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YUNIBESITHI YA PRETORIA

Behavioural ecology and population genetics of the African wild cat, *Felis silvestris* Forster 1870, in the southern Kalahari

by

Marna Herbst

Submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy (Zoology)
in the Faculty of Natural and Agricultural Sciences
University of Pretoria
Pretoria

August 2009

To my parents and my brother, for their love and support

Radio collared African wild cat, *Felis silvestris*
in the Kgalagadi Transfrontier Park

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Summary

The motivation for this study was to increase our knowledge on the natural history of the African wild cat and to investigate the genetic status of the Kalahari population. Hybridisation with the domestic cat is a global threat to the genetic integrity of the species. The Kalahari population was selected due to the isolation of the area and the slight possibility of contact with domestic cats. Radio telemetry and direct visual observations (1,538 hours) of eight habituated African wild cats (five male and three female) were used to address the feeding habits, foraging behaviour, spatial organisation and reproduction in wild cats. Throughout the study small skin biopsies were collected from both African wild cats and domestic cats from surrounding communities in order to address the potential of hybridisation and population genetic structure.

The Kalahari ecosystem not only experience annual dry and wet seasons but also longer lean and abundant periods that in turn influence rodent abundances and hence prey availability for the cats. This plays an important role in nearly all aspects of African wild cat behavioural ecology. The feeding habits of the African wild cat were discussed in the view of the optimal foraging theory. The lean season were characterised by a high species richness and high dietary diversity. African wild cats adapt their diet and foraging behaviour to seasonal prey abundances and availability. Male African wild cats were significantly larger than female cats and both sexes predominantly fed on smaller rodents, although there were

differences is diet composition with males hunting larger mammals and females favouring birds and reptiles.

Despite sexual dimorphism male and female cats show little differences in time budgets and both exhibit a two peak activity period with a strong seasonal shift from predominantly nocturnal during the hotter seasons to more diurnal activity in the colder seasons. The major factors influencing activity patterns and habitat use appears to be prey abundances and temperature extremes.

As predicted male African wild cats had significantly larger annual home ranges than female cats (MCP 95%, ♂ = 7.7 ± 3.5 km^2 and ♂ = 3.5 ± 1.0 km^2). Female cats shows extensive overlap of home ranges, however the core areas were mostly exclusive while male-male overlap were limited and show no overlap of core areas. There were no differences in seasonal ranges between male and female cats and thus reproduction seems to be aseasonal and depending on food availability. Urine spray marking in males were prominent with territorial behaviour and aggression observed, while female spray marking seems to be related to their reproductive status.

In our study we report the genetic variation and admixture analysis of 57 wild living African wild cats and 46 domestic cats using 18 microsatellite loci. Bayesian cluster analysis support the classification of African wild cats and domestic cats as two distinct entities and identified four cryptic hybrids among the wild cats. Although all hybrids were outside or on the periphery of the KTP, suggesting that levels of introgression are low, this is still a concern to the genetic integrity of African wild cats as a species.

Acknowledgements

I would like to express my sincere appreciation to my supervisors, Prof. Gus Mills and Prof. Paulette Bloomer, for all their encouragement, advice and guidance during my project. Especially Gus who visited and guided me while doing fieldwork and shared his Kalahari expertise and helped interpreted behavioural aspects of the wild cats. A special thanks to Paulette who skilfully directed me in understanding the different genetic perspectives as well as her support during my fieldwork. It was a privilege to conduct this project under the guidance of two supervisors who both share my fondness for the Kalahari.

I am most grateful to South African National Parks and Department of Wildlife and National Parks in Botswana for permission to work in the Kgalagadi Transfrontier Park. To all the SANParks staff in the KTP who supported the project and the Technical Department who assisted with numerous vehicle repairs. A special thanks to the Section Ranger, Nardus du Plessis and Christine du Plessis for all their assistance and true Kalahari hospitality.

I thank the SANParks veterinarians who assisted in the darting operations of the wild cats, Dr Peter Buss and Dr Danny Govender for working throughout the night in Kalahari temperature extremes. Martin Haupt, Paul Odendaal, Dr Lindie Jansen van Rensburg and Nicola Read are thanked for their assistance during the darting operations. The volunteers assisting with rodent surveys, Dr Marietjie Oosthuizen, Cassie Hughes, Jane Walker and Claire Warner are thanked for al the long hours and hard work in the field.

The project was initiated and supported by the Carnivore Conservation Group of the Endangered Wildlife Trust. In particular Pat Fletcher who dealt with numerous administrative issues and urgent requests from the Kalahari. I am grateful to all our sponsors, the Elizabeth Wakeman Henderson Charitable Foundation, the Skukuza Marathon Club, the Wildlife Conservation Society for the Kaplan Award, the National Research Foundation, the Wilderness Foundation, Maxiprest Tyres and the Eco Challenge for keeping me funded and equipped in the field.

Many thanks to the Mammal Research Institute under Prof. Elissa Cameron and the MRI Development Fund for making it possible for me to attend the Felid Biology and Conservation Conference in Oxford during 2007. Thanks to the Molecular Ecology and Evolution Program's students (MEEP'ers) for all their support and assistance while I was writing up in Pretoria.

A special thanks to all the people assisting with proof reading and positive critique during the write up, Dr Lindie Jansen van Rensburg, Dr Marie Warren, Dr Marietjie Oosthuizen, Dr Sam Ferreira and Paul Odendaal. Phozisa Mamfengu and Sandra MacFadyen, thanks for all the help with GIS images and analyses. Thanks to all my SANParks colleagues, who supported and encouraged me when the writing up became a part time endeavour.

Most importantly, I thank my parents for their unconditional support, encouragement and for believing in me when I followed my heart to the Kalahari. Their patience when stress levels were high and their understanding kept me going. I could not have finished this without your prayers and love.

To the Kalahari and the African wild cats – it was though but a remarkable journey! Words can not do justice to describe my experiences in the Kalahari.

God is in the details

~ Unknown ~

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