

Ranking locations for lion conservation in southern Africa—a new approach

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A new strategy ranks locations for lion conservation activities. Credit: Karen Arnold

An international team of scientists has developed a new strategy to rank locations for lion conservation activities, based on GPS collar data revealing lions' movements, in a study published July 5 in the open

access journal *PLOS ONE* by Samuel Cushman of the U.S. Forest Service and colleagues.

Due to land use changes and severe human-wildlife conflict, lions today occupy a range that is less than 10 percent of its historic size. Researchers agree that conservation actions should combine preservation of core habitat areas and the paths that link them with mitigation of human-wildlife conflict that can be deadly for lions. However, few efforts to prioritize conservation actions have considered all three factors.

In the new study, Cushman and colleagues used two spatial modeling approaches—known as "resistant kernel" and "factorial least cost path"—to analyze GPS collar data that captured the movements of lions outside of national parks in and around the Kavango-Zambezi Transfrontier Conservation Area (KAZA). KAZA spans more than 520,000 square kilometers in four countries.

The analysis revealed nine key dispersal areas—regions in which lions can move freely between breeding sites and thus maintain higher genetic diversity, which is essential for a population's long-term health and survival. Also identified were 27 corridors linking those core areas and 27 potential hotspots for human-[lion](#) conflict.

Based on their analysis, the researchers prioritized specific conservation actions. They identified three dispersal areas as being critical for continued management, four strategic corridors that should be protected to ensure safe movement by lions between the five most important dispersal areas, and four locations with the greatest risk of human-lion conflict that require conservation action, such as building strategically placed fences.

Combined with sociopolitical and economic factors, these findings could

help inform conservation decision-making; future research efforts could focus on strategies to formalize this combination. Meanwhile, the novel location-ranking strategy could be applied to conservation planning for other species in other regions.

Cushman adds: "The next decade is a critical time for lion conservation given the rapid pace of population growth and land use change across Africa. It is critical that landscape [conservation](#) designs based on rigorous analysis identify and prioritize the most important places for protection."

More information: Cushman SA, Elliot NB, Bauer D, Kesch K, Bahaa-el-din L, Bothwell H, et al. (2018) Prioritizing core areas, corridors and conflict hotspots for lion conservation in southern Africa. *PLoS ONE* 13(7): e0196213. doi.org/10.1371/journal.pone.0196213

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