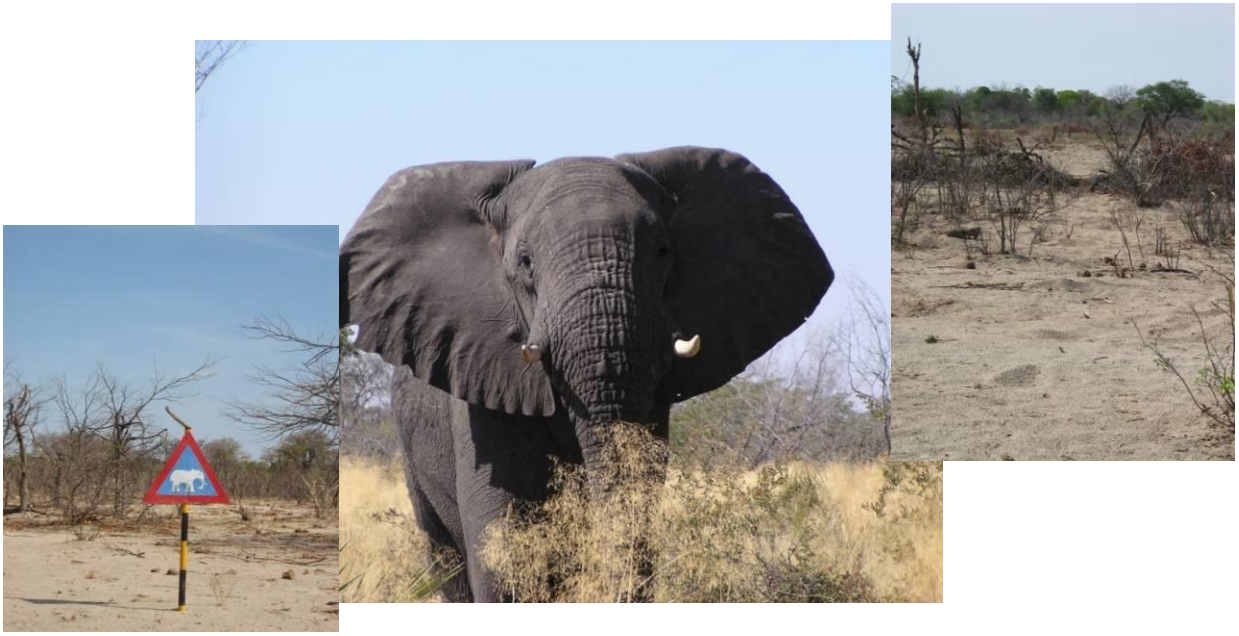
# Progress Report

## "Human-Elephant Conflict in HEC "Hotspots" in the Okavango Delta, Botswana"

## March 2009



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## Summary

The 2009 field season commenced in January, with enumerators being recruited in 12 villages (Mohembo-East, Kauxwi, Xakao, Tobera, Sekondomboro, Ngarange, Mogotho, Seronga, Gunotsoga, Eretsha, Beetsha and Gudigwa). Five new enumerators were recruited, and seven enumerators employed in 2008 were re-recruited for the 2009 field season. Crop-Raiding assessments began after training workshop at the beginning January. Additional fieldwork continued throughout January-March with transects to assess the spatial use of elephants and people. During February trial detailed farmer interviews were conducted and the interview survey commenced in March. Fifty farmers have been interviewed to date.

Educational talks are being organised with local schools and two were conducted in February and March. An article has been published in the January-March edition of "Conservation News" magazine.

## Project Overall Aim

Essentially this project aims to contribute information on the ecology and movements of elephants in HEC "hotspot" areas of the Okavango Panhandle in relation to HEC incidents, to assist wildlife managers and farmers in developing practical and effective alternative land use planning strategies to try to reduce HEC in the area, as well as provide valuable information on where to position and concentrate mitigation measures where they are likely to be most successful.

## Project Goals

The six main project Goals for year one are to:

- Collaborate with, and continue on from, the one-year ODMP HEC study in order to ensure a long-term approach to research and understanding of HEC in the Okavango Delta;
- Investigate the population structure and dynamics of the elephant population utilising HEC "hotspot" areas;
- Investigate movement patterns of elephants in the area and illustrate migration routes using GIS maps in relation to human settlement, agricultural land use, and water resources and investigate the relationship between the two in terms of conflict incidences;
- Work with the local communities, to record local knowledge on elephant movements and migration routes and the elephant population in the study area;
- Disseminate information to all stakeholders;
- Conduct educational talks to all stakeholders to provide information to contribute to the design of effective land use strategies to reduce conflict between Humans and Elephants in the study area;

