

7.5 Mountain Lion (*Puma concolor*) – Category SL

Management Units with Known Occurrences

The mountain lion (*Puma concolor*), also known as puma, catamount, and cougar, is San Diego County's widest ranging carnivore. In the United States, their current range is restricted to the 12 westernmost states and Florida. Mountain lions are a protected species in California and are adapted to a variety of habitats, including shrublands, woodlands, grasslands, and deserts. In the MSPA, locations for mountain lions are primarily derived from research by U.C. Davis since 2001 that found mountain lions largely restricted to more rugged terrain that remains largely uninhabited by humans in MUs 3, 4, 5, 8, 9, and 10 (Vickers in preparation).

Research over the past 15 years within San Diego, Riverside, and Orange Counties conducted by the U.C. Davis Wildlife Health Center has included studies of mountain lion movements, predator-prey interactions, interactions with humans and domestic animals, and exposure to disease and environmental toxins. This research project combined camera, Global Positioning System collar, and mortality data with state-of-the-art genetic analyses and modeling to produce the most comprehensive assessment to date of mountain lion connectivity within and adjacent to the MSP.

Management Categorization Rationale

Mountain lions should be managed as a Species Management Focus Category SL Species due to a high risk of loss from the MSPA and because managing habitat alone will not ensure persistence of the species.

Mountain lions are under threat in southern California on multiple fronts. In the MSPA, the majority of threats are related to genetic isolation, roads, further habitat loss and fragmentation, and inadequate livestock husbandry practices that lead to loss of mountain lions via depredation permits (Vickers in preparation).

Research by U.C. Davis indicates that annual survival rates of mountain lions in the region are very low (estimated at 56%) with vehicle strikes and depredation permits being the leading causes (Vickers et al. 2015). Depredation permits, which are authorized after a mountain lion kills a domestic animal, have increased during the past 4 years of study (2013–2016) over previous levels, with 14 mountain lions being killed between 2014 and 2016 (Vickers in preparation). Mortality caused by

vehicular strikes is the second highest cause of mountain lion death in San Diego County. Highways in the study area that contain sections that are partial barriers to movement or present higher risks for vehicle strikes include Interstates 8 and 15, Valley Center Road (S6), SR 67, SR 78, Wildcat Canyon / Barona Road, and SR 94 (Vickers 2014). In particular, Interstate 15 in the northern part of the MSPA is a major barrier to mountain lion movement between the Santa Ana Mountains and the eastern Peninsular Range (Palomar mountains) (Ernest et al. 2014; Vickers et al. 2015). The few lions (estimated 20–30 individuals) remaining in the Santa Ana Mountains are increasingly isolated and their persistence is threatened by low survival rates and a lack of genetic variability (Ernest et al. 2014; Vickers et al. 2015).

The wide-ranging nature of the species dictates the necessity for travel across unprotected open space as well as many road crossings for most mountain lions. Both travel across un-conserved lands and road crossings put mountain lions at increased risk from human-associated mortality causes. High levels of mortality and genetic isolation raise serious concerns about long-term sustainability of the mountain lion population in the region.

Mountain lion IMAs are identified on the online map at: <http://arcg.is/2jx4iBP>, and represent critical choke points where research and management should be focused to improve and protect regional connectivity.

Monitoring and Management Approach

The overarching goal for mountain lion is to enhance and expand areas occupied in San Diego County in large interconnected blocks (>1,000 acres) of suitable natural vegetation surrounded by a limited number of high use roads, and increase connectivity (and reduce potential road mortality) between occupied and suitable habitat areas to allow expansion and movement of mountain lion occurrences within San Diego County and adjacent counties. This would increase effective population size to sustainable levels and work to reduce depredation on livestock to ensure persistence in the MSPA over the long term (>100 years).

Management and monitoring efforts within the MSP during the 2017–2021 planning cycle will focus on using past research results to inform management and monitoring actions to enhance connectivity and reduce mortality from depredation permits and vehicle strikes. Management objectives for the 2017–2021 planning cycle are summarized below. For details and the most up-to-date goals, objectives,

and actions, go to the MSP Portal Mountain Lion summary page: http://portal.sdmmp.com/view_species.php?taxaid=552479

Conduct Linkage Assessments

For the 2017–2021 planning cycle, mountain lion movement data collected over the past 15 years will be used to model landscape use and movement in MUs 5, 8, 9, and 10, particularly where highways have been shown to be barriers to lion movement between protected areas. Modeling data will be used to define key movement areas along major roads where detailed linkage assessments will be performed. Linkage assessments will identify (1) blocks of habitat to be connected by the linkage, (2) specific areas of focus for connectivity planning/linkage design, and (3) the current level of permeability and specific barriers to lion movement within focal linkage areas.

Prepare Mountain Lion Connectivity Management Plan

Linkage assessments will inform the development of a Mountain Lion Connectivity Management Plan for priority mountain lion movement areas in MUs 5, 8, 9, and 10. The Management Plan will identify spatially explicit linkage design for each priority movement area, as well as specific actions to improve or protect lion connectivity (e.g., location and design of wildlife road crossing improvements, land acquisition, wildlife fencing). The Mountain Lion Connectivity Management Plan will consider the needs of deer where feasible. Planning and design of linkages should incorporate linkage design procedures developed by Beier et al. (2008) and Beier and Brost (2010) as available data and time allow.

Test and Implement Best Practices for Hazing Native Predators

Research will also be conducted to inform the development and implementation of BMPs for reducing mountain lion and other native predator predation on domestic livestock in an effort to reduce depredation permits. Research will focus on developing and testing various hazing devices to deter mountain lions from preying on domestic livestock. BMPs for deterring native predators from preying on domestic wildlife will be promoted in locations where depredation permits have been issued in the past and will be further monitored to evaluate their effectiveness.

Develop and Implement a Long-Term Mountain Lion Monitoring Program

A long-term mountain lion monitoring strategy will be developed and implemented that incorporates an array of best practices, including noninvasive

genetic sampling, camera traps, and collection of lion mortality data to document mountain lion movement, identify problem areas, and inform management actions.

Implement Regional Mountain Lion Management Coordination

Because the mountain lion is a wide-ranging species whose persistence is dependent on maintaining connectivity to areas to the north and east of the MSP, the monitoring and management approach for mountain lion will include maintaining cooperative efforts aimed at enhancing regional habitat connectivity with stakeholders in San Diego, Orange, and Riverside Counties (e.g., Tri County Inter-Agency Connectivity Coordination Coalition).

Mountain Lion References

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