Table MR5-1. Comments Addressed in Master Response 5

Comment Number	Commenter
O1-4	California Native Plant Society (Suba, Greg)
O1-8	California Native Plant Society (Suba, Greg)
O1-9	California Native Plant Society (Suba, Greg)
O1-10	California Native Plant Society (Suba, Greg)
O1-11	California Native Plant Society (Suba, Greg)
O4-40	Center for Biological Diversity (Keats, Adam)
O4-41	Center for Biological Diversity (Keats, Adam)
O4-54	Center for Biological Diversity (Keats, Adam)
O4-55	Center for Biological Diversity (Keats, Adam)
O4-56	Center for Biological Diversity (Keats, Adam)
O4-135	Center for Biological Diversity (Keats, Adam)
O4-150	Center for Biological Diversity (Keats, Adam)
O4-171	Center for Biological Diversity (Keats, Adam)
O4-204	Center for Biological Diversity (Keats, Adam)
04-207	Center for Biological Diversity (Keats, Adam)
04-220	Center for Biological Diversity (Keats, Adam)
O4-224	Center for Biological Diversity (Keats, Adam)
04-227	Center for Biological Diversity (Keats, Adam)
O4-229	Center for Biological Diversity (Keats, Adam)
O4-235	Center for Biological Diversity (Keats, Adam)
O4-335	Center for Biological Diversity (Keats, Adam)
O4-336	Center for Biological Diversity (Keats, Adam)
O4-337	Center for Biological Diversity (Keats, Adam)
O4-339	Center for Biological Diversity (Keats, Adam)
O4-338	Center for Biological Diversity (Keats, Adam)
O4-340	Center for Biological Diversity (Keats, Adam)
O4-341	Center for Biological Diversity (Keats, Adam)
O4-342	Center for Biological Diversity (Keats, Adam)
O4-343	Center for Biological Diversity (Keats, Adam)
O4-344	Center for Biological Diversity (Keats, Adam)
O4-345	Center for Biological Diversity (Keats, Adam)
O4-346	Center for Biological Diversity (Keats, Adam)
O4-347	Center for Biological Diversity (Keats, Adam)
O4-348	Center for Biological Diversity (Keats, Adam)
O4-349	Center for Biological Diversity (Keats, Adam)
O4-350	Center for Biological Diversity (Keats, Adam)

Comment Number	Commenter
O4-351	Center for Biological Diversity (Keats, Adam)
O4-354	Center for Biological Diversity (Keats, Adam)
O4-355	Center for Biological Diversity (Keats, Adam)
O4-357	Center for Biological Diversity (Keats, Adam)
O4-358	Center for Biological Diversity (Keats, Adam)
O4-359	Center for Biological Diversity (Keats, Adam)
O4-362	Center for Biological Diversity (Keats, Adam)
O4-363	Center for Biological Diversity (Keats, Adam)
O4-364	Center for Biological Diversity (Keats, Adam)
O4-365	Center for Biological Diversity (Keats, Adam)
O4-366	Center for Biological Diversity (Keats, Adam)
O4-367	Center for Biological Diversity (Keats, Adam)
O4-368	Center for Biological Diversity (Keats, Adam)
O4-369	Center for Biological Diversity (Keats, Adam)
O4-370	Center for Biological Diversity (Keats, Adam)
O4-371	Center for Biological Diversity (Keats, Adam)
O4-372	Center for Biological Diversity (Keats, Adam)
O5-22	Defenders of Wildlife (Flick, Pamela)
O5-23	Defenders of Wildlife (Flick, Pamela)
O6-1	Kern County California Native Plant Society (Clark, Lucy)
O6-3	Kern County California Native Plant Society (Clark, Lucy)
O6-8	Kern County California Native Plant Society (Clark, Lucy)

5.1 Summary of Substantive Comments

The following summarizes the substantive comments received on the Draft EIS and TU MSHCP specific to the habitat suitability models for the other Covered Species (i.e., excluding the California condor). Table MR5-1 provides a list of the commenters and a reference to the individual comment as summarized in the following list. The parenthetical reference after each summary bullet indicates where a response to that comment is provided. An overview of the approach to habitat suitability modeling and analyzing and interpreting the results is provided in Section 5.2.1, Overview.

- The habitat modeling process should be transparent and all biological information should be included and made available to the public. An independent scientific advisory committee should be created to review biological data upon which the TU MSHCP is based, including the habitat models. (Response provided in Section 5.2.2, Transparency of Habitat Modeling, Use of All Available Data, and Independent Scientific Review.)
- Habitat modeling should be done for a species' entire range because the scale of Tejon Ranch may be too small and the number of species' occurrence data points may be too few to accurately model a species' habitat. Additional data sets should be used and occurrence data should be shown on maps. (Response provided in Section 5.2.3, Spatial Scale, Available Occurrence Locations, and Additional Data Sets for Habitat Modeling.)
- Field ground-truthing and verification studies and iterative testing of the model results should have been conducted. (Response provided in Section 5.2.4, Field Ground-Truthing and Verification Studies.)
- Habitat modeling should be based on more advanced techniques such as MaxEnt (Elith et al. 2006, pp. 130–135). (Response provided in Section 5.2.5, Advanced Modeling Techniques.)
- Climate variables (e.g., temperature and precipitation), vegetation, and soils and geology data should be used for many of the Covered Species. (Response provided in Section 5.2.6, Climate Variables; Section 5.2.7, Vegetation Data; and Section 5.2.8, Soils and Geological Data.)
- Habitat may have been over- or underestimated for some species because of the inadequacies of the models. (Response provided in Section 5.2.9, Habitat Overestimation and Underestimation.)
- Plant models should have included aspect. (Response provided in Section 5.2.10, Plant Models and Aspect.)
- Species-specific model recommendations should be provided. (Response provided in Section 5.2.11, Species-Specific Recommendations.)

