

Aiding the development of scent and acoustic leopard deterrents



Alice McCosh Report 2016

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Aim of the project

The overall aim of this project is to aid the development of scent and acoustic based leopard deterrents that could be used to reduce human-leopard conflict.

Background to the project

Leopards are economically and ecologically important but they have disappeared from an estimated 48 - 67% of their range in Africa and their conservation status was recently downgraded to vulnerable. Human persecution is a key driver of carnivore declines with most mortality occurring when carnivores come into contact with humans outside of reserve boundaries. Unfortunately current strategies to mitigate human-carnivore overlap, such as fences and translocations, have low efficacy for leopards; there is little innovation in mitigating human-leopard conflict; and there is a deficiency in leopard research with conservation applications. This project addresses all of these short-comings and its output will directly aid leopard conservation. Supporting the development of tools that reduce the potential for conflict by restricting leopards from areas where they are likely to be persecuted will help stem the species' decline.

Project Objectives

1. To quantify whether there is spatial avoidance between leopards and their competitors (other leopards, lions, and spotted hyaena) (image 1 - 3) that could be exploited for conservation purpose.
2. To determine the role of scent marks and vocalisations in mediating interactions between leopards and their competitors.
3. To field-test a scent signal (tomcat-thiol) that could be used to repel leopards from entering undesirable areas.





Images 1- 3: The three species involved in this project: leopard (*Panthera pardus*), lion (*Panthera leo*), and spotted hyaena (*Crocuta crocuta*).

Progress

I have been based at the field site of my in-country collaborator, the Botswana Predator Conservation Trust (BPCT), since May and will remain here until late 2017.

The past five months have seen the bulk of the data collection period begin: camera traps have been placed at scent marking sites to gain an idea of how long scent signals are detectable, who is interested in the signals, and how interested parties respond; and we have begun playback experiments to investigate the effects of acoustics in causing leopards, lions and hyaenas to initiate or avoid encounters (Image 2). Preliminary results suggest that whilst leopards avoid areas where they have heard lions calling, lions will approach leopard vocalisations. Although, more of these

experiments need to be carried out, the results could have important implications for projects looking to manipulate leopard movements by playing the sounds of competitors.



Image 4: setting up the playback equipment for experiments.

I have also used my time at the site to begin building a picture of the ranges of the leopards within the study area and to identify suitable individuals that will be fitted with GPS collars for objective one. This has been achieved through a combination of camera trap images, spoor tracking of the animals, and by liaising with local guides. From this data we have identified the ranges of 6 target individuals (figure 1) and will have a vet in camp to assist us with the capture and release of these animals in November 2016.

Without the support of the Alice McCosh Trust, this field work would not be possible because of the costs associated with travelling to this remote field site.

