Working towards coordinated regional approaches in Human-Elephant Conflict management

Proceedings of a Workshop for the Kwando-Kavango region organised by Conservation International (CI)

June 2010

CONSERVATION INTERNATIONAL

Working towards Coordinated Regional Approaches in Human-Elephant Conflict Management

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Edited by

Anna Songhurst

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Maun, Botswana

Preface

The elephant meta-population in the Kwando - Kavango region –with its primary growth-engine in northern Botswana – is increasing in numbers and expanding in distribution. Increasing pressure is being exerted on environmental resources; water, food and land, and the incidence of human-elephant conflict (HEC) appears to be escalating,. Growing frustration amongst rural people, in particular, living in the region, is exacerbating negative perceptions towards the causes of, and reactions to their predicament. The situation is complex and calls for effective management interventions and mitigation strategies, through long-term, region-wide initiatives.

Monitoring and attempting to manage human-elephant conflict in this transboundary Kwando - Kavango region (see map in Figure 1) will require coordinated and complementary efforts. Region-wide co-ordination can only enhance a greater understanding of the route causes of HEC, assist in the design and sharing of effective mitigation strategies , and improve monitoring and the production of comparable data that will help improve our understanding even further.

This workshop was aimed at initiating such a common understanding by bringing together experts; researchers, NGOs and government officials from Angola, Namibia, Zambia and Botswana, specifically to:

a) Provide clarity on the current distribution and densities of elephants, and projected trends in the region;
b) Present current levels of human-elephant conflict experienced in the general area of junction between Angola, Namibia, Zambia and Botswana;
c) Present the current State-of-the-Art of human-elephant mitigation measures globally and regionally;
d) Address community perceptions and needs regarding HEC mitigation,
e) Present the monitoring methods used, data-availability and data-sharing in the different countries, and;
f) Discuss ways and means to improve regional coordination and complement future human-elephant conflict mitigation, including an assessment of training needs etc.

The workshop was arranged by Conservation International, as part of its ongoing programme of support to the reduction of conflict between elephants and people, for improved food security, and to improve rural people's perceptions of wildlife.

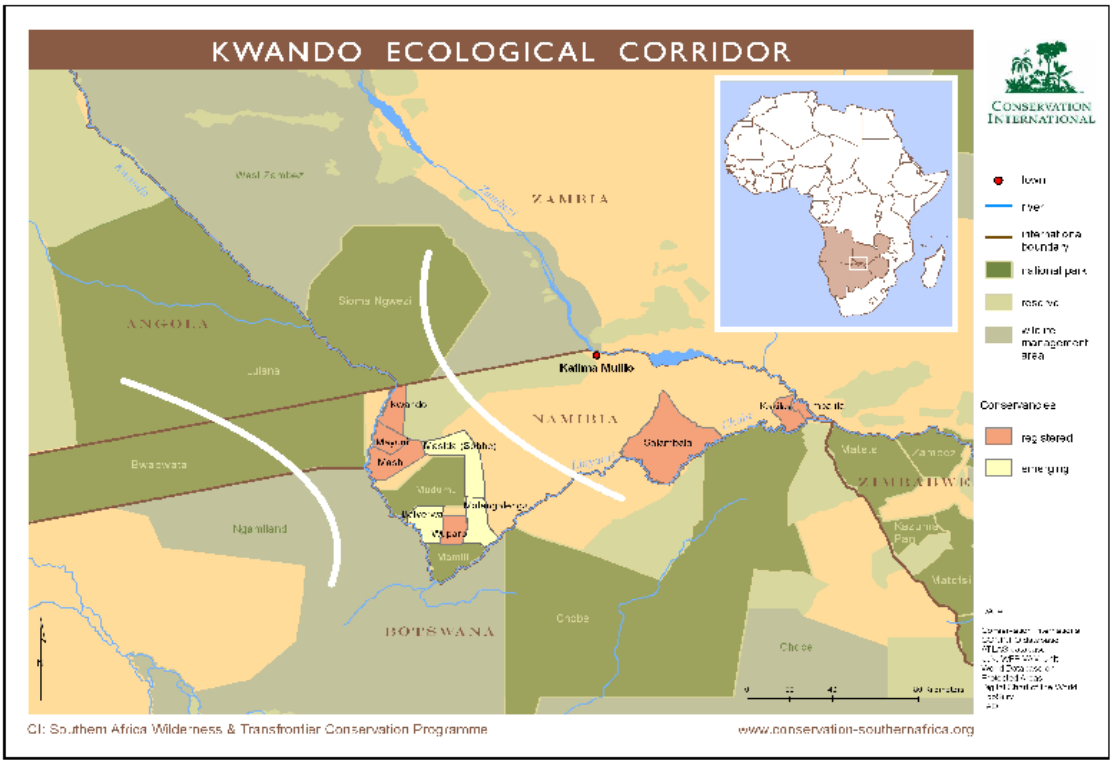

Figure 1. Map of the Kwando-Kavango Region, indicating the proposed KAZA Trans-Frontier Conservation Area corridor (inside the white lines)

List of Participants

Braack, Leo	CI, Botswana	l.braack@conservation.org
Busihu ,Bennety	IRDNC, Namibia	blbennety14@gmail.com
Chase, Michael	EWB, Botswana	er@info.bw
Chilli, Philani	DWNP, Kasane, Botswana	
Chishika, Joreck	ZAWA, Zambia	chishikajoreck@gmail.com
de Wet, John	CI, Botswana	jdewet@conservation.org
Gaothogogbwe, Titus	DWNP, Gaborone, Botswana	tgaothobogwe@gov.bw
Gimpel, Karl-Heinz	Destination Managers Botswana	khg@botswana-destination.com
Hudson, Joanna	OEPRP, Botswana	joannaehudson@btinternet.com
Jozefowicz, Tarina	Tauana Films	tauanafilms@mweb.co.za
Jozefowicz, Jurgen	Tauana Films	tauanafilms@mweb.co.za
Jozefowicz, Mr	Tauana Films	tauanafilms@mweb.co.za
Karidozo, Malvern	EPDT, Zambia	malvern@elephantpepper.org
Kenwendo, Moses	DWNP, Seronga, Botswana	
Kutembeka, Raymond	Kwandu Conservancy, Namibia	
Lekgowe, Ikemiseng	DWNP, Maun, Botswana	
Masunga, Gaseitsiwe	DWNP, RWO , Chobe District	gsmasunga@gov.bw
Mazebedi , John	DWNP, Head of PAC Ngamiland	
Meyer, Thoralf	SGI Botswana	thoralf.meyer@sgi-botswana.com
Miyanda, Chrispin	CCCD, Zambia	
Modise, Mogotsi	DWNP, Gumare, Botswana	Mmodise007@gmail.com
Montshobang, Benito	BWTI, DWNP, Botswana	benitomontshojang@ymail.com
Moseki, Lesego	BWTI, DWNP, Botswana	lmmoseki@yahoo.com
Mosojane, Sibangani	BioKavango / Tawana Land Board	smosojane@orc.ub.bw

Mosupi, Ohitiseng	OEPRP, Botswana	mojita2010@hotmail.com
Murphy, Carol	CCCD, Zambia	cmurphy@africaonline.com.na
Musiyalike, Charles	MET, Namibia	cmusiyalike@hotmail.com
Olesitse, Sebopeng	DWNP, Francistown, Botswana	
Osborn, Loki	EPDT, Zambia	loki@elephantpepper.org
Otumile, Gift	DWNP, Gaborone, Botswana	gotumile@gov.bw
Rieder, Erica	WWF, Zambia	ekrieder@wwfzam.org
Songhurst, Anna	OEPRP, Botswana	anna.songhurst@hotmail.com

List of Absentees (with apology)

Alpers, Friedrich	IRDNC, Namibia	falpers@iway.na
Anstey, Simon	Resource Africa, UK	Simon.anstey@gmail.com
Chansa, W	Zambian Wildlife Authority, Zambia	chansaw@zawa.org.com
Diggle, Richard	World Wildlife Fund, Namibia	rwdiggle@iway.na
Feuerriegel, Karsten	World Bank, South Africa	kfeuerriegel@worldbank.org
Landen, Kelly	Elephants Without Borders, Botswana	kellanden@aol.com
Mmopelwa, Trevor	DWNP, Director, Botswana	tmmopelwa@gov.bw
Modise, Sedia	KAZA TfCA, Botswana	rckazatfca.org
Muema, Dominic	Integrated Rural Development & Nature Conservation, Namibia	dmmwema@yahoo.com
Nyambe, Nyambe	World Wildlife Fund, Zambia	nnyambe@wwfzam.org
Othomile, Molotlhanyi	DWNP, Regional Wildlife Officer, Ngamiland, Botswana	mbothomile@gov.bw
Sikopo, Colgar	Ministry of Environment & Tourism, Namibia	csikopo@hotmail.com

Table of Contents

Preface..... 2

List of Participants..... 4

List of absentees (with apology)..... 5

List of Acronyms..... 8

Welcome & Opening Remarks (*L. Braack*)..... 9

Opening address (*J. Mazebedi*)..... 10

Presentations Summary..... 11

PRESENTATIONS

1. Elephant distribution, density, key corridors in the region and projected future trends (*Michael Chase*)..... 14

2. An overview of HEC mitigation techniques globally and regionally (*Loki Osborn*)..... 18

3. Current Status of HEC in Namibia, MET perspective (*Charles Musyalike*)..... 23

4. Current Status of HEC in Namibia, IRDNC perspective and The Namibian "Incident Report" system and HEC reporting method (*Bennety Busihu*)..... 26

5. Current Status of HEC in Namibia, Community perspective (*Raymond Kutembeka)*..... 28

6. Current Status of HEC in Botswana, DWNP perspective (*Gaseitsiwe Masunga*)..... 32

7. DWNP World Bank initiative (*Titus Gaothobogwe*)..... 35

8. Current Status of HEC in Botswana, OEPRP perspective (*Anna Songhurst*)..... 36

9. Current Status of HEC in Botswana, Community perspective (*Ohitiseng Mosupi*)..... 39

10. Current Status of HEC in Angola (*Malvern Karidozo*)..... 42

11. Current Status of HEC in Zambia, ZAWA perspective

(*Joreck Chishika*)..... 46

12. Current Status of HEC in Zambia, CCCD & WWF perspective
(*Carol Murphy & Erica Rieder*)..... 48

13. Current Status of HEC in Zambia, Community perspective
(*Chrispin Miyanda*)..... 51

Activities..... 53

Conclusion..... 57

Appendix I – Agenda..... 58
Appendix II –Photographs of Workshop..... 60

List of Tables

Table 1. Summary of the current regional elephant population estimates and status..... 11
Table 2. Summary of Successes, Challenges and Lessons Learnt in HEC in the four countries within the Kwando-Kavango..... 12
Table 3. Elephant Population Estimates in the four clusters in Namibia..... 23
Table 4. Amount of money given to offset losses through HWSRS..... 24
Table 5. Summary statistics of elephant crop-raiding in the Okavango Panhandle over 3 years (2008-2010)..... 37
Table 6. Number of HWC incidents and HEC incidents reported over a four year period (2006-2009)..... 46
Table 7. Yields from CA plots..... 50

List of Figures

Figure 1. Map of the Kwando-Kavango Region..... 3
Figure 2. Six main elephant movement corridors in the Kwando-Kavango Region..... 16
Figure 3. HWC reporting system in Namibia..... 25
Figure 4. Elephant paths in the Silowana complex, Zambia..... 48

List of Acronyms

AIDS	Acquired Immune Deficiency Syndrome
BWTI	Botswana Wildlife Training Institute
CA	Conservation Agriculture
CBCM	Community Based Conflict Management
CBNRM	Community Based Natural Resource Management
CCCD	Community Centred Conservation and Development
CEDP	Community Economic Development Project
CI	Conservation International
CITES	Convention on International Trade in Endangered Species
CSO	Central Statistics Office
DWNP	Department of Wildlife and National Parks
EIA	Environmental Impact Assessment
EPDT	Elephant Pepper Development Trust
EWB	Elephants Without Borders
FMD	Foot and Mouth Disease
GEF	Global Environment Fund
GMA	Game Management Area
GRN	Government Republic of Namibia
HACCIS	Human Animal Conflict Compensation Insurance Scheme
HEC	Human Elephant Conflict
HIV	Human Immunodeficiency Virus
HWC	Human Wildlife Conflict
HWSRS	Human Wildlife Self Reliance Scheme
IDP	Integrated Development Plan
IRDNC	Integrated Rural Development and Nature Conservation
ISPAAD	Integrated Support for Arable Agricultural Development
KAZA TfCA	Kavango Zambezi Transfrontier National Park
MET	Ministry of Environment and Tourism
MOMs	Management Orientated Monitoring System
NGO	Non Governmental Organisation
NRP	Natural Resources and People
ODMP	Okavango Delta Management Plan
OEPRP	Okavango Elephants and People Research Project
PAC	Problem Animal Control
PhD	Doctor of Philosophy
SADC	Southern African Development Community
UNDP	United Nations Development Programme
UNITA	National Union for the Total Independence of Angola
VAG	Village Action Group
WWF	World Wildlife Fund
ZAWA	Zambian Wildlife Authority

Welcome and Opening Remarks

L. Braack, Director of Southern Africa Wilderness Programme, CI

Good morning everyone.