5.2 Responses to Substantive Comments

5.2.1 Overview

The methods for developing the habitat models for Covered Species are described in Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS. This appendix lists the various sources used for developing the habitat models. The habitat models are primarily based on documented habitat relationships from both print and online sources, as well as the professional judgment of the biologists familiar with the Covered Lands. Each species was modeled with relevant habitat variables, such as vegetation cover types, elevation, and slope. A few species had additional data layers such as drainages, seeps, pools, and soils. Species occurrence data from wildlife and botanical surveys conducted in the TMV Planning Area in 2007 (Dudek 2007a, 2007b) were considered in developing the habitat models, but were not explicitly used as parameters in the models, nor were they used to formally test the accuracy of the models, because the TMV Planning Area cannot be assumed to be a statistically representative sample area for the entire Covered Lands. Because the habitat models are based on broad parameters such as vegetation communities, soils, elevation, and slope, and do not incorporate important habitat or microhabitat features for some species (e.g., talus slopes for Tehachapi slender salamander) due to a lack of comparable data for the entire Covered Lands, they are necessarily conservative and in most cases likely overestimate the amount of occupied habitat (as addressed in more detail later in this Master Response).

5.2.2 Transparency of Habitat Modeling, Use of All Available Data, and Independent Scientific Review

A commenter suggested that the process for developing the TU MSHCP needs to be open and transparent to ensure that all available biological information is included and made available to the public. A commenter also suggested that a scientific advisory committee should be created to review the biological data on which the TU MSHCP is based.

The methods to construct the habitat models for the Covered Species are described in detail in Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS, and were made available to the public for review and comment in both the Draft EIS and Draft TU MSHCP. Based on comments from independent reviewers, Section 1.2.1, Covered Species Occurrence Data, of this appendix has been revised to include the survey methods for the Covered Species occurrence data collected during the various surveys in portions of the Covered Lands (Dudek 2007a, 2007b). The Covered Species habitat models incorporated the comprehensive biological and physical database that was available for the Covered Lands, and describe in detail sources for, and limitations of, the various data layers that were used, including Covered Species occurrence data from various surveys of portions of the Covered Lands (Dudek 2007a, 2007b); occurrence data from the California Natural Diversity Databases (CNNDB) (California Department of Fish and Game 2007); vegetation communities, including the Tejon Ranch-wide vegetation composite and project-level vegetation mapping for the TMV Planning Area; a geographic information system (GIS) canopy cover database (Tejon Ranch Company 2007); water features and drainages; a digital terrain model (Intermap Technologies 2005); soils (U.S. Department of Agriculture 1981, 1999); and imagery, including geographically referenced U.S. Geological Survey (USGS) topographic quadrangle maps and full-color aerial images. These information sources are discussed in more detail below in relation to specific comments.

A variety of available literature sources, including peer-reviewed sources, were used to determine species' ranges, distributions, and habitat relationships in California. These sources are documented in the Covered Species accounts in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, and Section 5, Other Covered Species, of the TU MSHCP. This general information, in combination with the site-specific data, was reviewed by qualified biologists knowledgeable of the various Covered Species ranges, habitat requirements, behavioral patterns, and other information relevant to the habitat models. These biologists determined the appropriate data type and model input parameters uniquely suited to each of the Covered Species, and revisions were made where improvements or adjustments were determined to be necessary. The habitat models were then generated by overlaying this information and intersecting the data (e.g., combinations of certain vegetation and soils types). This is a standard, well-accepted method used in large-scale habitat conservation planning in California that has met the data standards for federally approved habitat conservation plans (HCP) (e.g., San Diego County Multiple Species Conservation Program [San Diego County 1997], Western Riverside County Multiple Species Habitat Conservation Plan [Riverside County 2007] , Orange County Southern Subregional Natural Community Conservation Plan/Master Streambed Alteration Agreement/Habitat Conservation Plan [Orange County 2006]), Coachella Valley Multiple Species Habitat Conservation Plan/Natural Community Conservation Plan [Coachella Valley Association of Governments 2007]).

Because of the limited occurrence data for several of the Covered Species for Tejon Ranch, the primary information for assessing potential take and proposed conservation strategies is known ranges and habitat relationships based on the available information in the scientific literature. When specific information was available, the habitat modeling was refined to capture the habitat factors that are necessary for the species (e.g., buffers around USGS blueline streams for Tehachapi slender salamander), but in most cases the habitat models are coarse-grained because they may not include unmapped microhabitat features that are important for a species, such as north-facing slopes with talus piles used by the Tehachapi slender salamander (Hansen and Wake pers. comm. 2008). Therefore, the habitat models were designed to identify habitat that could be occupied by the Covered Species, with the goal of including the vast majority of potentially occupied habitat. For that reason, many of the models conservatively include secondary habitat that may be less frequently used for life history needs (e.g., foraging, nesting) and which itself may not be adequate to support the species.

As noted above, this Supplemental Draft EIS includes all of the information related to the modeling assumptions in Appendix D, Habitat Suitability Criteria Methods, and a discussion of the survey methods for the Covered Species is included in Appendix E, Covered Species Survey Methods. Assembly and participation of an independent scientific advisory committee in the HCP planning process is not a requirement of the Federal Endangered Species Act (ESA), nor required to inform a legally adequate NEPA analysis. The public review process provides the opportunity for independent review.

5.2.3 Spatial Scale, Available Occurrence Locations, and Additional Data Sets for Habitat Modeling

The habitat modeling was only conducted for the Covered Lands, which some commenters suggest is too small a spatial scale and contains too few occurrence data points to assess effects or conservation. It was suggested that additional data sets should have been used in the conservation analysis, citing studies done by the Conservation Biology Institute (CBI) (2003a, 2003b), South Coast Wildlands (South Coast Wildlands) (2003), and CBI and South Coast Wildlands (2006).

The purpose of the modeling was to identify habitat areas with the potential to support the Covered Species on the Covered Lands and provide a quantitative basis for evaluating the potential effects of

the Covered Activities in the TU MSHCP. As habitat requirements for a given species can vary spatially and temporally, the focus in developing the site-specific models was to identify suitable habitat for each Covered Species on the Covered Lands by using information from comparable areas within the southern California range of the target species.

It is important to analyze the potential effects of the TU MSHCP in the context of a given species' geographic range, and the species' status within that range; however, delineating potential habitat for Covered Species beyond the boundaries of the Covered Lands is not necessary for an adequate analysis of effects of implementation of the TU MSHCP. The suitable habitat modeling for neotropical migrants (e.g., least Bell's vireo, willow flycatcher), for example, provides no insight into the winter habitat requirements for these species. Similarly, modeled habitat for ringtail on the Covered Lands (lake, riparian scrub, riparian woodland, riparian/wetland, wash, and wetland) is very different from the habitat used by the species in the desert southwest (juniper woodland, montane coniferous forest, and dry tropical habitats) (Poglayen-Neuwall and Toweill 1988, p. 4).

