Final Project Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF format**. 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 – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Complete the form in English and be as concise as you can. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Paola Stramandinoli Branco
Project Title	The Elephants of Gorongosa: An Integrated Approach to Conservation and Conflict Mitigation in the Shadow of War
Application ID	22671-1
Grant Amount	£5,000
Email Address	paolas@uidaho.edu / paola.medvet@gmail.com
Date of this Report	29th of June, 2018

1. 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
Use a combination of real-time satellite GPS collars and trained community members to quantify the timing (both time of year and time of day), frequency, and spatial distribution of crop-raiding behaviour by elephants at GNP.			■	We combined data on movements of crop-raiding elephants with data on crop availability, patterns of precipitation, NDVI, and the nutritional quality of natural versus cultivated forages to model the drivers of spatiotemporal variation in crop-raiding behaviour by elephants.
Experimentally evaluate the effectiveness of a suite approaches to reducing the occurrence of crop raiding by elephants in GNP.			■	We identified 13 key crossing points used by elephants to exit the park and access crops, we then experimentally tested three different strategies for deterring elephants from leaving the park to raid crops at those locations: beehive fences, chili fences, and a combination of both ("spicy beehive fences"). In addition to using GPS collar data to quantify elephant responses to the fences, we trained two teams of local community members to collect quantitative data on crop damage by elephants and to help construct and maintain the experimental fences.
Work closely with the Park's Department of Community Relations to implement a community outreach and education program to build support among local residents, farmers, and landowners for preserving elephants and other wildlife, and to demonstrate their value to the human and natural ecosystem.			■	During the project, we were able to do two educational activities with local farmers. The first one with 24 people, the second with 21 people. We spent a weekend at the Community Education Center in the park, where they had classes about elephant conservation, how our project could help, and how they could engage on the project. They were also taken on a safari, and watched a movie about the park to understand why elephants matter

				and why it is important to coexist. During the classes, we had opened conversations when they also shared ideas and comments, and helped us to better understand the community and how they perceive the problem.
Use the results of our study to help the park develop and implement a long-term plan for mitigating human-elephant conflict.				The park has access to the final results of the 3-year project, and we are at their disposal to help with future plans. The implementation of a long-term plan will depend on the park's management.

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

The main difficulty was to deal with people. Community members were usually very angry about the situation with crop-raiding elephants, and many times the meetings with the community were tense. It took time and effort to build respect and have them working with us. After many meetings and visits to the community, and especially after starting the trials with different fences (beehives and chili), they understood that we really wanted to help, and so they started working with us.

Logistics in such remote areas was another difficulty. To get all materials we needed and transport them there was hard. We had to get most of the supplies in South Africa, and in many different parts of Mozambique. The condition of the roads is very bad, and we took many weeks to be able to get all the supplies there. In the communities specifically, there are very few roads, mostly narrow trails. One of the ideas we had was to get a small motorbike to be able to move things to the community, and to reach all the places we needed.

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

a) We could scientifically understand and analyse Gorongosa's elephant crop-raiding behaviour with its spatial and temporal patterns for the first time.

b) Using an experimental design, we tested three different methods to decrease elephant crop-raiding and, by using camera traps, we could understand how elephants behave when they face different deterrents. We have promising results that can guide the future plans of human-wildlife conflict management of GNP.

c) We worked very close to the community and I believe we made a difference in their perception of the situation, as well as they changed mine. It was a huge exchange of knowledge and experiences. Besides that, the elephant deterrents we tested are all community-based strategies, which means they must be able to do by their own if they want

to. The project taught them how to protect their own crops, and after the end of the experiment, some farmers already started building their own fences.

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

The community was part of the project since the beginning. We had 16 local farmers working with us, and more than 50 others helping during the experiment. I believe the project opened everyone's mind. Human-elephant conflict is a sensitive topic, and at the beginning they were not as supportive of the project as they became after we started the activities. I believe that if we compare the community living around Gorongosa National Park before and after the project, nowadays they understand much better why it is extremely important to conserve elephants and other wildlife, how they can use beehives and chili fences to deter them from raiding their crops, and how these two strategies can help bringing another income by planting and selling chili, and by producing honey. Indirectly, they also learned basic beekeeping skills, some technology skills (such as what is a GPS and a camera trap and how to use them), and they also learned the concept of coexistence with wildlife. The farmers who were part of the team also benefited from having a temporary work.

5. Are there any plans to continue this work?

For now, this specific project reached an end. I believe it would be of huge importance to continue with education of the communities, and with trials of different and new strategies to decrease crop-raiding by elephants. This must be a continuous work. I will be happy to start a second part of this project, or start a new one wherever it is needed.