## Project Objectives

The seven main objectives of the project are to:

- Identify how many elephants utilise the HEC hotspot area of the Okavango panhandle;
- Identify what elephants in the population are involved in HEC incidences;
- Investigate elephant movement in the area and establish to what extent HEC incidences are related to seasonal and/or more frequent movement patterns into the conflict areas and what factors affect this movement (i.e. food availability etc.);
- Identify the main migration routes in the area and establish how these routes impact the rate of HEC incidents in the area, i.e. do most incidents occur on these routes;
- Investigate elephant habitat utilisation and determine the proportion of habitat use near human settlements to other habitats, and in addition investigate which environmental factors determine habitat selection in the study area i.e. water availability.
- Disseminate findings and information to all stakeholders through the media, website and reports.
- Conduct educational talks in Kgotla meetings and schools within the study area and organizations such as HOORC, EHF and BWTI.

## Review of Activities and Methodology

Below is a review of the methodological techniques used and the progress to date:

### 1. Elephant population data

***1.1 Aerial Population Survey***

A dry season aerial population survey is planned for August 2009. In order to reduce observer bias and other sources of bias from sampling techniques we felt it is better to conduct the survey using the same personnel as last seasons. Unfortunately, Elephants Without Borders are unable to assist with a wet season survey in 2009, therefore we will conduct a dry season survey only.

It is hoped that smaller scale aerial surveys can be conducted over the next few months to identify elephant daytime refuges during the crop season. This will be subject to plane and pilot availability.

***1.2 Ground Transects***

Ground transects have been driven three times a month during January, February and March, to collect data on the spatial use of elephants, people and livestock in the study area.

Data collected at elephant spoor sightings include: GPS co-ordinates; location; vegetation type; number of elephants in herd; number of Adults, adolescents, juveniles and babies in herd; measurement of bull spoor and baby spoor. At elephant sightings additional data on the age, sex, activity, physical condition, temporal secretions, and individual characteristics (i.e. ear patterns/tusks/tail) of the sighted elephant are recorded. Data collected on people include: GPS co-ordinates; location; sex, age class (Adult, child, baby), and activity. Data is also collected on

livestock (cattle, goats and donkeys), the GPS co-ordinates, location, number of animals are recorded.

Data input and analysis has taken place over the last 3 months (Sept-Nov). Elephant, people and cattle population density estimates will be calculated, in relation to distance to village/river/vegetation type etc. Results will be analysed to recognize if there are fluctuations in number and structure of populations, elephant distribution and densities, and habitat utilisation of elephants at the varying distances from human settlements during crop-raiding and non crop-raiding season

## 2. Elephant movements and migration routes

A total of 45 main elephant pathways have been identified through the study area, thus far. The points where these cross the main road and where they occur close to fields have been marked on the GPS and mapped in Arc View. The pathways have been identified through local knowledge from the community and through spoor identification during the ground transect surveys. Mapping using aerial orthophotographs is currently underway to illustrate the routes of the main pathways through the bush. Many of these paths are visible on the orthophotos, now that verification points have been mapped.

It is evident that there are at least 5 large elephant paths leading from waterholes in the North and East, leading to the Okavango River. This was verified during detailed aerial surveys in August 2008, when well trodden elephant paths were clearly visible from the air. The distances of fields to these elephant pathways will be measured once mapping is completed.

There are many farms located along or close to these main pathways, and it appears as if this does indeed make a farm more susceptible to raiding, however data analysis needs to be completed before we can conclude this is a significant result. Many new fields have been established this year in 2009 very close to some main paths. The HEC "hotspot" village of Tobera is a classic example of where the fields appear to be on a main elephant path. It looks like the elephants are using a path that connects a group of waterholes in the NE, through the line of fields and on to the River. The question is was this old elephant migration route here before the farmers planted their fields or have the elephants changed their route to the river to go via the fields with crops? The farmers' opinion is that the elephants have started coming for the crops, yet from the air and the map the path looks like it is the most direct route from the pans to the rivers.

Data collection is continuing throughout the 2009 field season. Data analysis and GIS mapping will continue after the 2009 field season.

## 3. Community Consultations

The PI and research assistant visited all village chiefs in December 2008 before data collection commenced in January. We confirmed who should be our enumerator for each village in 2009 and asked chiefs to clarify with villagers what we are doing and that project personnel are conducting research and not distributing compensation. Enumerators were recruited, briefed and

trained in January, and it was emphasized that all enumerators should explain to farmers and make sure they understand what they are doing before interviewing and field assessments take place.