The habitat models are based primarily on vegetation communities and other factors (e.g., elevation, slope) that, based on the available literature, are associated with species presence and for which there were comparable data for the entire Covered Lands. Plant and wildlife surveys were conducted in 2007 for the TMV Planning Area to support an analysis of the effects of the TMV Project (Dudek 2007a, 2007b). However, it is not assumed the results of these surveys are representative of the entire Covered Lands, and reliance on such information in the model would underestimate species occurrence. Furthermore, standard reconnaissance and single-year protocol-focused surveys (e.g., for least Bell's vireo and southwestern willow flycatcher) are not as useful for habitat modeling because of a general lack of sufficient spatial and temporal sampling data to determine occupancy rates, especially when detection probabilities are low (MacKenzie et al. 2002, p. 2253).

Specifically, the plant and wildlife species surveys in the TMV Planning Area were conducted in 2007 for the TMV Project and according to established field methods for the different taxonomic groups and species (Dudek 2007a, 2007b). For special-status plants, the field survey methods conformed to California Native Plant Society (CNPS) botanical survey guidelines (2001) and California Department of Fish and Game (CDFG) Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (2000). The plant survey coverage rates varied depending on potential presence of special-status species (determined through the pre-survey review of existing literature and databases), topography, and suitability of habitat being surveyed. Meandering transects were walked, and transect paths were recorded on field maps. Surveys for federally and state-listed or fully protected wildlife species were conducted in accordance with available official protocol methods or other accepted methods when official protocol survey methods were not available. These plant and wildlife protocols are designed to provide an adequate depiction of the biological resources for a defined project or study area (in this case, the TMV Planning Area) but cannot be used to make statistical inferences about areas that have not been systematically surveyed (in this case, the remaining Covered Lands). For these reasons, the TMV Project survey data do not meet the criterion of an unbiased sample of the remaining Covered Lands that would be required to statistically test the accuracy of habitat models. The occurrence data for the TMV Planning Area are not depicted on the maps because comparable surveys have not been conducted on the remainder of Covered Lands. A lack of occurrence data on Covered Lands outside the TMV Planning Area could erroneously portray these areas as unoccupied by Covered Species. However, the TU MSHCP has been revised to summarize all occurrence data from all past surveys, incidental sightings, and California Natural Diversity Database (CNDDB) reports (see Section 5, Other Covered Species, of the TU MSHCP). The additional information has also been added to the environmental setting information provided in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS.

As noted in the comments, additional data have been compiled and applied to Tejon Ranch. However, the additional data sets identified in the comment (Conservation Biology Institute 2003a, 2003b; South Coast Wildlands 2003; Conservation Biology Institute and South Coast Wildlands 2006) are not specifically relevant to the habitat modeling conducted for the TU MSHCP conservation analysis and do not include information that would have improved or supplemented the species-specific habitat models. The primary purposes of these studies were to characterize the relative conservation values on the entire Tejon Ranch to help direct reserve design and to identify important landscape-level habitat linkages.

CBI (2003a) did conduct habitat suitability models for two of the plant Covered Species—striped adobe lily and Tejon poppy—using vegetation, elevation, and soils data in a manner similar to the models described in Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS. CBI (2003a) also modeled habitat for Tehachapi pocket mouse using the same elevation parameter but somewhat different vegetation community parameters. It should be noted that the FRAP vegetation coverage updated by CBI (2003a) (using satellite imagery and aerial photography) is a regional vegetation coverage and does not have the detail and mapping precision of the vegetation data used for the TU MSHCP modeling, which was based on ground surveys. Therefore, with the more detailed vegetation available for the habitat models, the updated FRAP vegetation is not an appropriate or useful data set for the models.

CBI (2003b) primarily focused on the conservation value of Tejon Ranch, with the goal of raising the awareness of the public and decision-makers about the significance of the ranch and the need to conduct comprehensive, landscape-level resource planning on the ranch. As noted on page 1 of that report, CBI (2003b) does not advocate a particular open space or reserve design. It describes the high biological diversity and high species endemism of the ranch and the importance of the ranch for evolutionary processes such as divergence and speciation. As such, this report does not provide specific information that would supplement or improve the habitat models.

The focus of the SC Wildlands (2003) study was to identify a landscape habitat linkage across Tejon Ranch using landscape permeability analyses[1] for nine focal species: mountain lion, American badger, San Joaquin kit fox, mule deer, western gray squirrel, Tipton kangaroo rat, Tehachapi pocket mouse, California spotted owl, and blunt-nosed leopard lizard. Of these, the mountain lion, badger, deer, squirrel, pocket mouse, and spotted owl occur on the Covered Lands, but only the Tehachapi pocket mouse is a Covered Species under the TU MSHCP. As noted above, the models for Tehachapi pocket mouse used the same elevation parameter but somewhat different vegetation parameters. Because the focus of the SC Wildlands (2003) study was on identifying landscape linkages using a specific analytic technique (the permeability analysis), it is not relevant to the habitat models for the Covered Species. The reader is referred to the Master Response 7, Edge Effects, Fuel Modification, and Wildlife Habitat Connectivity for a discussion of the landscape habitat linkage and relevant aspects of SC Wildlands (2003).

CBI and SC Wildlands (2006) identify conservation objectives and propose a reserve design for Tejon Ranch using the information developed by CBI (2003a) and SCW (2003). The habitat modeling conducted for the Covered Species in the TU MSHCP was not intended to inform reserve design; the purpose of the habitat models was to analyze the potential effects of the Covered Activities, and conservation of suitable habitat for each of the Covered Species. Therefore, the information contained in the CBI and SC Wildlands (2006) study is not directly applicable to the habitat models.

[1] As defined by SCW (2003), "Landscape permeability analysis is a GIS technique that models the relative cost for species to move between core areas based on how each species is affected by habitat characteristics such as slope, elevation, vegetation, and road density" (p. 8).

The habitat suitability model will be used by the Service to assess potential direct and indirect effects on the Covered Species from the Covered Activities, and to identify potentially suitable habitat for each Covered Species in order to inform their evaluation of the proposed conservation strategy.

5.2.4 Field Ground-Truthing and Verification Studies

Commenters suggested that field ground-truthing and verification studies and iterative testing of the model results should have been conducted.

