

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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but I know you know my achievements.*

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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 pancreatitis 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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TABLE OF CONTENTS

Abstract	Page i
Acknowledgements	Page iv
Table of contents	Page vi
List of tables	Page x
List of figures	Page xii
Chapter 1 The importance of crocodylians in the ecosystem.	Page 1
References	Page 14
Chapter 2 Detailed overview of the Olifants River Basin.	Page 21
Location of the Olifants River	Page 21
Topography of the Olifants River Basin	Page 27
Geology of the Olifants River Basin	Page 29
Landforms of the Olifants River Basin	Page 35
Biomes and bioregions of the Olifants River Basin	Page 35
Vegetation types of the Olifants River Basin	Page 42
Present ecological state of the Olifants River	Page 57
Land-use of the Olifants River Basin	Page 59
Climate of the Olifants River Basin	Page 64
References	Page 65



Chapter 3	The conservation status and distribution of Nile crocodiles in the Olifants River.	Page 71
	Introduction	Page 71
	Location of the survey area	Page 74
	Methods	Page 77
	Results	Page 83
	Discussion	Page 100
	Conclusion	Page 124
	Recommendations	Page 126
	References	Page 132
Chapter 4	The current Nile crocodile population in the Loskop Dam, a case of "croc in crisis".	Page 143
	Introduction	Page 143
	Methods	Page 146
	Results	Page 149
	Discussion	Page 158
	Conclusion	Page 165
	References	Page 166



Chapter 5	Blood biochemistry of Nile crocodiles in the Olifants River.	Page 169
	Introduction	Page 169
	Methods	Page 171
	Results	Page 175
	Discussion	Page 198
	Conclusion	Page 209
	References	Page 212
Chapter 6	Conservation and management plan for the wild Nile crocodile population in the Olifants River, Mpumalanga province.	Page 220
	Introduction	Page 221
	Species concerned	Page 223
	Agency responsible	Page 223
	Conservation status and legislative framework	Page 224
	Biology of the Nile crocodile	Page 226
	Threats to the Nile crocodile population of the Olifants River	Page 232
	Goals and objectives	Page 237
	Management	Page 239
	References	Page 256



Chapter 7	The Nile crocodile population of the Olifants River, is there a future?	Page 261
	References	Page 268
	Summary	Page 270
	Opsomming	Page 273
Appendix I	Detailed conservation and management plan for the wild Nile crocodile population in the Olifants River, Mpumalanga province	Page 276
	Introduction	Page 277
	Species concerned	Page 278
	Agency responsible	Page 279
	Conservation status and legislative framework	Page 280
	Biology of the Nile crocodile	Page 281
	Threats to the Nile crocodile population of the Olifants River	Page 288
	Goals and objectives	Page 293
	Management	Page 295
	References	Page 318
Appendix II	Brief description of the taxonomy of the order Crocodylia.	Page 322

LIST OF TABLES

Table 1	The calculated water balance of the Olifants River for 2004 and the projected water balance of the Olifants River for 2025 (Basson and Rossouw, 2003).	Page 23
Table 2	Major water users in the Olifants River and projected needs for 2010 (Theron <i>et al.</i> , 1991; Basson and Rossouw, 2003).	Page 24
Table 3	Biomes, Bioregions and Vegetation Types of the Olifants River (after Mucina and Rutherford, 2006) in relation to ecoregions and conservation status.	Page 37
Table 4	Categories used to define the present ecological state of the Olifants River ecosystem (Water Research Commission, 2001)	Page 57
Table 5	The number of Nile crocodiles counted in each size class during aerial surveys of the Olifants River, Mpumalanga in 2005 and 2009 and the adjusted population size to correct for the undercount (figures in brackets indicate percentage of the total).	Page 84
Table 6	Number of Nile crocodiles counted in each area of the Olifants River system during both survey years.	Page 87
Table 7	Mean number of crocodiles their density and percentage of the total population per sector of the survey area both surveys combined.	Page 88

