The distribution, conservation status and blood biochemistry of Nile crocodiles in the Olifants river system, Mpumalanga, South Africa

by

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DECLARATION

I, Petrus Johannes Botha declare that the thesis, which I hereby submit for the degree Philosophiae Doctor (Wildlife Management) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

SIGNATURE:

DATE:

This work is dedicated to the people who had a special influence on my life and my work:

My wife Joyce and daughter Elzahn, the stability and support you both provided, the interest you took in my work and the encouragement to carry on every time I encountered a setback inspired me to complete this work. Thank you for understanding my passion for Nile crocodiles and allowing me the freedom and personal space to follow the direction that my life took and especially thank you for all the times you remained behind at home to ensure that life at home carried on normally while I was away doing fieldwork. Joyce, thank you for all the times you had to handle the many household emergencies from the dog being spat in the eyes by a Moçambique Spitting Cobra, to fixing household appliances, fixing the car, changing tyres on your own, but your willingness to step in on my behalf allowed me to concentrate on the work at hand with success. Elzahn, thank you for understanding, at your young age, the importance of this work to me and thank you for supporting your mother at home during all the times I was away doing fieldwork, being able to rely on you meant that I could successfully concentrate on what became a life absorbing project.

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by

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ABSTRACT

The outlook for Nile crocodiles in the Olifants River does not look optimistic. Since the increase in capacity of the Loskop and Flag Boshielo Dams, the crocodile population was left with no basking or nesting sites and has declined over the past 30 years. Shortly after the

Massingire Dam in Moçambique filled to full capacity an estimated 160 crocodiles died in the Olifants River Gorge, a couple of kilometres upstream from the dam. The Olifants River is acknowledged by many experts as one of the most polluted rivers in South Africa and acid mine drainage, industrial pollution and untreated sewage in the river are all contributing to the poor water quality of the river. Further, the Department of Water Affairs and Forestry acknowledge that water demand already exceeds their capacity to supply and that the situation will worsen considerably in the near future.

Aerial surveys of Nile crocodiles in the Olifants River was carried out during December 2005 and November 2009. An average total population of 714 Nile crocodiles were counted and corrected to an estimated 1140 individual crocodiles to eliminate the effects of undercounting. The Kruger National Park and specifically the area of the Olifants River Gorge was found to be one of the preferred habitat areas for crocodiles in the Olifants River as was the Flag Boshielo Dam, the area between the Blyde River and the western boundary of the Kruger National Park and the Olifants River between the Loskop Dam and the Flag Boshielo Dam. Repeated nesting in areas such as the Kruger National Park, the Flag Boshielo Dam and the Olifants River between the Loskop Dam and the Flag Boshielo Dam confirmed that these areas are critically important to the nesting success of Nile crocodiles in the Olifants River. The Elands River was confirmed as an important refuge area for Nile crocodiles in the Groblersdal-Flag Boshielo Dam area of the Olifants River. Surveys revealed an estimated total of only 15 crocodiles in the Loskop Dam and confirmed that no

crocodiles in the large (2.1 - 4.0m TL) and very large size class (>4.0m TL) are currently present in the population. Blood biochemistry results indicate that the Olifants River Nile crocodile population probably suffers from chronic inflammation (especially in the Loskop Dam and Olifants River Gorge populations), infectious disease (particularly in the Loskop Dam population but all other sites also showed elevated values), possible inadequate diet and malnutrition (especially during the pansteatitis outbreak of August/September 2008) and are suffering serious immune problems in the Olifants River Gorge. A conservation and management plan is suggested which identifies threats to the continued existence of a viable Nile crocodile population in the Olifants River.

Finally, it is suggested that the conservation status and risk of extinction of Nile crocodiles in the Olifants River be upgraded to the **Endangered** category since it currently complies to the following criteria; EN A2abce; C2a(i) published in the IUCN Red List Categories and Criteria Version 3.1 (IUCN, 2001).

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