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

The final report of this project is my master's thesis which is available through the University of Idaho library website. The thesis is public and will be available to everyone. Besides that, I am on the process of publishing two papers on scientific journals, one about crop-raiding patters, and one about mitigations strategies to decrease crop-raiding. The project was published at Nat Geo Blog (https://blog.nationalgeographic.org/2018/02/02/how-engaging-local-communities-helps-a-wildlife-veterinarian-save-elephants/) and part of this project will be in a new movie about Gorongosa that is coming up soon.

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

The grant was used during the last year of the project, from August 2017 to January 2018. The project started in August of 2015 and ended in May of 2018.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Salary for five local community members to work building and maintaining beehive and chili fences from August to December, based on Mozambique minimum wages.	850	840	10	We hired six local members. Each received the minimum salary in Mozambique (equivalent to 35 GBP per month).
Researcher's food and camping expenses at Gorongosa National Park for 6 months (per diem approx. £11, camping £4).	700	540	160	Total expenses for 198 days were 3,000, and it was covered by the researcher.
Researcher's transport from USA to Gorongosa National Park in Mozambique.	1,080	1,244	-164	Flight from Pullman -WA, USA to Johannesburg, South Africa + transport to Gorongosa National Park, Mozambique (both ways).
Educational campaign, engagement, and 1-week training of local community members (uniforms for the enumerators with our Logo, food and transport to the Park)	400	300	100	Uniforms + Name tags + notebooks and pens.
Chili fence supplies (chili, sisal ropes, engine oil, fabric, mortar and pestle, tools)	620	790	-170	100kg of Chili + Sisal ropes + 40 meters of cloth + mortar and pestle + 100L of vegetable oil (we used it instead of engine oil).
Beehive fence maintenance (hive cleaning supply kit, bee attractants, honey harvesting supplies)	650	556	94	Bee attractant + 2 bee suits + bee brush + smoker + grease + gloves + batteries for camera traps.
Beehive fence supplies	700	270	430	Wire + Nylon ropes + yellow

(plain wood, wire and sisal ropes, iron sheets, paint and tools)				paint + paint brushes + thinner + black markers.
Motorbike	0	460	-460	After consulting Rufford Foundation, I relocated money from some of the other expenses to buy a small motorbike for the project. The transport in the community was a big obstacle before it.

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

It is important that protected areas keep investing on research and education of local communities living around them. Humans and wildlife will always compete for food and water, and as the human population grows, the pressure on natural environments is increasing rapidly. I believe that the only long-term solution for wildlife conservation is quality education of local people. They are the ones who will choose between conflict and coexistence with wild animals.

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

I used Rufford Foundation logo in presentations about the project at Gorongosa National Park, at the University of Idaho, at the Idaho Chapter of the Wildlife Society (ICTWS) of 2018, and in my thesis defence. I acknowledged Rufford Foundation in my thesis, and will also do in the future scientific publications.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Elyce Gosselyn: Field assistant, University of Idaho student.
Tosca Tindal: Field assistant, University of Oxford student.
Alana Reynolds: Field assistant, Princeton University student.
Michel Souza: Field assistant, Gorongosa intern.
Castiano Lencastro: Field assistant, Gorongosa intern.

Local farmers hired to report human-elephant conflict events, to monitor and maintain beehive and chili fences:

Campira Chaurombo, Daniel Zeca Greia, Fernando José Mulegue, Issa Abu Issa, Lavado Vasco, Pedro Gequecene, Pedro Bonjesse, Janeiro Cotama Janeiro, José João Joquita, Sérgio Tito Cinco Reis, Chamar da Silva, José Bestala Franque, Manuel Alface Tesoura, Marcos Armando Jeque, Paulo Albino Luis and **João Felisberto João**

Dr. Ryan Long: Advisor, University of Idaho.

Dr. Jerod Merkle: Committee member, University of Wyoming. Helped with statistical analysis of data.
Dr. Janet Rachlow: Committee member, University of Idaho. Helped with comments and suggestions though the whole project.
Dr. Marc Stalmans: Director of Science, Gorongosa National Park. Helped with comments and suggestions though the whole project.
Dr. Rob Pringle: Collaborator, Princeton University. Helped with comments and suggestions though the whole project.
Dr. Lucy King: Collaborator, Save the Elephants. Provided all her knowledge and experience with the use of beehive fences, and allowed me to be an intern at Elephants and Bees Research Centre for one month.

12. Any other comments?

I am truly thankful for the support I received from Rufford Foundation. The grant allowed me to perform an important experiment that brought improvements and knowledge to Gorongosa National Park and the communities living in its buffer zone.

Thank you very much.