FINAL REPORT

TITLE: Accumulation of Persistent Organic Pollutants (POPs) in the Nile Crocodile of the Okavango Delta

PRINCIPLE RESEARCHER: Vince Shacks

LOCATION OF RESEARCH: The research is currently being conducted throughout the Okavango Delta from Mohembo to Maun.

PERIOD COVERED BY GRANT: March 2010 - March 2011

PROGRESS DURING THE REPORT PERIOD: May – November 2011

During this period our crew attempted captures on the southern limits of the Delta. This portion of the Okavango is characterised by slow flowing, shallow channels which drain slowly from flooded grasslands. Previous work on POPs in sediment of the Okavango (Mmualefe LC et al, 2007) found a variation in contamination between the upper and lower Delta indicating a possible cumulative effect of pesticides in the direction of water flow from the Panhandle to the lower Delta. This result may have been due to a difference in the storage capacity of sediments, which vary from sandy in the Panhandle to organic rich clay in the lower delta. There is also a chance however, that the current input of pesticides from agricultural activities in the surrounding areas caused this variation in results. It is our hope that assessment of crocodile samples will help to clarify this variation.

In May and June 2011 our team undertook 4 nocturnal capture sessions from the Maun bridge to the Buffaloe fence, a total distance of 35.4 km. During these surveys we encountered only 2 crocodiles both of which were larger than our intended capture size class. Navigation through this section was difficult as most of the river runs through old farm land which still has farm fencing and poles still in place. This channel has only been consistently flowing for the last two years. It was our intention to carry out some more survey work in this section later in the year once the annual floods had come in and improved boat access. The large influx of flood water however, caused excessive flooding of the local crocodile farm causing over 500 crocodiles (of varying sizes) to escape into the river. Our team assisted the local DWNP with recapture measures but it was impossible to differentiate the farmed crocodiles from wild crocodiles. This breakout has forced our project to avoid this section completely.
During the months of July and August we managed to carry out a number of nocturnal surveys in the lower central delta (Jao/ Boro system figure 2) and the Panhandle section of the Delta. We were able to collect tissue samples from 13 crocodiles of the correct size class (taking our total sample size to 20 animals). Our samples have been stored in Maun for laboratory analysis which we hope will take place at the end of 2012.

An unexpected and regrettable loss of funding from the GEF Small Grants Programme lead our team to unfortunately have to change research institutions. The grant which was supposed to pay for all laboratory analysis at the University of Botswana was lost as all students had to be Botswana citizens (I am a South African citizen and Botswana resident). Our team has however, approached the South African POPs working group for collaboration and a team from the University of Pretoria (Dr Jan Myburgh) as well as the Medical University of South Carolina (Prof Louis J. Guillette) have expressed an interest to collaborate on this work. This team will be visiting the project in early 2012.
Our team hope to carry out survey work in the northern portions of the Delta along the Maunachira channel running through Moremi Game Reserve and the NG 21 concession. We hope to collect at least 5 samples from this section of the river in order to provide good spatial coverage for all of the samples collected up to now. We are currently acquiring permission to work in this area from the concession managers and hope to have a survey carried out before the end of 2011.
Once a new collaboration has been set up which allows us to analyse the collected samples, our team will attempt to also gather tissue and blood samples from a breeding female crocodile and her eggs in order to be able to assess mother to young contamination. The team spent 4 weeks in late July and early August on the Panhandle identifying and recording the position of various potential females which may provide us with this opportunity. In order to avoid stressing the females through capture (and thus causing them to potentially leave the area or not lay eggs) we hope to first allow females to lay their eggs before we attempt capture. We have developed a tail recognition system which will allow us to photograph a female on a nest using a remote camera trap. Upon later capture we can then confirm whether we have the correct female crocodile and correlate the samples from the eggs. We hope to carry out this work during the 2012 nesting season. We will make use of the 2011 nesting season (Nov – Jan) to test this method of remote photo capture on the nest.

REFERENCE:

Mmualefe LC, Torto N, Huntsman-Mapila P and Mbongwe B, 2007. Supercritical fluid extraction of pesticides in sediment from the Okavango Delta, Botswana, and determination by gas chromatography with electron capture detection (GC-ECD) and mass spectrometry (GC-MS). University of Botswana, Dept. of Chemistry, Private Bag UB00704, Gaborone, Botswana