I welcome all present today. We are all privileged to be working in a job, which brings enjoyment and satisfaction. Thank you to all participants for attending this workshop, especially to those who have travelled far. To mention a few, Dr Osborn has come from Cape Town, Mr Musiyalike has travelled from Rundu, Dr Chase has just returned from the USA, so thank you all for making the effort to be here today.

I wish you all a warm welcome.

Thank you to Anna Songhurst for organising the workshop on behalf of CI.

Opening Prayer: We will open the workshop with a prayer given by Mr G. Otumile, Department of Wildlife and National Parks, Botswana.

I would like to say a few words of context on behalf of the sponsors Conservation International. In 1992, Karen Ross set up the first office for Conservation International in Botswana, in Maun. This was as a result of the elephant population increasing and starting to cause problems in northern Botswana. Back then, 15-20 years ago the elephant population in northern Botswana was estimated at ~60,000 elephants, now in 2010 it is estimated to be over ~ 150,000 elephants. As elephant populations increase and animals start to move away from areas where numbers are exerting pressure on resources, elephants start to move more frequently into areas where people are living.

Conservation International employed Mike Chase to carry out elephant population aerial surveys and deploy satellite collars on elephants to investigate movements and population dynamics in the Kwando – Kavango region. In 2006, a workshop was held in Gaborone to consolidate this data and try to identify transboundary corridors; sources and sinks of elephant populations; and obstructions to elephant movements i.e. fences. CI worked together with organisations like IRDNC to promote transboundary corridors for wildlife movement, linking countries in the Kwando – Kavango region i.e. Botswana to Caprivi, Angola to Zambia etc.

Conservation International have since carried out a lot of work on Human – Elephant Conflict issues in the region.

The aim of this workshop is to share information and experiences from people working on HEC issues and mitigation in their respective areas. We have representatives from four countries, Botswana, Zambia, Namibia and Angola. We should be an appropriate group to share experiences, challenges and successes with HEC mitigation and elephant conservation efforts. Through sharing information today, whether from the community, Government or an NGO, we hope to explore the problems people are facing, what are the possible solutions to these problems, what are the challenges people are experiencing and discuss a way forward to address these challenges.

Opening Address

J. Mazebedi, DWNP, Head of PAC, Ngamiland, Botswana

I can see representatives here from different organisations and places: CI; EPDT; Government of Namibia; Government of Zambia; Government of Botswana; OEPRP.

Ladies and Gentlemen let me take this opportunity to give a few words of welcome. Good morning to all.

The DWNP Regional Wildlife Officer of Ngamiland, Mr M Othomile who was supposed to be here to officiate this workshop, unfortunately cannot be present due to other commitments. I am therefore honoured, on behalf of Mr Othomile, to officially open this very important workshop.

It is good that all participants arrived safely from their respective countries.

This workshop is very important for a number of reasons. It is important for everyone here to be able to visit Ngamiland, both Maun and the Okavango Delta. Maun is the centre of tourism in Botswana, because of the Delta.

We are experiencing quite a number of human-wildlife conflicts here in Botswana, especially with elephants. These conflicts are mostly caused by an increase in the human population and consequently an increase in agricultural fields to provide food for more people. This increase in fields leads to a decrease in land for wildlife, often blocking routes for wildlife migration. Less land for wildlife leads to an increase in conflict incidents, including wildlife destroying crops and property. People often see wildlife as a nuisance and this can lead to the indiscriminate killing of wildlife. Many people don't see the benefit of wildlife and therefore, may try to poach wildlife species.

The Botswana Government has tried to come up with mitigation measures to reduce human-wildlife conflicts in Botswana. I believe the presentations we will hear today will highlight some of these measures. However, we are still experiencing human-wildlife conflict incidents, especially those involving elephants. In Ngamiland, we have problems with elephants damaging crops, and between January and May 2010, seven elephants have been killed due to PAC. If such conflicts are not addressed, more elephants will be killed and this could lead to a reduction in the elephant population. We are also aware that many people depend on agriculture for subsistence. If HEC is not addressed there will be less food for people and this increases poverty.

It is up to us as conservationists and professionals to come together and come up with mitigation measures to reduce this conflict. I believe our gathering here today will come up with sound mitigation measures to reduce HEC and save our wildlife species, especially elephants.

Before I conclude, I would like to warn our visitors. Ngamiland is a tourist attraction area and we have different types of people visiting Maun. I advise all to be careful whilst in Maun and take preventative measures against the deadly disease – HIV.

I urge all to be professional in our discussions, deliberate freely and respect each other's views.

Welcome everyone to Maun.

As director of ceremonies, I declare this gathering open. Pula!!

Presentations Summary

1. Elephant distribution, density, key corridors in the region and projected future trends

Elephants Without Borders (EWB) together with Conservation International (CI) have been deploying satellite collars on elephants throughout the Kwando-Kavango region to better understand the spatial ecology of elephants and to identify key conservation corridors. The elephant population numbers, status and trends were outlined (see table 1 for summary) in the four countries: Namibia; Botswana; Angola; and Zambia within the region. Challenges in surveying on a regional scale were highlighted, such as the unreliability of some aerial survey results, when surveys are conducted independently. It was suggested that a regional-wide survey be conducted between the four neighbouring countries to reliably assess the status of the regions elephant population.

Table 1. Summary of the current regional elephant population estimates and status

Country	Survey Area	Population Estimate	Year Survey Conducted	Status	Comments
Namibia	Caprivi Strip	8,380	2007	Stable (possible decline)	Transient population and cross border movement
Botswana	North	151,000	2005	Increasing (possibly stabilising)	Range expanding and cross border movement
Angola	Luiana Partial Reserve	7,500	2008	Increasing	Range expanding and cross border movement
Zambia	Sioma Ngwezi National Park	365	2006	Declining	Cause of decline unclear

2. An overview of HEC mitigation techniques globally and regionally

In the past, it was thought that the best way to resolve human-elephant conflict (HEC) was to separate people and elephants. Current thinking, however, takes on a different view that we should rather look for ways to reduce human-elephant conflict so that people and elephants can co-exist.
Each case of HEC merits individual attention, with recommendations for action based on a variety of local conditions. Purely technical solutions do not work and we need to encourage a combined approach of both passive and active PAC deterrents. It is important to plan mitigation strategies and consider why previous trials in an area have failed. Mitigation trials should be managed appropriately and monitored throughout implementation. Improving rural incomes and developing alternative livelihoods should also form an integral part of any mitigation strategy planning phase.

3. Successes, Challenges and Lessons learnt in Human – Elephant Conflict (HEC) from Namibia, Botswana, Angola and Zambia

The Government, Non-Governmental Organisation (NGO) and Community perspectives on the current status of HEC in Namibia, Botswana, Angola and Zambia where shared. The common successes, challenges and lessons-learnt in HEC within the Kwando-Kavango region are summarised in table 2 below.

Table 2. Summary of Successes, Challenges and Lessons Learnt in HEC in the four countries within the Kwando-Kavango Region

Country	Successes	Challenges	Lessons Learnt
Namibia	• Elephant numbers have increased in Namibia • CBNRM has achieved considerable success • Training effective • Collaborative management strategies have been established to address HEC • Funding to assist with funeral costs available, not intended as compensation for loss of life ▪ Legal bodies in conservancies now recognized by Government ▪ Money comes from conservancies for self reliance scheme and is topped up by IRDNC and Government. ▪ Self reliance scheme encourages farmer responsibility for crop protection ▪ Alternative mitigation measures being trialled i.e. Bees ▪ Farmers believe that chilli and CBCM techniques are effective	▪ HEC may hinder CBNRM goals and objectives ▪ Hostile actions by local communities towards conservation ▪ Elephants are reclaiming historical distribution areas ▪ Different sector policies ▪ Difficult to measure damages caused by elephants ▪ Limited resources and personnel ▪ HIV/AIDS pandemic ▪ NOT possible to eradicate all HEC	▪ Wildlife can injure and kill people. The losses to families from such incidents needed to be covered by self reliance scheme ▪ Lethal action by farmer can be more beneficial to communities if they collaborate with professional hunters. ▪ Chill does work to mitigate elephants ▪ Buffer zones are essential in CBCM techniques
Botswana	▪ Countrywide HEC mitigation efforts are underway ▪ DWNP have been awarded World Bank funding ▪ A comprehensive database of HEC incidents has been established by OEPRP in the Okavango Panhandle over three years ▪ Community enumerators have been trained ▪ An effective information exchange network has been established between OEPRP project personnel and farmers ▪ Monitoring efforts have proven to be effective with community enumerators ▪ Community perceptions have improved ▪ Farmers are willing to try new mitigation methods	▪ DWNP have limited resources to address HEC issues ▪ Can't eradicate HEC ▪ Still a dependence of farmers on stream bank cultivation ▪ Literacy level of farmers is low and can affect monitoring efforts ▪ Community Enumerators need management ▪ Farmer expectations can be high ▪ Mitigation materials supply is logistically difficult and expensive ▪ Local supply of chilli not available ▪ Problems with growing local chilli supply i.e. water pumps breaking, seeds and plants attacked by insects ▪ Difficult to quantify effectiveness of mitigation	▪ A lot of resources are required to cover cost of production/purchase of chilli-pepper to assist farmers affected by HEC ▪ Long-term data collection is essential to gain an understanding of HEC ▪ Community participation important in both planning and implementation of mitigation strategies ▪ Long-term and short-term mitigation strategies are required to reduce HEC ▪ Encouragement and support to farmers is essential for correct mitigation implementation ▪ Training from local level in villages and through enumerators is effective ▪ Start small then build up mitigation efforts ▪ Conservation agriculture possible strategy in

		methods in reducing HEC incidents ▪ ODMP-HEC consultancy recommendations have not yet been adopted by all stakeholders	Okavango panhandle ▪ Chilli is an effective deterrent
Angola	▪ Progress has been made towards integrating all elephant management functions in the country's National Biodiversity Strategy and Action Plan. This includes addressing human-elephant conflict	▪ Logistical (bad roads; landmines still present in some places) ▪ Administrative (visas; border controls; political sensitivity) ▪ Institutional (capacity lacking; centralization of decision making, policy/legislation) ▪ Operational (resources and priorities i.e. conservation vs. Reconstruction) ▪ No National policy for problem elephants	▪ Land-use planning to reduce wildlife habitat fragmentation is needed ▪ Introduction of more sustainable agro-pastoral systems needed ▪ Identification of corridors of movement between elephant ranges needed ▪ Development of an HEC strategy that enables communities to manage elephant problems is essential ▪ Capacity building of local wildlife managers to deal with HEC is required ▪ Education / awareness building of the value of elephant conservation needed
Zambia	▪ ZAWA officers are deployed after reports of HEC incidents are received and scare elephants from people's fields. ▪ Farmers use a variety of mitigation methods including chilli ▪ Farmers who have followed all crop protection measures introduced through CBCM saved their crops from raiding by elephant ▪ Farmers have started to move away from elephant corridors ▪ People have started using early maturing seed, which has saved harvests.	▪ Some people are not adopting new methods of mitigation i.e. chilli fencing ▪ Farmers often do not stay at their fields, and fields are located far from homesteads ▪ Lack of resources for ZAWA to address HEC issues ▪ Poaching is a big problem in the Silowana complex ▪ Large Areas to attend with poor Roads ▪ Very Low Wildlife Numbers and Limited Tourism potential in Silowana complex ▪ Limited Markets for selling produce ▪ Community Awareness on Elephants & Protection Methods (chilli, CA, etc) is lacking ▪ High Expectations, people believe CCCD can solve all problems ▪ There are large labour costs involved for farmers to protect their crops ▪ Materials for mitigation can be expensive. ▪ No proper land-use planning in Imusho and no clear corridors for elephants	▪ Link Conservation Agriculture with crop protection ▪ Seeing is believing –demonstration farmer-to-farmer effective ▪ People need incentives to adopt new behaviour ▪ Strong extension effort needed & NGO expense with inputs not sustainable ▪ Huge labour effort for farmer ▪ Land use planning from the start has better long term benefits ▪ Shooting problem elephants who regularly crop raid is favoured by the community ▪ Farmers would like compensation for damage

PRESENTATIONS

4. Elephant distribution, density, key corridors in the region and projected future trends

M. Chase

Introduction

Elephants Without Borders (EWB) are investigating aspects of elephant ranging ecology and the population status of elephants in the region. Specifically we are looking at the following topics:

a) Elephant Ranging Ecology
- Understanding the spatial ecology of elephants
- Investigate how reproductive status and gender influence ranging behaviour
- Determine how elephants interact with local communities
- Delineate key conservation corridors

b) Population Status of Elephants
- Seasonal distribution and abundance

EWB together with CI have been deploying satellite collars on elephants throughout the region to better understand the spatial ecology of elephants and to identify key conservation corridors. To augment this elephant movement study we have also been conducting aerial surveys to determine the seasonal distribution and abundance of elephants.

