of all avoidance and minimization measures (pre-construction surveys and avoidance and setbacks to protect breeding southwestern willow flycatchers).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled breeding/foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging habitat would be conserved on site in a large, unfragmented open space system to support any future breeding southwestern willow flycatchers. In addition, the current known breeding range of this subspecies does not extend north to the Covered Lands, with known breeding locations limited to Southern California, southern Nevada, Arizona, and New Mexico (Garrett and Dunn 1981). Nonetheless, rangewide, the loss of a maximum of two breeding territories represents about 0.15% of the estimated 1,299 breeding territories rangewide and 1.16% of the estimated 172 breeding territories in California (Durst et al. 2008). The permanent loss of 1% of modeled breeding/foraging habitat for southwestern willow flycatcher within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within its breeding range.

6.2.2.9 TRICOLORED BLACKBIRD

6.2.2.9.1 DISCUSSION OF POTENTIAL TAKE OF TRICOLORED BLACKBIRD

Covered Activities would result in the permanent loss of 1,130 acres (6%) of modeled suitable habitat for tricolored blackbird (*Agelaius tricolor)* within Covered Lands, including 1,107 acres (6%) of modeled foraging habitat and 23 acres (8%) of modeled primary breeding habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-14* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.9.3, the tricolored blackbird has been observed nesting and foraging in the southwestern portion of the TMV Planning Area around Castac Lake; the observed population was approximately 15 individuals. As described in Section 5.2.2.9.1, tricolored blackbirds nest in colonies, unlike many species whose breeding sites are well-spaced. Certain disturbances may result in the abandonment of the entire colony (Beedy and Hamilton 1999). For this reason, the

breeding site unit of analysis for the tricolored blackbird is the entire colony location as opposed to individual nest sites. All 289 acres of modeled primary breeding habitat are in the TMV Planning Area, so it is very unlikely that breeding colonies occur on other portions of Covered Lands. Because there was one breeding colony observed on site, the permanent loss of 23 acres of primary breeding habitat within Covered Lands would result in the potential loss of one active nesting colony of tricolored blackbird. The potential loss of one colony would be minimized through the avoidance and minimization measures identified for this species in Section 7.1.1.2.9 of this TU MSHCP, including pre-construction surveys and avoidance of construction if nesting tricolored blackbirds are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on tricolored blackbird include impacts to water quality, noise levels, inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on tricolored blackbird include lighting effects.

Other Covered Activities with potential non-permanent effects on tricolored blackbird individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading modeled foraging and primary breeding habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, use of pesticides, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.9.

6.2.2.9.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TRICOLORED BLACKBIRD

Tricolored blackbirds primarily occur in California (approximately 95% of the species (The Tricolored Working Group 2007)), but their range covers portions of Oregon and Washington, eastern Nevada, and northern Baja California, as well as central Mexico (Beedy and Hamilton 1999). Populations in California have been restricted to the Central Valley and surrounding foothills, coastal, and some inland localities in Southern California. Within California, the tricolored blackbird breeds locally west of the Cascade Range, Sierra Nevada, and southeastern deserts, from Humboldt and Shasta counties south to extreme southwestern San Bernardino County, western Riverside County, and western and southern San Diego County. In central

California, breeding extends east into the foothills of the Sierra Nevada. It also breeds in the marshes of Klamath Basin in Siskiyou and Modoc counties and Honey Lake Basin in Lassen County (Beedy and Hamilton 1999). The most recent census of the tricolored blackbird population in 2005 estimates a population of approximately 260,000 in California (The Tricolored Working Group 2007).

A small population of tricolored blackbirds numbering about 15 individuals was observed foraging and nesting in the southwestern portion of the TMV Planning Area around Castac Lake in 2007. The tricolored blackbird is considered to have a high potential to forage elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands, but because modeled suitable wetland breeding habitat is limited, it is considered to have very low potential to nest on Covered Lands outside of the TMV Planning Area.

Covered Activities would result in the permanent loss of 1,130 acres (6%) of modeled suitable habitat for tricolored blackbird within Covered Lands, including 1,107 acres (6%) of modeled foraging habitat and 23 acres (8%) of modeled primary breeding habitat. Based on the TMV 2007 survey, which includes modeled suitable breeding habitat with the highest potential for a breeding colony on Covered Lands, it is estimated that one colony of tricolored blackbird could be affected by Covered Activities prior to implementation of avoidance and minimization measures. The potential for the loss of one nesting colony would be reduced with application of all avoidance and minimization measures (pre-construction surveys, avoidance and setbacks to protect the breeding colony).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 17,373 acres (94%) of modeled foraging habitat and 198 acres (68%) of modeled primary breeding habitat for this species within Covered Lands.

With this level of conservation, adequate modeled foraging habitat and modeled breeding habitat would be conserved on site in a large, unfragmented open space system to support the observed small breeding population and additional small breeding populations. In addition, this species is still widespread in California in the Central Valley, the Central Coast region, and the coastal and desert regions of Southern California. The estimated population in California in 2005 was approximately 260,000 (The Tricolored Working Group 2007). Therefore, the loss of one potential small nesting colony of similar size to that observed in the TMV Planning Area (approximately 15 individuals) would represent 0.006% of the total estimated population in California. Covered Activities would not substantially affect the future use of Covered Lands for foraging and breeding by tricolored blackbirds nor would they substantially affect the species within its California range.

6.2.2.10 WESTERN YELLOW-BILLED CUCKOO

6.2.2.10.1 DISCUSSION OF POTENTIAL TAKE OF WESTERN YELLOW-BILLED CUCKOO

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for western yellow-billed cuckoo (*Coccyzus americanus occidentalis)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-15* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.10.1, western yellow-billed cuckoo home ranges are quite large at 20 to 100 acres or more of riparian habitat (Gaines 1974; Laymon and Halterman 1987). Home ranges in the south fork of the Kern River averaged about 42 acres (Laymon et al. 1993). Assuming a minimum territory size of 20 acres, the permanent loss of 8 acres of modeled breeding/foraging habitat within Covered Lands would result in the loss of modeled habitat supporting at most one breeding territory of the western yellow-billed cuckoo.

This estimate is considered to be high for two reasons. First, focused surveys in the TMV Planning Area were negative for this species (Dudek 2009). Second, TMV vegetation mapping did not identify areas with appropriate patch size or configuration likely to support breeding territories, and it was concluded that the potential for western yellow-billed cuckoo to nest or forage in the TMV Planning Area is very low. Further, the permanent loss of active nests and breeding territories would be avoided through the avoidance and minimization measures identified for this species in Section 7.1.1.2.10 of this TU MSHCP, including pre-construction surveys and avoidance of construction if nesting cuckoos are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on western yellow-billed cuckoo include impacts to water quality and noise levels.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on western yellow-billed cuckoo include lighting effects.

Other Covered Activities with potential non-permanent effects on western yellow-billed cuckoo individuals and/or modeled breeding/foraging habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.10.

