Distribution and status of *Crocodylus suchus* in Kidepo Valley National Park, Uganda.

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Previous and recent research carried out in Uganda's National Parks focused mainly on large mammals and birds with little research directed towards reptiles and amphibians. A new species of crocodile was recorded in Kidepo Valley National Park (KVNP) in 2009 raising the total number of crocodile species ever recorded in Uganda to three (*Crocodylus niloticus*, *Osteeolamus osbornii*, and now *C. suchus*). Only *C. niloticus* has been widely known in Uganda but as a result of a 2009 crocodile survey in Kidepo, *C. suchus* has also been confirmed present (Hekkala *et al.* 2011). While *C. niloticus* is categorized as Low Risk on the IUCN Red List 2011, *C. suchus* is uncategorized mainly due to lack of adequate information on its distribution, habitat preference and survival. This knowledge gap in the ecology of this species in Uganda is the background upon which this research is based. The objective of this research was to establish the crocodile distribution and to assess its population status and habitat preference in the KVNP in northeastern Uganda.

The distribution, relative abundance and population status of the crocodiles in KVNP were assessed using the Line-Transect method with the river courses used as the line transect walked. Presence and signs of crocodiles were observed for and GPS coordinates taken for all rivers surveyed and for all observations made. As transects were walked, habitat information was recorded including presence or absence of water, river substrate, river bank characteristics and any observable threats. More information about threats was collected by asking park rangers and residents of villages near the rivers that were surveyed. Population structure was studied by capturing, measuring, weighing and 'sexing' some crocodiles. Crocodile hind-foot tracks in the river banks, and/or dry river beds were measured and using equations were used to estimate the total body length and hence the estimated age of the crocodiles.

Relative abundance was analysed using patch-occupancy Binomial Mixture models, using Repeated count data model (Royle 2007) and run in PRESENCE software to estimate the relative abundance of crocodiles in and around KVNP. Crocodiles were placed in their age categories and plotted to show the different age group percentages. Habitat data was classified according to Uganda's National Environment Management Authority, and the Wetland Departments

guidelines, and customized for KVNP. The habitat characteristics and threats were regressed against abundance and age of crocodiles using Generalized Linear Models for poisson distribution in R (version 8.2.1).

Results indicated that there was 80.2% chance of detecting the crocodiles if they were present at a given transect (detection probability = 0.802, standard error = 0.0470, 95% Confidence Interval was 0.72, 0.90). The abundance was estimated at 103 (± 15.74) crocodiles with 95% confidence interval as 76.50, 139.11; 70% in the Narus Valley, 23% in Kidepo Valley and 7% outside of the park. Most crocodiles observed in KVNP were adults, and 80% of captured crocodiles were female. Region where transect was located, and the season of surveys did not significantly impact the presence (or detection) of crocodiles at a given transect; P-value for season = 0.3326, and P-value for region analyzed = 0.9926. Habitat characteristics were shown to slightly affect the abundance and age of crocs observed although the analysis P-value = 0.061 indicates that the observation is not statistically significant. The younger crocodiles were found in more swampy areas whereas the less swampy river courses had the adult crocodiles.

The results of this research are in agreement with earlier research by Thorbjarnarson and Shirley (2009) that indicated that the total abundance of crocodiles in KVNP would be between 100-150 crocodiles; with about 80% crocodiles in Narus and 20% in Kidepo valley. It also agrees with earlier research on crocodilians that younger crocodiles are more likely to inhabit slow moving streams or ponds with submerged plants whereas older ones prefer clearer faster moving waters. Crocodiles in KVNP were observed to dig, burrow and aestivate in mud caves during the dry season; this has been reported of other *C. suchus* in Mauritania. This research provides some baseline upon which the KVNP management can monitor for crocodiles to ensure their continued presence and provide information for future research. Future research is recommended to model survivorship of these crocodiles in both the current habitat condition, and in face of changing climate and probably microhabitats in the park. Genetic analysis of crocodiles outside KVNP is also needed to decide whether they are same species as *C. suchus* inside the park.

In conclusion, according to this study the crocodile population in KVNP appears viable for survival if the current habitat characteristics don't change greatly in the next years. Basing on this research, I recommend continued monitoring of crocodiles and their habitats by the Uganda Wildlife Authority.