Throughout the KAZA TFCA data on the seasonal distribution and abundance or density of elephants are recorded by aerial surveys. However, these are highly variable estimates as a result of aerial survey methodology, the movements of elephants and environmental variation. Obtaining reliable measures of abundance and density are difficult.

Botswana Elephant Population

The last aerial survey conducted in Botswana by the DWNP took place in 2005 and estimated 151,000 elephants. Figures indicate that the population has been steadily increasing since 1940. Aerial surveys are not precise, so it can be argued whether the data is reliable and whether or not there are too many elephants in Botswana. Current data is urgently needed to determine the current population estimate. Van Aarde *et al*, believe that the intrinsic growth rate has reached its maximum and predict population numbers to level out, however within Botswana the intrinsic growth rate is highly variable. There is movement across international borders, elephants concentrate at rivers during dry seasons, wet season ranges are almost double dry season ranges, and artificial waterholes change distribution and abundance of elephants in Botswana (i.e. Boteti and Savuti areas). Botswana's elephant range has expanded by 43% since 1994.

Angola Elephant Population

Since the end of the civil war in Angola, elephant populations appear to be increasing and their range expanding. An increase in elephant numbers in southeast Angola is supported by EWB's three aerial surveys over Luiana Partial Reserve. In 2001 numbers were estimated at 126 elephants and in 2008 this has increased to 7500 elephants. The end of the civil war has probably provided the requisite security for elephants to return to southeast Angola despite the heavy presence of landmines in the region.

Zambia Elephant Population

In contrast to Luiana Partial Reserve, Angola, the elephant population in Sioma Ngwezi National Park in southwest Zambia appears to be declining. Survey results indicate that in 2005 elephant numbers were as high as 1650 and this declined to 385 in 2006.

We are uncertain whether the decrease in elephant number in Sioma Ngwezi is related to seasonal availability of water, extensive fires, dates of our aerial surveys or a long term decline associated with increasing human settlements in the park, especially along the Kwando River.

Namibia Elephant Population

In the Caprivi Strip, Namibia elephant numbers appeared to be relative stable in the early 1990s until 2007. However, in 2008 numbers appeared to drop dramatically, from an estimated 8380 elephants in 2007 to 2380 elephants in 2008. The 2008 survey was conducted by inexperienced observers, however, and may therefore be discounted. The Caprivi estimates do show that the elephant population here appears to be transient, with elephants moving into and out of neighbouring countries.

Survey estimates in the Caprivi may be biased due to some observers being inexperienced in conducting aerial surveys. Also, one survey results reported for Mudumo National Park showed that 1168 elephants were actually seen during the survey but the population estimate calculated was 314 elephants, which is not possible. This highlights the unreliability of some aerial survey results in the region and shows the imperative need for a co-ordinated regional-wide survey to be conducted between the four neighbouring countries.

Elephant Densities

Elephant densities vary throughout the region. Densities along rivers are highest and lots of elephants concentrate in high densities in National Parks and protected areas. For example, in Chitabe concession (a wildlife management area) in the Okavango Delta elephant density was estimated as 3.8 elephants/km^2, whereas in the Okavango Panhandle, elephant densities were 1.2 elephants/km^2.

Elephant Range Ecology

EWB has deployed 63 satellite telemetry collars on elephants throughout the Kwando-Kavango region. Elephant collaring sites are selected after consultation with governments, communities and collaborating partners.

Human settlement patterns show human encroachment into certain areas, i.e. the Okavango Delta, however veterinary fences like the southern buffalo fence have blocked this. The Caprivi has high concentrations of human activity.

Elephant movements in the region are widespread. We have little data however for the Okavango area. We have identified six main movement corridors in the Kwando region (see Figure 2), including the following:

- Mudumo ↔ Kwando
- Kwando ↔ Luiana
- Sioma ↔ Caprivi East
- Sioma ↔ Caprivi ↔ Ngoma
- Sioma ↔ Luiana

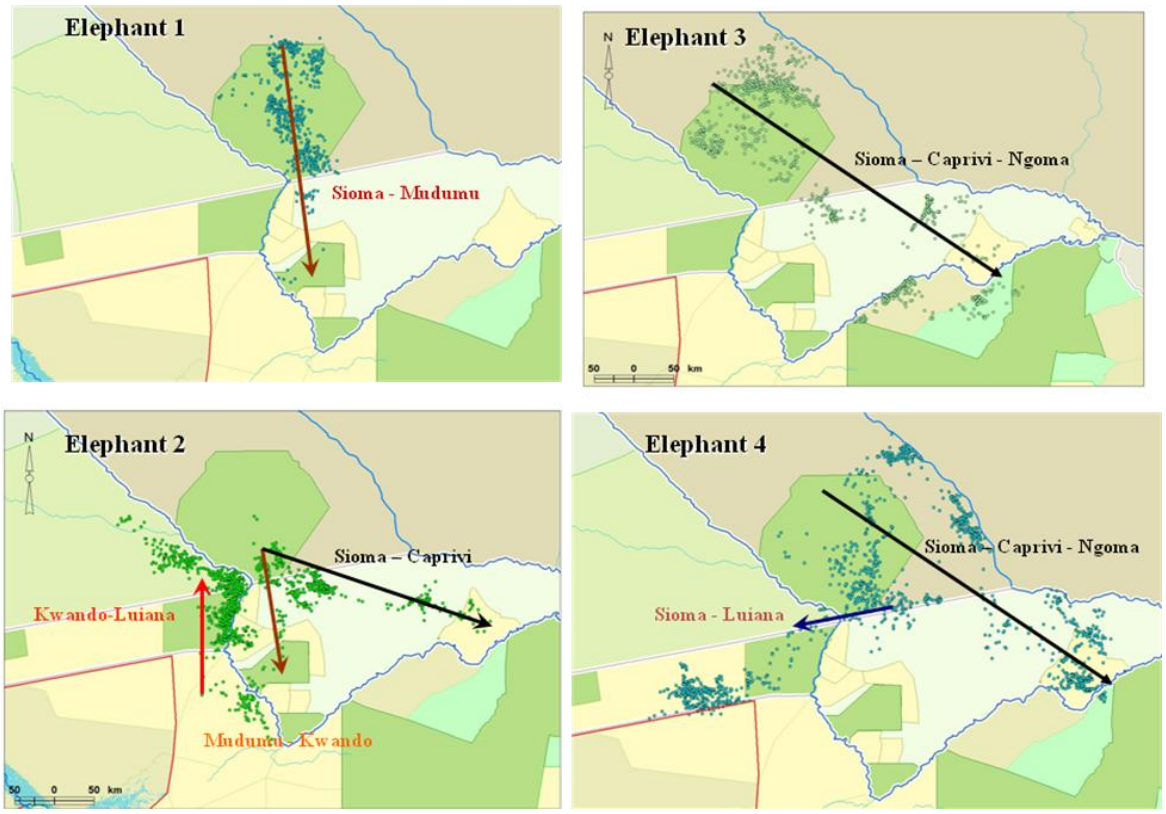

Figure 2. Six main elephant movement corridors in the Kwando-Kavango Region

There appears to be little movement of elephants across Kwando or Zambezi rivers, possibly due to human populations living along these rivers. The movements of one collared elephant cow in the Kwando corridor illustrates that elephants are repopulating southeast Angola from Botswana, through the Caprivi. Collaring data also indicate that the eastern fence along the Khaudom National Park appears to be effective at blocking movements of elephants, even though it does get breached occasionally. In the Caprivi the main highway and the Namibian border fence seem to limit elephant movements. The Makgadikgadi National Park fence and southern buffalo fence appears to be effective at funnelling movement of elephants from the Makgadikgadi to the Okavango Delta.

Collaring data also suggests that there may be another movement corridor from Kavango - Cuito.

Elephant Conservation and Community Outreach Farming Project

In 2010, EWB initiated a new project to rigorously test the effectiveness of deterrence measures which are used to reduce elephant crop raiding and damage to property. The project aims to:

- develop trial plots and independently farm its own crops - carefully quantify the impact of elephants on crop production
- experiment with deterrence options, and
- accurately quantify and document effective strategies which aim to reduce elephant crop raiding

We have established a baseline control plot of 20 hectares, where we planted staple crops such as Maize, Sorghum and Beans. We used no deterrence methods in 2010 and the plot was raided by zebra, eland and elephants, leading to zero yield. Next year we will begin testing a variety of mitigation techniques.

Publications:

1. Mapping landscape resistance to identify corridors and barriers for elephant movement in southern Africa. (2010) In S.A. Cushman and F. Huettmann (Ed.), *Spatial Complexity, Informatics, and Wildlife Conservation*, (pp. 349-367). Springer Japan.
2. Chase, M.J. and Griffin, C. (2009). Elephants caught in the middle: Impacts of war, fences and people on elephant distribution and abundance in the Caprivi Strip, Namibia. *African Journal of Ecology*.
3. Chase, M.J. and Griffin, C. (2009). Seasonal abundance and distribution of Elephants in Sioma Ngwezi National Park, southwest Zambia. *Pachyderm.*

Questions and comments

Q1. L. Osborn: *The population in Sioma Ngwezi appears to be dwindling and there doesn't seem to be much movement across the Kwando. Where are they crossing? Are they being poached?*

A1. *Elephants are crossing east to Salambala and Chobe. The water availability is limited so it could be human disturbance which is causing this decrease. Elephants in the east Caprivi are joined by elephants from Sioma and Chobe.*

L. Osborn highlighted that this information is important for addressing HEC situations on a macro level.

E. Rieder commented that her work in Sioma Ngwezi involves mapping HEC incidents and villages. The northern section of the park has fewer people, but elephants tend to cross the river in the south where there are more people. Not sure why this is so?

Q2. T. Gaothobogwe: *This information indicates that despite the presence of human settlements, elephants still cross. How can movement corridors be protected and maintained?*

A2. *Landboard have been given our maps indicating main elephant paths and which routes should be left open. Despite this information people have been relocated in the Chobe area and allocated fields on the Chobe Ridge which is a main elephant route and there has been an increase in crop raiding incidents.*

5. An overview of HEC mitigation techniques globally and regionally

L. Osborn

History of Human-Elephant Conflict

By the 1930's, Colonial Game Officers wrote extensively about the control of elephants. Over the years patterns emerged but the situation has become far worse now and harder to solve. These rangers had many ideas about why elephants were raiding and killing people and in many cases it was recognized that people were being allowed to settle in known elephant pathways and that many elephants are injured through wounds inflicted by primitive guns or spears from desperate farmers. It was thought the best way to resolve conflict was to separate people and elephants.

This scenario, however, is not a feasible solution in most modern human-elephant conflict (HEC) situations. In the current literature there is an acknowledgement that if we want elephants to extend beyond the formally protected areas, it will be necessary to balance ecological interests with community incentives, making elephants an asset rather than a liability to communities.

There are a number of issues that compound the problems of human – elephant conflict, including:

- Ineffective traditional PAC
- Animals not responding to techniques
- Problems with centralised PAC units
- Agricultural organisation
- Loss of livelihood which leads to negative views of Community-Based Natural Resource Management (CBNRM) efforts

Mitigating Human-Elephant Conflict

Each case of HEC merits individual attention, with recommendations for action *based on a variety of local conditions,* including the following:

- Availability of funds
- Present distribution of arable lands and human settlements in relation to elephant movement patterns
- Land use planning
- Accessibility of area concerned to extension and training staff
- Capacity building and trained human resources
- Attitudes of effected communities and willingness to try new mitigation techniques
- Government Policies, both national and local, involving wildlife and problem animal control

Several **traditional methods of mitigation** have a good short-term record, including positioning watchmen, driving elephants away i.e. (banging drums, shouting, cracking whips and lighting fires etc.), clearing areas around fields, erecting low-cost barriers, planting thorny plants as 'live fencing', and using dogs. These methods are usually relatively cheap, materials are easily accessible, local communities can implement them themselves and they are usually not fatal to elephants. When elephants are not used to these methods they seem to work, but often elephants appear to know

when something is being protected and the fear of people by elephants is not there anymore in many situations. Elephants can habituate easily to most traditional deterrents as they are not 'real threats' and they can soon learn to avoid or ignore them.