6.2.2.10.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO WESTERN YELLOW-BILLED CUCKOO

The yellow-billed cuckoo full species summers and nests from interior California east to New Brunswick, Canada, and sporadically southward to southern Mexico. The species presumably migrates throughout much of North America and winters primarily from northern to central South America (AOU 1998). Within California, the western yellow-billed cuckoo subspecies is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations (Zeiner et al. 1990b). It breeds along the Colorado River; in the Sacramento and Owens valleys; along the South Fork of the Kern River, Kern County; along the Santa Ana River, Riverside County; and along the Amargosa River, Inyo and San Bernardino counties (Zeiner et al. 1990b). The Covered Lands are situated in the central portion of the known current range for western yellow-billed cuckoo in California. There has not been a systematic statewide survey of western yellow-billed cuckoo in California since 1987, but the most recent estimate showed a decline of 123 to 163 pairs in 1977 to 30 to 33 pairs in 1987, or a 73% to 82% decline over this 10-year time period (Laymon 1998).

Focused surveys for western yellow-billed cuckoo in the TMV Planning Area in 2007 were negative and the vegetation mapping for the TMV Planning Area indicates that the site does not support areas with appropriate patch size or configuration to support breeding pairs of this species. On the remainder of Covered Lands the available vegetation data did not allow for such a refined analysis of patch size and configuration, but due to the general lack large riparian zones in the TMV Planning Area, it is assumed that the potential for the western yellow-billed cuckoo to nest or forage on Covered Lands overall is very low. However, the potential for the species to nest or forage on Covered Lands cannot be completely dismissed.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for western yellow-billed cuckoo within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled breeding/foraging habitat, this would amount to a potential loss of habitat supporting one or two breeding territories. Based on the negative survey results within a portion of the Covered Lands, current distribution data for this species, and because not all modeled breeding/foraging habitat is expected to be occupied by this species, it is estimated that there could be habitat loss potentially supporting one western yellow-billed cuckoo breeding territory, if occurring within Covered Lands, prior to application of avoidance and minimization measures to protect individuals and active nests. After application of all avoidance and minimization measures (pre-construction surveys, avoidance during breeding season), there would be no permanent loss of western yellow-billed cuckoo individuals or active nests.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled breeding/foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging habitat would be conserved on site in a large, unfragmented open space system to support any future breeding pairs of the western yellow-billed cuckoo. The species breeds throughout the eastern United States and the western subspecies nests locally in scattered locations throughout California, including along the Colorado River; in the Sacramento and Owens valleys; along the South Fork of the Kern River, Kern County; along the Santa Ana River, Riverside County; and along the Amargosa River, Inyo and San Bernardino counties (Zeiner et al. 1990b). The potential loss of one breeding territory would represent about 3.0% to 3.3% of the 30 to 33 pairs estimated in 1987 (Laymon 1998). The permanent loss of 1% of modeled breeding/foraging habitat for western yellow-billed cuckoo within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within its California range.

6.2.2.11 WHITE-TAILED KITE

6.2.2.11.1 DISCUSSION OF POTENTIAL TAKE OF WHITE-TAILED KITE

Covered Activities would result in the permanent loss of 1,874 acres (21%) of modeled foraging habitat for white-tailed kite (*Elanus leucurus)* within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-16* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.11.1, the white-tailed kite forages from a central perch over areas as large as 1.9 square miles (1,216 acres) (Warner and Rudd 1975). Assuming saturation of all modeled foraging habitat, the permanent loss of 1,874 acres within Covered Lands could result in the permanent loss of one foraging range for the white-tailed kite.

As stated in Section 5.2.2.11.3, the white-tailed kite has been observed foraging in the TMV Planning Area (Dudek 2009), but, for several reasons, is not expected to nest in areas where Covered Activities would result in permanent habitat loss. Generally, the elevation of the Covered Lands is too high for this species: the species avoids areas that freeze (Dunk 1995). The Covered Lands are generally above 2,000 feet amsl on the north (San Joaquin Valley) side of the mountains and on the south (Antelope Valley) side, the elevation ranges from about 3,200 feet amsl to about 4,700 feet amsl, following the Los Angeles County line, with an average elevation of 4,100 feet amsl. CNDDB records for breeding kites range in elevation from sea level to 640 meters amsl (sea level to 2,100 feet). The TMV Project, where the large majority (88%) of habitat loss on Covered Lands would occur, ranges in elevation from 2,586 to 5,408 feet amsl, and the majority of the TMV Project is at the middle elevation range of approximately 3,400 to 4,399 feet. Although the species was observed foraging on site, non-breeding white-tailed kites

are known to have nomadic movements and to respond to prey populations. In addition, they can be present within an area as a non-breeding individual and may forage miles from their roost site in response to areas that may be good for foraging (Dunk 1995). Suitable foraging habitat needs to be associated with a water source for this species (Faanes and Howard 1987). The suitable foraging habitat was modeled to represent this association using the best available information; however, based on review of the areas that were modeled as suitable, most of the drainages that were included are intermittent and would not provide the required association with a water source. The area that does provide this resource is associated with Castac Lake and Grapevine Creek where the white-tailed kite has been observed foraging. Castac Lake and Grapevine Creek will be preserved under the TU MSHCP.

Typical breeding locations for this raptor are located within a variety of species of trees that are of moderate height and near a food source, no more than approximately 1.2 miles from the foraging area (Faanes and Howard 1987). Since most of the potential grassland and marshland foraging areas are at elevations that are higher than where the white-tailed kite has been recorded and few of the foraging areas within the ecoregion are adjacent to permanent water sources, the foraging habitat would not be expected to be saturated by the white-tailed kite or used in conjunction with breeding; thus, it is likely that the Covered Lands provide suitable foraging for a portion of one foraging range. In addition, no active nest sites in the TMV Planning Area were detected and, due to the behavior of the species, nesting activity is very easily observed. For these reasons, while the potential for the white-tailed kite to forage within suitable habitat on non-surveyed portions of Covered Lands is high, this species is not expected to breed on site.

Nonetheless, impacts to the white-tailed kite can include the following. In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on white-tailed kite include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on white-tailed kite include lighting effects.

Other Covered Activities with potential non-permanent effects on white-tailed kite individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading modeled foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the white-tailed kite is a California Fully Protected species, avoidance and minimization measures proposed in Section 7.1.1.2.11 of this TU MSHCP are designed to address the potential impacts listed above and avoid lethal take. No white-tailed kite individuals or active nest sites would be lost in association with the permanent loss of 1,874 acres of modeled foraging habitat

within Covered Lands. Measures related to commercial and residential Covered Activities include pre-grading construction surveys, establishment of a 500-foot setback around active nests, if found, and monitoring of construction activities. Measures for long-term operational Covered Activities include providing 500-foot setbacks for active nests from recreational activities during the white-tailed kite breeding season; public education and regulation of recreation through the Public Access Plan; baseline surveys to inform management; pre-disturbance surveys prior to installation of infrastructure and trails, and contractor education, staking and temporary construction fencing, if found; and siting of new public access trails in consultation with the project biologist.