Table 8	Number of Nile crocodile nests located during the 2005 and 2009 aerial surveys of the Olifants River.	Page 96
Table 9	Comparison of different Nile crocodile surveys done in the Olifants River excluding the Kruger National Park between 1981 and 2009.	Page 101
Table 10	Major water users in the Olifants River in 1987 and 2000 and projected use for 2010 and 2025 (Theron <i>et al.</i> 1991; Basson and Rossouw, 2003).	Page 107
Table 11:	Summary of Nile crocodile surveys in the Loskop Dam showing size distribution and density of crocodiles/km of available shoreline.	Page 150
Table 12	Comparison of Nile crocodile population densities from the Olifants River in South Africa.	Page 161
Table 13	Blood biochemical parameters of Nile crocodiles at selected localities in the Olifants River (n = 30) compared to other recent studies of Nile crocodile blood biochemistry in southern Africa.	Page 176

LIST OF FIGURES

Figure 1	Distribution (in yellow) of <i>Crocodylus niloticus</i> in Africa (Britton, 2007).	Page 2
Figure 2	The distribution (in green) of <i>Crocodylus niloticus</i> in South Africa based on a map published by Jacobsen in 1988.	Page 3
Figure 3	Locality of the Olifants River basin in South Africa.	Page 22
Figure 4	The Olifants River and its major tributaries in relation to major towns and conservation areas in the region.	Page 25
Figure 5	Broad geology of the study area showing the Olifants River superimposed in blue over the figure.	Page 31
Figure 6	Biomes of South Africa showing the Olifants River superimposed in blue over the north-east of the country.	Page 39
Figure 7	Bioregions of South Africa showing the Olifants River superimposed in blue over the north-east of the country.	Page 41
Figure 8	Vegetation types of the study area showing the Olifants River superimposed in blue over the area.	Page 56
Figure 9:	Aerial view of an opencast coal mine (Kromdraai Coal Mine) situated on the watershed of the Olifants River and Wilge River.	Page 60
Figure 10	Olifants River Gorge during a period of no-flow in October 2005.	Page 63
Figure 11	Locality of the Olifants River basin in South Africa.	Page 76

- Figure 12 The Olifants River and its major tributaries in relation to major towns and conservation areas in the region. Page 77
- Figure 13 Age pyramid (both sexes combined) showing the percentage of crocodiles in each of the major size classes of the Nile crocodile population present in the Olifants River during the final aerial survey completed during November 2009. Page 90
- Figure 14 Dispersal of Nile crocodiles over the entire length of the survey area in the Olifants River as observed during December 2005. Red dots represent areas where Nile crocodiles occur in the river. Page 93
- Figure 15 South African reptile conservation assessment distribution map of *Crocodylus niloticus*. Page 94
- Figure 16 Distribution of Nile crocodile nests during December 2005 in the survey area including the Kruger National Park. Page 95
- Figure 17 Nile crocodile nests at Flag Boshielo Dam during the 2000, 2001, 2002, 2003 and 2005 nesting surveys. Page 98
- Figure 18 Nile crocodile nests located along the Olifants River and inlet of the Flag Boshielo Dam during 2000, 2001, 2002, 2003 and 2005. Page 99
- Figure 19 Preferred crocodile habitat in the Olifants River based on the combined 2005 and 2009 aerial surveys, the percentage of the total population occupying each sector is shown between the green markers. Page 114

