

TERRESTRIAL MAMMAL SPECIES OF SPECIAL CONCERN IN CALIFORNIA

Introduction

California possesses one of the richest mammalian faunas in the United States. The terrestrial mammal fauna, which excludes marine mammals, consists of 166 species, 15 of which are endemic (i.e., they occur only in California), and 420 subspecies. Considering species and subspecies together, approximately 25 percent are endemic to California. The state's enormous agricultural productivity, desirable living conditions, and associated population growth underlie major changes in the state's natural communities. For the terrestrial mammal fauna, the most important changes have been the conversion of native habitats to agricultural, suburban, and urban land uses, as well as timber harvest in parts of the state. These and other changes and land use practices described in this document have resulted in declines in the distribution and abundance of some taxa. As of 1998, there are 15 Threatened or Endangered terrestrial mammals that are protected under the California Endangered Species Act (CESA). [Editor's note: for current information about State- and Federally-listed species see <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf>.]

The first Mammal Species of Special Concern (MSSC) document was prepared in 1986 (Williams 1986). This updated report on mammals joins similar Department of Fish and Game (Department) reviews of amphibians and reptiles (Jennings and Hayes 1994), fishes (Moyle et al. 1995), and birds (Remsen 1978). [Editor's note: A revised report on birds became available in late 2008; see <http://www.dfg.ca.gov/wildlife/species/ssc/birds.html>. Work on a new mammal species of special concern document will begin in 2009.] This document reviews the status of terrestrial mammal species and subspecies in California for the purposes of revising the previous MSSC list (generated by the 1986 document), compiling updated data on distribution and abundance, describing each species' biology and current threats, and recommending management actions.

A taxon is assigned Special Concern status when its population numbers are declining at a rate that could result in its becoming Threatened or Endangered in the future if efforts to stop or slow its declines are not successful, or, in some cases, because it historically occurred in low numbers and there are known threats to its persistence. [Editor's note: More current information about the Species of Special Concern designation is at <http://www.dfg.ca.gov/wildlife/species/ssc/index.html>.] Available scientific data indicate that some of these Special Concern taxa may meet the State definitions for Threatened or Endangered (see page 4 for definitions). This review excluded State-listed species but included Federally-listed species that are not State-listed.

“Species of Special Concern” (SSC) is a Department administrative designation, not defined by the California Endangered Species Act, and the Department is not required under State law to maintain the Special Concern list or periodically review population trends of species on the list. However, the Department determines SSCs to provide an early warning system that identifies declining species before they become Threatened or Endangered, and to learn whether reasonable action can be taken to avert listing. These status reviews are intended to lead to considerations and management efforts that reduce conflicts between conservation of the state's natural heritage and its economic development.

Under California Environmental Quality Act (CEQA) guidelines, the following sections can apply to SSCs:

15065. Mandatory Findings of Significance

(a) A lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where there is substantial evidence, in light of the whole record, that any of the following conditions may occur:

(1) The project has the potential to: substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species....

15380. Definitions. Endangered, Rare or Threatened Species

(a) "Species" as used in this section means a species or subspecies of animal or plant or a variety of plant.

(b) A species of animal or plant is:

(1) "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or

(2) "Rare" when either:

(A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or

(B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.

(c) A species of animal or plant shall be presumed to be endangered, rare or threatened, as it is listed in:

(1) Sections 670.2 or 670.5, Title 14, California Code of Regulations; or

(2) Title 50, Code of Federal Regulations Section 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.

(d) A species not included in any listing identified in subdivision (c) shall nevertheless be considered to be endangered, rare or threatened, if the species can be shown to meet the criteria in subdivision

(b).