6.2.2.11.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO WHITE-TAILED KITE

White-tailed kites primarily occur along the west coast and primarily within California within the coastal and valley lowlands southward to northern Baja California and northern Mexico. Few data exist on the abundance of the white-tailed kite within its United States range. Because the majority of the kite population in the United States is within California, the impacts of incidental take are analyzed, from both a habitat and species perspective, in the context of the range of the species in California. Its yearling range in California includes the entire coastal area, the Central Valley, and the irrigated agricultural areas of the Southern California desert region from the Coachella Valley south to Imperial County. Its winter range also includes the western Mojave Desert.

The white-tailed kite was observed foraging in the TMV Planning Area in 2007, but no active nest sites were observed. Modeled foraging habitat is present on Covered Lands and the potential for the species to forage within modeled foraging habitat on non-surveyed portions of Covered Lands is considered to be high for areas that are associated with a permanent water source. The Covered Lands are not within the breeding range of the species, but because white-tailed kites have been observed foraging on site, because breeding habitat elements exist on site albeit outside of the elevation at which they occur, and because this species does have nomadic movements, the potential for breeding on site cannot be dismissed. Thus, the potential for breeding on site is considered to be low.

Covered Activities would result in the permanent loss of 1,874 acres (21%) of modeled foraging habitat for white-tailed kite within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled foraging habitat, this would amount to a potential loss of habitat supporting one foraging range. Based on the fact that the potential grassland foraging areas are outside of the elevation at which the species occurs and few of the foraging areas within the modeled suitable foraging habitat are adjacent to permanent water sources, and these foraging areas are located at higher elevations than what is recorded for the species, and because not all modeled habitat is expected to be occupied by this species, it is estimated that modeled foraging habitat loss would potentially affect no more than a portion of one foraging range. All active nest sites would be conserved and no lethal take would occur as a result of

application of all avoidance and minimization measures (pre-construction surveys for active nests and provision of protection zone around any active nests during construction activities).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 7,021 acres (78%) of modeled foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled foraging habitat would be conserved in large, unfragmented open space system on site to support white-tailed kites that currently forage on Covered Lands. In addition, this species has a broad range in California, including the entire coastal area, the Central Valley, the western Mojave Desert (winter range only), and the agricultural regions of the southern desert region from the Coachella Valley to Imperial County. The permanent loss of a portion of one foraging range within Covered Lands resulting from Covered Activities would not substantially affect the potential for the white-tailed kite to nest on site although breeding on site is unlikely. The permanent loss of 21% of modeled foraging habitat within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for foraging by the species. These impacts would not substantially affect foraging by the species within its California range.

6.2.2.12 YELLOW WARBLER

6.2.2.12.1 DISCUSSION OF POTENTIAL TAKE OF YELLOW WARBLER

Covered Activities would result in the permanent loss of 2,695 acres (5%) of modeled suitable habitat for yellow warbler (*Dendroica petechia brewsteri)* within Covered Lands, including 8 acres (1%) of modeled breeding/foraging habitat and 2,687 acres (5%) of modeled secondary foraging habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-17* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.12.1, the yellow warbler tends to have relatively small territories and home ranges, varying from 0.08 to 0.5 acre (Lowther et al. 1999), with peak densities measured in southeast Arizona reaching 119 birds per acre (Lowther et al. 1999). However, these densities are much higher than those observed in the TMV Planning Area, where surveys documented five potential breeding territories (based on singing males) in a total of 144 acres of modeled breeding/foraging habitat in the TMV Planning Area; that is, although this species may have small territories, the density observed on site was one breeding territory per 29 acres of the suitable habitat. Assuming a similar density and distribution of breeding territories on the 986 acres of modeled suitable breeding/foraging habitat on Covered Lands, the Covered Lands could support up to 34 breeding territories. At the observed density of one breeding territory per 29 acres, it is estimated that one active breeding territory would be permanently lost with the permanent loss of 8 acres of modeled breeding/foraging habitat within Covered Lands. The potential impacts to one active breeding territory and active nests by Covered Activities

would be avoided with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.12 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting yellow warblers are observed.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on yellow warbler include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on yellow warbler include lighting effects.

Other Covered Activities with potential non-permanent effects on yellow warbler individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.12.

6.2.2.12.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO YELLOW WARBLER

The yellow warbler is a widespread species that nests across much of North America and Baja California, Mexico, and winters from the southern United States to central South America (AOU 1998). In California, the yellow warbler is an uncommon to common summer resident in the north and is locally common in the south. It breeds in riparian woodlands southward from the northern border of the state generally west of the Sierra Nevada to the coastal slopes of southern California and from coastal and desert lowlands to montane chaparral and forest habitats (Lowther et al. 1999). Regional population estimates and population declines of yellow warbler have been documented by various studies, but there is no current estimate for the rangewide population size for the species and the local abundance and long-term trends of this species vary widely by region (Heath 2008).

Five potential yellow warbler breeding territories, based on the presence of singing males, were observed in the southwestern and central portions of the TMV Planning Area in 2007 during focused surveys for the least Bell's vireo and willow flycatcher. It is expected to breed in modeled breeding/foraging habitat throughout Covered Lands. Assuming a similar density and distribution in modeled breeding/foraging habitat as the TMV Planning Area, the Covered Lands could support up to 36 breeding territories.

Covered Activities would result in the permanent loss of 2,695 acres (5%) of modeled suitable habitat for yellow warbler within Covered Lands, including 8 acres (1%) of modeled

breeding/foraging habitat and 2,687 acres (5%) of modeled secondary foraging habitat. Assuming a similar density and distribution in modeled suitable habitat in the Covered Lands as the TMV Planning Area (i.e., one breeding pair per 29 acres), it is estimated that there could be habitat loss potentially supporting no more than one breeding territory of yellow warbler prior to implementation of avoidance and minimization measures. After application of all avoidance and minimization measures (pre-construction surveys, avoidance during breeding season), there would be no permanent loss of yellow warbler individuals or active nests.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled breeding/foraging habitat and 49,008 acres (95%) of modeled secondary foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging and modeled secondary foraging habitat would be conserved in a large unfragmented open space system on site to support up to an estimated 35 breeding territories of yellow warblers on site. In addition, this species' breeding and migration range includes virtually all of North America. Its breeding range in California is very widespread and includes all coastal areas, northern California north of the Central Valley, the foothills of the Sierra Nevada, and the Great Basin Desert. The permanent loss of 1% of modeled breeding/foraging habitat, 5% of modeled secondary foraging habitat, and no more than one active breeding territory within Covered Lands, resulting from permanent habitat loss associated with Covered Activities would not substantially affect the warbler breeding population on site. Although there are no current estimates of the yellow warbler breeding population in California (Heath 2008), impacts would not substantially affect breeding populations of this species within its California range.

6.2.3 INSECTS

6.2.3.1 [RESERVED]

6.2. MAMMALS

In addition to impacts from permanent habitat loss, other potential non-permanent effects to mammals include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on mammals vary by individual species.

