

Exploring Mountain Lion Habitat Connectivity in Central & Southern California

Executive Summary | Spring 2022

Group Members: Meghan Fletcher, Alyssa Kibbe, Grace Kumaishi, Anna Talken, Nikole Vannest
Faculty Advisor: Kelly Caylor



The Issue

The California landscape has become increasingly fragmented as urban development, infrastructure, and agriculture has expanded across the state. Maintaining connectivity between areas with prime wildlife habitat is important for the viability of many long-ranging species, such as the mountain lion (*Puma concolor*). **Mountain lion populations are highly susceptible to the negative impacts associated with habitat fragmentation, including reduced access to resources, increased human-lion conflict, and decreased genetic diversity.** The Nature Conservancy (TNC) was recently donated the Jack and Laura Dangermond Preserve (JLDP), a pristine parcel of land nested within the central California coast, and may be used as a coastal access point and corridor by mountain lions within this region. In this study and in collaboration with TNC, we explore mountain lion suitability, connectivity and conductance between the preserve and other regional protected areas.

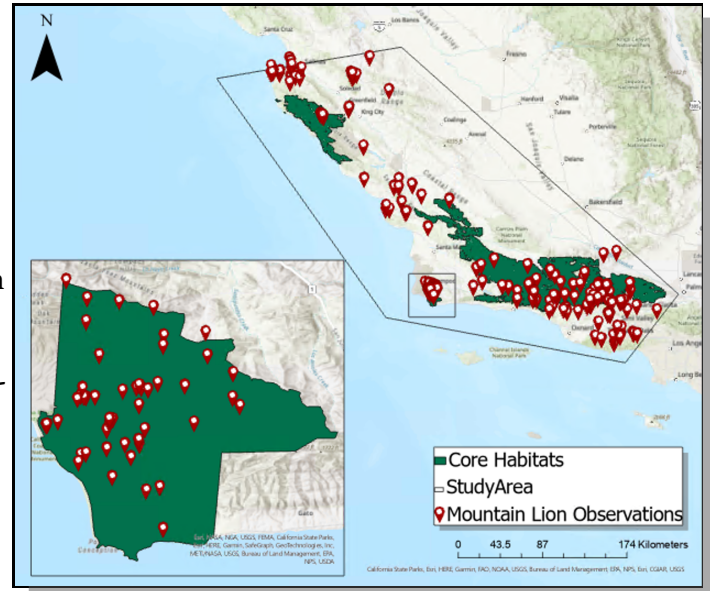
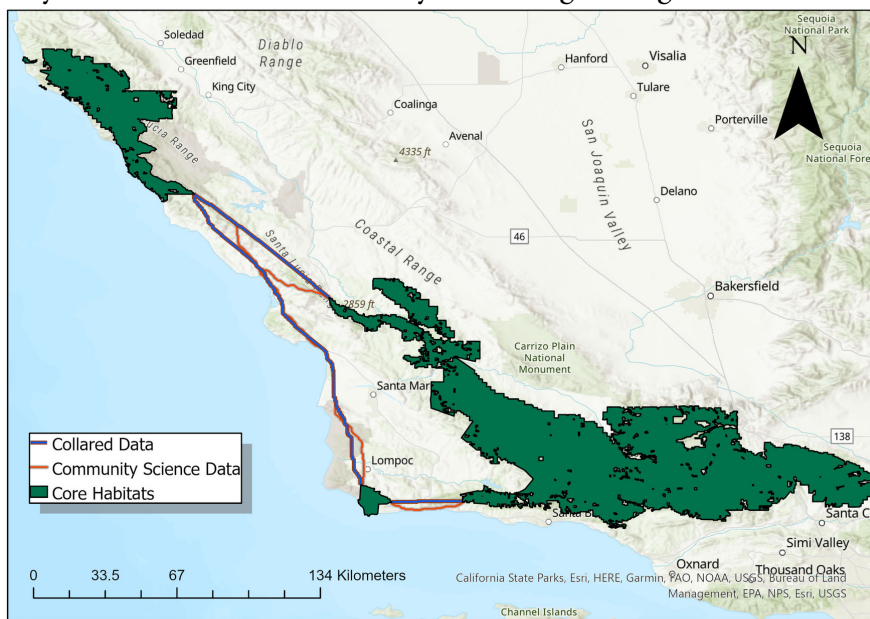


Figure 1. Map of the region of interest spanning from northern Big Sur to Santa Monica and towards the central valley. An image of JLDP zoomed-in is pictured in the bottom-left box.

Results

Regional: When considering mountain lion connectivity between JLDP, Los Padres National Forest and Big Sur protected areas using the Circuitscape model, we found the path of least resistance, or least cost path (LCP), between JLDP and Big Sur follows a coastal route (Figure 2). The mountain lion observations from our regional analysis were crowd-sourced from community science data (iNaturalist) and camera trap observations from JLDP (2012-2014). We compared our results to a suitability study based on collared lion data from CDFW and found the paths followed similar routes but differed in resistance. Using community science observations and camera traps in lieu of movement data (collared data) resulted in a lower resistance along the least cost path and may underestimate the difficulty in moving through urban areas and across highways.