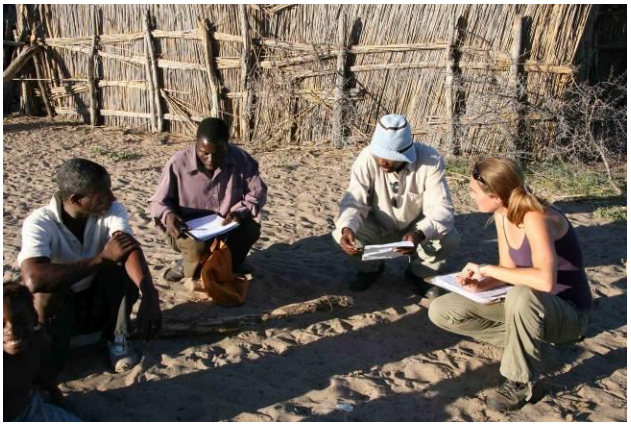

**Fig. 1** Farmer consultation in Teekae Village, nr Seronga

## 4. Human Attitudes and Perceptions of HEC

A total of 628 farmers were interviewed in 2008 field season, with questions primarily directed towards investigating elephant damage and elephant movements. Treves *et al* (2006) highlighted how important it is to also understand how perceptions influence complaints about HWC, acceptance of research and its findings, and the acceptability of management actions when addressing Human-Wildlife Conflict issues. Community attitudes and perceptions towards elephants and HEC are now being investigated through detailed structured interviews with a sample of farmers during 2009 crop season.

To ensure question clarity and effectiveness of questions in gaining the required information, questionnaires were tested on a random sample of 10 farmers from different villages, ethnicity, gender and economic backgrounds.

Questions are designed to:

- Investigate historical and cultural relationships of communities with elephants
- Assess peoples attitudes towards elephants
- Assess perceived effects and impact of Human-Elephant Conflict, in particular crop-raiding
- Investigate current deterrent and coping strategies used in controlling problem elephants
- Investigate peoples attitudes towards current land use planning and suggestions on future changes
- Investigate attitudes on possible solutions for reducing HEC in the area

Tlholego Setshwantsho (Nature), our translator has been trained in interview techniques. The PI conducts interviews in English with Nature translating into Setswana, Hambukushu or Seyei. For Sisawara speaking interviewees, further translation takes place from Setswana to Sisawara through our enumerator in that village. All questions have been designed and translated in the lab and answers coded to facilitate analysis, (Kangwana, 1996);

The Interview consists of 56 questions and lasts on average 25-30 minutes. Respondents are selected randomly and we aim to interview at least 20 farmers from each village, plus all the village chiefs (n=252). The survey will aim to represent individuals from different economic, social and cultural backgrounds, to ensure the sample is representative of the different communities. To date, 52 farmers have been interviewed from 8 villages.

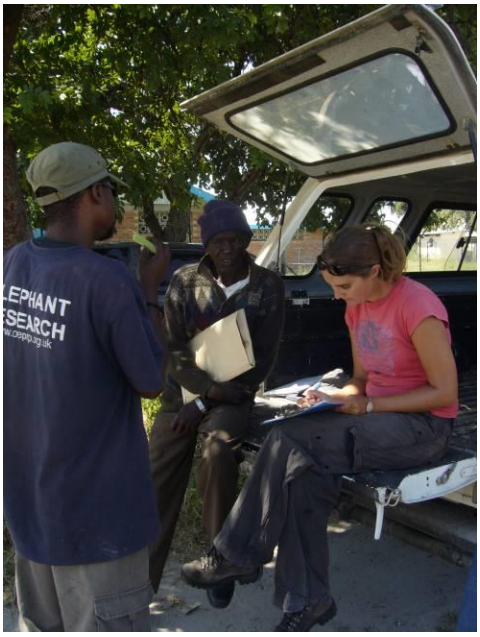

**Fig. 2** Interview with Headman of arbitration in Beetsha Village

## 5. Educational Talks

School talks have been conducted in Gunotsoga and Beetsha primary schools. Gudigwa and Seronga primary schools have been approached and talk dates are being arranged. The talks were conducted to the environmental clubs. The environmental clubs had 30-80 students ranging from 6-15 years old. The talks last ~15 minutes and are conducted in English and Setswana. The students are then divided into groups (selected based on age) and two group activities are carried out; the first one to ask individual students questions about elephants and the talk; and the second to get students to identify different crop raiding animals footprints. The session ends with a summary, then questions and answers session. The students enjoyed the talk and we asked environmental clubs to assist us with the research by recording all elephant sightings by students in their school.

