

The Rufford Small Grants Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Malvern Karidozo
Project title	Human-wildlife coexistence in a landscape mosaic – A landscape level approach to mitigate human-elephant conflicts in Livingstone, Zambia
RSG reference	RSG 20.11.06
Reporting period	February 2007-March 2008
Amount of grant	£5000.00
Your email address	malvern@elephantpepper.org mazdzambo@yahoo.co.uk
Date of this report	02/04/08

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
1. Determining the wildlife movement patterns and corridors			X	This objective and related activities were fully achieved. Several historical and current wildlife (particularly elephant) movement paths/corridors were identified in the study area and mapped. Most of the movement corridors mapped transcend national borders.
2. Determining the nature and patterns of conflict in relation to habitat use			X	The spatial and temporal patterns of human-elephant conflict in relation to habitat use were fully achieved. However, there is still need to have the process repeated to come up with more accurate data as this was conducted over one farming season.
3. Identifying, characterizing and mapping human wildlife conflict hotspots			X	Conflict hotspots were identified and mapped. A new phenomenon regarding conflict also emerged-not only was conflict a preserve of the rural and farming communities (commercial and subsistence) but also increased incidences of human-elephant conflict in urban areas were noted.
4. Developing a GIS database on human-wildlife conflicts with much focus on elephants		X		This remains an ongoing activity as data collection and collating is still underway. Available data sets have been send to experts in GIS to come up with the database.
5. Proposing landscape structures relevant to the findings of this study.		X		Although partially achieved, it is important to note that contributions as a result of this study were taken on-board during the formulation of the Kavango-Zambezi Transfrontier Conservation Area (KAZA-TFCA) operational plan for the Zambian component.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

The major unforeseen difficulties that were experienced were un expected above normal rainfall that affected some of the field based operations and the strengthening of the local currency (Zambian Kwacha) against the major currencies particularly in the third quarter of the project.

The study area received above normal rainfall from December 2007 until March 2008. This affected accessibility of most field sites thereby forcing the project team to extend the project period by 4 months. The flooding also resulted in the relocation of some of the community members involved in the study to other areas not prone to flooding. This impacted on the project as these communities will no longer be included in the post project impact assessment. The floods experienced during this period also resulted in elephants and other wildlife moving out of some parts of the study area into higher ground thereby affecting some study components such as habitat usage. By extending the project period until after the flooding period, the project team managed to assess the impact of the prolonged rains as well as having enough time to continue investigation of wildlife movement patterns when the animals started returning to their earlier refuge areas. All relocated project participants were also interviewed to solicit their input on the project's impact through collaboration with government agencies.

The local currency strengthened against major currencies (GBP and USD) from the period August 2007 to April 2008. This negatively affected the project delivery as costs of implementing the project became extremely higher than anticipated. This was coupled with the continuous increase in fuel prices (Zambia has some of the most expensive fuel which at one time reached GBP 1.70 per litre of petrol) as well as other operational costs. However, the project managed to cope with the situation by reducing the number of field visits as well as looking for additional funding from other sources.

3. Briefly describe the three most important outcomes of your project.

a) Identification of elephant corridors and movement patterns

A total of twelve prominent elephant movement corridors within the study area were identified and mapped. Adequate evidence was established that some seasonal elephant movement between Zimbabwe's Victoria Falls National Park and the Mosi O Tunya National Park in Zambia, areas that forms part of the study area.

It was also noted that elephant bulls were taking the risks of crossing human settlement in order to search for feed and interact with other populations. Elephant bulls are known to move more for social and reproductive reasons (principally to seek out cows in oestrus) but young bulls which are unlikely to be breeders are also making these movements. Young bulls do tend to exhibit this behaviour which may be to do with exploring bigger home ranges for future use. Cows do not appear to move from reasonably safe refuges consisting of quite large areas of natural habitat which is undisturbed by agriculture. This again fits with what has been observed elsewhere – elephant cows live in cohesive family units in fairly well defined home ranges, maybe because they are reluctant to put calves at risk by unnecessary travel

The study area still has a contiguous elephant population. This is despite widespread fragmentation of natural habitat in the area by seemingly unregulated and unplanned subsistence and commercial agriculture. It is apparent that if a resident and breeding population of elephants is to be assured of a future in any given part of the study area, it must share with human settlement; a reasonably large refuge of undisturbed habitat will have to be maintained. If there are no such areas, the bulk of the elephant population may be displaced. In settled areas such as Mukuni, Libuyu and Maunga villages, the population will then consist merely of occasional itinerant bulls and occasionally cow groups, some of which become a seasonal nuisance as crop raiders. We can confidently predict this because of ongoing monitoring of elephant populations in these villages which are already heavily settled

(particularly Mukuni). Here elephant bulls make wet season forays into farmland to feed on crops and dry season raids on fruiting mango trees and irrigated vegetable gardens along the rivers.

