CHAPTER 7

THE NILE CROCODILE POPULATION IN THE OLIFANTS RIVER

IS THERE A FUTURE?

Crocodilians are one of only two, with birds living representatives of one of the most successful groups of land-dwelling vertebrates ever known, the Archosauria. These reptiles dominated animal communities on the continents during the Mesozoic era (245 - 65 million years ago). In addition to the crocodilians, the Archosauria included the dinosaurs, pterosaurs or flying reptiles, birds and an assortment of early Mesozoic forms often referred to as thecodontians, which included a variety of primitive archosaurs, some of which could have been the precursors of later groups such as crocodilians.

Hans-Dieter Sues (1990) wrote: *"Despite their antiquity it is quite inappropriate to treat crocodilians as "living fossils" whose "inferiority" forced them into a marginal ecological role as amphibious predators in a world now dominated by mammals. In fact they are highly specialized for their particular mode of life and have undergone considerable changes during their long evolutionary history which spans more than 200 million years".*

The outlook for Nile crocodiles in the Olifants River does not look optimistic. We have established that crocodiles are important to aquatic ecosystems because they maintain

biodiversity in their habitats where other animals are advantaged by the activities of crocodilians such as maintaining their deep pools and trails; by feeding on abundant species and thus increasing resources for less abundant species; they could possibly contribute to limiting water borne diseases because they control predatory fish which allows other smaller fish species to thrive thereby eliminating many insect vectors of disease; crocodiles are an environmental indicator species for pollutants and contaminants in aquatic ecosystems; crocodiles have aesthetic value and attract tourism as one of Africa's legendary predators; crocodiles are economically important and huge profits are produced annually by crocodile farms in selling their skins and meat; and as a result of crocodilians feeding on adult fish cause the amounts of calcium, magnesium phosphorus, potassium and sodium in nutrient poor streams and lakes double.

Despite all of this, it was shown in this project that Nile crocodile numbers in the Olifants River have not increased as one would have expected over a time-frame of almost 30 years. The distribution patterns of crocodiles in the Olifants River have changed very little over many years with possibly just the removal of the western boundary fence of the Kruger National Park having some influence on their distribution patterns. While distribution did not change much, numbers in certain important populations have declined to the effect that one may speak of a "population crash".

The areas which are the cause of most concern are the Loskop Dam population which has dwindled from over 80 animals in the early 1970's to only about 18 individuals but even more disturbing is that two entire and very important size classes (all animals larger than 2.1m TL) have disappeared totally from the population. This effectively negated the population's ability to increase naturally and therefore there is little hope for this population to survive without intervention. All indications at the Flag Boshielo Dam are that a large percentage of that population have left the area. What is clear is that the Flag Boshielo Dam habitat has been altered dramatically by effectively removing access to all basking and nesting sites merely by raising the dam wall and dramatically increasing the full supply level (height of the water). The Olifants River Gorge population has declined sharply by as much as 60% (an estimated minimum of 160 animals) since August 2008. As in the case of Loskop Dam population, crocodiles in the Olifants River Gorge were found dead in the water in large numbers and the losses also appear to be limited to the animals in large size classes (i.e. 2.1 - 4.0m and > 4.0m TL).

Results of tests on the blood biochemistry of Nile crocodiles from populations over the entire length of the Olifants River and in the Blyde River (considered to be an unpolluted class A river) suggest that the crocodiles occurring here are generally in poor health. Based on the current results, crocodiles in the Olifants River have probably been suffering from long term chronic inflammation and infection (elevated total serum protein, elevated globulin and elevated glucose levels) with serious problems in their immune systems (low vitamin E

levels) and probably suffer from an inadequate diet (elevated potassium and low triglyceride levels).

We do know that the environment of the Olifants River have changed constantly over the last 30 years. Since the increase in capacity of the Loskop Dam, the crocodile population has declined. The increase in capacity of the Flag Boshielo Dam left the crocodile population with no basking or nesting sites in fact, the only available shore was developed into a public angling area. 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 (Engelbrecht, 1992; Batchelor, 1992; Myburgh, 1999; Water Research Commission 2001; Driver *et al.* 2004; Havenga, 2007; Hartdegen, 2009). Acid mine drainage, industrial pollution and untreated sewage in the river are all contributing to the poor water quality of the Olifants River.

Further, the Department of Water Affairs and Forestry acknowledge that water demand already exceeds their capacity to supply and the situation will worsen considerably in the near future (Havenga, 2007) which will almost certainly lead to the impoundment of more

rivers in the Olifants River system thereby demanding even more from an aquatic system already stressed over its limit.

There has been a dramatic increase in construction and building projects in South Africa over the last several decades. A concern is the development of camping areas, fishing camps, eco-lodges and weekend homes on the banks of the Olifants River. These recreational areas now bring a large number of people to the river turning the entire resident crocodile population into "problem crocodiles". If these developments are authorised, then the responsible department did not take the impact on the environment into consideration when authorising development and if the developments did not follow the EIA process, then the situation is that illegal developments are forcing nature conservation officers to remove crocodiles which have become "problem crocodiles" by default unnecessarily from the ecosystem. This is a possibility which cannot be allowed to happen.

As little as seven years ago the Olifants River was the location of choice for natural history filmmakers but today this is no longer the case as one is not sure of finding a single crocodile during a whole night of surveying.

The net result of all of the above is that the coincidence in these cases is glaring, but the question must be asked: Is it possible that official government departments will make the

same mistakes in the same river system? In terms of the survey and blood biochemistry results from this project and the statements from aquatic experts regarding the pollution status of the Olifants River and given the acknowledgements from the Department of Water Affairs and Forestry that they have allowed the river to be over utilised then the answer to this question must be a shameful and unambiguous: **YES!**

Few animals inspire the sort of awe and fear that crocodilians do. Those of us who study these animals and their habitats tread carefully at the water's edge and their mythology abounds with stories and legends. However, in spite of the antiquity of the animals and the awe and fear that have made them part of the mythology of the ages, it seem that some humans are prepared to destroy these keystones of aquatic ecosystems, not directly but by poisoning or destroying their habitat and by making it impossible for them to find nesting space by artificially raising water levels or by constructing buildings and fishing camps on their basking sites - all for quick financial gain. Will the human race's well documented greedy nature ultimately lead to the disappearance of a 245 million year evolutionary animal from the face of the planet within our lifetime? The answer presumably is, "Unlikely in all aquatic systems, but highly likely in many", such as the Olifants River ecosystem.

In my view, based on all of the above, Nile crocodiles will have difficulty in surviving another 20 years intact in the Olifants River as we know it, leaving no viable populations in a river

that was once described as "infested" with crocodiles by the first settlers who came to the valley in the Olifants River in 1886.

In view of the arguments above and results gained from this research, it is my opinion that the conservation status and risk of extinction of Nile crocodiles in the Olifants River must be upgraded to the Endangered category since it currently satisfies the criteria EN A2abce; C2a(i) as published in the IUCN Red List Categories and Criteria Version 3.1 (IUCN, 2001).

The ultimate value of a crocodile

lies not in his belly hide,

nor his value as a tourist attraction,

nor even in his ecological significance,

but simply in the fact that he is a crocodile:

big and ancient and monstrously magnificent

James Powell, IUCN Crocodile Specialist Group, 1971.

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