Long-term (operational) impacts with potential non-permanent effects on mammals include exotic plant and animal species (e.g., pet cats), urban runoff, and lighting effects. As discussed above in Section 6.2.2, invasion of non-native plants has been found to modify the structure and composition of vegetation communities and some invasive plant species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause

changes in the pattern of plant succession. Native mammal populations may be threatened from exotic invasive species of animals, including pet cats, which often prey on native species. As noted above, as community organization is modified by exotic species, the native community relationships may be altered or eliminated. The potential impacts of urban runoff may result in increased flooding or inundation, which could result in conversion of more upland forest habitats to marshland habitats, thus resulting in loss of habitat for forest-dwelling species. Mammals that occur in more aquatic ecosystems or forage in aquatic ecosystems may be exposed to toxic substances in runoff or by ingesting food that has been exposed to toxins. The effects of artificial light on mammals may include disruption of foraging patterns, increased predation risk, disruption of biological clocks, increased mortality on roads, and disruption of dispersal movements (Beier 2006).

6.2.4.1 [RESERVED]

6.2.4.2 TEHACHAPI POCKET MOUSE

6.2.4.2.1 DISCUSSION OF POTENTIAL TAKE OF TEHACHAPI POCKET MOUSE

Covered Activities would result in the permanent loss of 57 acres (3%) of modeled suitable habitat for Tehachapi pocket mouse (*Perognathus alticolus inexpectatus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-20* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.4.2.1, the estimated home range for the Tehachapi pocket mouse is based on the data for the closely related Great Basin pocket mouse (*Perognathus parvus*), which is reported as ranging from 0.16 to 0.78 acre in British Columbia and south–central Washington (Howard 1996). Assuming an average home range of 0.5 acre, a uniform, non-overlapping distribution, and saturation of the entire 57 acres of modeled suitable habitat to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to about 114 Tehachapi pocket mouse individuals.

This estimate is considered to be high for several reasons. First, as stated in Section 5.2.4.2.1, the Tehachapi pocket mouse is known from a few scattered localities in the Tehachapi Mountains, from Tehachapi Pass on the northeast to the area of Mt. Pinos on the southwest, and around Elizabeth, Hughes, and Quail lakes on the southeast. A survey of a number of historical Tehachapi pocket mouse locations in the 1980s failed to record any Tehachapi pocket mouse individuals (Laabs 2008). Second, its documented occurrence in the TMV Planning Area was limited to 2 of approximately 27 trap lines in modeled suitable habitat; that is, 7% of the traplines were occupied by Tehachapi pocket mouse. It was found only in the southeastern portion of the TMV Planning Area between Oso and Dark canyons near the southern border of the site during various surveys (see Section 5.2.4.2.3). All of the occurrences in the TMV Planning Area are within the Antelope–Fremont Valley watershed, and the trapping study indicates that this is the northerly limit of the species' range. Although the percentage of traplines occupied cannot be

directly extrapolated to a percentage of modeled suitable habitat, it can be reasonably assumed that a strong positive correlation exists between the percentage of traplines in occupied habitat and the percentage of modeled suitable habitat occupied. Assuming a somewhat higher occupation rate of 10% to 15%, the number of Tehachapi pocket mouse individuals estimated to be permanently lost with the loss of the 57 acres of modeled suitable habitat within Covered Lands is 11 to 16 individuals (e.g., at 10%, 5.3 acres of habitat would be occupied with 1 individual/0.5 acre). This estimated loss would be reduced by about 60% to four to six individuals with application of avoidance and minimization measures identified for this species in Section 7.1.1.4.2, including a 5-night pre-construction live-trapping program in modeled suitable habitat within 7 days prior to commencement of ground disturbance activities and capture and release of individuals in the nearest suitable habitat outside the disturbance area.

Short-term construction-related impacts with potential non-permanent effects on Tehachapi pocket mouse include inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

Long-term (operational) impacts with potential non-permanent effects on mammals, including Tehachapi pocket mouse, are described in Section 6.2.4. Other Covered Activities with potential non-permanent effects on Tehachapi pocket mouse individuals and/or modeled suitable habitat include cattle-related impacts (e.g., trampling of, and otherwise degrading modeled suitable habitat), ranch operations related to maintenance of roads, utility maintenance, film production, use of rodenticides, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.4.2.

6.2.4.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TEHACHAPI POCKET MOUSE

Because of the relatively small and concentrated range of the Tehachapi pocket mouse, the impacts of incidental take of the species are analyzed, from both a habitat and species perspective, within the context of the small range of the species.

The Covered Lands are in the central portion of the range of the Tehachapi pocket mouse. Focused live-trapping studies were conducted in representative suitable habitat in the TMV Planning Area in 2007 and individuals were captured in the southeastern portion of the site between Oso and Dark canyons near the southern border of the site. Additionally, trapping surveys in 2010 documented the pocket mouse in the Bi-Centennial and Tri-Centennial conservation easement areas adjacent to the southeastern portion of the Covered Lands (Cypher et. al. 2010).

Covered Activities would result in the permanent loss of 57 acres (3%) modeled suitable habitat for Tehachapi pocket mouse within Covered Lands. Based on the live-trapping data for sampled traplines conducted to establish presence/absence, no documented occupied areas would be permanently impacted. However, it is assumed that the Tehachapi pocket mouse could occur in modeled suitable habitat that was not trapped and that individuals could be directly affected by Development Activities. Based on documented typical home range sizes of closely related pocket mouse species, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat supporting up to 114 individuals. However, because not all modeled habitat is expected to be occupied by this species, it is estimated that 12 to 17 individuals would be permanently lost with the permanent loss of 57 acres of modeled suitable habitat within Covered Lands prior to implementation of avoidance and minimization measures. After application of all avoidance and minimization measures (pre-construction trapping program in suitable habitat, relocation of an estimated 60% of the population), it is estimated that habitat loss could result in the loss of four to six individuals.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 1,874 acres (97%) of modeled suitable habitat for this species within Covered Lands.

With this level of conservation, adequate modeled suitable habitat would be conserved within a large, unfragmented open space system on site to support the Tehachapi pocket mouse. Although no known occurrences of the species would be directly affected, it is assumed that some modeled suitable habitat that would be affected is occupied. The permanent loss of 3% of modeled suitable habitat within Covered Lands and an estimated four to six individuals resulting from permanent habitat loss associated with Covered Activities (assuming the suitable habitat is patchily occupied) would not substantially affect the Tehachapi pocket mouse population on site, if present. Pocket mouse reproduction, in general, is responsive to changing environmental conditions and females can breed in their natal season and may reproduce at least twice in a year in good conditions, resulting in the birth of several young per year (e.g., three to five offspring/litter in several pocket mouse species (Jones 1993)). Given conservation of 97% of the modeled suitable habitat, replacement and recruitment in a local population therefore can occur fairly rapidly even though pocket mice, compared to some other rodent species, are not prolific breeders. Loss of 3% of modeled suitable habitat in the Covered Lands also would not substantially affect the species in its broader range, including the Tehachapi Mountains, from Tehachapi Pass on the northeast to the area of Mt. Pinos on the southwest, and around Elizabeth, Hughes, and Quail lakes on the southeast.