While ground-truthing and verification of habitat modeling results can increase confidence in a model and in conclusions drawn from a model, in the absence of formal truthing and verification efforts, the Service must proceed using the best available science. The habitat modeling approach described in Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS, and the species-specific surveys of the TMV Planning Area represent the best available data to inform our analysis in accordance with Federal standards for information pursuant to the ESA. Species specific survey data are available for the TMV Planning Area and were used to check the accuracy of the model, as described above.

5.2.5 Advanced Modeling Techniques

A commenter suggested that advancements in suitable habitat modeling can provide a better understanding of a species distribution across the landscape. One commenter referred to work by Elith et al. (2006, pp. 129–151), which lists a number of techniques that the commenter suggests would perform a better analysis than the one performed for the TU MSHCP, which used a general GIS analysis with overlay techniques. The commenter indicates that one such technique—the MaxEnt technique—could provide a much more detailed understanding of a species' suitable habitat and notes that MaxEnt supports modeling of rare species and outperforms other modeling techniques. Species with limited occurrence data and those with little to no absence data would benefit the most.

The Service is required to use the best available scientific and commercial data when making decisions. The methods used to model habitat in the Covered Lands are well established and commonly used. The process of developing an alternative, validated, predictive habitat model for even a single species is very rigorous. Elith et al. (2006, p. 147) indicate that partial occurrence sampling within a species' range may not capture important environmental conditions that affect the species distribution, especially for species with large ranges. Therefore, development, testing, and validation of an alternative model should be done across the entire range of the species. Most of the Covered Species have a geographic range that extends well beyond the Covered Lands, and development of a habitat model outside the Covered Lands is outside the scope of our analysis.

The Service has determined that certain limitations of the Elith et al. models prevent their application to the Covered Species. These reasons are based on Elith et al.'s (2006, p. 147-148) descriptions of the models' limitations and include:

1. No one model performed well across species and regions;
2. All 16 habitat modeling approaches reviewed by Elith et al. (2006) were tested over large spatial scales (e.g., Australian wet tropics; birds of Ontario, Canada; northeast New South Wales, Australia; plants of New Zealand), and it is unclear if these modeling approaches would be appropriate at the scale of the Covered Lands or for all Covered Species;

3. The results provided by the Elith et al. (2006) models do not appear to be an improvement over the current models, because they "…do not accurately predict probability of presence…Rather, they provide relative indices of suitability (p.148)";
4. The data required to remedy the immediately preceding limitation are not available;
5. The data used for the models "required considerable grooming and manipulation" to create consistency both within and between regions (Elith et al. 2006, p. 131); and
6. The models are still in a refinement phase and require additional investigations, testing, analysis, and evaluation.

The Service believes the habitat models considered in this EIS and in the TU MSHCP represent the best scientific and commercial data currently available, in accordance with Federal standards for information pursuant to ESA.

5.2.6 Climate Variables

Commenters suggested that climate variables such as temperature and precipitation be incorporated into the habitat models for several of the Covered Species, including Tehachapi slender salamander, western spadefoot, yellow-blotched salamander, American peregrine falcon, western yellow-billed cuckoo, Fort Tejon woolly sunflower, striped adobe lily, and Tejon poppy.

The direct relationship of climatic variables such as temperature and precipitation to occurrence of Covered Species is difficult to determine, especially when considered at coarse scales. Fine-scale data showing variation in rainfall and temperature in the Covered Lands are not available. While there are several examples of temperature and precipitation requirements as they relate to life history stages, such as Tehachapi slender salamanders remaining underground during subfreezing temperatures or western spadefoot waiting until water temperature is at least 10°C before egg deposition, many Covered Species are more reliant on certain microclimates created by habitat structure than general climatic variables. For example, adequate cover and moisture retention by detritus and soil under that cover is likely more important to amphibian species distribution than rainfall or daytime air temperature. Therefore, adding general climatic data to the models is unlikely to further inform the models and improve the understanding of the Covered Species distribution on Covered Lands.

The habitat models are based primarily on vegetation communities and other abiotic factors (e.g., elevation, slope) with which each Covered Species is associated. The Service believes that vegetation communities, by proxy, can reflect the climatic requirements of a given Covered Species. Also, elevation, aspect, and slope tend to be correlated with temperature and precipitation on a local scale. Because these abiotic variables were incorporated into the models for each Covered Species based on known habitat requirements, the Service believes the climatic requirements for each species are accounted for in the models.

5.2.7 Vegetation Data

Commenters suggested that vegetation data be included for all species. One commenter stated that vegetation cover detailed enough to identify vegetation structure for each specific polygon should be included in the models for bird species, such as least Bell's vireo, willow flycatcher, and western yellow-billed cuckoo. This comment indicated that the Normalized Difference Vegetation Index (NDVI) has been used for many studies of bird suitable habitat modeling, has provided useful insight, and should be included in the habitat models. Comments suggested that the NDVI should also be used in the habitat models for the ringtail and Tehachapi pocket mouse. Comments also recommended that drainages, seeps, and ponds be included in the models of bird species

specializing in riparian and wetland habitats (including tricolored blackbird) and that elderberry plants should be included in the model for valley elderberry longhorn beetle.

Vegetation communities were included in the models for all of the Covered Species. As described in Appendix D, Habitat Suitability Criteria Methods, to this Supplemental Draft EIS, vegetation communities used in the models included two data sources: the ranch-wide vegetation composite map and the vegetation map created for the TMV Planning Area in 2007. The NDVI referenced in the comments is an index of relative vegetative productivity derived from data collected satellite-based sensors that capture visible and infrared light reflected from the Earth's surface. The NDVI can indicate the presence of live green vegetation and, as noted in the comment, has proven useful in adding information in large-scale habitat modeling. The NDVI is also used to track and predict trends in land use, drought, and weather patterns (e.g., El Niño). The spatial resolution of available data from which an NDVI can be calculated currently varies between 30 meters and 1 kilometer depending on the data source.

Mapping in the TMV Planning Area included a minimum mapping unit of 1 acre for special-status vegetation communities (i.e., vegetation communities listed as a high priority for mapping by the CNDDB, including riparian areas) and 2.2 acres for other vegetation communities. Vegetation mapping for the Covered Lands outside of the TMV Planning Area (i.e., the Tejon Ranch-Wide Vegetation Composite described in Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS) was also ground-based and reflects several surveys conducted between 1980 and 1994, and in 2000 to fill in gaps in the vegetation map. The resolution of vegetation mapping data collected for the Covered Lands falls within the range of data resolution available for an NDVI. In addition, the data for the Covered Lands contains greater species-specific detail than satellite-based data. Therefore, the Service does not anticipate that an NDVI would add information to the vegetation database that is not already reflected in the models for the Covered Species.