Broadly, four types of elephant movement have been identified in the project area. These are:

1. those making 'long range' movements from Zimbabwe (Victoria falls and possibly Hwange), Namibia (the Caprivi Strip) and Botswana (Chobe-Kasane);
2. those which make 'short range' excursions out of the Mosi O Tunya National Park to the villages and occasionally peri-urban settlements;
3. Mosi O Tunya National Park residents (very few)
4. residents making local movements around villages

However, at the time of compiling this report, numbers of elephants and other wildlife could not be ascertained.

b) Conservation relevance of the work

This project is unique among current elephant research and management initiatives in Africa. Firstly it combines research and management outputs simultaneously, which is not very common. Secondly, the following are examples of important conservation issues which this study is revealing and/or addressing. They are divided into research (more general) and management (more local) issues but of course aspects of both are interrelated.

Research

- The process of range loss in elephants due to agricultural expansion has not been closely studied or quantified. Minimum habitat patch size to sustain elephants is a critical area of elephant management information for savanna ecosystems. This study has a good chance of being among the few currently doing the same.

Male and female elephant exhibit marked sexual dimorphism and correspondingly marked behavioural differences. Sex differences in refuge requirements for unprotected elephant populations are not well studied. This study has confirmed that some itinerant male elephants are 'disturbance tolerant' and use narrow corridors which are already heavily transformed by agriculture whereas females with young are usually found further from permanent disturbance. Thus if a resident, breeding elephant population is to be retained it may require a reasonably large, relatively undisturbed natural refuge.

Management

- Local authorities, tour operators, commercial farmers and relevant village communities will shortly be implored to try to safeguard further agricultural degradation of the identified corridors and wildlife refuge areas abutting the Zambezi River link to the hinterlands. These landscapes and corridors will ensure continuity of wildlife interaction between the protected area (national park) and main elephant refuge areas outside the protected area.
- Problem elephant activity can be managed (e.g. by land use planning, fencing, disturbance shooting, control shooting, benefit distribution) if the distribution, frequency and severity of elephant raids has been quantified as indicated elsewhere (Hoare 1995). Although the problem in the study area cannot be eliminated, since a reliable reporting scheme has been run,

intelligent use of the problem elephant information means scarce resources can now be more effectively deployed to reduce this phenomenon.

- If elephants in and around communities near the Mosi O Tunya National Park become completely cut off from those in nearby countries, apart from potential genetic isolation of this sub-population, there is the possibility that elephant raids around MTNP and nearby villages will intensify.

c) Community and farmer sensitisation and training on the application of appropriate Problem Animal Control (PAC) techniques to protect subsistence crops.

This is an ongoing activity and 25 training sessions were conducted over the course of the project period in Chiefdoms Mukuni, Musokotwane and Sekute. Prior to the trainings, an assessment of the conflict situation as well as training needs assessment were conducted in the areas that falls within the project catchment. All the areas visited during the baseline study exercise had their human-wildlife conflict (HWC) situation investigated and recorded.

Human Elephant Conflict is escalating throughout the project area according to reports as agriculture expands into wildlife habitat. Farmers in most of the project area bear the costs of living with elephants, whilst receiving few of the benefits. These costs include damage to crops and property, competition for water and fruiting trees, reduced access to local areas, time and risk spent guarding crops, etc. As a result, there can be intensely negative attitudes towards elephants and wildlife conservation in general, at the local level. As such, community sensitization on the importance of elephants on the landscape was conducted and remains an integral part of the project's exit strategy. The project team continues to explore methods addressing the imbalance between costs and benefits as it is central to the success of human-wildlife coexistence by sensitizing and training communities on how to reduce HEC and at same time try to make sure the benefits of living with wildlife are increased. Within the project area, 122 households were exposed to the trainings and were given "starter pack" materials for implementing community based human wildlife conflict mitigation techniques. The households in each community were identified as the hardest hit areas by HEC and were trained and then supplied with materials to protect, initially dry season vegetable gardens and in the rain season, focus will shifted to their rain fed field crops.

Prior to these trainings, village meetings were conducted in order to:

- Obtain and record baseline information on the presence or absence of other key wildlife species on village land as perceived by local communities;
- Obtain and record baseline information on the type of crops grown and livestock kept in the proposed project areas;
- Get an idea of the extent and nature of the conflict as well as damage inflicted by elephants on local people and their properties (crops and livestock)
- Gather the views of local communities on potential conflicts with other wildlife species;
- Record local people's view on wildlife (elephants), current local methods of wildlife utilization and their attitude towards wildlife conservation.