- Figure 20 Number and dispersal of Nile crocodiles per 5 km segment of the Olifants River as surveyed during 1993, 2005 and 2009. Page 116
- Figure 21 An illustration of the changes in the age structure of the Loskop Dam population of Nile crocodiles since 1981 (Data from Table 11). Page 151
- Figure 22 Distribution of Nile crocodiles in the Loskop Dam during surveys done in 2001, 05, 06, 07 and 09 (one dot represents one animal). Page 153
- Figure 23 Actual number of Nile crocodiles counted in the Loskop Dam and the adjusted number of Nile crocodiles present in the Loskop Dam during survey years (The spike in August 2007 represent the experimental release of 13 Nile crocodiles into the system). Page 154
- Figure 24 Population structure of Nile crocodiles (both sexes combined) in the Loskop Dam during 1981 based on aerial survey results reported by Jacobsen (1984). Page 155
- Figure 25 Population structure of Nile crocodiles (both sexes combined) in the Loskop Dam during 2001 based on aerial survey results. Page 155
- Figure 26 Population structure of Nile crocodiles (both sexes combined) in the Loskop Dam during 2005 based on aerial survey results. Page 156
- Figure 27 Population structure of Nile crocodiles (both sexes combined) in the Loskop Dam during June 2006 based on spotlight survey results. Page 156
- Figure 28 Population structure of Nile crocodiles (both sexes combined) in the Loskop Dam during January 2007 based on spotlight survey results. Page 157

- Figure 29 Population structure of Nile crocodiles (both sexes combined) in the Page 157
Loskop Dam during August 2007 based on spotlight survey done
after the experimental release of juvenile crocodiles in the dam.
- Figure 30 Population structure of Nile crocodiles (both sexes combined) in the Page 158
Loskop Dam during August 2009 based on spotlight survey results.
- Figure 31 Mean TSP concentration measured in the plasma of Nile crocodiles Page 178
at various sampling sites in the Olifants River compared to
concentrations reported by Lovely, *et al.* (2007) for the Okavango
Delta.
- Figure 32 Mean albumin concentration measured in the plasma of Nile Page 179
crocodiles at various sampling sites in the Olifants River compared
to concentrations reported by Lovely, *et al.* (2007) and Swanepoel
et al. (2000) for the Okavango Delta and Olifants River.
- Figure 33 Mean globulin concentration measured in the plasma of Nile Page 180
crocodiles at various sampling sites in the Olifants River compared
to concentrations reported by Lovely, *et al.* (2007) for the
Okavango Delta.
- Figure 34 Mean albumin/globulin ratio measured in the plasma of Nile Page 181
crocodiles at various sampling sites in the Olifants River compared
to concentrations reported by Lovely, *et al.* (2007) and Swanepoel
et al. (2000) for the Okavango Delta and Olifants River.

- Figure 35 Mean alanine transaminase (ALT) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 182
- Figure 36 Mean alkaline phosphatase (ALP) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 183
- Figure 37 Mean aspartate aminotransferase (AST) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 184
- Figure 38 Mean glucose concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 185
- Figure 39 Mean sodium (Na) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 186

- Figure 40 Mean potassium (K) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) and Swanepoel *et al.* (2000) for the Okavango Delta and Olifants River. Page 187
- Figure 41 Mean calcium (Ca^{2+}) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 188
- Figure 42 Mean calcium (Ca^{Total}) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) and Swanepoel *et al.* (2000) for the Okavango Delta and Olifants River. Page 189
- Figure 43 Mean magnesium (Mg) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) and Swanepoel *et al.* (2000) for the Okavango Delta and Olifants River. Page 190
- Figure 44 Mean serum inorganic phosphate (SIP) concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Swanepoel *et al.* (2000) in the Olifants River. Page 191

- Figure 45 Mean cholesterol concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 192
- Figure 46 Mean creatinine concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) and Swanepoel *et al.* (2000) for the Okavango Delta and Olifants River. Page 193
- Figure 47 Mean chloride concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) and Swanepoel *et al.* (2000) for the Okavango Delta and Olifants River. Page 194
- Figure 48 Mean uric acid concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River compared to concentrations reported by Lovely, *et al.* (2007) for the Okavango Delta. Page 195
- Figure 49 Mean triglyceride concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River. Page 196
- Figure 50 Mean vitamin A concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River. Page 197

Figure 51 Mean vitamin E concentration measured in the plasma of Nile crocodiles at various sampling sites in the Olifants River. Page 198

Figure 52 Head shape of the Nile crocodile (Wermuth and Fuchs, 1978). Page 226

Figure 53 Head shape of the Nile crocodile (Wermuth and Fuchs, 1978). Page 282