

Identifying suitable habitats for cheetahs
(*Acinonyx jubatus*) in the Maasai Mara, Kenya



Mara Cheetah Project

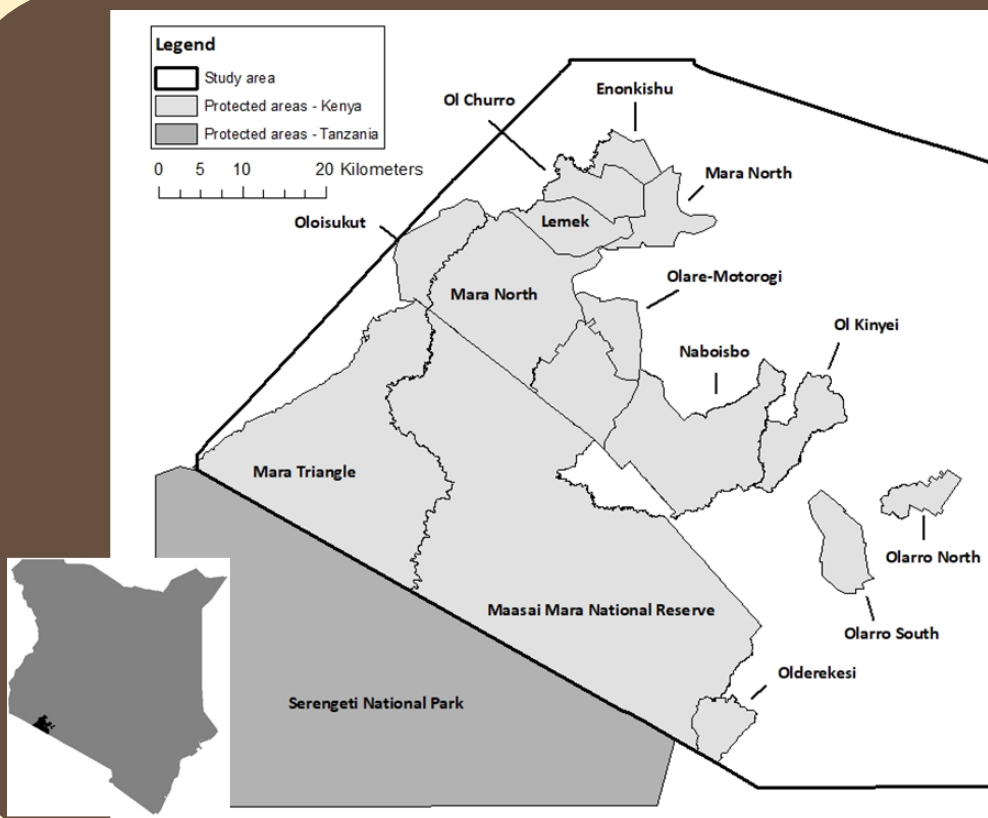
Kenya Wildlife Trust

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Background

Cheetahs (*Acinonyx jubatus*) are a wide-ranging, large carnivore species, whose significant decline is largely attributed to habitat loss and fragmentation. It is believed that 77% of the global cheetah population ranges outside protected areas, and yet little is known about cheetahs' resource use in these human-dominated landscapes. The goal of this study was therefore to determine the habitat preferences of cheetahs residing in a human-wildlife landscape.

In order to achieve this, data were used from 6 cheetahs (4 males and 2 females) that were fitted with satellite collars that collected information on their whereabouts between 11th April 2015 and 16th August 2017. In compliance with Kenyan law, all immobilisations for deployment/removal of radio-collars were performed by a Kenya Wildlife Service veterinarian. The study was conducted in the Maasai Mara, Kenya (~5,762 km²) and included both protected areas (PAs) and non-protected areas (non-PAs; Figure below). The PAs (~2,601 km²) are areas that are set aside for wildlife-based activities, such as photographic tourism, and include the Maasai Mara National Reserve (MMNR) and the surrounding conservancies. The non-PAs (~3,161 km²) are the areas outside the MMNR and the conservancies.



Suitable habitats for cheetahs in the Maasai Mara, Kenya, were identified using data from satellite radio-collars

Our aim was to identify suitable habitats for cheetahs by determining whether cheetahs avoid or select for the following features:

- **Human pressure** (includes settlements, livestock enclosures, dams, towns and agricultural land)
- **Protected areas** (MMNR and the surrounding wildlife conservancies)
- **Semi-closed habitat** (includes Acacia woodland, mixed scrub and bushes)
- **Edge density** (transition between open and semi-closed habitat)
- **Slope** (steepness)

Key findings

Our results show cheetahs have a strong preference for protected areas and avoid human presence. This would suggest that cheetahs potentially consider humans as a bigger threat than other predators. What is striking about the data is that the collared cheetahs rarely left the protected areas despite frequently coming close to the boundaries. None of the protected areas are fenced making it possible for cheetahs to move into the human-dominated areas. However, a high number of human settlements are found on the borders of the protected areas, possibly creating a barrier. This barrier is however not a hard boundary as there is occasional movement of cheetahs in and out of the protected areas.