Remote sensing data, including high-resolution aerial photography, is usually inadequate to identify species or delineate vegetation structure within a riparian corridor. Likewise, the vegetation mapping data for the Covered Lands do not include a sufficient level of detail on a polygon-by-polygon basis to identify specific vegetation structure suitable for the Covered Species, including the least Bell's vireo, willow flycatcher, western yellow-billed cuckoo, Tehachapi pocket mouse, and ringtail. This is noted in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, and in the species accounts in Section 5.2.2, Birds, of the TU MSHCP. Although the TMV Planning Area vegetation mapping for riparian areas was conducted with a minimum mapping unit of 1 acre, this vegetation information was combined with the ranch-wide vegetation composite map, which generally was mapped at broader mapping scales using more generalized community types. Refer to Section 3.1.3.1, Mapping Methods, in Volume I of this Supplemental Draft EIS for a discussion of how and why the Tejon ranchwide vegetation layer was crosswalked with vegetation mapping of the TMV Planning Area.

With regard to the comment that drainages, seeps, and ponds should be included in the habitat models for the riparian and wetland species, the riparian zones that provide habitat for riparian and wetland birds have been delineated. Seeps, ponds, and drainages do not always support woody riparian vegetation suitable for riparian-obligate bird species; however, any riparian vegetation associated with drainages, seeps, and ponds was mapped as such and included in relevant species models. Wetland nesting habitat for the tricolored blackbird is discussed in detail below under Section 5.2.11, Species-Specific Recommendations.

The habitat model for valley elderberry longhorn beetle relies on the vegetation communities typically associated with the presence of elderberry, including oak woodland and savanna, California buckeye woodland, and intermixed conifer within 300 feet of USGS blueline streams (150 feet on either side) at elevations between 1,900 feet and 3,000 feet above mean sea level (amsl) on the Covered Lands. Elderberry was only specifically mapped in the TMV Planning Area, and mapping

data for elderberry vegetation is lacking for the rest of the Covered Lands. For this reason, it is likely that some modeled habitat may not contain the microhabitat (i.e., elderberry shrubs and trees) required by this species, resulting in an overestimate of the amount of suitable habitat for the valley elderberry longhorn on the Covered Lands. The following points should be noted:

- Focused surveys for the species in 2005 and 2007 in the TMV Planning Area were negative (Dudek 2009).
- There are no known locations of valley elderberry longhorn beetle on the Covered Lands (California Department of Fish and Game 2007).
- The majority of the Covered Lands are above the elevation range of the species.
- The Covered Lands are located at the extreme southern edge of the species' geographical range.

5.2.8 Soils and Geological Data

Comments suggested that soils and geology data be incorporated into the habitat models for all species, and specifically for Tehachapi slender salamander (talus slopes), western spadefoot (sandy and gravelly soils), yellow-blotched salamander (loamy soils), ringtail (rock piles and talus slopes), coast horned lizard (loose, sandy soils), two-striped gartersnake (streams with rocky or sandy beds), burrowing owl (no soil type identified in comment), and Kusche's sandwort (quartz monzonite, alluvial terraces, and debris flows).

The construction of the habitat models, including whether or not soils should be considered, relied on the best available print and online literature for each of the species. Where the literature clearly identified soil or geology as a factor in species distribution, and those data were available for the Covered Lands, they were included as parameters in the habitat models. This occurred for Kusche's sandwort (granitic soils), round-leaved filaree and striped adobe lily (clay soils), and Tehachapi buckwheat (Anaverde Gravelly Loam, Xerorthents-Rock Outcrop Complex, Very Steep or Lebec Rocky Loam). Soils and geology factors were not included in the habitat models for Tehachapi slender salamander, ringtail, western spadefoot, yellow-blotched salamander, coast horned lizard, two-striped gartersnake, or burrowing owl, for the reasons discussed below.

For Tehachapi slender salamander and ringtail, data regarding the presence or absence of talus substrates and rock piles are not available for the Covered Lands. The geology data available for the Covered Lands are USGS data, which are too coarse to identify specific locations for talus slope microhabitats that could be used by Tehachapi slender salamander and talus slopes and rock piles potentially used by ringtail. Similarly, the geotechnical study completed by ENGEO (2008) for the TMV Planning Area was too coarse to identify specific locations for rock pile and talus slope microhabitats that could be used by these species.

Western spadefoot are seasonally associated with multiple soil types. The species may breed in vernal pools, other ephemeral pools underlain by clay soils, and riparian zones that support breeding pools. Sandy or gravelly soils may be a necessary condition for aestivation and hibernation habitat. However, the Service is not aware of any studies describing the extent to which each soil type is a predictor of species occurrence. Adding soils and geologic features to the model for this species is unlikely to improve the understanding of the western spadefoot's potential distribution on Covered Lands.

Similar to issues identified for western spadefoot, an association between yellow-blotched salamander and loamy soils, soils which likely occur much more broadly than the distribution of salamanders, suggest that it would not be an important predictor of occupied habitat for this species.

Coast horned lizards may commonly occur in sandy washes and areas with loose soils, but also may occur on other substrates, including gravelly loams and clays where harvester ant prey is available, as long as patchy areas of loose soils are available (note that there is very little clay soil on the Covered Lands; see Figure 3.1-1in Volume I of this Supplemental Draft EIS). Similarly, two-striped garter snakes use a variety of soils associated with riparian and aquatic sites in addition to streams with rocky and sandy substrates (Zeiner et al. 1990). Using the soil type recommended by the commenter to refine the habitat models for these species likely would remove areas that are suitable for the species.

For the burrowing owl, the availability of small mammal burrows is an important factor in whether habitat will support the species. Although small mammal burrows are usually associated with the availability of friable soils, this definition of suitable soils is too broad to be a useful predictor in the habitat model for the owl because presence of friable soils may or may not indicate the presence of small mammal burrows that are suitable for the species. The actual location of small mammal burrow distribution would be a better predictor; however, burrowing mammal location data (e.g., California ground squirrel colonies) are not available for the Covered Lands.