When elephants **are disturbed near to human settlements and arable land** (using methods such as firing weapons; using thunder flashes or flares; broadcasting elephant alarm calls etc.) they often don't move far away during the day so they can become harassed and become dangerous.

Killing Problem Animals can be beneficial to communities as they can utilise the meat. It is generally accepted that this method is only used if the "problem animal" has injured or killed a person, but it has little measurable deterrence value. This method takes the pressure off wildlife management departments for a while, but can lead to corruption. In Zambia, for example, there have been cases of people putting fields in elephant corridors so that they can legally shoot elephants for meat. There is also a problem with correctly identifying the "problem animal" to kill.

Translocation of problem animals is widely advocated by animal rights groups, however, it is very expensive and requires skilled personnel and specialized vehicles to move animals. It is often difficult to identify the correct problem animals to translocate and also to find a relocation site that will accept the problem animal. Cases where animals have been relocated have often been unsuccessful, with animal's frequently moving back to where they came from.

Fences (physical barriers) can be effective to stop elephants moving into an area but they are expensive. There have also been problems with fencing materials being stolen i.e. solar panels and wire has been used for poaching snares. Donor agencies like fencing projects as they ensure a tangible output for the donor involvement, however if the funding is not available for maintenance it can be a problem. Community ownership and responsibility is essential for the success of such initiatives.

A cost-benefit analysis conducted on a fence in Kenya indicated that it costs US$10,000/km. These mitigation methods are therefore often more expensive than the value of the crop they are trying to protect. It could be argued, that it would be cheaper to distribute food to HEC affected communities.

There are however, lots of interesting and innovative designs of barriers e.g. chicken wire has been used to protect trees, but again the wire sometimes gets stolen.

Compensation schemes are in place in Botswana. These can have major problems and often lead to corruption. It is advised that we try to move away from Government compensation schemes. **Self - Insurance** schemes are also in place in Namibia.

Relocation of agricultural activities and changing the cropping regimes can be good. Thiese methods include growing less palatable or non-palatable crops (i.e. coffee, chilli peppers, tea) to elephants in vulnerable areas. This is dependent on farmer investment, climate and soil suitability, as well as the ability to market such crops. The benefits of having elephants living close to communities must exceed the cost of daily or constant exposure to people and their arable lands.

We need to look at innovative ways for people and elephants to co-exist. **Creation of secure routes or "corridors" for elephants** could be effective. People still settle in main movement paths of elephants. As elephant populations become more constrained so the need for 'safe corridors' between protected areas becomes even more important.

Repositioning boundaries of protected areas is another possible solution. This does not mean that the size of a protected area needs to be reduced. Additional land could be incorporated away from areas of higher human population density as long as there is minimum impact on the ecological integrity of the protected area.

Experimental Methods

- Acoustic infrasonic playbacks
- Olfactory repellents i.e. *Capsicum* deterrents
- Bees
- De-tusking known fence breakers
- Cell phone fences – alert farmers to elephant presence
- Chemical deterrents i.e. *Revira* granules (musth secretions)

Long-term methods

- Land use planning at the micro and macro levels
- Off-setting costs of conflict
- Benefits of wildlife should be centralised
- Development of HEC management plans needed per area

Community Based Conflict Mitigation (CBCM) strategies are effective. Communities need to take responsibility to protect their crops and the centralised PAC approach is not effective. There are three assumptions of CBCM, including:

- the farmer is responsible for protecting his/her crops or property
- mitigation methods must be based on locally available materials
- mitigation must be linked to larger land-use questions and movement paths must be maintained

Purely technical solutions do not work and we should not be looking for a 'silver bullet' to reduce conflict. Rather we need to be a 'jack of all trades' to find solutions to reduce the conflict. We need to encourage a passive PAC approach with active PAC and combine deterrents; we need to use buffer crops which are unpalatable to elephants; and we need to agree on corridors of cultivation. Wildlife departments and Land authorities need to be synchronized.

Developing Community-Based HEC Mitigation

When developing an HEC mitigation project a number of points need to be considered and issues addressed. These include:

- Conducting a rapid survey of Current Mitigation Methods
- Selection of Mitigation Methods
- Cost and Technology
- Site-Specific Considerations
- Spatial Arrangement of Fields
- Community Cooperation
- Previous Crop Protection Trials
- Summary of Selection Criteria
- Selecting Which Methods to Use
- Responsibility for Mitigation Methods
- Where to Start
- Location of Demonstration Sites
- Establishment of Demonstration Sites

- Improving Rural Incomes and Developing Alternative Livelihoods
- Crop Damage and Rural Incomes
- Small Enterprise Development
- Action plans for each site
- Location of sites, and reasons for selection.
- Activities and time line.
- Monitoring regime: who, what information, how many people?
- Budgets

Planning future mitigation strategies

In the planning phase, it is important to consider why previous trials failed? There should be one trial session and it needs to be decided who will be responsible for this? The logistics and locations of where to do demo sites need to be considered and ways to try and improve rural incomes & develop alternative livelihoods need to form part of this planning phase.

A few points to consider in future planning include:

- Find better ways to communicate with people living in areas of high conflict

- Link to sustainable funding sources which are self perpetuating and not dependant on an individual

- Food security and livelihood issues are at the core of this problem. Intensify farming to reduce footprint and provide strategic land for elephants.

<u>Questions and comments:</u>

Q1. G. Masunga: Is detusking a way of reducing conflict or is it just a process of removing their weapon?

A1. *Tusks don't conduct electricity so theoretically elephants with big tusks can damage electric fences, so by removing them you reduce this risk.*

Q2. G. Otumile: Is Community Based Conflict Management (CBCM) just a short term approach?

A2. *Our colleagues i.e. Anna Songhurst, Carol Murphy, and Malvern are trying the CBCM approach in different countries and we will hear how it is working from their presentations later.*

Q3. J. De Witt: It seems as though we need to find indicators to test effectiveness of methods. How do you measure success?

Current Status of Human-Elephant Conflict in Namibia

6. Current Status of HEC in Namibia, Ministry of Environment and Tourism perspective

C. Musyalike

Introduction

Namibia has adopted a number of innovative approaches:

- Communal Conservancy programme – rights over wildlife and tourism
- Proclamation of Protected Areas / Freehold Farms
- Commitment – recovery of wildlife
- Government of the Republic of Namibia (GRN) recognizes that living with elephants carries a cost
- Increased elephants populations and expanded ranges result in HEC
- GRN also recognizes that such conflicts have always existed
- Not possible to eradicate all conflicts
- Conflict can be managed
- People and elephants live in an interconnected and dynamic environment
- Land use patterns and elephants distribution patterns are changing

The GRN recognise that conflicts have always existed, but land use patterns are now changing. These conflicts in Namibia range from destruction of crops, water installations and other property to occasional loss of human lives.

Distribution of elephants in Namibia

Four clusters of elephant populations occur in Namibia with population estimates derived for each (see Table 3 below). These populations are monitored regularly through game counts and foot patrols.

Table 3. Elephant population estimates in the four clusters in Namibia

Cluster Name	Population Estimate
Western Caprivi cluster	6,000
Khaudum/Nyae-Nyae	3,000
Etosha	2,000
Kunene	800

The Etosha elephant population is largely confined in the National Park, however elephants do breakthrough the fence and come into conflict with expanding human populations on the periphery of the park. The Kunene elephant population is free-ranging and also comes into conflict with local human communities. The Khaudum/Nyae-Nyae elephant population borders Botswana, and the Caprivi cluster is surrounded by Angola, Zambia, Botswana and Zimbabwe.

Types of HEC

Crop damage is the most prevalent form of human-elephant conflict in Namibia, and the number of incidents appear to have steadily increased from 2007-2010. Elephants are the main perpetrators of crop damage according to data on the number of incidents reported over the last five years.

The number of people injured or killed by elephants over the last 4 years has increased, with 4 people killed in 2007 and 11 in 2010.

Mitigation Strategy

A number of mitigation strategies and methods are currently in place in Namibia, including:

- Land use planning and integrated measures to avoid HEC, including zoning
- Responsibility of all stakeholders to try to reduce HEC
- Community Based Natural Resource Management (CBNRM) programmes introduced. This allows communities to derive benefits from elephants, improves perception of community towards elephants and encourages community ownership and responsibility for elephant populations hence discouraging poaching
- Delegation of decision making authority, to reduce delays in processing reports
- Develop and implement the best technical solutions for mitigating HEC, through community consultations and introduction of alternative methods i.e. chilli pepper
- Research and monitoring is crucial to give feedback to the communities
- Building the Human Wildlife Self Reliance Scheme (HWSRS) to replace the Human Animal Conflict Compensation Insurance Scheme (HACCIS) scheme
- Protected Areas need to be preserved
- Removal of problem animals
- Establishment of a system to assist families with funeral costs, when family members have been lost to wildlife. This is aimed at contributing to costs incurred for funerals not as compensation
- Application of revenues from problem animals and wildlife to assist affected persons with losses incurred

The amount of money given to offset losses through HWSRS is outlined in Table 4 below.

Table 4. Amount of money given to offset losses through HWSRS

Loss Incurred	Amount given (N$)
Crop Damage (¼ hectare)	200
Crop Damage (1 hectare)	800
Cow or Bull (>6 years)	1500
Goat	200
Donkey, sheep & pig	250
Horse	500
Funeral assistance (GPTF)	5000

Reporting and Feedback loops

The reporting system is shown in Figure 3 below, all decisions have to be finally agreed by the Minister of Environment and Tourism.

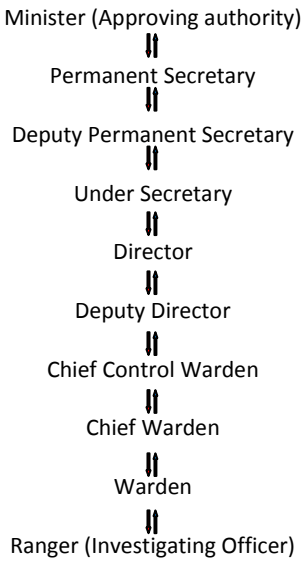

Figure 3. HWC Reporting System in Namibia

Challenges

- HEC may hinder CBNRM goals and objectives
- Hostile actions by local communities towards conservation
- Elephants are reclaiming historical distribution areas
- Different sector policies
- Difficult to measure damages caused by elephants
- Limited resources and personnel
- HIV/AIDS pandemic
- Disease outbreak (FMD, Anthrax etc)
- NOT possible to eradicate all HEC

Successes

- Elephant numbers have increased
- CBNRM has achieved considerable success
- Restructuring of MET
- Appropriate training received
- Collaborative management to carry out HEC exists
- NPHWC provide for crop and livestock loss offset
- Funding to assist with funeral costs available, not intended as compensation for loss of life
- Over N$ 2. Million available to boost self reliance scheme

7. Current Status of HEC in Namibia, Integrated Rural Development and Nature Conservation (IRDNC) perspective and The Namibian "Incident Report" system and HEC reporting method

B. Busihu

Event Book

In Namibia we have an event book system for recording HWC incidents. It was felt that the community needed to be educated in what the game guards were doing. Guards kept losing papers and reports and it became difficult to manage papers. An event book system was therefore developed so that each guard has one book.

Guards record data from fixed foot patrols; mortalities of wildlife; fire incidents; endangered species sightings; and HWC incidents. All data goes into the supervisors book, which is then collated at the end of each year. A report and the data are then submitted to the Ministry of Environment and Tourism. Donors also receive reports on this final data.

The system is working and we are proud. We are willing to exchange information to other SADC countries.

Conservancies

Communities want to take responsibility of their crops and protect their own property. Community rangers/guards assess incidents, identify elephant corridors and conduct fish net patrols. Crop raiding incidents by elephants are high in most conservancies, especially Kwandu conservancy and Bwabwata National Park. In 2009, in the Mudumo complex there were 1079 incidents of crop-raiding. Elephants are the main perpetrators of crop raiding and bush pig are also a problem. Elephants and crocodiles are the main animals who attack humans in the area.

HACCIS scheme

The IRDNC has been working for the last five years in the Caprivi region and introduced the HACCIS scheme. This scheme aims at covering losses from HWC using the benefits from wildlife. The purpose is to strike a balance between economic losses from individual farmers verses collective benefits from wildlife.

The scheme covers losses to livestock and crops from a variety of wildlife perpetrators, including elephant, hippo, lion, leopard, cheetah, crocodile, buffalo and rhinoceros. There is also a conditional funeral cover available to families who have lost people through attacks by wildlife. Up to N$5,000 can be given to contribute to the cover of funeral expenses such as coffin, food and transport costs.