We found that cheetahs preferred areas dominated by semi-closed habitat which could explain why cheetahs preferred the protected areas despite the high lion densities. Semi-closed habitat provides concealment, thereby minimising the possibility of being detected by other predators. By selecting areas that provide coverage, an individual may increase its fitness thereby increasing its longevity. This illustrates the importance of conserving dense vegetation patches both inside and outside protected areas. In addition, cheetahs selected for areas with a high density of edges between open and semi-closed habitat which could increase their hunting success as they use wooded areas to stalk and open habitat to pursue and catch prey. We also found that cheetahs avoided steep slopes probably as it limits their hunting ability.

Using these findings we have created a habitat suitability map showing areas that cheetahs like (red) and do not like (dark blue).

Cheetahs like:

Protected areas

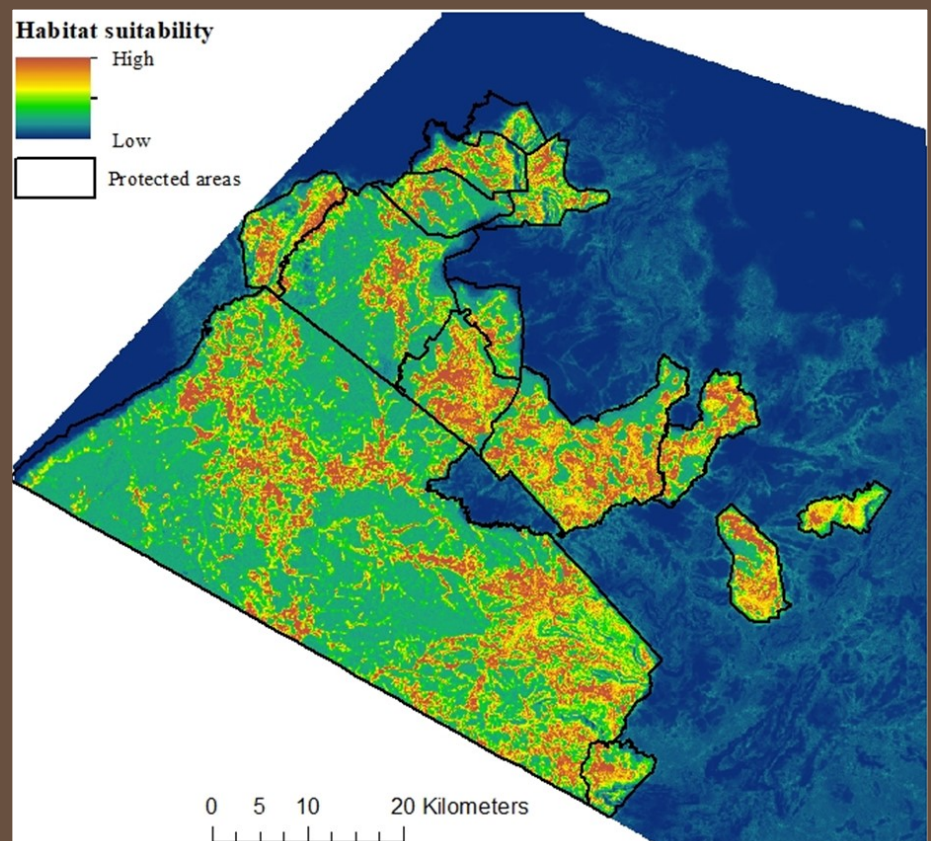
Semi-closed habitat

High density of habitat edges

Cheetahs don't like:

Human presence

Slopes



Recommendations

The most suitable areas for cheetahs are found in Olare-Motorogi, Naboisho, Ol Kinyei and Olarro South Conservancies and in the East of Maasai Mara National Reserve and around the major rivers. Our findings show that protected areas are important for cheetahs and future conservation planning priorities could include the expansion of current conservancies and the creation of new conservancies and wildlife corridors to ensure connectivity. This is something that could be considered, especially in light of the increasing development in the area, including the erection of fences and the tarmacking of the Sekenani road. However, it is important to note that while increasing the amount of land that is protected can be beneficial to cheetahs, it can also have a negative conservation outcome if local people become resentful, especially if they are displaced or access to resources are restricted. Land protection schemes should therefore not only take the needs of cheetahs and other wildlife into account, but also those of the people, if conservation is to be successful. In addition, it is still believed that 77% of the current range of cheetahs globally lies outside formally protected areas. As cheetahs do predate on livestock, conservation efforts should foster a tolerance towards cheetahs and other predators outside the protected areas.

Based on our findings we recommend the following:

- If additional land is set aside for conservancies and corridors then this should include a variety of habitat types, especially semi-closed habitat.
- The creation of too much open space, through for example overgrazing and burning, should be controlled.
- Development of a spatial plan for the Maasai Mara region which includes regulations on human development.
- Additional research should be carried out to determine areas that could be good for connectivity outside the protected areas.

Acknowledgements

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