Final Evaluation Report

Your Details	
Full Name	Cesar Rojano
Project Title	Giant anteaters on roads: understanding the problem
Application ID	23277-1
Grant Amount	£4900
Email Address	c.rojanob@gmail.com
Date of this Report	21/02/2020

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
To identify the effect of roads on the behaviour and home range of giant anteaters and understand how this species uses landscapes fragmented by roads.			▨	During the study, the project achieved its objective. Two individuals were captured and monitored for a 5-month period, finding for the first one a home range of approximately 35 ha, and for the second one a home range greater than 250 ha. Both animals kept to one side of the road, which suggests that it constitutes a barrier. As for the use of habitat, both did not use the transformed areas (palm crops and urbanised areas, amongst others), and their habitat was restricted to savannas and natural forests.

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

There were two difficulties for this project, which are described below:

1. The legal procedures to carry out the animal captures delayed the project for more than 14 months. In Colombia, there was a government change during the project start date and this delayed the response to the research permit required by Colombian environmental legislation. In this situation, I asked Rufford for a new deadline that would allow us to send the final project report at a later date. During the process, the importation of the required equipment was carried out.

2. In the way the project was proposed, we initially expected both individuals to cross the road that was close to their home range. The idea was to understand what sites animals used to cross, or what habitat characteristics made them cross at that point. However, in none of the cases did this happen. The solution we found to this difficulty was to restructure the research question, so that the data allowed us to answer how the giant anteaters use the transformed habitats and how the roads impact their home range area.

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

For this project we recognize the following outcomes:
1. For the first time in Colombia, VHF-GPS-satellite technology is used to monitor giant anteaters. This monitoring allowed us to collect important data on the home range area of two adults and the adaptations they generate to habitat conditions. The

previous data for Colombia were estimated based on VHF telemetry that presented a high error range. However, we now better understand the ecology of this species in the country.

2. This project helped us understand the impact the roads have on the home range area of a giant anteater. For the first individual, a young female, an area of approximately 35 ha was found. The limits of this home range were a small forest corridor to the north of its used area, and the road that leads from Yopal to Orocué, in the extreme south. The "fence" tool was used to alert us when the animal crossed the road. However, this did not happen. This means that the animal avoided crossing the road because it perceives it as a threat. For the second animal, an adult male, a home range of approximately 250 ha was found. His home range was delimited by an oil palm plantation and the road. However, the closest point to this road, which leads from Yopal to San Luis de Palenque, was 300 m away. This distance would mean that the animal avoided the road, and its home range does not include this area as suitable habitat. With regard on the anteater's home range area, this project concluded that it is likely that the animals are perceiving the roads as a threat and avoid this in its suitable zone to live. The size of the home range will depend on the conditions of the habitat, especially supply of shelter, water and food, but the roads limited this area in both cases.

3. In reference to the behaviour of the monitored animals, for both the habitat selection index was similar. Male and female presented a high selection value for natural savannas, gallery forests and shrubs. Both presented a low or null selection value for roads and crops (palm, rice, corn). This allows us to infer that giant anteaters avoid the roads as much as possible and can change their behaviour and home range size. However, those who are killed on roads are probably those who live in areas with scarce resources and highly fragmented habitats, which forces them to move and cross the road and are exposed to being run over. This information is extremely important, since it will make it possible to carry out analyses at a landscape scale and around the roads, which will help to identify critical areas for the roadkill of giant anteaters and establish preventive measures in them.

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

The involvement of communities consisted of them supporting and participating in the captures, and in addition to accompanying us during the giant anteater monitoring and characterisation of the habitat. In the specific case of the second monitored individual, he was captured in a private nature reserve where the owners were actively involved in both monitoring and information analysis. Since nature tourism is carried out in this reserve, the owners actively linked tourists in some cases to monitoring. For this reserve it is of special importance to link researchers and wild species conservation processes to their farms, since this helps to preserve in some way the ecotourism, which is one of its productive and subsistence alternatives.

5. Are there any plans to continue this work?

Currently this project continues. From the radio collar that was acquired with the help of this grant, and from the divulgation of the results, new organisations and people were motivated to support our project. This is why we currently have four radio collars with which giant anteaters are monitored in the department of Casanare. The idea is that these monitored animals allow us to generate more information about the ecology of the species in relation to roads. Additionally, new underpasses will be installed on a highway in Casanare, which we will monitor with trap cameras, to determine if they are used by giant anteaters.

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

Two tools are being used to share the results obtained from this project: the publication in an indexed journal of a scientific manuscript about the ecology of the species around roads. Currently we are working on this data. On the other hand, it will be sought that this work be published in a national medium in Colombia, where the scope of the project and the achievements are counted. In addition to this, this project is reported periodically through the social networks of the Cunaguaro Foundation.

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 for a period of 2.5 years, approximately 1.5 years more than the time initially proposed. The cause of this extension was the extensive process that we had to undergo to obtain the capture permit.

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
One (1) Anteater collar VHF +Wireless + GPS	3200	3176	-24	
Transport (4x4 truck per days)	1000	1000		
Researchers per diem	500	524	+24	
Materials and medicines	200	200		
TOTAL	**4900**	**4900**		£1=COP3900 (value of 2017)

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

The next steps should be to increase the number of collars installed on giant anteaters in order to make more comparisons and include new variables in the analysis (for example, ecosystem transformation percentage). Similarly, to support the work carried out by the Cunaguaro Foundation at present, where it seeks to build wildlife crossing points for giant anteaters on high vehicular flow roads. This will consist of monitoring giant anteaters with the use of radio telemetry in areas where there are already built wildlife crossing structures. This will allow us to understand the variables related to crossing through these structures, and to measure their effectiveness.

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?

Yes. Until now, the Cunaguaro Foundation and I have shared the results obtained from this study through their networks, on their website and in academic events. Here are some links.
https://www.facebook.com/pg/fundacion.cunaguaro/photos/?ref=page_internal

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

Daniel Restrepo Marín: Veterinary assistant. Accompaniment during captures to install or remove the collars.

Samantha Rincón: Ecology, support during monitoring of giant anteaters, and data analysis and processing.

Renzo Ávila: Ecology, support during monitoring of giant anteaters, and analysis and processing of data, especially those related to vegetation cover.

Camilo Morales: download and processing of satellite images for data analysis.

12. Any other comments?

I highly appreciate your support and funding. I sincerely apologise for the delay in the delivery of the final report but it was due to external factors.