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	Patrick Aust
Project title	Behavioural Conditioning as a Tool for Reducing Human-Crocodile Conflict
RSG reference	15651-1
Reporting period	June 2014
Amount of grant	£5921
Your email address	patwaust@gmail.com
Date of this report	22/6/2015

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
Publication of results (report to MET, peer reviewed article in appropriate journal, poster/oral presentation to IUCN-SSC Crocodile Specialist Group Meeting 26th Working Meeting.	Yes			Report to MET, publication of article and presentation to IUCN-SSC are due in 2016
Estimation of the effectiveness of the device under different scenarios	Yes			Experiment was largely unsuccessful in terms of evaluating effectiveness of the concept and the device
Recommended methods of deployment		yes		Considerable progress was made in terms of deployment, particularly with regards to what doesn't work.
General design and construction of the behavioural conditioning device, including materials and costs involved		yes		Considerable progress was made in terms of improving the overall design of the device.
Associated risks and assumptions	yes			Little progress was made in this regard.

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

Drought conditions

In recent years the region has experienced below average rainfall, and the 2014/2015 season was particularly poor in terms of runoff. This has meant that the water levels in the Okavango River are below average and receding rapidly. This resulted in three principle problems:

1.) Devices (i.e. tyres) had to be repositioned virtually every day to account for rapidly falling water levels. This resulted in excessive human activity around the devices constantly disturbing the crocodiles.
2.) The premature drying up of inland water bodies (e.g. pans, ephemeral pools etc.) resulted in elevated numbers of dangerous game animals around the study site. This hindered fieldwork because baiting stations had to be selected partly based on vehicle accessibility. In also resulted in unnecessary bycatch/interference from inquisitive animals.
3.) Unseasonally high numbers of ungulates congregating along the river's edge translated into well-fed crocodiles. Consequently, the team struggled to attract crocodiles to the devices using baits.

Winter conditions

Although crocodiles in northern Namibia do feed throughout the year, the cool winter months do result in decreased hunting activity and sluggish behaviour. In future, any experiment of this nature should be carried out when crocodiles are hungry and air/water temperatures are optimal (summer). These are also the conditions usually associated with attacks on humans and livestock and will thus replicate the target setting more accurately.

Poaching leading to dilution of MET resources

Shortly before the start of the project there was a spike in rhino poaching in Namibia. Because of this, MET resources had to be diverted towards anti-poaching work and as a result, no capturing and collaring work could be carried out during the course of the project.

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

a) Transferring experimental methods from the controlled environment of a crocodile farm to a real-world situation requires considerably more forethought, and developing this concept will require more time and effort than originally anticipated.

b) The device design lacks rigour in terms of environmental dynamics. Theft of baits by monitor lizards, bycatch and interference by other animals and changes in water levels proved to be major operational challenges. Crocodile feeding behaviour also proved to be problematic. Crocodiles attacked from directly below the device (rather than from side as was originally anticipated) and thus avoided electric shocks altogether. This resulted in them destroying the device in an effort to get to the bait. Improvements to the device now include a) easy-to-adjust height settings: b) monitor lizard proofed receptacles for the bait (perforated tin cans); and c) positioning of a second electrode close to the bottom of the tyre. In the longer term one solution may be to explore the feasibility of a floating device which would negate interference from terrestrial animals and water level changes.

c) Camera traps are considerably more effective than radio collars in terms of an experimental method/collecting data for this project. The baits failed to attract any of the collared crocodiles and no collared crocodiles were observed throughout the course of the experiment, despite searching for crocodiles with a boat. The sheer width of the floodplain (we were effectively operating in the pan handle of the Okavango Delta) and the large number of crocodiles mean that collaring is unlikely to work in terms of data collection for this shorter-term project. We have developed a rigorous experimental design for the project following methods developed for a similar project (see http://www.sciencedirect.com/science/article/pii/S0261219403000486)

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

The entire project was carried out within the confines of a fully protected wildlife area and until the project starts to produce meaningful results, no attempt will be made to introduce the concept to local communities. However, the project worked closely with a large number of MET staff and several staff members were shown how to construct and deploy the device in addition to being taught how to operate the camera traps and collect the data.

5. Are there any plans to continue this work?

Yes. The project has been temporarily suspended due to the above-mentioned reasons. Iita Matheus, the Head of Scientific Services, will be returning to the study site towards the end of the year when water levels are higher, and temperatures are more favourable to run the experiment again.

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

Publication of results (report to MET, report to Namibian Nature Foundation, peer reviewed article in appropriate journal, poster/oral presentation to IUCN-SSC Crocodile Specialist Group Working Meeting.

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

Funds for the project were obtained in June 2014. Planning for the project began in January 2015. Fieldwork began on the 4th May 2015.

Initially the project was scheduled to run for 12 months under part time management. However, due to various factors it was decided to condense the experiment into a shorter period of time to allow two people to manage the experiment full time. Having two qualified researchers manage the project would a) allow for a more complex experimental design and b) reduce the risk of human error/suboptimal data. Furthermore, the cost and logistics of sourcing baits and baiting the devices proved to be far greater than originally anticipated, and the risk of running out of bait on a regular basis over the 12-month period proved too great. The revised fieldwork period was due to last for 2 months (1st May to 2nd July) but was eventually reduced to one month due to various issues (see above). Fieldwork has now been temporarily suspended. A further month of field trials is planned for the end of 2015/beginning 2016 when water levels are higher, and temperatures are more favourable.

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.
Figures in £ sterling. Exchange rate ~ £1=N$18

Item	Budgeted Amount	Actual Amount	Difference	Comments
Equipment	1241.00	958.78	282.22	The project purchased 6 camera traps instead of collars
International travel	1100.00	777.28	322.72	includes JHB to Windhoek return
Transport	900.00	750.00	150.00	vehicle hire plus NNF boat running costs
Accommodation	600.00	750.00	-150.00	includes hotels at Rundu and JHB
Food	0.00	101.00	-101.00	

MET salary	960.00	0.00	960.00	MET covered staff costs
Baits	520.00	0.00	520.00	supplied by MET
Miscellaneous	600.00	375.00	225.00	admin, tips, entertainment
TOTAL	5921.00	**3712.06**	2208.94	

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

In some regards the project was a failure in terms of what it originally set out to achieve. However, it is important to be mindful of the fact that this is a novel concept involving a novel device and it is still very much in the research and development phase. Teething problems are to be expected. Nevertheless, valuable lessons have been learned and improvements have been made in terms of the device design and deployment. The MET have committed to setting up the experiment for a second time at the end of 2015/beginning of 2016 when there is a far greater chance of success.

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?

As yet the project has not published any material and has therefore not had an opportunity to use the RSGF logo.

11. Any other comments?

All equipment purchase for the project has been donated to MET. Remaining funds will be used in developing the concept further and associated reports will be submitted to RSG in 2016.