Methods

The methods focused on the objectives of updating the MSSC list consistent with the Department's definition of SSC (see below), and providing updated information on each taxon's status, distribution, biology, and recommendations for their management. Updating the list and the preparing this report involved the following steps:

The authors prepared a list of species and subspecies of terrestrial California mammals (Appendix 1) to provide the most current taxonomic list of California mammals, based on the existing literature. The list was based mainly on the synopses found in Hall (1981) and Reeder and Wilson (1994). A number of recent revisions for individual taxonomic levels (i.e., species, species groups, and families) were also considered. Discrepancies among any of these sources were resolved based on the professional judgement of the authors. Taxa endemic to California were identified. Taxa with highly restricted distributions were also identified, because of their potentially greater susceptibility to impacts.

The authors sought recommended changes to the previous list from qualified individuals. The

authors sent letters to 130 mammalogists, field biologists, and State/Federal resource managers to obtain information on existing Special Concern taxa, and solicit recommendations for additions and deletions to the current Special Concern list. They also requested information about population trends, threats, management recommendations, published and unpublished reports, and trapping records. The authors provided a list of potential Special Concern taxa in the information request (Appendix 2), although respondents were also asked to make recommendations and/or provide information on taxa not on the list. The list included then-current Special Concern taxa, candidates for listing by the USFWS¹, Federally-listed taxa not also listed by the State of California, and several taxa that initial review indicated could meet Special Concern criteria.

The authors constructed a database of museum records and non-museum observations of California mammals. Specimen records of California mammals were requested from 44 museums (Appendix 3). Each museum was asked to provide standard museum data (locality, sex, date of capture, catalogue number, etc.) for all California specimens in its collection. When this was too difficult to provide (e.g., for museums lacking computer databases), records for a list of potential Special Concern taxa were requested. These records were used to create a computerized database of approximately 90,000 specimen records for all taxa, and 22,000 specimen records of potential Special Concern taxa. These records served three purposes: *a*) to confirm the distributions of species with restricted distributions identified using Hall (1981); *b*) to identify taxa with few California records; and *c*) to prepare the distribution maps for Special Concern taxa.

The list of Special Concern taxa was prepared based on inclusion criteria. The general criterion for including a species on the list is that it meets the definition for Special Concern. At the time this report was prepared, the Department defines Species of Special Concern as described below [Editor's note: current SSC info is at <http://www.dfg.ca.gov/wildlife/species/ssc/index.html>]:

"Species of Special Concern" (SSC) status applies to animals not listed under ESA or CESA, but which nonetheless 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist. SSC share one or more of the following criteria:
"Species of Special Concern" (SSC) status applies to animals not listed under the Federal Endangered Species Act or the California Endangered Species Act, but which nonetheless 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist. SSC share one or more of the following criteria:

- 1. occur in small, isolated populations or in fragmented habitat, and are threatened by further isolation and population reduction;*
- 2. show marked population declines. Population estimates are unavailable for the vast majority of taxa. Species that show a marked population decline, yet are still abundant, do not meet the Special Concern definition, whereas marked population decline in uncommon or rare species is an inclusion criterion;*
- 3. depend on a habitat that has shown substantial historical or recent declines in size. This criterion infers the population viability of a species based on trends in the habitats upon which it specializes. Coastal wetlands, particularly in the urbanized San Francisco Bay and south-coastal areas, alluvial fan sage scrub and coastal sage scrub in the southern coastal basins, and arid scrub in the San Joaquin Valley, are examples of California habitats that have seen dramatic reductions in size in recent history. Species that specialize in these habitats generally meet the criteria for Threatened or Endangered status or Special Concern status;*
- 4. occur only in or adjacent to an area where habitat is being converted to land uses incompatible with the animal's survival;*
- 5. have few California records, or which historically occurred here but for which there are no recent records; and*

¹ ***The practice of designating Category 2 candidates for listing by the USFWS has since been discontinued. Under this previous classification, Category 1 species were those for which the USFWS had enough information to support listing as Threatened or Endangered. Category 2 species were those which may have been appropriate for listing, but sufficient data were not available to the USFWS to support a proposal for listing. Candidates for listing are now classified simply as "Candidates" and conform to the former Category 1 definition.***

6. *occur largely on public lands, but where current management practices are inconsistent with the animal's persistence.*

This designation is intended to result in special consideration for these animals by the Department, land managers, consulting biologists, and others, and is intended to focus attention on the species to help avert the need for costly listing under Federal and State endangered species laws and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them.