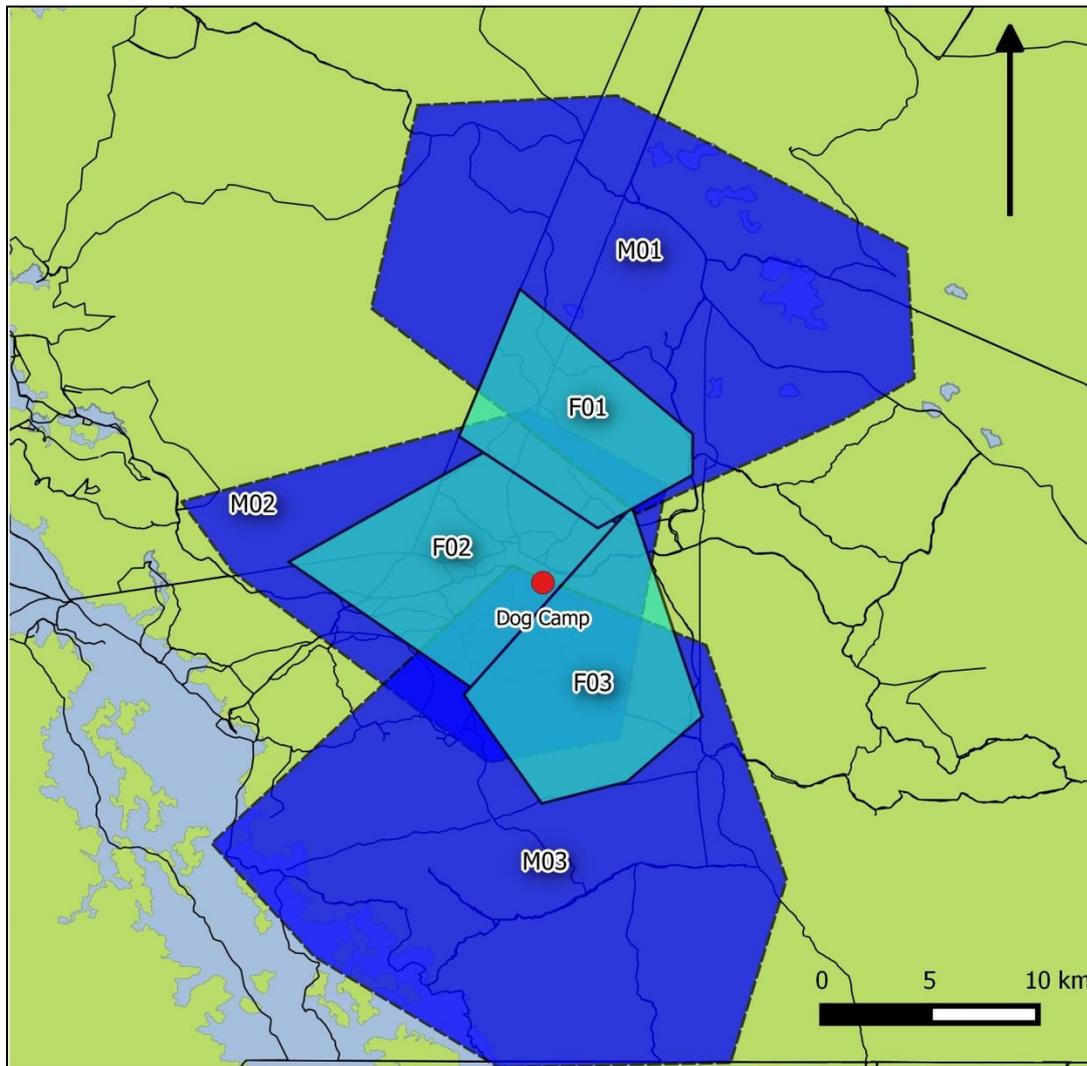


Figure 1. Map of the core study area with estimated territories of target leopards (dark blue = male leopards; light blue = female leopards).

Long Term Impact of the Project

A new conflict mitigation strategy under consideration for large carnivores is manipulating carnivore space use by mimicking areas that the species would naturally avoid. Understanding how species maintain spatial and temporal boundaries could lead to the development of scent- or acoustic-based biological-boundaries (bio-boundaries). This project will provide the groundwork for signal-based management tools to reduce human-wildlife conflict. Human persecution is a key driver for predator declines, and the leopard will be a useful case study for whether signal-based management tools could be used to mitigate human-predator conflict. There are several reasons that the leopard,

in particular, is an ideal case study species for determining the viability of such tools. For example, aspects of the leopard's ecology, such as small range sizes (relative to other large African carnivores) and their solitary nature, make it easier to plan experiments and interpret behaviours. Furthermore, there is a need to reduce human-leopard conflict throughout sub-Saharan Africa as leopards suffer intense persecution for the real and perceived threats they pose landowners and local communities.

The project will also provide information on how leopards coexist with other large predators. This is important because competitor encounters can impact the density, distribution, and reproductive success of competing species. This is important for leopards because their numbers are currently declining and protected areas shared with competitors may be key to their survival.

Acknowledgements

I would like to thank the Alice McCosh Trust, the Scottish International Education Trust, Idea Wild, the Wilderness Wildlife Trust, Liverpool John Moores University, Mataka and Axivity for providing the funds and equipment to carry out this project. I would also like to thank the Government of Botswana for providing permission to carry out this research and to the Botswana Predator Conservation Trust for hosting the project.