Crop types compensated for, from crop-raiding incidents, include maize, sorghum and millet. Damage is assessed in quadrats. If a ¼ of the field is damaged then the compensation payment will

be N$250, if ½ is damaged the payment is N$500, if ¾ is damaged the farmer receives N$750 and if a whole field is damaged then a payment of N$1000 is given. If people have Conservation Agriculture (CA) plots, an amount of N$40 is added to the total amount as a benefit/incentive to people to practice CA techniques.

Terms & Conditions

- Final decisions made by community game guard, traditional authority and community committee
- The Traditional Authority inspects stock enclosures and fields
- 50% of compensation comes from conservancy
- Report period reduced
- Livestock must be kralled and not within a wildlife corridor
- Crops must look healthy
- All conservancy members must be informed of terms and conditions

HACCIS Success

- Legal bodies in conservancies now recognized by Government
- Money comes from conservancies and topped up by IRDNC
- Encourage farmer responsibility for crop protection (i.e. Scheme doesn't pay if farmer hasn't sleep at the field or shown they have tried to mitigate elephant damage)
- Crocodile proof fencing project funded by GEF UNDP
- Thorn fences to keep out predators
- Bees being introduced

Lessons Learnt

- Wildlife can injure and kill people. These losses didn't use to be covered by HACCIS and we needed to find ways to assist people afflicted by such conflict
- Livestock injury from wildlife is not currently covered by HACCIS
- Lethal action by farmer (i.e. killing problem animals) can be more beneficial to communities if collaborate with professional hunters. Communities can then receive economic benefits as well as meat

8. Current Status of HEC in Namibia, Community perspective

R. Kutembeka (translated by B. Busihu)

I thank you for this opportunity to share my view with the group. I am here to represent farmers in my community and share my experience of human-elephant conflict and the chilli pepper mitigation programme.

I witnessed crop raids from elephants every year. Five years ago (2005) I received training from Zambian trainers on how to use chilli pepper to stop elephants raiding my field. In 2008, I started using these methods and at the end of the 2008 season I harvested 80 bags of maize. This year, 2010, I want to be able to sell 90 bags. From my experience, chilli definitely works.

How does it work?

- Clear a 5m buffer zone around field
- Cut poles and build a fence
- Clear a 5m buffer zone between the fence and crops
- Construct chilli fence around field
- Put chilli bombs around field in the direction where elephants come from

The buffer zone is essential, elephants notice something strange. The chillibombs also affect the farmer if you stay in the field. These chillis have a strange smell and I'm not surprised elephants are affected by this strong smell. This pepper also works against bush-pigs.

I would like to gain experience from others on best methods to use against elephants. It seems to me that Botswana has an increasing problem with elephants and if want to kill elephants then all would need to be killed. Communities need awareness and training to use chilli and other methods. I have heard that elephants come towards people if they bang drums, but in Caprivi they run away. Whistles also work to scare elephants.

Communities should have sympathy with themselves, because Governments can't afford to compensate the losses incurred. I ask from SADC Governments – if you kill an elephant in one area will that stop elephants going into another area?

Questions and comments to Namibia:

Q1. L. Osborn: Why does Namibia have a system where 10 people decide whether an elephant gets shot? Is this to dissuade PAC shooting?

A1. *C. Miyanda: This is the 1975 act which is still in force. The system will be improved.*

Q2. G. Masunga:

- Is this reporting system just for PAC lethal control or also for crop damage incidents?
- Are the funeral expenses coming from Government or communities?
- Who measures damage to crops, is it Government or communities?
- Do you work with the Agricultural demonstrators?

A2. *C. Miyanda:*

- *All reports go through the same system and the Minister has to make final approval*
- *With funeral expenses, this is an HWC policy launched in 2009. Government contribute to scheme as well as conservancies. The money goes into a trust fund.*
- *Rangers and community game scouts assess damage. They are not qualified and measure damage just by looking at the field.*

Q3. G. Otumile: Are the conservancies all over Namibia? How do you apply the self insurance scheme in areas where there are no conservancies?

A3. *C. Miyanda: The self insurance scheme is for all citizens of Namibia apart from commercial farmers.*

Q4. J. Mazebedi:

- Namibia has lots of strategies which seem to have worked for HEC. Do these strategies work to reduce poaching?
- Birds (especially starlings) eat chilli. I am worried that chilli might spread into areas i.e. Okavango Delta, do you have any experience of this?

A4. *C. Miyanda: These strategies are working 100% in Namibia and do help to reduce poaching. The communities monitor themselves which reduced poaching.*

B. Busihu: HACCIS scheme makes sure that if a person is suspected to be poaching that they do not get compensated. I have never seen starlings eating chilli.

L. Braack: Spontaneous seed dispersal through birds is unlikely because the climate is not wet and humid enough to let the seeds propagate.

Comment 1. T. Gaothobogwe: If the expectations of farmers here was to meet other farmers, we need to ensure more community representation in future workshops.

Q5. G. Otumile: Are bees active at night?

A5. L. Braack: No

Comment 2. C. Miyanda: Just to clarify the funeral expenses contribution requirements. A contribution will only be made if deceased is:

- Citizen of Namibia
- Not poaching
- Animal not provoked
- Not insured
- Not drunk
- Dead

Q6. M. Karidozo: What criteria do you use to select offending animals?

A6. *C. Miyanda: The offending animals are elephant, hippo, lion, leopard, cheetah, crocodile, buffalo and rhinoceros*

Q7. A. Songhurst: Do you think that the trend in increasing number of reported HEC incidents is due to an increase in people actually reporting incidents or that the number of incidents have increased?

A7. *C. Miyanda: It could be that reporting has increased as our figures don't show that the number of incidents have definitely increased.*

Q8. L. Osborn: Who pays the rangers and manages them?

A8. B. Busihu: The conservancies cover the full cost of the rangers and manage them

Q9. G. Masunga: How long does it take for the data to reach MET?

A9. B. Busihu: The game scouts collect the data in community conservancies. This data goes to MET at the end of every year.

Comment 3. C. Musyalike: The conservancies take management decisions on their own. The MET uses data to set quotas for hunting etc. The conservancies then make decisions and MET give advice and support.

Current Status of Human-Elephant Conflict in Botswana

9. Current Status of HEC in Botswana, Department of Wildlife and National Parks perspective

G. Masunga

I am presenting on behalf of the Department of Wildlife and National Parks, Botswana and our team who compiled this presentation included Mr G. Otumile, Mr T. Gaothobogwe and myself, Dr G. Masunga.

Background

The elephant population in Botswana used to be low due to hunting and poaching pressure, but now with a decrease in poaching numbers of elephants are increasing.

In 2006, the DWNP estimated the Botswana elephant population to be 154, 658 elephants and their range covers an area of approximately 80,000km^2. The Government hopes to conduct a survey in 2010, possibly in collaboration with neighbouring countries i.e. Zimbabwe and Namibia.

Northern Botswana is an important elephant range but it is also inhabited by people. There is an increase in both elephant and human populations and demand for land and water is increasing. Human poverty level in northern Botswana is high and there is a real need to develop measures to address the HWC/HEC conflict.

The DWNP Mission Statement:

> "We, DWNP, will effectively conserve the wildlife in consultation with all stakeholders for the benefit of the present and future generations"

Addressing Human-Elephant Conflict

In 2006, a consultancy was conducted on HEC through the wildlife management component of the Okavango Delta Management Plan (ODMP), by Natural Resources and People (NRP). The results of this study identified that 98% of households rely on cropping & gardening as a source of livelihood in Ngamiland and 82% of households rely on livestock production. Maize and Sorghum are the most important crops grown, with 98% and 70% of farmers growing these. The socio-economic study revealed that elephant are the worst perpetrator of crop damage in Ngamiland, with an average of 67% of yield damaged when an elephant raids.

The main recommendations from the ODMP consultancy were to:

- Implement existing land use plans and reduce illegal settlements
- Prohibit streambank cultivation
- Identify and recognize elephant movement corridors
- Introduce conditional payment for compensation
- Use chilli pepper and other traditional mitigation methods to reduce crop damage by elephants

- Develop a phased programme that encourages farmers to take responsibility for protecting their own crops
- Detailed identification and marking of elephant movement corridors is critical

Reporting System

Farmers are required to report human-wildlife conflict incidents to the Kgosi (Chief), police or DWNP officers in their village. Reports are then collected by DWNP PAC officers in the local DWNP office and assessed. All compensation claims have to be authorized in the Regional head office.

Action Taken by DWNP

A conditional payment scheme was introduced in April 2009. For crops this compensation is given based on the following conditions:

- Fields are categorized as commercial or subsistence
- Proof of ownership or lawful occupation of land must be shown
- Fields must be properly fenced with at least 4 strands of wire and be 1.4m high
- In elephant range, compensation will only be given if farmers prove that they have tried to mitigate against elephant crop raiders using recommended/or traditional methods e.g. Chilli pepper.

DWNP have initiated trials to test the efficacy of chilli pepper and other mitigation methods in reducing crop-raiding by elephants. Plans have been made to engage land-boards to discourage allocation of crop fields within identified wildlife movement corridors, breeding and drinking sites

Chilli Pepper Pilot Study

- Trial plots have been developed in Ngamiland, specifically in the villages of Seronga, Sepopa, Etsha, Gumare, Shorobe, Matsaudi, Dikgatlhong and Mawana
- The acceptance of the chilli pepper mitigation strategy is still low in the Chobe District, with only two trials in place in the villages of Kachikau and Kavimba.
- Since 2005, over 300 farmers have been given chilli-pepper and associated materials to develop pilot trials and report on the efficacy of the method.

Status of HEC

The number of elephant crop raiding incidents in the Maun and Chobe regions in 2009-2010 peaked in March, however, in 2008-2009 raiding incidents peaked in February in the Chobe region. The amount of money paid as compensation in Ngamiland, peaked in August 2009, indicating that payment of money is delayed once incidents have been reported.

Challenges

- An apparent non-commitment to implementing the ODMP-HEC recommendations by all stakeholders.
- Dependence of farmers on streambank cultivation
- Literacy level of farmers/reluctance in completing monitoring data forms
- Prohibitive cost of production/purchase and inadequate stock of chilli-pepper to assist all farmers affected by elephants

Future

- DWNP have planted a 1ha field of chilli plants in Xobe and a 1ha field in Eretsha to initiate a local supply of chilli.
- The World Bank has given the Government of Botswana BWP40 million to assist farmers in northern and central Botswana with funds to develop traditional deterrent methods that are effective in addressing human-wildlife conflict. A community based approach is encouraged.
- Conservation International is willing to assist with funds to train farmers in the use of chilli-pepper as a mitigation measure
- Intend to revise and implement the National/Regional Elephant Management Strategy/Plan
- Implement recommendations from the ODMP HEC report, specifically i) Stop allocation of crop-fields within known elephant movement corridors; ii) Implement community-based H.E.C mitigation strategies and compensation schemes; iii) Intensify public awareness on use of chilli pepper and other non-lethal mitigation measures
- Develop an 5-year Strategic Action Plan
- Standardize data collection on HEC (e.g. through MOMS)
- Strengthen regional cooperation and collaboration (e.g. exchange programs and discounted charges)
- Increase funding and commitment to HEC mitigation strategies

7. DWNP World Bank Initiative

T. Gaothobogwe

The Government of Botswana has been granted Global Environment Fund (GEF) World Bank funding to assist in addressing the challenges and problems associated with human-wildlife conflict management. The latest strategy is to try to prevent damage from occurring. If damage occurs then compensation is given. The new HWC project aims to introduce preventative measures.

A total of US$20.47 million has been given, including a US$5.5 million grant for HWC mitigation. It is a five year pilot project and the main targets of the project are to:

- Reduce conflict
- Strengthen capacity in DWNP and the communities
- Supply equipment for mitigation measures

The project appraisal revealed that communities are not participating in tourism and need to be trained in skills for other employment opportunities, including tourism.

The project will be carrying out a number of activities, including:

- Piloting chilli pepper as a deterrent against elephants
- Encouraging herding dogs to protect livestock
- Providing seeds that can be harvested before elephants come to fields

The start date was the 1st of January 2010 and phase 1 has been completed. More information and current reports are available on the following websites: www.eis.gov.bw and www.worldbank.org

8. Current Status of HEC in Botswana, Okavango Elephants and People Research Project perspective

A. Songhurst

Introduction

The Okavango Elephants and People Research Project is an independent research programme through Imperial College, University of London, with a local supervisor from the Harry Oppenheimer Okavango Research Centre, University of Botswana. Our team consists of a principal researcher, two research assistants and 12 trained community enumerators. We are working in the eastern Okavango panhandle in northwest Botswana, investigating the underlying patterns and processes involved with human-elephant conflict in the area.

Current Status of HEC

The eastern Okavango panhandle covers an area of 8,559km^2, with twelve main villages situated along the banks of the Okavango River. In 2008, the estimated elephant population was 9,015 elephants (Chase & Songhurst, 2008) and a comparable survey will be conducted this year. The estimated human population in the area is 15,718 people (CSO, 2001).

