



South African Conservation Genetics Project in association
with The Cape Leopard Trust -
Report on Leopard Biopsy Sampling in the Sabi Sands, May 2007

By:

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In the second week of May this year, Quinton Martins (Cape Leopard Trust - CLT) & Gerrie Camacho (Mpumalanga Tourism & Parks Agency), were invited to collect biopsy samples of leopards in the Sabi Sands Reserve. Both Gerrie and Quinton are committee members of the South African Leopard Forum (SALF). Aims of the SALF are, through communication between leopard researchers, conservationists and land owners, to ensure the future conservation of leopards in SA.

Aims of the Project

The CLT, SALF and Prof. Conrad Matthee (Stellenbosch University) are working together to continue with the leopard conservation genetic work Nicole Martins concluded in 2006. The aim is to obtain an even larger sample size of leopard DNA throughout their range in SA. The results of this study will; (a) provide us with a better understanding of whether there is sufficient genetic diversity within particular populations of leopards in SA; (b) to illustrate whether there is in fact gene flow between so-called contiguous populations or whether external factors, such as land-use, may be creating isolated or 'island populations' of leopards within their range; (c) a detailed genetic comparison will be made between northern leopards and the smaller, isolated leopards living in the mountains of the Western Cape; and (d) to use these DNA samples to look at relatedness amongst leopards within the Sabi Sands Reserve, which would

prove to be of interest to tourists, as well as field rangers, providing them with a better understanding of their subjects. The Sabi Sands Reserve also provides an ideal opportunity to access a statistically viable sample size from one area, which can be used as a genetic reference for future studies here.

Background - Information taken from:

**CONSERVATION GENETICS OF *PANTHERA PARDUS* IN SOUTH AFRICA:
PHYLOGEOGRAPHY OF MITOCHONDRIAL LINEAGES – by: Nicole Martins
(Published Masters Thesis)**

Leopards (*Panthera pardus*) have long been considered one of the most adaptable cats, having a wider distribution than any other large felid. A recent PHVA (Population and Habitat Viability Assessment) demonstrated that in South Africa some populations are currently threatened, existing as heavily fragmented or isolated entities due to human expansion, habitat loss and direct persecution. Using mitochondrial DNA, Nicole undertook to assess the population structure, population history and genetic diversity of leopards in South Africa.

Historically, the leopard's range in Africa spanned the entire continent. Today, although its' geographic range is still extensive, many leopard populations now exist as heavily fragmented or isolated entities. This can mainly be attributed to anthropogenic factors such as, human population expansion, habitat reduction, hunting, poaching and 'problem-animal' control (Norton, 1986; Uphyrkina *et al.*, 2001).

It is important to conserve threatened or endangered species by not only maintaining viable population sizes, but also preserving genetic diversity. One of the aspects of the CLT's work is looking at leopard populations in the Western Cape, where these animals are recognized as being morphologically different (up to half the mass) to their northern counterparts (Skinner and Smithers, 1990; Martins & Martins, 2006). Recent research identified only one subspecies, *P. p. pardus*, occurring throughout Africa (Miththapala *et al.* 1996; Uphyrkina *et al.* 2001). [This study, however, was able to collect only 5](#)

samples from one population in the Kruger National Park. It has been generally assumed that leopards in sub-Saharan Africa form one continuous population with little or no population structuring, as they are able to disperse over large distances and are highly adaptable. This, however, may not be true for South African populations based on current ranges of leopards. This study aimed to reveal the genetic diversity and population structuring of leopards in South Africa. Its aim was also to determine whether the smaller leopards of the ‘Cape’ should be recognized as a separate management unit. Results of a comprehensive genetics study such as this will provide insight into leopard populations in SA, leading to a reassessment of the current conservation management strategies.

Methods

Very strong care and consideration was taken when the darting took place. Both the animal itself and the paying guests viewing leopard were of utmost importance. Leopard were darted with an adjustable air driven biopsy dart in order to assure that the least impact were made in terms of noise and dart impact. The animals where only darted once they were fully relaxed and looking away from the dart gun. Care was also taken not dart leopard in dangerous situations such as when lions were in close proximity.

We documented darting by video, and found that there were almost no adverse reactions from the cats. Leopard viewings with guests continued after we had obtained our sample, and the leopards were as a whole relaxed, not knowing where this ‘sting’ had come from.

Results

Incredibly, 9 different leopards were successfully darted for biopsy samples – in 9 game drives!

The following leopards were darted:

Sample No.	Date	I.D.	GPS	Locality
1	14/05/2007	Shangwas cub	S24.77401 E31.39499	Exeter

2	14/05/2007	Mambirhi	S24.81880 E31.38832	Idube
3	15/05/2007	Wallis male	S24.77168 E31.37737	Inyathi
4	16/05/2007	Makwela	S24.81130 E31.37701	Dulini
5	16/05/2007	Makwela's cub	S24.81112 E31.37579	Dulini
6	16/05/2007	Unknown male	S24.75660 E31.39906	Exeter
7	16/05/2007	Thai dam female	S24.75459 E31.36751	Inyathi
8	16/05/2007	Shangwas cub #2	S24.77732 E31.39240	Exeter
9	17/05/2007	Ottowa male	S24.79680 E31.39629	Idube

Discussion

The results of the genetic work may take several months, however, in the interim, it is imperative that the perception that “leopards are all OK” is regarded as exactly that – a perception. The Sabi Sands Reserve is one of the best places on earth to observe leopards in their natural habitat. Here they occur in a large well protected area bordering and forming part of the Kruger National Park. It is our recommendation that further genetic sampling takes place within the reserve, possibly more in the South & East, as well as in the North. It would also be of extreme benefit to all working in the reserve, to see a formal study being set up and conducted here. Natasha de Wororin (presently at Londolozzi), has collected a great deal of data in her area. Please contact her or Jonathan Swart for further information on furthering the work here. It would also be advisable to investigate the movements of leopards bordering the western side of the reserve, where many will traverse highly populated human areas – a concern from a predator/human conflict point of view.

Acknowledgements

Thanks to: the Sabi Sands Reserve – ecologist Jonathan Swart for making arrangements for us to conduct the darting operation; Savanna Lodge – Paddy Hagglesworth (camp manager) for facilitating all our darting expeditions, ensuring

we were well fed & had great accommodation; rangers Greg & Patrick & our tracker Julius for all their time and patience escorting us in the bush. Greg for such impeccable reversing skills while being charged by a massive elephant cow. Inyathi Lodge – George & Colin for coming out to collect us when no other rangers were free. All the rangers of Exeter, Dulini, Idube, Ulusaba, Inyathi and Savanna for putting up with our darting antics.

Nicole Martins for the use of her thesis material. Prof. Conrad Matthee for the storing & DNA analysis of the tissue samples.

For the leopards of the Sabi Sands for putting up with a pain in the butt.

Gallery



Savanna Private Game Reserve's Greg & Julius



Greg reversing from irate pachyderms



Quinton explaining the ins & outs of the project to Exeter guests



Interested guests – “so that’s what leopard tissue looks like!”



Those relaxed Sabi Sands Cats!!

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