




Research Article

# Using Mountain Lion Habitat Selection in Management

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**ABSTRACT** Wildlife agencies are generally tasked with managing and conserving species at state and local levels simultaneously. Thus, it is necessary for wildlife agencies to understand basic ecological processes of a given species at multiple scales to aid decision making at commensurately varied spatial and behavioral scales. Mountain lions (*Puma concolor*) occur throughout California, USA, and are at the center of a variety of management and conservation issues. For example, they are genetically and demographically at risk in 1 region yet apparently stable and negatively affecting endangered species in another. Currently, no formal plan exists for mountain lions in California to deal with these diverse scenarios involving issues of local mountain lion population viability and problems related to predation of endangered species. To facilitate development of a state-wide management and conservation plan, we quantified habitat selection by mountain lions at 2 spatial scales across the range of environmental conditions in which the species is found in California. Our analyses used location data from individuals ( $n = 263$ ) collared across the state from 2001–2019. At the home range scale, mountain lions selected habitat to prioritize meeting energetic demands. At the within home range scale, mountain lions avoided areas of human activity. Further, our analyses revealed 165,350–170,085 km<sup>2</sup>, depending on season, of suitable mountain lion habitat in California. Fifty percent of the suitable habitat was on unprotected lands and thus vulnerable to development. These habitat selection models will help in the development of a state-wide conservation and management plan for mountain lions in California by guiding mountain lion population monitoring through time, prioritization of habitat to be conserved for maintaining demographic connectivity and gene flow, and efforts to mediate mountain lion-prey interactions. Our work and application area will help with wildlife policy and management decisions related to depredation problems at the local scale and issues of habitat connectivity at the statewide scale. © 2019 The Wildlife Society.

**KEY WORDS** habitat modeling, landscape planning, mountain lion, *Puma concolor*, resource selection.

Wildlife managers are mandated by laws and regulations to ensure species viability across large jurisdictions (e.g., states, provinces, countries; Robinson et al. 2016, Ryder 2018). Understanding factors associated with habitat selection is key in helping wildlife managers ensure species persistence across

large areas and can also facilitate development of strategies to deal with localized issues (Morrison and Matthewson 2015). Thus, quantifying habitat selection patterns provides the primary explanatory variable for managing wildlife at multiple spatial scales (Zeller et al. 2017).

Mountain lions (*Puma concolor*) are the most widely distributed mammal species in the Western Hemisphere (Hornocker and Negri 2010). In the western United States, where mountain lions are continuously distributed (Pierce and Bleich 2003), most states classify them as game animals

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