The main types of conflict between people and elephants in the area include:

- Crop raiding by elephants
- Fence and property damage by elephants
- Killing and injury of people
- Elephant impact on vegetation
- People putting fields in elephant pathways
- Killing of elephants
- Destruction of elephant habitat by people

Crop raiding by elephants is the most prevalent form of conflict in the area. Over the past 3 years, data on crop-raiding incidents shows that the raiding season begins in Jan through to May, but peaks in raiding incidents vary between years. This emphasizes the importance of long term data collection when investigating patterns of conflict incidents. Our research will be investigating what factors affect the temporal patterns of raiding incidents i.e. rainfall and flooding in the area. In summary, there were more raiding incidents and more damage to crops by elephant in 2008 compared with 2009 and 2010. The percentage of a field damaged by elephants ranged from 0 – 100%, with the mean % of a field damaged being more in 2008 (23.7%), compared to 2009 (5.1%) and 2010 (9.1%). See Table 5 below for summary statistics of crop raiding over the past 3 years.

Table 5. Summary Statistics of elephant crop raiding incidents in the Okavango Panhandle over 3 years (2008-2010)

Year	2008	2009	2010
Total Number of Raiding Incidents	411	263	198
Total Area Damaged in study site (ha)	125.82	12.81	33.21
Average Area of a field damaged (ha)	0.61	0.06	0.20
Mean % of a field damaged	23.73	5.14	9.06
Range % of a field damaged	0-100	0-100	0-100

Crop-raiding occurs around all twelve villages in the area, but the seven worst effected villages include: Mohembo-East; Sekondomboro; Tobera; Mogotho; Seronga; Eretsha; and Beestha. Our project is investigating the spatial patterns of these crop-raiding incidents and trying to identify what environmental factors make a field more susceptible to raiding by elephants.

Over the past three years the number of elephants killed due to problem animal control has increased from 6 in 2008 to 13 in 2010. One person was killed by an elephant in the eastern Okavango Panhandle in 2009.

Mitigation

There are numerous traditional mitigation techniques being used to deter elephants from fields, including:

- Fences (bush and wire)
- Plastic and tin cans on fences
- Watch-huts
- Drums
- Whips
- Guns
- Dogs
- Torches

Watchuts, drums and bush fences are the most common mitigation techniques used, with the use of other methods (i.e. dogs, guns, chilli) increasing every year.

Community Based Conflict Management

In 2009, the concept of community based conflict management was introduced into the Okavango Panhandle and the Chobe Enclave to empower communities to try and reduce human-elephant conflict incidents themselves.

Training

Two training workshops were carried out in October 2009. They were conducted by EPDT, funded by CI and organised by OEPRP. In total, 42 people were trained and supplied with starter equipment packs. The trainings consisted of theory and practical components on existing and new mitigation techniques, including the use of chilli pepper as a deterrent against elephants. Training on how to grow chilli was also given to encourage people to start producing a local supply of chilli peppers.

Monitoring

Community enumerators were trained in CBCM and deployed to monitor use of mitigation methods. Independent primary data has been collected over three years on mitigation methods used in both raided and non-raided fields, including the use of chilli, for a comparative analysis. The enumerators were essential in monitoring the use of different techniques as well as providing support and encouragement to farmers within the community. There has been an increase in the use of chilli as a deterrent to elephants and many farmers believe it is effective in scaring elephants. The main problem people have found is that there is no local supply of chilli, therefore farmers run out of materials half way through the crop season.

Successes

The main successes of the OEPRP project can be summarised as follows:

- A comprehensive database of HEC incidents has been established over three years
- Data collection has been enhanced through community enumerators
- An effective information exchange network has been established between project personnel and farmers
- Monitoring efforts have been effective and enumerators provided additional support and encouragement from a local level
- Community perceptions have improved
    - Many people believe in chilli and have seen it working in neighbouring fields.
    - Farmers have been given hope that there may be a solution to reduce conflict
    - Willingness to try new methods has increased

Challenges

There have been numerous challenges with implementing project activities, the main ones include:

- Community Enumerators need management
- Farmer expectations can be high i.e. people often want to be able to protect whole field, but realistically only possible to do one side or small portion
- Mitigation materials supply is difficult, particularly chilli pepper and used oil
- Local supply of chilli not available and people have experienced problems with growing their own chilli supply i.e. water pumps breaking, seeds and plants attacked by insects
- Difficult to quantify effectiveness of chilli/other methods in reducing HEC incidents
- Support on a larger scale requires a lot of logistics and resources

Lessons Learnt

In summary, the lessons ,learnt from project activities and the introduction of CBCM include:

- Long-term data collection is essential to gain an understanding of HEC
- Community participation important in both planning and implementation of mitigation strategies
- Long-term and short-term mitigation strategies are required to reduce HEC
- Encouragement and support to farmers is essential for correct mitigation implementation
- Material supply difficult – need to encourage local supply of materials, especially chilli growing (i.e. local gardens and commercial fields)
- Start small then build up mitigation efforts – conservation agriculture possible strategy in panhandle
- Training from local level in villages and through enumerators is effective

9. Current Status of HEC in Botswana, Community perspective

O. Mosupi

I am representing the community perspective on HEC from the Okavango Delta.

One of the main issues with HEC in my area is that the DWNP have limited resources and it takes a long time for fields to be assessed for elephant damage. The DWNP did well to train people in the use of chilli pepper, however, there was no supply of chilli to use. This is a big problem with the use of chilli in our area, there is no local supply.

I do not believe there is a solution to eradicate the conflict between people and elephants completely, but I do believe it can be reduced. It is really important to encourage farmers to learn about the use of chilli and see its importance in preventing elephants coming to their fields.

It is evident that the DWNP need more resources. The community feel that when they report to the DWNP they should get something back from the Government. Farmers are trying to plough their fields and grow crops and the elephant is a BIG problem. Government and communities need to build up a friendship. Communities need to be shown that there is a benefit from living close to elephants, when their main experience with elephants usually involve elephants destroying crops or property and/or threatening lives.

Localised training efforts are important. Training workshops are more effective if they are conducted in villages where people are experiencing problems.

Questions and comments to Botswana:

Q1. How do you monitor the Government chilli trials? What is recorded?

A1. G. Masunga: We use forms to monitor

Q2. T. Meyer: What percentage of all fields are effected by crop raiding? What is the average size of a field ?

A2. A. Songhurst: The average field size in the panhandle is 3-4ha. We do not know what percentage of all fields are effected by raiding yet, but it is something I will be investigating

Q3. Is political pressure affecting HEC work at Department of wildlife?

A3. There is good support from the president for the worldbank project. Compensation is an issue and has become political. A problem with villagers is that they are taught about mitigation techniques but often don't listen, so training is made redundant. There are negative attitudes from communities towards Government. You can take a horse to water but you can't force it to drink!

Comment 1. O. Mosupi: We need to find a way in Botswana of communicating with local communities and addressing what local people think. Focus strategies with them no at them.

Comment 2. Just giving out money and chilli etc. is bad. Rather we need to involve communities and get them to take responsibility.

Comment 3. L. Braack: Something needs to be done now to address HEC issues. The human population is increasing and so is the elephant population, therefore people need to stand up and take responsibility.

Q4. L. Osborn: To what extent are Government Departments collaborating on projects such as the chilli project?

A4. T. Gaothobogwe: There is a lot of collaboration between departments for the World bank project. Particularly between Department of Agriculture and Department of Wildlife and National Parks.

Current Status of Human-Elephant Conflict in Angola

10. Current Status of HEC in Angola

M. Karidozo

I would like to start by clarifying that I am from Elephant Pepper Development Trust and I am not representing the Government or community view in Angola. I am giving feedback based on work we conducted in south east Angola in 2008.

Elephant Population in Angola

Large mammal population declined dramatically due to heavy poaching during Angola's Civil War. However, conditions for regeneration of mammal populations now exist. In 2006, the elephant population in Angola was estimated at 2,384 (Chase & Griffin, 2005; Blanc et al., 2007) and this could now be close to 7,500 in 2010 (Chase pers. comm.) mainly within south eastern Angola. Only 9% of the elephant range is protected and there are both African Savannah (*Loxodonta africana)* and African Forest (*Loxodonta cyclotis*) elephants, the later mainly confined in the forests of Cabinda (Blanc et al., 2007).

Kuando Kubango Province

The Kuando Kubango province has the largest block of protected forest areas i.e. two nature reserves and four game reserves in southern Angola and share international boundaries with Namibia and Zambia. The Mucusso Game Reserve (Coutada) incorporates approximately 21,300km² of land and adjoins the Kubango (Kavango) River and Namibia to the South, and the Cuito River to the West. The Coutada do Mucusso reserve is also inhabited by people. The largest human settlements occur in two areas of the reserve: in the South, where a series of small villages line the banks of the Kubango and Cuito Rivers, and in the North, where the Likua settlement aligns the Lumuna River. Most agricultural activity occurs along the Kubango and Cuito Rivers. Other human settlements appear to be small in scale. The reserve overlaps with two municipalities, Dirico and Rivungu, and five communas Xamavera, Dirico, Mucusso, Luiana and Galangue. Only the Mucusso communa is wholly within the boundaries of the Mucusso Reserve. After the civil war both people and elephants started re-colonizing these areas. There are 8 villages within the reserve, with approximately 4,500 people.

Generally food productivity is low with many families experiencing food shortages beginning in September, and continuing through March

HEC precursors in Coutada do Mucusso

- Elephants moving into Angola from neighbouring countries i.e. Zambia, Namibia as well as Botswana
- Human encroachment into sparsely settled areas adjacent to Mucusso Reserve
- Subsistence agriculture along the main river, lack of defence of crops by farmers
- Lack of proper land tenure and planning
- Human population rising at an annual rate of close to 4%

Current status of HEC

There is no quantitative data on the current status of HEC in the area. However, available land cover and land use maps as well as land satellite images show that the number of human settlements and cultivated areas have substantially increased from 2002-2006, and a lot of the riverfront is now settled and planted with crops. People living in the area indicate that the numbers of elephant crop raiding incidents per year are increasing.

Other impacts of HEC include:

- Snaring and spearing of elephants by humans
- Bush encroachment by agricultural fields
- Property destruction by elephant

This recent newspaper article illustrates that HEC is increasing in Angola:

"*LUANDA (Reuters) – Wild elephants rampaged through a southern village in Angola last weekend, destroying farms and dozens of houses and prompting most of its 4,000 residents to flee to neighbouring Namibia, a local official (District Administrator) said on Tuesday.*" (Reuters, March 9, 2010)

Most information on the current status of HEC in Angola is not quantified; we only have local community views. One major constraint for addressing HEC issues in Angola, particularly in the south east, is that key institutions (i.e. wildlife authorities, agricultural authorities; land use planning authorities; and others) are lacking. For example, Menonge the Provincial capital has only one environmental officer and human-wildlife conflict, while recognised as a critical issue, is not currently regarded as one of the major priorities. There are other more urgent challenges needing to be addressed, such as demining of land mines. Currently elephant crop raiding incidences are reported to the District Administrator's office located in Mucusso. This information is then passed on to an office which is close to 300 km away on a dirt road and known to have land mines in some sections. Like any other African country coming out of a civil war, national politics is also an issue. Many Non Governmental Organisations (NGOs) and foreign consultants have found it difficult to work in south east Angola, an area which used to be controlled by the National Union for the Total Independence of Angola (UNITA) led by the late Jonas Savimbi which was fighting the government of the time during the civil war. As such, our observations were that there is still suspicion and fears that some elements of UNITA could still be present, hence the immense bureaucracy involved in vetting and verifying foreigners and NGOs who are trying to address issues such as HEC and in obtaining operational documentation in the area. This puts into perspective the challenges being experienced in south east Angola

HEC Mitigation used

The main types of HEC mitigation used in Angola are traditional methods (i.e. fire; watchmen; noise; buffer zones; sharp objects on paths; killing problem animals; pit traps). Since our work, community based conflict mitigation techniques have been introduced.