The objectives were to equip farmers with Community Based Problem Animal Control (CBPAC) techniques and to set up a demonstration plot where training participants and other community members will learn the methods from and assess their effectiveness.

All trainings were conducted over two days and composed of theoretical and practical sections. The training content focussed on the history of human wildlife conflict, past and present methods of conflict mitigation, general elephant behaviour and behaviour during crop raiding, recording conflict incidences and the use of CBPAC techniques which are chilli pepper based. In all the areas, a demonstration site was established at a place considered to be a conflict hot spot where the communities are growing some vegetables and is favoured by the elephants.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

The success of a project of this nature depends heavily on the involvement of local communities. From the commencement of the project, the research team appreciated and recognised that indigenous local communities have a great deal of knowledge about their environment, and that this information is accessible through a number of research techniques. Local community members were involved in several aspects of the project from the formulation of the project concept, participation in actual project activities such as identification of wildlife habitat/refuge areas, transect walks, mapping as well as in different trainings conducted by the project team and other partners. More importantly, communities were also involved in project monitoring as well as coming up with recommendations for future activities and plans.

5. Are there any plans to continue this work?

This is ongoing work and forms part of the combined efforts towards finding the long term solutions towards human wildlife conflict mitigation and fostering human wildlife coexistence within the study area and beyond. Plans are underway to mobilise resources (mainly financial) and involve more stakeholders' in order to have a holistic approach towards the continuity of the work as well as avoid duplicating of roles particularly within the focal area.

6. How do you plan to share the results of your work with others?

Several visibility actions are being explored including the use of pamphlets, theatre as well as publishing a paper in a peer reviewed journal. Funds permitting, several media (electronic and print) will be used to disseminate findings of the project and proposed future steps. The Elephant Pepper Development Trust has agreed to publicise such findings on its website as well.

7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

The project team ensured that the funds were spread even throughout the entire project period.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

An average of GBP1: ZMK 4,000 was used

Item	Budgeted Amount	Actual Amount	Difference	Comments
TRAVEL: Field vehicle, gas and maintenance - motorcycle:	2,700.00	2,700.00		This budget line was heavily complimented by other

2000km x £0.75 per km; 4x4: 1000 km x £1.20 per km				matching funds and proved to be the most strained.
PERSONNEL	250.00	250.00		These funds were paid out as stipends for field based personnel as per Zambian law.
TRAINING: Enumerator training, three workshops	250.00	250.00		Enumerator training included recording and monitoring wildlife human conflict incidences and is ongoing.
Local community training workshops and extension support (3 workshops @ £500 each)	1,500.00	1,500.00		These formed part of the exit strategy and included local communities' food during workshops
EQUIPMENT: 4 x GPS unit @ £300 each	300.00	300.00		This equipment is highly valuable to the continuation of the project activities.
TOTAL	5,000.00	5,000.00		

9. Looking ahead, what do you feel are the important next steps?

Several targets and key activities need to be planned and implemented:

Specific activities

- Continue training communities in the study area in Community Based Human Wildlife Conflict Mitigation (CBHWCM) methodologies particularly in areas that were not covered.
- Establish a dedicated community based HWC committee to oversee the development of a conflict mitigation strategy following the trainings.
- Implement a comprehensive conflict reporting programme using the protocol of the EPDT/African Elephant Specialist Group (AfESG) (Parker *et al.*, 2007).
- Continue work on the establishment and updating a HWC database, analyse data monthly and feed back information to HWC management.
- Recommend pilot projects of appropriate HWC mitigation methods in communities worst affected by conflict.
- Recommend land use plans with stakeholders to conserve buffer zones and corridors and to separate wildlife from agriculture.
- Recommend pilot projects that use appropriate and sustainable agricultural practices in elephant/wildlife range in order to reduce farmer vulnerability to conflict.
- Propose to responsible authorities the amendment of the Wildlife Act to include specific policies on community-based conservation and human-wildlife conflict
- Lobby responsible authorities to cooperate with neighbouring countries, especially those within the KAZA-TFCA in developing a coordinated wildlife policy relating to cross border law enforcement.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

The RSGF logo was used in all printed material for the project as well as T-shirts which the trained enumerators would put on during project activities.

11. Any other comments?

I would like to thank the Rufford Small Grants Foundation (RSGF) for sponsoring part of this project. Without the financial support this project would not have achieved most of the outputs.