**Aims of the Talk:**

- To inform students about the research
- To share knowledge about elephants
- To explain about and gain feedback on crop-raiding animals

**Learning Outcomes:**

- Ability to identify crop-raiding wildlife spoor
- Estimate ages of elephants from footprints
- Identify main features of elephant
- Gain understanding about the crop-raiding situation in the panhandle
- Meet researchers working in their village

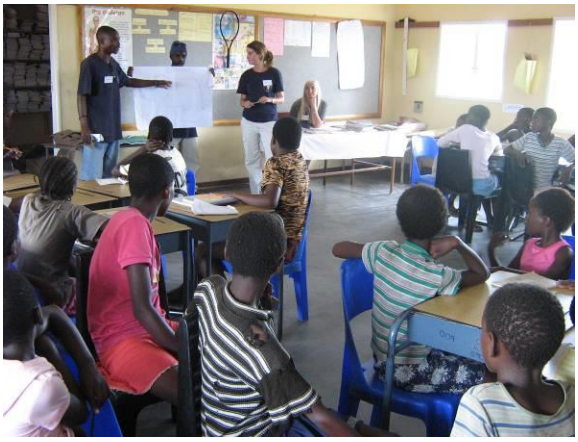

**Fig. 3** Anna and Nature conducted school talk in Gunotsoga Primary School.

**Fig.4** Activity groups at Gunotsoga Primary School, with Mojita and Nature.

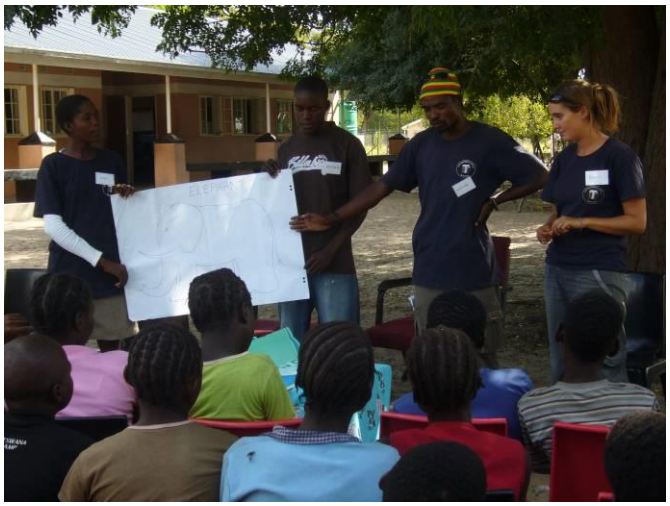

**Fig. 5** Gase, Baleseng, Nature and Anna conducted school talk in Beetsha Primary School

### 6. Elephant crop-raiding data collection

A total of 70 fields have been raided by elephants so far in 2009. All have been visited by enumerators and PI.

Interestingly, during March this year we had a lot of rain and the number of crop raiding incidents decreased. It is surmised that the rained encouraged elephants to move north back into the bush and therefore stay away from the fields. More data would need to be collected on the effect of water in rain filled pans as well as other factors (i.e. ripening of fruits in the delta) that may influence the movement of elephants to come south to the delta, however, this observation could indicate that there may be potential of providing water for elephants further in the bush during the crop-raiding season to encourage them to stay away from fields until crops have been harvested.

All field data is being inputted into spreadsheets and preliminary data analysis is underway.

## Other Project Accomplishments

An article “Conflict or Coexistence?” has been published in “Conservation News” the Botswana Government, Department of Environmental Affairs magazine.

Conservation International have agreed to sponsor a chilli pepper mitigation trial in the eastern panhandle, as part of a transboundary HEC mitigation project. Training workshops will commence in August 2009.

## Aims for next 3 months

Continue fieldwork and farmer interviews. Educational talks will be conducted in the remaining seven village primary schools.

## Acknowledgements

We would like to thank everyone who has sponsored and assisted the project so far. A special thank you to Department of Wildlife and National Parks, Wildlife Conservation Society, Wilderness Wildlife Trust, The Rufford Small Grants Foundation, Tati Company (Pty) Ltd., The Jolly Bushman (Pty) Ltd., Leica Camera (Pty) Ltd., David White, Brian McCulloch, Maureen & David Songhurst, Elephants Without Borders, Wings for Wildlife, Professor Tim Coulson, Dr Casper Bonyongo, Dr Graham McCulloch, Dr John Hanks, Dr Loki Osborn, Darren Saunders, Roni McFarland, Simon Allan, Jocasta Bobeng, Francesa Ercoli and Zoe Pocock.