Challenges in Angola

There are a number of challenges in Angola with regards to addressing human elephant conflict issues. These can be broken down into four categories:

- Logistical (bad roads; landmines still present in some places)

- Administrative (visas; border controls; political sensitivity)
- Institutional (capacity lacking; centralization of decision making, policy/legislation)
- Operational (resources and priorities i.e. conservation vs. Reconstruction)

Successes

Progress has been made towards integrating all elephant management functions in the country's National Biodiversity Strategy and Action Plan. Government is committed to do this and has started engaging stakeholders. This includes:

- Conducting elephant census to ascertain the status of the elephant population
- Enforcing anti poaching and preventing illegal trade in elephant products and monitoring these activities
- Investigating the distribution, movements and habitat use of elephants
- Addressing human-elephant conflict

Future

A number of short and long term recommendations can be given on how HEC can be reduced in Angola, these include some of the following:

- Land-use planning to reduce wildlife habitat fragmentation and HEC.
- Introduction of more sustainable agro-pastoral systems.
- Identification of corridors of movement between elephant ranges
- Development of an HEC strategy that enables communities to manage elephant problems
- Investigation into income generation through elephant tourism.
- Investigate sustainability of sport hunting system, and assess its feasibility for the region
- Capacity building of local wildlife managers to deal with HEC
- Education / awareness building of the value of elephant conservation
- National policy for problem elephants

Conclusions

In conclusion it is evident that logistical, institutional and administrative challenges need redress in Angola. One intervention alone will never ameliorate HEC and there is need to address the problem at all levels, both the "symptoms" and the underlying causes. More detailed studies on HEC (site specific) are needed and there is need to respond more directly to the human dimension of HEC. Successful long-term management of HEC requires solid support from all levels of government and this must be supported by clear policies and legal frameworks at the local, district and national levels. Conflict mitigation must have strong local participation and be integrated with other elephant, wildlife and land management activities

Current Status of Human-Elephant Conflict in Zambia

11. Current Status of HEC in Zambia, Zambian Wildlife Authority perspective

J. Chishika

Background

I am going to use the southern part of Zambia as an example of the HEC situation in the whole country. In the Mosi-Oa-Tunya National Park, near Livingstone, elephants move out of the park into human settlements surrounding the park.

Conflicts between humans and animals are a serious problem in areas surrounding Mosi-Oa-Tunya National Park. The damage and destruction to human property (and sometimes to human life) by elephants is a significant danger to many local communities. In 2009, five people were killed by elephant in this area.

The communities often feel relieved when an elephant is killed and the meat consumed. In Zambia there is no compensation by the government for the destruction caused to people's fields and this is a challenge for ZAWA. Some people wonder why they don't get compensated for damage. Especially when the same animal causing damage in Zambia goes to Namibia, causes damage and the farmer gets compensated. The trend of killing problem animals poses a threat to the continued survival of the elephant.

Reporting Procedure

- Affected people report HEC incidents to the ZAWA office in town. Some people who are far from the office in remote areas don't report.

- The information is entered in the occurrence book.

- ZAWA deploys officers to make an assessment of the damage incident, but sometimes resources are low (i.e. no fuel) which delays assessment

Current Status of HEC around Mosi-Oa-Tunya National Park

There has been an increase in the number of human-elephant conflict incidents reported to ZAWA over the past four years, 2006-2009 (see Table 6 below).

Table 6. Number of HWC incidents and HEC incidents reported over four years 2006-2009.

Year	No. HWC incidents Reported	No. HEC incidents Reported
2006	254	213
2007	241	218
2008	334	292
2009	408	377

Maize is the crop most affected by crop raiding by elephant (46% of reported incidents), with groundnuts (13%) and pumpkin (11%) also frequently damaged. People are often forced to harvest their crops early to avoid damage by elephants.

Mitigation

The main areas affected by HEC are between 2km to 50km from the national park boundary. The main mitigation methods currently used include:

- ZAWA officers are deployed after reports of HEC incidents are received. Officers attend affected areas and scare elephants from people's fields.
- Farmers use fireworks i.e. bangers
- Chilli methods have been introduced but some people don't believe it works. Few people have adopted the use of chilli.
- Farmers commonly resort to their own methods to defend their fields by lighting fires at the edge of their fields, beating drums and throwing stones at the elephants

Shortfalls

- People not adopting methods of mitigation i.e. chilli fencing
- Farmers not staying at their fields, and fields located far from homesteads
- Lack of resources for ZAWA to address HEC issues. Many resources are put into the protection of the white rhino population.

Summary

Conflicts between wildlife and humans are not new, but they are becoming more frequent and widespread. Education programmes can play an important role in reducing conflicts by improving public understanding and attitudes towards elephants. A combination of good communication networks with local communities along with management interventions need to be adopted to reduce HEC. Continuous communication with the local people about wildlife will help impart positive attitudes towards wildlife, which can lead to the peaceful co-existence of humans and wildlife.

12. Current Status of HEC in Zambia, Community Centred Conservation Development & World Wildlife Fund perspective

C. Murphy & E. Rieder

Background

The Community Centred Conservation and Development Project (CCCD) aims to support the Zambian Integrated Development Plan (IDP) for the Silowana Complex, in partnership with ZAWA. It consists of a consortium, including:

- IRDNC (Integrated Rural Development and Nature Conservation)
- WWF-Zambia/WWF-Namibia
- CEDP (Community Economic Development Project)

The two main objectives of CCCD include:

1. Management practices for natural resources, especially:
   - wildlife introduced
   - establishment of transboundary wildlife movement corridors
   - reduction of poaching and illegal trade in wildlife products
2. Alternative livelihood options for targeted communities identified and introduced as incentives for communities to participate in land-use planning processes which promote wildlife/tourism as viable and complementary land-uses

Silowana Complex

The Silowana complex is made of two Game Management Areas (GMAs) around the Sioma-Ngweze National Park; Mufulani and Sesheke West GMAs. The area is managed by two Community Resource Boards and 24 Village Action Groups. The estimated elephant population in the area was 1000 elephants in the wet season in 2004 and 305 in the dry season of 2005. There are elephant paths all over the park, coming from Angola and Namibia (see Figure 4 below).

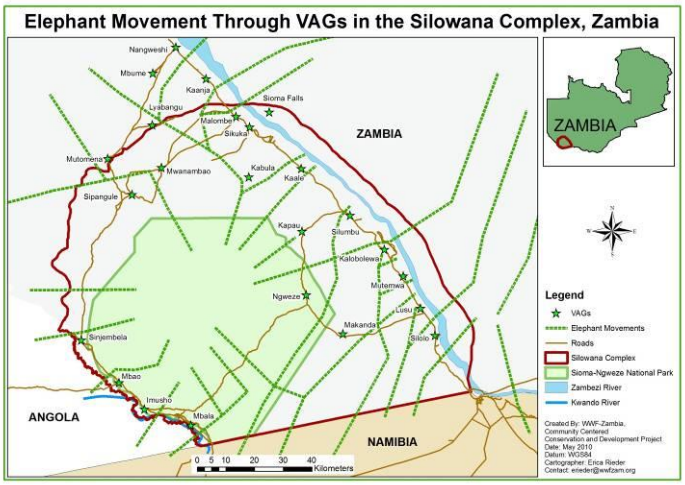

Figure 4. Elephant paths in the Silowana Complex, Zambia

Mitigation Strategies

In this area, ZAWA resources are low i.e. there is one vehicle available to cover the whole area and it is therefore difficult to monitor and address human-elephant conflict. Also, poaching is high and often people are afraid to report HEC incidents and encourage a ZAWA presence due to fear of being caught poaching.

Our project has been running for one year and we have introduced or are planning to introduce a number of HEC mitigation strategies. These include:

- Event Book
- Elephant Restraining Lines
- Natural Resource and Land-use Mapping
- Crop Protection
- Conservation Agriculture

The ***event book*** is a recording system for details of conflict incidents i.e. where/when/description of conflict/quantify damage/species sightings. This has already been introduced in the Silowana complex.

Elephant restraining lines have been proposed in places where conflict is high, however these are expensive to implement.

People have been living in and around the National Park for many years, and we are trying to help communities to live and benefit from wildlife. A VAG mapping exercise has been introduced to map ***natural resources and land-use***. This is an example of micro-level planning, looking at where people are living in relation to natural resource location. This helps to identify where new settlements and fields should be to minimise conflict, and already people have started to move people out of corridors.

A ***Crop Protection*** demonstration was initiated in 2006 in Imusho, which involved giving information to farmers on mitigation techniques, employing an elephant deterrent extension officer in 2009, providing inputs (e.g. materials) to farmers for implementing mitigation techniques, encouraging community monitoring of farmers and facilitating participatory farmers assessments. The farmer assessments provide direct feedback from farmers on success/failure of techniques. The inputs given to farmers, however, are not sustainable and it is important to look at the long-term sustainability of such initiatives. For example, farmers need a local supply of chilli and other materials should be available locally therefore the use of chilli bricks are strongly encouraged. We also used torches to "performance enhance" and encourage farmers to implement mitigation techniques correctly. It is important to remember that crop protection is reactive rather than preventative.

Conservation Agriculture (CA) has also been introduced in Imusho to encourage smaller fields with higher yields. It is based on the following elements:

- Basic element – minimum soil disturbance
- Early preparation of planting basins for seed (MAKES PERMANENT FIELDS)
- Mulching (moisture retention)
- Rotation of crops & manure (improve soil quality)

In Imusho 150 farmers were trained in CA in 2009/2010 and we aimto train 220 farmers in 2010/2011. Yields have been high from CA plots (see Table 7.)

Table 7. Yields from CA plots

Plot size (m^2)	Yield (kg)
10	109
50	773

Training workshops and demonstration plots for conservation agriculture are essential and we recommend that 5-7yrs of encouragement and support to farmers are required to ensure successful implementation of techniques. NGO support, however, is difficult so initiatives that require large NGO support are not encouraged.

Learning Points for Human-Elephant Conflict

Lessons learnt from the CCCD programme include the following points:

- Link Conservation Agriculture with crop protection
- Seeing is believing – hence the demonstration farmer-to-farmer
- People need incentives to adopt new behaviour (subsided solar torch for crop protection)
- Strong extension effort needed & NGO expense with inputs not sustainable (only a demonstration
- Huge labour effort for farmer (wiser for farmer to move out of Elephant corridor)
- Land use planning from the start has better long term benefits

Challenges

The challenges our project has faced so far include the following:

- Poaching is a big problem in the Silowana complex
- Large Area, Poor Roads
- Very Low Wildlife Numbers & Limited Tourism
- Limited Markets for selling produce
- Obtaining Verified Data
- Community Perceptions/Awareness on Elephants & Protection Methods (chilli, CA, etc)
- High Expectations, people believe CCCD can solve all problems

Opportunities for CCCD

A number of opportunities are available for the CCCD's work, including:

- Linking CA with Crop Protection Measures & Land Use Planning
- An increasingly strong partnership with ZAWA
- Expertise within Consortium Members & Within Region
- Large Coverage Area if Successful

13. Current Status of HEC in Zambia, Community perspective

C. Miyanda

I am presenting the community experience on human wildlife conflict in Zambia. I will explain about my experience in the Imusho area in Sioma Ngweze National Park in Western Province Zambia, over the last 3 years. Specifically, I will highlight the concerns and frustrations, ideas, successes and shortfalls we are experiencing.

Sioma Ngwezi National Park is in southwest Zambia. People live within the national park and there are two main elephant corridors either side of the park. We can therefore expect a fight between humans and elephants.

Concerns and Frustrations

The main concerns and frustrations people are experiencing include:

- Loosing food (crops). Farmers work for three months in the fields and in one night all the crops can be destroyed
- No benefit from wildlife that eats the crops e.g. no tourism or trophy hunting
- After food is lost, no compensation

Ideas

Ideas for reducing the human-elephant conflict in our area include:

- Shoot elephants who regularly raid crops
- Compensate farmers for damage
- Farmers should protect crops more efficiently, i.e. use chilli methods
- Farmers should prepare land early, enhancing early planting
- Each household could grow own chilli plot
- Farmers should use early maturing varieties of maize seed

Successes

Farmers who have followed all crop protection measures saved their crops from raiding by elephant. Farmers have started to move away from elephant corridors where elephants are less troublesome. People have started using early maturing seed, which has saved harvests.

Shortfalls

There are large labour costs involved for farmers to protect their crops and materials for mitigation can be expensive. In the Imusho area there is no proper land-use planning and there are no clear corridors for elephants to move to get to the river. It is also hard to integrate with the government.

Questions and comments to Zambia:

Comment 1. S. Mosojane: It looks like the symptoms of human-elephant conflict are being addressed here. Personally, I believe that land use planning is the main cause of HEC and crop-raiding is the symptom.

Q1. G. Masunga: What benefits are there to communities from the park? Where are the elephants moving between rivers?

A1. E. Reider: CCCD has revitalised action groups and put the VAG maps into the parks to improve land use planning. There are no benefits going to people in game management areas at the moment and this is what CCCD programme is addressing.

Comment 2. L.Braack: The Sioma Ngweze National Park was proclaimed when people were living in the area.

Comment 3. M. Karidozo: It is believed that in the wet season elephants come to Livingstone and in the dry season they move into Zimbabwe. My current research will be looking at this movement. Elephants do not appear to be moving back into Zimbabwe so there is an increase in conflict incidents in Livingstone,as well as increased poaching outside of parks and injured elephants causing problems in Livingstone area. HEC is now happening in the town of Livingstone – why is it now happening in urban areas? Angola needs to have CBNRM programmes so that communities can benefit from tourism.