Department staff should consider SSCs during 1) the environmental review process, 2) conservation planning process, 3) the preparation of management plans for Department lands, and 4) inventories, surveys, and monitoring (conducted either by the Department or others with whom we are cooperating).

Taxa that are not State-listed but which may meet the definitions for such were also included on the Special Concern list. CESA defines an Endangered species as a native species or subspecies which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease. A Threatened species is one that is not presently threatened with extinction, but is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts (Fish and Game Code of California, §2062 and 2067). The Special Concern list was divided into taxa that may meet State definitions of Threatened or Endangered (Class I) and those that are of Special Concern and are not thought to be Threatened or Endangered (Class II).

Special consideration was given to taxa that occur on one or more lists of sensitive taxa maintained outside of the Department. These include taxa that are listed as Threatened or Endangered, candidates for listing, or found on a list of sensitive species by the U.S. Fish and Wildlife Service (USFWS), Oregon Department of Fish and Wildlife (ODFW), or the Arizona Game and Fish Department (AGFD). Special consideration was not specifically given to species and subspecies that are endemic to California; however, such species were more likely to meet the inclusion criteria than species whose distributions included neighboring states.

Species accounts and distribution maps were prepared for Special Concern taxa. Species accounts provide an overview of the species' description, taxonomy, life history, habitat relationships, status, and management recommendations. These accounts are based on published literature and unpublished reports, on the field experiences of the authors and, in some cases, on personal communications from experts. Distribution maps were prepared by the Department using ArcMap 9.2 to plot all available museum records and reliable non-museum observations in the database compiled by the authors, as well records in the Department's California Natural Diversity Data Base (CNDDDB).

Results

The list of terrestrial California mammals (Appendix 1) consists of 166 species, 15 of which are endemic, and 420 subspecies. Considering species and subspecies together, approximately 25 percent are endemic to California. There is broad agreement between existing reference taxonomies of California mammals (Hall 1981, Wilson and Reeder 1995) and separate taxonomic reviews. There are, however, a number of important differences in the nomenclature and taxonomic list of California mammals. This fauna differs from the list of Laudenslayer et al. (1991) through the addition of some taxa and the removal of others. The taxonomic decisions made in preparing Appendix 1 were those of the authors based on the best available scientific information and the rules of nomenclature.

The updated list of California Special Concern mammals contains 46 species or subspecies (Table 1).

[Editor's note: The authors did not explain why certain taxa on the Department's Mammal SSC list at the time this document was prepared were not included on their new list. However, most of the non-included taxa were those on the former Federal Category 2 candidate list, a list which did not require significant justification for inclusion of a taxon. The Category 2 candidate list and the addition of taxa to the Department's SSC list without rigorous documentation have both been discontinued.] The "additional status" column in Table 1 indicates whether or not the taxon is listed as Federally Threatened or Endangered, or if it is included on the current sensitive species lists maintained by ODFW or AGFD. The Special Concern list is divided into two groups, Class I and Class II. For Class I taxa, the available data indicate that the species may be Threatened or Endangered according to criteria defined by CESA. In some cases, the distinction of whether the taxon may meet State standards of Threatened or Endangered will require a more detailed status review than was undertaken here. The taxa in Class II are those with low or declining numbers of individuals, or low, scattered or highly localized populations that require active management to prevent them from becoming Threatened or Endangered species.