5.2.9 Habitat Overestimation and Underestimation

Commenters and specific habitat model recommendations indicate that the habitat models may have overestimated habitat for some species and underestimated habitat for others, and in some cases overestimated some habitat types supporting one phase of a species' life history and underestimated habitat supporting another phase of the species' life history (e.g., least Bell's vireo and willow flycatcher).

The comments and habitat model recommendations for least Bell's vireo and willow flycatcher suggest that suitable habitat may have been overestimated for breeding activity and underestimated for migration. The comments suggested using more detailed vegetation structure for riparian polygons that could support breeding, which would reduce habitat estimates, but including migration habitat (e.g., upland communities), which would increase habitat estimates.

Species for which the comments and habitat model recommendations imply that suitable habitat may have been overestimated, and for which model refinements likely would reduce habitat estimates, include the following: Tehachapi slender salamander, burrowing owl, tricolored blackbird, western yellow-billed cuckoo, valley elderberry longhorn beetle, ringtail, coast horned lizard, two-striped garter snake, Kusche's sandwort, round-leaved filaree, striped adobe lily, Tehachapi buckwheat, and Tejon poppy. Species for which the comments and habitat model recommendations imply that suitable habitat may have been underestimated, and for which model refinements likely would increase habitat estimates, include the following: western spadefoot, bald eagle, and Tehachapi pocket mouse. Species-specific comments are addressed below in Section 5.2.1.1, Species-Specific Recommendations.

A challenge in developing habitat models is to include the habitat parameters that are considered to be most important for species' presence and use, without inappropriately overestimating or underestimating suitable habitat for the species. At the same time, a habitat model should focus on the habitat features necessary to meet the relevant life history requirements of a species in a particular area and therefore may not include all areas that could ever be used by a species during its lifetime. This requires incorporating the available information for a species, and in some cases extrapolating from the available information to identify other habitat features that might be important to a species. If studies of a species are limited, restricting the habitat model to only the habitat features of sites where the species was documented could easily overlook important habitat. In this case, a conservative habitat model is an appropriate starting point until additional information can be used to refine the model. Better understood species present a different

challenge. Even though a species may occur in a habitat area occasionally, the area may not be important or critical to the species and other available areas may fulfill the species' needs; that is, the occurrence or habitat type may be a statistical outlier and should not be included in the model. Habitat models that attempt to account for 100% of a species' occurrences or use areas may overestimate the amount and distribution of important habitats.

For the purpose of the EIS and TU MSHCP habitat models, the Service determined that overestimates of suitable habitat are preferable to underestimates for the following reasons:

- Important habitat information may not be available for a species that allows for refinements to the models. For this reason, the habitat model must rely on broader habitat parameters that are considered necessary conditions for the species. Because these broader habitat parameters may be necessary but not sufficient conditions for species presence, in the models may overestimate suitable habitat.
- Habitat models for species that may have low detection probabilities should be conservative in order to avoid excluding potentially occupied habitat. Standard reconnaissance and even protocol focused surveys, if conducted in a single year, may not be useful for habitat modeling, because they lack sufficient spatial and temporal sampling to estimate occupancy rates, especially when detection probabilities are low. If sufficient data are not available to estimate occupancy rates, models that tend to overestimate occupied habitat are preferable to models that may underestimate occupied habitat. It is more likely that habitat areas that meet important life history requirements of a species will be included in a model that overestimates suitable habitat versus a model that underestimates suitable habitat.

Some comments expressed concern that some models may underestimate habitat and that the input parameters should be expanded. For example, willow flycatchers may occasionally use nonriparian vegetation communities during migration (Sogge et al. 1997, p. 13); therefore, other communities should have been included in the model for the species. This comment was also applied to least Bell's vireo.

The habitat models are intended to model the habitat considered to be most important to a species. As described above, including habitats that may occasionally be used in the model could greatly overestimate the amount of important habitat on Covered Lands used by species. In the case of the willow flycatcher and least Bell's vireo, which may use nonriparian habitat during migration, expanding the model to include all these habitats would reduce the value of the model for analyzing the alternatives considered in the EIS. Where supported by the literature and based on input from the biology working group that reviewed the model parameters, suitable habitat was refined into different habitat use types as appropriate, including:

- Suitable (meets all life history needs)
- Primary breeding
- Wintering
- Breeding and foraging
- Secondary breeding and foraging (less frequently used and alone may not be adequate to support the species)
- Foraging
- Secondary foraging

Although there is some level of uncertainty inherent in habitat modeling, the approach used in the EIS and TU MSHCP is an acceptable and reasonable method in accordance with Federal standards for information pursuant to the ESA.

5.2.10 Plant Models and Aspect

A comment indicated that aspect is critically important to plants, but is not considered in the habitat models for these species.

As noted above, the habitat models are primarily based on documented habitat relationships from both print and online sources, as well as the professional judgment of the biologists familiar with the Covered Lands. While aspect information was available for Fort Tejon woolly sunflower, Kusche's sandwort, and striped adobe lily, aspect is an unmapped microhabitat feature. As described in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, and the species-specific discussions of habitat characteristics and use in Section 5.3, Plants, of the TU MSHCP, the majority of Kusche's sandwort plants were found on north-facing slopes, the majority of Fort Tejon woolly sunflower plants were found on north- and south-facing slopes, and the majority of striped adobe lily plants were found on north-facing slopes. If the models were run with aspect, some portion of potential habitat would be excluded, as a minority of the plants is found on other slope aspects. In addition, the digital elevation model for Tejon Ranch is not refined enough to pick up microhabitat features of aspect. Because the habitat suitability models were run without aspect, the models are considered to be more conservative than if they had been run with aspect. As discussed above, erring on the side of the models overestimating suitable habitat is preferable to underestimating suitable habitat and potentially missing important populations of a species.

5.2.11 Species-Specific Recommendations

The comments included several species-specific recommendations regarding the habitat models for the Covered Species.