We also modeled specific barriers to movement along the least cost path and our analyses indicate that urbanized coastal zones, inland areas near Santa Maria, and the eastern edge of the Los Padres National Forest act as barriers to mountain lion movement and contain pinch points, potentially impeding and channelizing mountain lion movement.

JLDP: The results of our suitability analyses show the Jack and Laura Dangermond Preserve contains suitable habitat for mountain lions and plays a role in coastal connectivity (continued on page 2).

Figure 2 (left). Comparing the least cost paths to and from core habitats between our computed regional resistance layer (red) and a collared resistance layer (blue) from Dellinger et. al. 2019.

We used the Omniscape model to determine "ease of mobility" within the preserve and found the results are dispersed with little to no barriers or bottlenecking. Ease of mobility modeled as conductance in areas adjacent to the preserve show areas of high traffic near Jalama and on the outskirts of Lompoc connecting to southern regions of the Los Padres National Forest (Figure 3). Additionally, the results of this model highlight areas of little to no mobility (seen here in purple) around dense urban areas such as Oxnard, Santa Monica, and the San Fernando Valley.

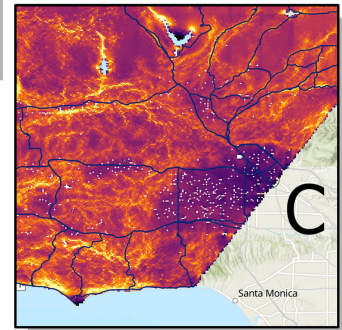
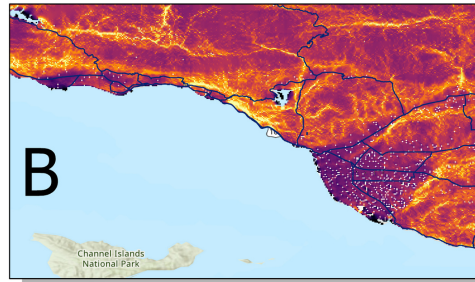
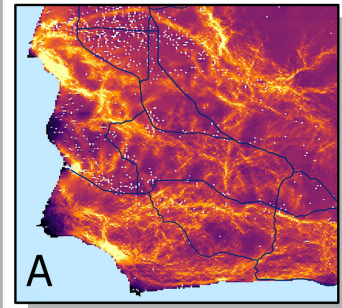
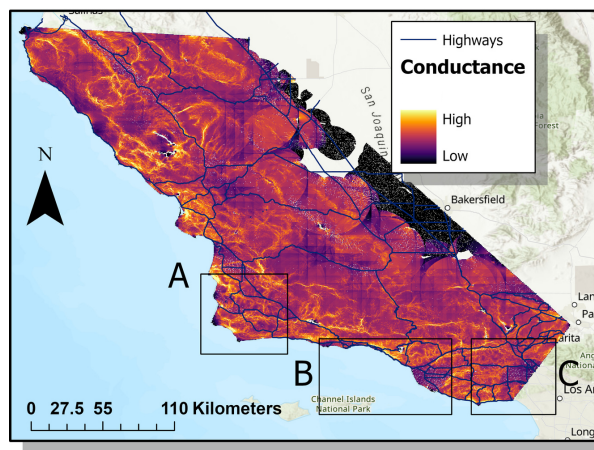


Figure 3 (right). Regional ease of movement modeled a conductance in Omniscape. High to low conductance is described by light to dark colors respectively.

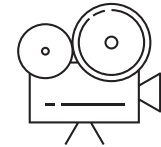
Deliverables



Estimate mountain lion use on JLDP and throughout the region by performing habitat suitability analyses.



Model mountain lion movement in regions adjacent to JLDP to determine regional connectivity between protected areas.



Create an educational short-film highlighting our research, habitat connectivity, and the role JLDP plays in conservation.

Conservation Recommendations

- 1. Regional and preserve-level efforts focused on existing corridors and channelized areas:** Maintain protected land along mountain lion LCPs and area surrounding JLDP.
- 2. Restoration efforts at high-risk movement areas:** Establishing wildlife corridors, such as highway overpasses, should be focused where the LCP crosses Highway 101 north of Gaviota State Park.
- 3. Develop additional science communication materials:** Focus on the importance of mountain lions and habitat connectivity in the region to increase community engagement and conservation support.

Educational Short Film



Our film aims to **educate** and **inspire** the local community about the importance of habitat connectivity for mountain lions and the Preserve's role in wildlife conservation. We hope to inform our audience about the importance of habitat connectivity, as well as encourage the local community to get involved in conservation work.



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