A third class of taxa appears on the Watch List in Table 2. The 22 Watch List taxa are those with restricted distributions that we do not currently consider to be Species of Special Concern. Watch List taxa merit field studies that yield data on the status of and trends in their populations, and monitoring of potential threats. Populations of these species should be assessed periodically and considered in management decisions and multispecies and habitat conservation plans. The Department's Resource Assessment and Nongame Wildlife programs provide mechanisms to help determine and monitor population status and trends. The Department's Conservation Planning Program provides a large-scale planning framework to conserve significant pieces of habitat for listed and special concern species. This document will help these programs determine priorities for species status assessment and monitoring and help large-scale conservation planning efforts determine which species should be included in plans.

The list of 46 Special Concern taxa contains five species or subspecies of shrews (11%), 14 bats (30%), two hares/rabbits (4%), 20 rodents (44%), and five carnivores (11%). Of these, 12 taxa may meet the criteria for State Threatened or Endangered (Class I) status.

The principal cause of population declines in Special Concern species has been and continues to be habitat loss. Habitat loss and associated declines in native mammals are generally the result of past and present increases in the state's human population. Habitat conversion as a result of population growth has been especially strong in the Sacramento and San Joaquin valleys, the south coast (Orange and San Diego counties) and Inland Empire (parts of Riverside and San Bernardino counties) and in the Sierra Nevada (especially in Nevada, Placer, and El Dorado counties). Much of this population growth has been suburban that followed agricultural conversion of native habitats starting in the last century, but much of it also has involved the direct conversion of native habitats. The habitats most influenced by such development are the coastal wetlands of the Bay Area and southern California, the grassland and arid scrub communities of the San Joaquin, Salinas, and Coachella valleys, and the riparian habitats of the Colorado River and San Joaquin Valley. Few species have benefited from these habitat changes, and those that have are often not native to California. For the areas where rapidly growing human population and associated habitat loss prompts the involvement of the Department's Conservation Planning Program, this document can help determine which species to include in the process and provide information about their biology and conservation needs.

There are a number of causes for the decline in bats. Bats, especially those that roost colonially, are highly susceptible to disturbance and subsequent mortality. Closure, human disturbance, and "pest

control” at colony sites (caves, mines, buildings and bridges) have had major adverse impacts on bat populations. Additional factors include unsustainable management practices of public and private forest lands for cavity-dwelling species, and farming practices such as removal of riparian forests and the use of insecticides. [Editor’s note: The Department is a member of the Western Bat Working Group – a partner in the Coalition of North American Bat Working Groups – consisting of agencies, organizations and individuals interested in bat research, management, and conservation from 13 western states and the Canadian provinces of British Columbia and Alberta. The group works to facilitate communication and exchange of scientific and management information, and reduce risks of species declines. The Department also participates in the California Bat Working Group (which has similar objectives to the larger group), and contributes to bat conservation by conducting status assessments (based on the Mammal Species of Concern list), considering bats in timber harvest plans and other environmental review documents, collaborating with other agencies on bat conservation issues, and disseminating information about bats to the public. The Department began preparation of a statewide bat conservation plan during in 2004-2005 using Federal State Wildlife Grant funds – the plan will be completed in 2010.]

Special Concern taxa are not evenly distributed throughout the state. Only five species, all of which are bats, are found widely in the state. The largest number (40 taxa, or 48% of the total) occurs in southern California. Within southern California, the largest number of taxa (6) occurs in the coastal basins of Los Angeles County and western Riverside and San Bernardino counties. The remaining species occur in the mountains above the Los Angeles basin (3), in the Coachella Valley (2), along the Colorado River (5), and on the Channel Islands (2). Similar numbers of taxa are found in northern and Central California (9 and 10, respectively). In northern California, they occur in the north Coast Range (4 taxa), San Francisco Bay area (4), and Sacramento Valley (1). In central California, they occur in the San Joaquin Valley (5 taxa), Sierra Nevada (1), Coast Range (1), and in the Tahoe/Mono basins and Modoc Plateau (2).