6.2.5 REPTILES

In addition to impacts from permanent habitat loss, other potential non-permanent effects to reptiles include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on reptiles vary by individual species.

Long-term (operational) impacts with potential non-permanent effects on reptiles include exotic plant and animal species and urban runoff. As discussed above, invasion of non-native plants has been found to modify the structure and composition of vegetation and has been found to have negative effects by reducing the structural and compositional diversity. Also as noted above, some invasive plant species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native reptile populations may be threatened from exotic invasive species of animals, including Argentine ants which replace the native ant population and which are not used as a food source by some species of reptiles (Suarez et al. 2000). The potential impacts of urban runoff may result an increase in flooding or inundation, which could result in conversion of upland communities to wetlands, thus resulting in loss of habitat. Reptiles that occur in aquatic ecosystems may be exposed to toxic substances in runoff similar to amphibians as described in Section 6.2.1. An additional threat associated with increased human presence is illegal collecting for commercial or personal purposes.

6.2.5.1 COAST HORNED LIZARD

6.2.5.1.1 DISCUSSION OF POTENTIAL TAKE OF COAST HORNED LIZARD

Covered Activities would result in the permanent loss of 3,962 acres (10%) of modeled suitable habitat for coast horned lizard (*Phrynosoma blainvillii)* within Covered Lands, including 3,959 acres (10%) of modeled primary habitat and 3 acres (4%) of modeled secondary habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-21* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.5.1.1, radiotelemetry of several dozen coast horned lizards in Southern California locations over a 5-year period documented annual home range sizes of approximately 3 to 3.5 acres, with the likelihood that, across years, home range areas could be larger (Suarez, pers. comm. 2005). Assuming an average home range of 3 acres, a uniform, non-overlapping distribution, and saturation of the entire 3,962 acres of modeled suitable habitat to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to 1,321 individuals.

This estimate is considered to be high. The 2007 survey of the TMV Planning Area, which includes approximately 13,007 acres (32%) of the total of the 41,145 acres of modeled suitable habitat on Covered Lands documented coast horned lizard in Rising Canyon, north of Castac Lake, and on a ridge above Silver Canyon (Dudek 2009). In addition, there is no information in the literature to suggest that the coast horned lizard occurs in uniform distributions and it seems to be restricted to localized populations because of its association with loose soils that have a high sand content (Jennings and Hayes 1994). Therefore, it is reasonable to assume that the

number of individuals likely to be permanently lost is substantially smaller than the estimated 1,321 individuals that could be lost with the permanent loss of 3,962 acres of saturated modeled suitable habitat. However, because of its patchy distribution within its range and because it hibernates in the winter and aestivates in the warm summer months, establishing precise population densities and loss estimates of coast horned lizard individuals is difficult. The expected loss of coast horned lizards would be a small (e.g., less than 10) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.5.1, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and construction monitoring. The extent to which these avoidance and minimization measures would further reduce the loss of coast horned lizard individuals would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Short-term construction-related impacts with potential non-permanent effects on coast horned lizard include inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

Long-term (operational) impacts with potential non-permanent effects on reptiles, including coast horned lizard, are described in Section 6.2.5. Other Covered Activities with potential non-permanent effects on coast horned lizard individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading modeled primary and secondary habitat), ranch operations related to maintenance of culverts and crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation. An additional threat associated with increased human presence is illegal collecting for commercial or personal purposes.

Conservation measures to address these threats are provided in Section 7.1.1.5.1.

6.2.5.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO COAST HORNED LIZARD

The coast horned lizard occurs throughout most of California in locations west of the desert and Cascade-Sierran highlands, in elevations from sea level to around 2,438 meters (8,000 feet) amsl.

The coast horned lizard was observed in Rising Canyon, north of Castac Lake, and on a ridge above Silver Canyon during the 2007 surveys conducted by Dudek (2009), and it is expected to occur in modeled suitable habitat throughout the Covered Lands (Dudek 2009).

Covered Activities would result in the permanent loss of 3,962 acres (10%) of modeled suitable habitat for coast horned lizard within Covered Lands, including 3,959 acres (10%) of modeled

primary habitat and 3 acres (4%) of modeled secondary habitat. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat supporting up to 1,321 individuals. However, based on scattered individuals observed within the TMV Planning Area and because not all modeled habitat is expected to be occupied by this species, it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 3,962 acres is substantially smaller than 1,321 individuals. The expected loss of coast horned lizards is a small (e.g., less than 10) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 37,074 acres (90%) of modeled primary habitat and 51 acres (84%) of modeled secondary habitat for this species within Covered Lands.

With this level of conservation, adequate modeled suitable habitat would be conserved in a large, unfragmented open space system on site to support the coast horned lizard. In addition, this species is still widely distributed in California, ranging south along the coastal regions from north of the San Francisco Bay area and western foothills of the Sierra Nevada, to coastal Southern California (except for the Los Angeles Basin and urbanized Orange County), including western Riverside County, southwestern San Bernardino County, and all but the easternmost portion of San Diego County. Therefore, the permanent loss of 10% of modeled primary and secondary habitat within Covered Lands and a small (e.g., less than 10) but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.2.5.2 TWO-STRIPED GARTER SNAKE

6.2.5.2.1 DISCUSSION OF POTENTIAL TAKE OF TWO-STRIPED GARTER SNAKE

Covered Activities would result in the permanent loss of 34 acres (9%) of modeled suitable habitat for two-striped garter snake (*Thamnophis hammondii)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-22* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.5.2.1, the two-striped garter snake is not territorial and summer ranges of 0.37 acre can support seven two-striped garter snakes, while the winter ranges of 0.84 acre can support three two-striped garter snakes (Zeiner et al. 1990a). Therefore, the maximum density is estimated to be about 4 individuals per acre in the winter and 19 individuals per acre in the summer. During

summer, therefore, the permanent loss of 34 acres of modeled suitable habitat within Covered Lands could result in the reduction of habitat for up to about 646 individuals.

This estimate is considered to be high for several reasons. First, it is based on an estimated carrying capacity and does not necessarily reflect typical conditions. Second, it also assumes that all modeled suitable habitat has the maximum summer range carrying capacity. Third, surveys in the TMV Planning Area in modeled suitable habitat, which comprises 340 acres (94%) of the 360 acres of total suitable habitat in Covered Lands, yielded observations in Grapevine Creek, adjacent to Pastoria Creek in Beartrap Canyon, within a drainage running through Dry Field Canyon, and at an on-site stock pond south of Castac Lake (Dudek 2009). If modeled suitable habitat on Covered Lands was saturated by two-striped garter snake or the species was abundant on site, it is likely that many additional occurrences would have been recorded.

Based on the apparently low densities observed within the TMV Planning Area and because not all modeled suitable habitat is expected to be occupied by this species, the expected loss of two-striped garter snakes would be a small (e.g., less than 30) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.5.2, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and/or construction monitoring. The extent to which these avoidance and minimization measures would further reduce the loss of two-striped garter snake individuals would depend on several factors, such as season and weather conditions, as this species remains underground in hibernation during the colder months (generally October through March depending on elevation and latitude).