Q2. T. Gaothobogwe:

a) How effective are elephant restraining lines and how long have you used them for?
b) How long has CA been used and how effective is it?
c) Comment 4: Looking at the way forward, we are always talking about incorporating ideas into future land use plans, but taking this forward and putting plans into action is difficult. Recommendations can be made but this doesn't mean they can be implemented.

A2a. E. Reider: There are no elephant restraining lines in place yet, it is still in the planning phase. We are looking at the costs involved before implementing such a project and we need to make sure that the fences make sense to the communities.

A2b. C. Miyanda: Conservation has had a long history in Zambia. The success of CA can be measured in the yields from CA plots i.e. from a 10m x 10m plot farmers yielded 109kg of cereal crop.

Comment 5. M.Karidozo: I just want to clarify that presentations are site specific.

Comment 6. L. Osborn: Intensifying agriculture is key in reducing HEC. The continued perseverance of efforts is very credible and there are lots of exciting initiatives. I just wonder why Sioma Ngweze is a National Park? And why is so much effort going in to this area?

ACTIVITIES

L. Braack

Following the above presentations, we now have a better understanding of what the current status of Human-Elephant Conflict is in the Kwando-Kavango region, where the main elephant movement corridors are, what options are available to reduce conflict, and what mitigation strategies are being implemented in neighbouring countries.

The workshop participants were now kindly requested to conduct some activities to further focus on, and discuss some of the main HEC issues, challenges and opportunities for the way forward:

Activity 1

In this exercise participants were asked to think about: What are the problems being experienced in the region? What are the challenges? And why is this workshop being held today?

Everyone was asked to write their top two main challenges down on cards and pin them on the wall.

Outcomes:

The main challenges identified by workshop participants were grouped into clusters. These included:

- Community responsibility and local empowerment
- Direct conflicts occurring between people and elephants
- Difficult to separate people and elephants
- Land-use planning
- Lack of resources
- More research needed

Activity 2

Everyone was asked to close their eyes and indicate whether they thought we need to look at ways to reduce the elephant population to reduce conflict.

Outcomes:

21 people (65% of participants) raised their hands in agreement that ways to reduce elephant populations need to be investigated. Root causes of conflict need to be explored. It was suggested that a transboundary workshop would be needed to discuss this issue to gain a regional consensus.

Activity 3

Participants were split into four groups to discuss the main issues/challenges identified in activites 1 and 2.

Group 1: Community Empowerment
Group 2: Land-Use Planning
Group 3: Direct impacts of HEC on people
Group 4: Root causes of HEC

Outcomes:

Group 1: Community Empowerment

This group discussion concentrated on an important issue in human-elephant conflict, that there often seems to be a dependency of farmers on Government departments and NGOs to reduce conflict, rather than communities feeling responsible themselves. The resources and funding to address HEC issues usually comes from Government or NGOs and this sometimes leads to community dependency. Donors often give the fish not the rod, when they really need to provide rods i.e. employment, to empower communities.

Training and education were identified as key elements to include in HEC mitigation strategies to facilitate community empowerment. Such training needs to be given at local, regional, and international levels to all stakeholders. It is also important to include experiences from farmers at transboundary workshops, to share frustrations and ideas on a regional scale.

At a regional and national level, policies need to be reviewed which might encourage community reliance, i.e. ISPAAD scheme in Botswana. Policies in Namibia seem to be orientated towards encouraging self reliance where as in Botswana this is often not the case. Although, communities in Botswana are encouraged to develop CBNRM initiatives and explore the photographic safari industry, to try and reduce dependency on Government input. However, income from Community Trusts or CBNRM initiatives do not provide many direct benefits at the household level. At a community level, however, this concept could empower local communities to address HEC issues. An important question was raised "How can policies from each country (e.g. compensation) be harmonised to be consistent on a transboundary level to reduce HEC?" It was thought that such concepts could be introduced at a regional level through the KAZA forum.

Group 2: Land-Use Planning

The group discussion identified two main stakeholders that need to be considered in land use planning, namely elephants and people (Government and communities). Elephants belong to all countries in the region as they cross borders freely, therefore they can be utilised and protected by all countries, and policies need to use a KAZA approach.

The question was posed "Is it possible to zone for people and elephants?" It was agreed that this is not possible, rather land-use planning needs to combine areas for both people and elephants. Two case studies were used to illustrate this idea: the eastern Okavango Panhandle in Botswana (where people and elephants live in a wildlife management area) and Sioma Ngwezi National Park in Zambia (where people are living inside the national park). In both case studies, the main resource people and elephants are competing for is water. Therefore, one solution to reduce conflict would be to identify elephant movement corridors to allow free access to the water away from people.

A number of factors need to be considered when developing such a land use plan, including:

- Policies and traditional land rights need to be considered and harmonised
- Need stakeholder "buy in"/agreement
- An interdisciplinary approach is required to gain all the expertise needed
- Socio-economic issues need to be considered
- A governing/co-ordinating body is needed to oversee plan i.e. landboard
- An Environmental Impact Assessment (EIA) would be needed

Successful implementation of the plan would require funding and "buy in" from all stakeholders.

A question was raised "How practical is it to actually implement these land use plans?" An example of the Okavango Delta Management Plan (ODMP) was used to illustrate that such integrated land use plans can be implemented. In this plan, areas have been designated for certain land use and land authorities can't allocate in these areas now unless the land will be used for what it is designated.

Group 3: Direct Impacts of HEC on People

The main problems people are facing in the region from living close to elephants include:

- Crop damage
- Broken fences
- Threats to humans
- Damaged boreholes
- Lack of capacity to reduce conflict
- Restricted settlement patterns

Direct possible solutions identified to reduce the problems people are facing included:

- Alternative agricultural regimes i.e. Conservation Agriculture (CA)
- Using chilli mitigation methods
- Set Problem Animal Control (PAC) quotas
- Increase economic opportunities i.e. tourism and small businesses

The question was posed "Who is responsible for reducing conflict?" It was agreed that all stakeholders have a responsibility: Farmers; NGOs; Governments; and Local organisations i.e. Community Trusts. To implement mitigation measures identified would therefore require a combination of factors:

- Encourage farmer ownership
- Collect feedback from farmers and provide feedback from other stakeholders to farmers#
- Provide training and education campaigns for all stakeholders
- Listen to farmer concerns and provide relevant training to address these
- Review certain Government policies in the region and learn from neighbouring countries i.e. compensation in Botswana (which is a top-down approach) and compensation in Namibia (conservancy led approach)

It was posed that the proceeds from community hunting quotas could be used to provide funds to compensate in an indirect way in Botswana i.e. not directly from the Government. A point was raised that some Government schemes conflict in Botswana, for example the Department of Agriculture ISPAAD scheme (which encourages people to farm and money given relates to size of fields ploughed) and DWNP compensation scheme (which pays for damage by wildlife to fields). In Namibia the Government does not compensate, rather they contribute to offsetting losses.

Group 4: Addressing Root Causes of HEC

One main issue that was raised in the group discussion was that the management of elephants in Africa is often dictated by people who don't live with elephants i.e. CITES. An idea was put forward that Africa should have one voice or regional voices i.e. SADC.

Currently, there are different policies to address human-elephant conflict issues regionally. If we believe that the root cause of HEC in the region is that there are too many elephants, then we need to consider ways to reduce elephant populations. Two options were identified, lethal and non-lethal.

A number of things to be considered if lethal population control is used:

- Benefits need to be derived from elephant products i.e. ivory for furniture; bones for crafts; skin for leather
- Abattoirs would be required to process and sell meat
- Poaching would need to be controlled. Once there is a demand for elephant products it can facilitate the illegal trade. Could be an option to consider utilising elephants sustainably and supply the demand with a legal trade.

The non-lethal population control methods are expensive options, including:

- Contraception
- Sterilization
- Sell live elephants to other countries

An important point to consider in this discussion is whether we have enough data to show people (locally and internationally) that we have too many elephants? Some people travel through Botswana and do not see many elephants, which makes them think that there aren't many elephants here. It is a highly debatable issue, some data illustrates that population numbers are definitely increasing but sometimes data is highly biased. There is always politics in science and sometimes research is set up for own agendas. More data is required, before this issue can be sensibly addressed.

Conclusion

L. Braack

It is evident from this workshop that it is imperative to involve local communities in planning and implementing of mitigation measures in order to successfully try to reduce conflict. Information from these kinds of workshops and research needs to be disseminated to relevant stakeholders, to aid in addressing issues such as land use planning. This workshop has been good at identifying main problems associated with human-elephant conflict in the Kwando - Kavango region and suggesting possible solutions to reduce such conflict. All participants need to take this information back to others.

Thank you to all for participating in the workshop.

Thank you to Anna Songhurst for organising the workshop on behalf of Conservation International.

Appendix I

Agenda

TUESDAY 8 JUNE 2010		
09h00	Welcome	**Dr Leo Braack (CI)**
09h10	Prayer	**Mr Gift Otumile (DWNP)**
09h15	Opening remarks by workshop sponsors	**Dr Leo Braack (CI)**
09h20	Opening Address	**Mr John Mazebedi (DWNP, Head of PAC, Ngamiland)**
09h50	Elephant distribution, density, key corridors in the region, and projected future population trends	**Dr Michael Chase (EWB)**
10h35	An overview of HEC mitigation techniques globally and regionally	**Dr Loki Osborn (EPDT)**
11h10	TEA/REFRESHMENTS	
11h40 12h25 12h40	Current status of HEC in Namibia: Government perspective Current status of HEC in Caprivi: IRDNC perspective Community perspectives on HEC: Concerns, frustrations, ideas, expectations, successes and shortfalls	**Mr Charles Musiyalike (MET, Namibia)** **Mr Bennety Busihu (IRDNC)** **Mr Raymond Kutembeka (Kwandu Conservancy)**
13h20	**LUNCH**	
14h20 14h55 15h05 15h35	Current status of HEC in Botswana: Government perspective DWNP World Bank Initiative Current status of HEC in the eastern Okavango Panhandle: OEPRP perspective Community perspectives on HEC: Concerns, frustrations, ideas, expectations, successes and shortfalls	**Mr Gaseitsiwe Masunga (DWNP, Botswana)** **Mr Titus Gaothobogwe (DWNP, Botswana)** **Ms Anna Songhurst (OEPRP)** **Mr Ohitiseng Mosupi (Gunotsoga Village)**
15h55	TEA/REFRESHMENTS	
16h20	Current status of HEC in Angola	**Malvern Karidozo (EPDT)**
16h45	Sundowner boat cruise on Thamalakane River	
WEDNESDAY 9 JUNE 2010		
08h20	Current status of HEC in Zambia: Government perspective	**Mr Joreck Chishika (ZAWA)**

08h40 09h10	Current status of HEC in the Sioma Ngwezi: CCCD & WWF perspective Community perspectives on HEC: Concerns, frustrations, ideas, expectations, successes and shortfalls	**Ms Carol Murphy (CCCD) & Ms Erica Rieder (WWF)** **Mr Chrispin Miyanda (Imusho, Zambia)**
09h50	The Namibian "Incident Report" system and HEC Report method .	**Bennety Busihu (Integrated Rural Development and Nature Conservation)**
10h10	Facilitator-led identification of key themes for discussion; i.e. what are the current frustrations and challenges, and what is necessary to improve our understanding and management of HEC?	
10h30	TEA/REFRESHMENTS	
11h00	Prioritization of key challenges	
11h20	Discussions on priority issues, needs and actions (break-away groups)	
12h20	Review and feedback from group discussions	
13h15	Conclusion	
13h30	Workshop Closure	
13h45	**Lunch and departure of delegates**	

Appendix II

Photographs of workshop

Dr Leo Braack (CI)

Mr John Mazebedi (DWNP)

Dr Loki Osborn (EPDT)

Dr Michael Chase (EWB)

Workshop Participants

Mr Charles Musiyalike (MET)

Mr Bennety Busihu (IRDNC)

Mr Raymond Kutembeka (Namibia Community Representative)

Questions to Namibian speakers

Dr Gaseitsiwe Masunga (DWNP)

Ms Anna Songhurst (OEPRP)

Mr Ohitiseng Mosupi
(Botswana Community Representative)

Mr Gift Otumile & Mr Titus Gaothobogwe (DWNP)

Questions to Botswana speakers

Mr Malvern Karidozo (EPDT)

Mr Joreck Chishika (ZAWA)

Ms Carol Murphy (CCCD) & Ms Erica Rieder (WWF)

Mr Chrsipin Miyanda
(Zambia Community Representative)

Questions to Zambian speakers

DWNP Officers, Botswana

Mr Moses Kenwendo (DWNP)

Mr Sibangani Mosojane (BioOkavango)

Mr Chilli and DWNP officers

Group discussions