- **Tehachapi slender salamander.** A comment recommended that talus slopes be added to the habitat model and that the elevation variable for Tehachapi slender salamander should be lowered to 1,500 feet amsl. As noted above, information about talus slopes on the Covered Lands is not available. The Covered Lands do not include areas below 1,900 feet amsl. Therefore, lowering the model input parameter to 1,500 feet amsl would not affect the habitat model results for this species. Of note, since publication of the Draft EIS, the habitat model for Tehachapi slender salamander has been revised to include scrub and chaparral communities, which may include yucca (*Yucca* spp.) due to recent occurrence data for the species in dead yuccas on north-facing slopes (Sweet 2011).
- **Western spadefoot.** A comment recommended that the suitable habitat model for western spadefoot be expanded beyond 5 feet of seeps and springs to include a buffer around seeps and springs that is at least several hundred meters. Although it is known that western spadefoot uses upland habitats adjacent to breeding areas, an accurate quantitative habitat analysis for western spadefoot on the Covered Lands that does not grossly overestimate suitable habitat is difficult. As described in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, and Section 6.2.1.2.1, Discussion of Potential Take of Western Spadefoot, of the TU MSHCP, focused surveys for the western spadefoot in the TMV Planning Area were negative in 2007, and this species is considered to have low potential to occur on the Covered Lands below 3,000 feet amsl, and a very low potential to occur on Covered Lands above 3,000 feet amsl. If the western spadefoot does occur in the Covered Lands, it is expected to occur in a very sporadic and patchy distribution in modeled habitat. The estimate that 30 acres of modeled habitat would be affected by the Covered Activities (Table 4.1-3 in Volume I of this Supplemental Draft EIS), therefore, is likely an overestimate of the potential for effects on this species, and would accommodate any terrestrial habitat that may be affected at an occupied site; in other words, it is highly unlikely that more than 30 acres of actual occupied habitat, including adjacent uplands, would be affected. Furthermore, setbacks from modeled habitat for western spadefoot would be

incorporated into the design features of development under the TU MSHCP. These setbacks would provide an upland buffer between development and modeled habitat that could be used for terrestrial aspects of the species' life history.

- **American peregrine falcon.** A comment indicated that climate variables provide more information for American peregrine falcon. Potential foraging habitat for American peregrine falcon that could be used during migration was analyzed in the EIS (Section 3.1, Biological Resources, and Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS,). The literature review presented in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, indicates that information on climate requirements for this very wide-ranging species is generally lacking. Temperature and precipitation can be correlated with suitable habitat factors (e.g., elevation ranges) within the known range of this species, but there are few or no data correlating climate variables with American peregrine falcon presence. However, the only regions that this species does not occupy as a breeder are the Amazon Basin, the Sahara Desert, most of the steppes of central and eastern Asia, and Antarctica. Based on the species' range, it is reasonable to infer that it has a broad tolerance to different climate regimes. Therefore, we would not expect climate variables to affect a habitat model in the relatively temperate region in which the Covered Lands occur.
- **Bald eagle.** A comment recommended that "other areas of suitable vegetation cover around water sources" be included in the model for bald eagle. Modeled habitat for the bald eagle includes oak woodlands and savannah and riparian/wetland within 1 mile of Castac Lake (Section 3.1, Biological Resources, and Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS,). Bald eagles are not expected to occur on the Covered Lands other than in association with Castac Lake, because Castac Lake is the only perennial water body supporting sufficient populations of fish to support bald eagles.
- **Burrowing owl.** A comment recommended that burrowing mammal location data be included in the model for burrowing owl. As stated in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, the availability of numerous small mammal burrows is a major factor in determining whether an area with apparently suitable habitat will support burrowing owls (Coulombe 1971, p. 162), and burrowing owls rarely use areas unoccupied by colonies of burrowing mammals (Zarn 1974, p. 14). However, burrowing mammal location data (e.g., California ground squirrel colonies) are not available for the Covered Lands. As such, the model relies on more general habitat suitability parameters for the burrowing owl.
- **Least Bell's vireo and little willow flycatcher.** Comments recommended that migration habitat be included in the models for least Bell's vireo and little willow flycatcher, and that more detailed vegetation structure data be used for riparian areas. As described above in Section 5.2.7, Vegetation Data, the suitable habitat models were designed to estimate the distribution and amount of habitat most likely to be used by Covered Species. As described in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, both the least Bell's vireo and willow flycatcher may use nonriparian habitats during spring and fall migration (U.S. Fish and Wildlife Service 1998, pp. 10–12; Sogge et al. 1997, p. 13), but both primarily use riparian habitat during migration, which was included in the suitable habitat model for both species. Including upland communities such as sage scrub and woodland in the model would greatly overestimate habitats likely to be used by these species during migration. More detailed data on vegetation structure were not available for the entire Covered Lands.
- **Tricolored blackbird**. A comment recommended that proximity to wetlands, riparian areas, and seeps be added to the model for tricolored blackbird. This species has two fairly distinct life history requirements: foraging habitat and breeding habitat. Modeled foraging habitat for tricolored blackbird includes agriculture, grasslands, riparian scrub, riparian woodland, and wash (wash/desert and wash/riparian/seeps vegetation types). Modeled breeding habitat for

tricolored blackbird includes wetlands and riparian/wetlands (Section 3.1, Biological Resources, and Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS). Because the tricolored blackbird prefers to breed in freshwater marshes with dense growths of emergent vegetation dominated by cattails (*Typha* spp.) or bulrushes (*Schoenoplectus* spp.), modeled breeding habitat includes the general vegetation categories of wetlands and riparian/wetlands. While the tricolored blackbird colonies require a nearby water source, this species typically forages in grassland, woodland, or agricultural croplands. During the breeding season, tricolored blackbirds generally forage within about 4 miles of nesting colonies (Orians 1961). However, this species also often changes its nesting location from year to year, so its foraging patterns and use areas may also change. Suitable water sources are scattered throughout the Covered Lands, and there also may be unmapped water sources outside of the Covered Lands that could support breeding and be a source of tricolored blackbirds foraging on site. If proximity to water was included in the model (e.g., within a 4-mile radius), the results would not have been substantially different than those included in the EIS and TU MSHCP (Figure 3.1-20 in Volume I of this Supplemental Draft EIS), but likely would have resulted in reduced habitat estimates. Therefore, the model for foraging habitat was based only on vegetation type and elevation range.