Short-term construction-related impacts with potential non-permanent effects on two-striped garter snake include impacts to water quality and dust.

In addition to the long-term (operational) impacts with potential non-permanent effects on reptiles noted in Section 6.2.5, long-term (operational) impacts with potential non-permanent effects on two-striped garter snake include lighting effects.

Other Covered Activities with potential non-permanent effects on two-striped garter snake individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat), ranch operations related to maintenance of culverts and crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.5.2.

6.2.5.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TWO-STRIPED GARTER SNAKE

The two-striped garter snake occurs through coastal California in the vicinity of the southeast slope of the Diablo Range and the Salinas Valley south along the Coastal and Transverse Ranges to Rio Rosario in Baja California, Mexico. The western parts of the Covered Lands adjacent to Interstate 5 represent the eastern extent of the range of the two-striped garter snake. The impacts of the incidental take of the two-striped garter snake are analyzed, for both habitat and individuals, in the context of the broad range of the species.

The two-striped garter snake was observed during surveys in the TMV Planning Area in 2007 in the southwestern and central portions of the site east of Rising Canyon, in Dry Field Canyon, and in Beartrap Canyon. Almost all of the modeled suitable habitat for this species is in the TMV Planning Area.

Covered Activities would result in the permanent loss of 34 acres (9%) of modeled suitable habitat for two-striped garter snake within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat supporting up to about 646 individuals. However, it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 34 acres is substantially smaller than 646 individuals. The expected loss of two-striped garter snakes is a small (e.g., less than 30) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and/or monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 254 acres (70%) of modeled suitable habitat for this species within Covered Lands.

With this level of conservation, adequate modeled suitable habitat would be conserved in a large, unfragmented open space system on site to support the two-striped garter snake, although the permanent loss of 9% of modeled suitable habitat within Covered Lands would reduce its distribution on site. However, this species is widely distributed in coastal California from the San Francisco Bay area south to Baja California, Mexico, including the southwestern portion of San Bernardino County, western Riverside County, and all but the easternmost portion of San Diego County. Furthermore, the western parts of the Covered Lands adjacent to Interstate 5 represent the eastern extent of the range of the two-striped garter snake. Therefore, the permanent loss of 34 acres of modeled suitable habitat within Covered Lands and a small (e.g., less than 30) but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities is not considered to be a substantial effect on the species rangewide. Also,

because the Covered Lands are on the eastern boundary of the species' range, the continuous north–south distribution of this species would not be affected.

6.3 ANTICIPATED EFFECTS ON COVERED PLANT SPECIES

6.3.1 FORT TEJON WOOLLY SUNFLOWER

Fort Tejon woolly sunflower (*Eriophyllum lanatum* var. *hallii)* has no Federal designation but is a California Rare Plant Rank (CRPR, previously known as the California Native Plant Society (CNPS) List) 1B.1 taxa that is considered seriously endangered in California (CDFG 2011d). In addition, it has a California Heritage Element Ranking of S1, meaning that it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state (CDFG 2011d).

The Fort Tejon woolly sunflower is known from the southern Tehachapi Mountains (near Fort Tejon) and the Sierra Madre Mountains in the southeastern Outer South Coast Ranges. It occurs in Kern and Santa Barbara counties (Jepson Flora Project 2011).

In the Covered Lands, Fort Tejon woolly sunflower was observed in the TMV Planning Area in the following locations: the central portion in Beartrap Canyon; in the far western portion in Rising Canyon near Interstate 5; and in the south-central portion near Poleline Ridge, Skinner Canyon, and Johnson Canyon (Dudek 2009). In total,36 areas that supported approximately 3,000 to 8,500 individuals were observed (Dudek 2009). All of these located are in the permanently protected TMV Planning Area Open Space. There are no CNDDB occurrences documented in the Covered Lands; however, there are occurrences west of Interstate 5 near Fort Tejon State Historic Park (CDFG 2011a). The largest population on 18.9 acres in Santa Barbara County had 850 individuals when last observed in 1994. The other occurrence in Los Padres National Forest had 37 plants when last observed in 1994. No number of individuals was provided for one population reported in Johnson Canyon west of Fort Tejon. The occurrence east of Johnson Canyon and north of O'Neil Canyon had an estimated 530 plants in 1987.

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-23* and *Appendix D* for description of methods used to develop the model). A total of 57,430 acres of suitable habitat for Fort Tejon woolly sunflower was modeled for Covered Lands. Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 52,046 acres (91%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 5,368 acres (9%) of modeled suitable habitat for Fort Tejon woolly sunflower within Covered Lands. The 36 occurrences within the Covered Lands, representing 3,000 to 8,500 individuals, are located within the TMV Planning Area Open Space and would be preserved.

Because this species was found within the surveyed TMV Planning Area, the potential for this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high. However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled habitat is expected to be occupied by this species. Furthermore, because 91% of modeled habitat for the Fort Tejon woolly sunflower would be conserved and all 36 occurrences within Covered Lands would be preserved within a large, unfragmented open space system, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.3.2 KUSCHE'S SANDWORT

Kusche's sandwort (*Arenaria macradenia var. kuschei*) formerly was recognized by the CNDDB and CNPS as a special-status species. Based on recent collections, in the *Flora of North America* (Hartman et al. 2005), *A. m. var. kuschei* is treated as a synonym of the more widespread *Eremogone macradenia* var. *arcuifolia*, distributed in the southern Sierra Nevada and San Gabriel Mountains. *A. m. var. kuschei* may be an extreme local variant of *E. m.* var. *arcuifolia* (Stephenson and Calcarone 1999). This taxon currently has no Federal, State, or CRPR special status.

Kusche's sandwort is limited to the western Transverse Ranges (Jepson Flora Project 2011), with the only previous known occurrences from Liebre Mountain in Los Angeles County (CDFG 2007a). Kusche's sandwort was previously only known from one indistinct collection in 1929 from Forest Camp in the Mojave Desert. This taxon was not collected again until 1994, when the plant was found near the western summit of Liebre Mountain (Ross and Boyd 1996). A study conducted in 1997 included a survey of potential habitat on Liebre Mountain and adjacent areas and located six new populations. Most of these recently discovered populations are small, both in number of individual plants and in area covered by the plants (Stephenson and Calcarone 1999).

Kusche's sandwort was observed in the Covered Lands on the TMV Planning Area in one general location that contained approximately 24 individuals among 7 separate occurrences (Dudek 2009).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-24* and *Appendix D* for description of methods used to develop the model). A total of 30,505 acres of suitable habitat for Kusche's sandwort was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 28,407 acres (93%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 2,097 acres (7%) of modeled suitable habitat for Kusche's sandwort within Covered Lands. Approximately 16 individuals of Kusche's sandwort will be avoided in Special Management Area 6, which includes

a 100-foot buffer, and the remaining eight individuals are located in TMV Planning Area open space, resulting in avoidance of 100% of the known population occurrences. It is anticipated that pre-construction surveys may identify additional Kusche's sandwort individuals that could be permanently lost.

Because this species was found within the surveyed TMV Planning Area, the potential of this species to occur elsewhere within suitable habitat on non-surveyed portions of Covered Lands is high. However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 93% of the modeled suitable habitat for Kusche's sandwort would be conserved within a large, unfragmented open space system, the seven known occurrences within Covered Lands representing approximately 24 individuals would be avoided and conserved, and the remaining known occurrences of Kusche's sandwort would be conserved in the Angeles National Forest, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.3.3 ROUND-LEAVED FILAREE

Round-leaved filaree has no Federal designation but is a CRPR 1B.1 species and is considered seriously endangered in California (CDFG 2011d). This species has a California Heritage Element Ranking of S2, indicating a very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state (CDFG 2011d).

The range of round-leaved filaree (*California macrophylla)* extends from northern Mexico to Oregon and southern Utah (CNPS 2010; Jepson Flora Project 2011). It is reported in 27 counties in California, from Lassen to San Diego. It may be extirpated from Santa Cruz Island and Butte County (CNPS 2010). Gillespie (2003) determined that 105 unique populations have been reported, with most on the eastern side of the California Coast Ranges. The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the Sacramento Valley, northern San Joaquin Valley, central western California, South Coast, northern Channel Islands (i.e., Santa Cruz Island), western Transverse Range, and the Peninsular Ranges as the geographic regions in which round-leaved filaree occurs. While apparently well distributed in central and northern California, it is very rare in Southern California (Reiser 2001). It is considered scarce and declining in western Riverside County (Roberts et al. 2004).

Round-leaved filaree was observed in the southeastern portion of the Covered Lands in 11 areas within the TMV Planning Area that supported approximately 430 to 730 individuals (Dudek 2007a). The CNDDB contains 142 records for round-leaved filaree in California, of which 12 are documented from Kern County (CDFG 2011a). All 12 occurrences in Kern County are considered extant. One occurrence is on the Wind Wolves Preserve, one on publicly held land,

four are on private land, and ownership on the remaining six occurrences is unknown (CDFG 2011a). In Kern County, round-leaved filaree is reported from the Temblor Range, the foothills east of Tehachapi, in the extreme southwestern Tehachapi Mountains along the northwest side of the desertous Antelope Valley, at Dry Bog Knoll, and at the head of Adobe Canyon in the Greenhorn foothills (Twisselmann 1967). Collections by Wiggins and Wolf from 1935 at the borders of Kern County have not been more recently verified (CDFG 2011a). A population of about 400 plants was reported in 2004 at Bodfish, south of Lake Isabella (CDFG 2011a).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-25* and *Appendix D* for description of methods used to develop the model). A total of 58,073 acres of suitable habitat for round-leaved filaree was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 53,076 acres (91%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 4,997 acres (9%) of modeled suitable habitat for round-leaved filaree within Covered Lands.

Known or future detected populations of the round-leaved filaree would be conserved under two alternative scenarios: (1) three known occurrences, representing approximately 220 to 420 (52% to 58%) individuals of round-leaved filaree would be conserved within TMV Planning Area Open Space; or (2) at least three occurrences will be conserved in TMV Planning Area Open Space, including two currently known occurrences representing approximately 120 to 220 individuals and any new occurrence(s) documented within TMV Planning Area Open Space prior to development, such that the new occurrence(s) total(s) at least 100 individuals.

Under the first scenario, 8 currently known occurrences containing approximately 205 to 305 individuals would be lost. Under the second scenario, 9 currently known occurrences containing approximately 310 to 510 individuals would be lost; however, the percentage of the population lost likely would not be higher because this alternative scenario requires the documentation of new populations in the TMV Planning Area prior to development impacts and, therefore, the baseline number of individuals would be higher.

Because this species was found within the surveyed TMV Planning Area, the potential of this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high. Furthermore, although the commercial and residential Covered Activities will result in loss of 205 to 305 individuals under one conservation scenario and 310 to 510 individuals under the other conservation scenario, because 91% of the modeled suitable habitat for round-leaved filaree would be conserved within a large, unfragmented open space system, and because of the relatively broad range of this species in California (i.e., in 27 counties and 105 unique populations), the proposed impacts to this species as a result of Covered Activities would preserve suitable habitat on site and would not substantially affect the species in its broader range within California.

6.3.4 STRIPED ADOBE LILY

The striped adobe lily (*Fritillaria striata)* has no Federal designation but has been listed in California as threatened since 1987. The striped adobe lily is also a CRPR 1B.1 species, and is considered seriously endangered in California (CDFG 2011d). The striped adobe lily has a California Heritage Element Ranking of S2, indicating a very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state (CDFG 2011d).

The striped adobe lily is endemic to the southern Sierra Nevada foothills of eastern Tulare and Kern counties (CDFG 2000b). The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the southern Sierra Nevada, especially the Greenhorn Mountains, as the geographic region in which striped adobe lily occurs. Rare plant surveys in the TMV Planning Area in 2007 did not detect this species, although it was detected in Covered Lands in a reference location in the Old Headquarters area (Dudek 2009; Enright, pers. comm. 2011). The CNDDB contains 23 records for striped adobe lily in California (CDFG 2011), 16 of which are from Kern County. Fifteen of the populations from Kern County occur on private land and the land ownership of the other is unknown. All but one of the Kern County occurrences are considered extant. Of the seven Tulare County occurrences, three are extirpated. The striped adobe lily is reported from various places throughout the county, including the Greenhorn Mountains, along Rancheria Road, and in the Tejon Hills. The three Tejon Hills records are in the northern portion of Covered Lands within Existing Conservation Easement Areas.

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-26* and *Appendix D* for description of methods used to develop the model). A total of 32,213 acres of suitable habitat for striped adobe lily was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 29,476 acres (92%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 2,737 acres (8%) of modeled suitable habitat for striped adobe lily within Covered Lands. The three documented occurrences on Covered Land are conserved in Existing Conservation Easement Areas.

Because this species occurs within the Covered Lands, the potential of this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high (and it is possible that pre-construction surveys could identify individuals that could be permanently lost). However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 29,476 acres (90%) of the overall modeled suitable habitat for striped adobe lily would be conserved within a large, unfragmented open space system, and because of the number of remaining 20 extant populations of this species in Kern and Tulare

counties and because the three known occurrences on Covered lands will be conserved in Existing Conservation Easement areas, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.3.5 TEHACHAPI BUCKWHEAT

Tehachapi buckwheat (*Eriogonum callistum)* does not have Federal or state status, but has been recognized as a special-status species by CNDDB and added to the database (CDFG 2011d). Tehachapi buckwheat is also a CRPR 1B.1 species, and is considered seriously endangered in California (CDFG 2011d). Tehachapi buckwheat was first described in 2006 (Reveal 2006a). The Tehachapi buckwheat has a California Heritage Element Ranking of S1, indicating it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state (CDFG 2011d).

Based on the TMV Planning Area surveys, Tehachapi buckwheat is known only from the area immediately in and around the south central portion of the Covered Lands, near Poleline Ridge. In 2007, approximately 500 to 600 individuals were observed in this area (Dudek 2007a).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-27* and *Appendix D* for description of methods used to develop the model). A total of 2,579 acres of suitable habitat for Tehachapi buckwheat was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 2,562 acres (99%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 16 acres (less than 1%) of modeled suitable habitat for Tehachapi buckwheat within Covered Lands.