- **Western yellow-billed cuckoo**. A comment suggested that better data for vegetation structure be included in the model for this species. Detailed vegetation structure in riparian zones is not available for the entire Covered Lands. In addition, as described in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, in the TMV Planning Area, where more detailed vegetation mapping was conducted, there is a lack of riparian habitat with appropriate patch size and configuration to support breeding territories of this species.
- **Coast horned lizard and two-striped garter snake.** Comments suggested that soils information be used to refine the habitat models for the coast horned lizard by including loose, friable soils, and, for the two-striped garter snake, by including streams with rocky and sandy soils associated with willows. Coast horned lizards may most commonly occur in sandy washes and areas with loose soils, but they also may occur on other substrates, including gravelly loams and clays where they find harvester ant prey, as long as patchy areas of loose soils are available (note that there is very little clay soil on the Covered Lands; see Figure 3.1-1 in Volume I of this Supplemental Draft EIS). Similarly, two-striped garter snakes use a variety of soils associated with riparian and aquatic sites in addition to streams with rocky and sandy substrates (Zeiner et al. 1990). Using soils to refine the habitat models for these species likely would remove areas that are suitable for the species, at least for some phases of their life cycles.
- **Ringtail.** A comment suggested that habitat for ringtail is poorly modeled because ringtail territories are known to be within 0.5 mile of riparian zones. The comment stated that the "modeling does not track with other riparian dependent species." The habitat model for ringtail (Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS) is consistent with the scientific literature regarding location of territories. The ringtail model includes areas within 1 kilometer (0.6 mile) of riparian and wetland communities, seeps and springs, and perennial streams. Another comment suggested that talus slopes and rock piles should have been added to refine the model. This information is not available for the Covered Lands.
- **Tehachapi pocket mouse**. A comment recommended that the modeled elevation for Tehachapi pocket mouse be lowered to 3,000 feet amsl. As described in Section 3.1, Biological Resources, in Volume I of this Supplemental Draft EIS, published data reports the Tehachapi pocket mouse generally occurring between 3,500 and 6,000 feet amsl. This approach to modeling habitat for the Tehachapi pocket mouse is consistent with other studies of this species (SC Wildlands 2003)
- **Valley elderberry longhorn beetle**. A comment recommended that additional habitat information for the valley elderberry longhorn beetle based on the Talley et al. (2007) report be

incorporated into the model for this species. Also, a comment suggested that all vegetation communities supporting elderberry be added to the model. Talley et al. (2007) characterize the valley elderberry longhorn beetle on the basis of the host plant (elderberry [*Sambucus* spp.]), as well as an array of physical and biological characteristics. Their goal is to develop habitat definitions that reliably indicate occupancy and local persistence and abundance, in order to assess whether unoccupied sites are suitable habitat, and to prioritize land acquisitions and identify management actions. Talley et al. (2007) found that higher densities of elderberry plants and larger mature elderberry plants (i.e., larger size, number of stems, range of branch sizes) were associated with increased valley elderberry longhorn beetle populations. In addition, proximity to habitat edge and topography was also important. However, it is not possible to revise the habitat model using the parameters identified by Talley et al. (2007), because this information is not available for the Covered Lands. Talley et al. (2007) found a statistically significant relationship between topography and beetle occupancy, but this relationship occurs at too fine a scale (the elevation range in their study area was only 2 to 18 meters) to be applicable in the habitat model developed for the Covered Lands.

With regard to including all vegetation communities with elderberry in the habitat model, this level of detail is not available for all of the Covered Lands. Therefore, vegetation communities known to often include elderberry as a constituent were used in the model.

- **Kusche's sandwort and round-leaved filaree.** Comments recommend that disturbed areas that may provide openings in the landscape for Kusche's sandwort and round-leaved filaree be added to the habitat models for these species. The vegetation mapping effort in the TMV Planning Area defined disturbed habitat as areas that experience regular or high levels of human disturbance (e.g., dirt ranch roads, areas associated with ranch facilities and structures) and combined these areas with developed areas. The locations of other or naturally occurring disturbed areas are not available for the Covered Lands. The Service assumes that such openings in the natural vegetation communities, where they occur, would have been smaller than the minimum mapping unit, and would have been mapped as part of the associated habitat parameters for these species. Any openings within otherwise suitable modeled habitat would already be included in the habitat models for these species; however, disturbed areas or openings within natural vegetation communities that could support the Kusche's sandwort and round-leaved filaree were not defined as a separate mapping category.

  A comment indicated that round-leaved filaree habitat may have been overestimated because the model is not restricted to clay soils. This assertion is incorrect. As noted in the habitat model parameters listed in Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS, clay soils are included in the model.

- **Striped adobe lily**. A comment suggested that the model for the striped adobe lily be based on heavy adobe clay soils in blue oak woodland. The habitat model for this species has broader parameters that include clay soils and savannah and grassland communities (Appendix D, Habitat Suitability Criteria Methods, of this Supplemental Draft EIS). These soils and communities were selected based on the habitat associations for this species described in the literature (California Department of Fish and Game 2007) (63 *Federal Register* 177). Most of the verified reports have been from annual grasslands with a mixture of nonnative grasses and native forbs. At least two documented occurrences of striped adobe lily are from oak woodlands, and one record is from a native perennial grassland. While the species appears to be restricted to heavy, usually red, clay soils, the physiological and/or ecological basis for this restriction is not known (Stebbins 1989). The habitat model therefore was conservative in the habitat parameters for this species.

- **Tehachapi buckwheat.** A comment recommended that the habitat model for Tehachapi buckwheat include information on pollinator distribution. Tehachapi buckwheat is a new

species that was discovered in 2006 and very little is known about the natural history of this species. Observations of Tehachapi buckwheat during 2007 surveys suggest the species may be pollinated by a variety of beetles and ants (Dudek 2007a), but no information exists on specific pollinators of this species. In addition, information on the distribution of pollinators on the Covered Lands is not available.

- **Tejon poppy.** A comment suggested that the habitat model for this Tejon poppy be based on adobe clay or sandy soils in sparsely vegetated grassland and valley chenopod scrub. Most of the verified reports of Tejon poppy in the CNDDB (California Department of Fish and Game 2007) from Elk Hills are from valley saltbush scrub, with common saltbush and nonnative annual grasses such as red brome, wild oats, and rat-tail fescue. Because there are no known occurrences of Tejon poppy in the Covered Lands based on a literature review (California Department of Fish and Game 2007), and because the species was not observed during surveys conducted in the TMV Planning Area, there are no documented habitat associations for this species on the Covered Lands. Therefore, the habitat model used relatively broad parameters, including grasslands and all scrub communities in all soils, for the habitat model to ensure that potential habitat areas were not excluded.