Of the 500 to 600 Tehachapi buckwheat individuals documented in the Poleline Ridge area within Covered Lands, all individuals are within TMV Planning Area Open Space and will be avoided and conserved.

Because this species was found within the surveyed portion of Covered Lands, the potential of this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high. However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 99% of the modeled suitable habitat for Tehachapi buckwheat would be conserved within a large, unfragmented open space system, and because the known population of 500 to 600 individuals would be avoided and conserved, the proposed

impacts to this species as a result of Covered Activities would not substantially affect the species' population or range.

6.3.6 TEJON POPPY

Tejon poppy (*Eschscholzia lemmonii* ssp. *Kernensis)* has no Federal designation, but it is a CRPR 1B.1 species, considered seriously endangered in California (CDFG 2011d). The Tejon poppy has a California Heritage Element Ranking of S1, indicating it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state (CDFG 2011d).

Tejon poppy is endemic to central and western Kern County. The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the southwest Tehachapi Mountain Area and northern Western Transverse Ranges as the geographic regions in which Tejon poppy occurs. The CNDDB includes 58 occurrences of this species (CDFG 2011), all of which are assumed to be extant. Tejon poppy is known to be extant in Elk Hills; and populations documented in older literature reports and collections from Comanche Point, Tejon Hills, Dry Bog Knoll in the Greenhorn Range foothills, near the mouth of Salt Creek, south of Maricopa near Devil's Gulch, and in the mesas east of Bakersfield are believed to be extant as habitats in these areas have not been altered significantly (Cypher 2006). No populations of Tejon poppy are known to have been extirpated, so the status of this species is assumed to be stable.

Tejon poppy was not observed during surveys in the Covered Lands and there are no CNDDB records for Covered Lands; however, there are numerous CNDDB records for Tejon poppy that lie west of the Covered Lands in Kern County. The nearest occurrence is approximately 1 mile southwest of the northern section of the Covered Lands and two other occurrences are west of the Covered Lands in the Tejon Hills (CDFG 2011a; TRC 2007a).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-28* and *Appendix D* for description of methods used to develop the model). A total of 12,672 acres of suitable habitat for Tejon poppy was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 12,533 acres (99%) of modeled suitable habitat for this species within Covered Lands. No individuals of Tejon poppy have been observed within the Covered Lands, but Covered Activities would result in the permanent loss of 108 acres (less than 1%) of modeled suitable habitat for Tejon poppy within Covered Lands.

Because this species was found adjacent to Covered Lands, the potential of this species to occur within modeled suitable habitat on non-surveyed portions of Covered Lands is high (and it is possible that pre-construction surveys could identify individuals that could be permanently lost).

However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 99% of the modeled suitable habitat for Tejon poppy would be conserved within a large, unfragmented open space system, and because of the number of remaining 58 extant populations of this species in Kern County, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.4 SUMMARY OF EFFECTS

Table 6-1 summarizes impacts to Covered Species' modeled suitable habitat.

Table 6-1. Conservation Goals and Impacts for Covered Species' Modeled Suitable Habitat within Covered Lands

Species	Species Model	Suitable Habitat Lost[1] (acres / %)[2]	Suitable Habitat Conserved[4] (acres / %)[3,4]
Tehachapi slender salamander	Suitable habitat	143 (4%)	3,921 (96%)
Western spadefoot	Suitable habitat	30 (3%)	1,055 (90%)
Yellow-blotched salamander	Suitable habitat	1,179 (3%)	33,988 (97%)
American peregrine falcon	Foraging	2,741 (10%)	23,862 (89%)
	Breeding	1 (1%)	79 (99%)
Bald eagle	Foraging	5 (1%)	499 (96%)
	Wintering	834 (58%)	604 (42%)
Burrowing owl	Breeding/foraging	2,485 (10%)	22,406 (90%)
	Secondary breeding/foraging	552 (7%)	7,521 (93%)
Golden eagle	Foraging	3,040 (9%)	30,791 (91%)
	Breeding/foraging	2,045 (6%)	30,972 (94%)
	Primary breeding	2,613 (5%)	45,357 (95%)
Least Bell's vireo	Breeding/foraging	8 (1%)	582 (95%)
Little willow flycatcher	Foraging/Stopover	8 (1%)	954 (97%)
Purple martin	Breeding/foraging	4,762 (6%)	81,015 (94%)
Southwestern willow flycatcher	Breeding/foraging	8 (1%)	954 (97%)
Tricolored blackbird	Foraging	1,107 (6%)	17,373 (94%)
	Primary breeding	23 (8%)	198 (68%)
Western yellow-billed cuckoo	Breeding/foraging	8 (1%)	954 (97%)
White-tailed kite	Foraging	1,874 (21%)	7,021 (78%)
Yellow warbler	Breeding/foraging	8 (1%)	954 (97%)
	Secondary foraging	2,687 (5%)	49,008 (95%)
Tehachapi pocket mouse	Suitable habitat	57 (3%)	1,874 (97%)
Coast horned lizard (*frontale* and *blainvillii* populations)	Primary habitat	3,959 (10%)	37,074 (90%)
	Secondary habitat	3 (4%)	51 (84%)
Two-striped garter snake	Suitable habitat	34 (9%)	254 (70%)

[4] Suitable habitat conserved is species' suitable habitat within Established Open Space and TMV Planning Area Open Space (TU MSHCP Mitigation Lands) as well as the Existing Conservation Easement Areas, which have been permanently protected by recorded conservation easements.

Table 6-1. Conservation Goals and Impacts for
Covered Species' Modeled Suitable Habitat within Covered Lands

Species	Species Model	Suitable Habitat Lost[1] (acres / %)[2]	Suitable Habitat Conserved[4] (acres / %)[3,4]
Fort Tejon woolly sunflower	Suitable habitat	5,368 (9%)	52,046 (91%)
Kusche's sandwort	Suitable habitat	2,097 (7%)	28,407 (93%)
Round-leaved filaree	Suitable habitat	4,997 (9%)	53,076 (91%)
Striped adobe lily	Suitable habitat	2,737 (9%)	29,476 (92%)
Tehachapi buckwheat	Suitable habitat	16 (1%)	2,562 (99%)
Tejon poppy	Suitable habitat	108 (1%)	12,533 (99%)

Notes:
[1] Suitable habitat lost is species' modeled suitable habitat within areas identified for Covered Activities.
[2] Percentage of modeled suitable habitat lost is calculated using species' total suitable habitat within Covered Lands.
[3] Percentage of modeled suitable habitat conserved is calculated using species' total suitable habitat within Covered Lands.
[4] The percentages of modeled habitat conserved and lost may not sum to 100% for three possible reasons: (1) rounding error; (2) 75% of riparian/wetlands are assumed avoided in development areas, but avoided areas are not included in the open space acreages; and (3) and 145 acres in the Lebec/Existing Headquarters Area are not developed but are not included.