

Final Evaluation Report

Your Details	
Full Name	Luz Irene Loria Amores
Project Title	White-faced monkey conservation in agrosystems: investigating crop-raiding patterns in maize fields and farmer's perception in Southwestern Panama
Application ID	24386-1
Grant Amount	£4,446
Email Address	lilaloria@gmail.com
Date of this Report	March 2019

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
Collect crop-raiding data about white-faced monkeys in maize fields.				Camera traps were set continually during two periods in one maize field: July – August 2018 and December 2018 – January 2019. Because of unforeseen difficulties, we could not conclude camera trapping in three other farms as we planned.
Explore farmers' perceptions and willingness to conserve.				We conducted interviews in the communities of Cañas Gordas, Plaza Caisán and Dominical, located in Renacimiento District. All farmers who plant maize near forest in these communities were interviewed.
Promote farmer's participation in conservation.				We originally planned to conducted participatory workshops, but we realised that the farmers are not organised and live in places difficult to access, making it difficult to hold a meeting with all of them at the same time. We will conducted follow up interviews and, when it is possible, focal groups to achieve this objective. To date we have educational material ready to promote farmer's participation in primate conservation.

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

We were originally planning on placing cameras in five maize fields in Caisán, but I had to carry out camera trapping only in one maize field. One of the maize fields in Caisán was affected by a tropical storm in June 2018, causing the fall of maize plants and the interruption of camera trapping. The cameras were removed from two other fields due to the request of the owners who withdrew their willingness to collaborate in the project. Due to these drawbacks direct observation of behaviour were not carried out. The difficulties were tackled by moving camera trapping to the community of Majagua Civil located 200 km far from Caisán. In Majagua Civil a farmer offered us his support to place cameras. Two more farmers will facilitate their maize fields to carry out the study in 2019.

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

- A. Camera trapping in Majagua Civil has recorded valuable information on crop feeding behaviour of white-faced monkeys. This is the first study in Central America reporting when and how white-faced monkeys feed on corn crop (Figures 1 and 2). This is an opportunity to explore the behavioural flexibility of this species in environments where the composition and availability of resources has changed, at least for 100 years.



Figure 1. Camera trap photograph of a white-faced monkey manipulating a maize plant. Majagua Civil 2018.



Figure 2. Camera trap photograph of a white-faced monkey carrying a corn ear. Majagua Civil 2018.

- B. Interviews showed that farmers do not take lethal actions against white-faced monkeys during crop feeding events. Only one farmer mentioned that he has hunted monkeys and hang the corpses to scare other members of the troop so they do not return to maize fields. We identified farmers' awareness of primate habitat destruction, suggesting the community of Caisán has a potential acceptance by farmers of conservation efforts. Based on fieldwork and farmers' willingness we identified locations for enrichment planting and natural habitat protection.



Figure 3. Photograph of an ocelot captured by camera traps. Caisán 2018.

- C. Camera traps recorded additional information about terrestrial mammals such as ocelot (*Leopardus pardalis*, Figure 3), crab-eating raccoon (*Procyon cancrivorus*), white-nosed coati (*Nasua narica*), red-tailed and variegated squirrels (*Sciurus granatensis* and *S. variegatoides*), striped hog-nosed skunk (*Conepatus semistriatus*) and forest rabbit (*Sylvilagus gabbi*). Photographs of ocelots are a valuable information because this species was not included in the list of the Conservation Plan of the Caisán River watershed. This information could be used to update the conservation plan. Photographs also recorded corn feeding by coatis (Figure 4). This data is useful for analysing overall crop damage in maize fields.



Figure 3. Camera trap photograph of an adult coati carrying a corn ear. Caisán 2018.

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

My fieldwork assistant is a farmer of Majagua Civil who has been involved in camera trapping and is planning with me a pilot programme of community-based conservation in his farm (Figure 5). His proposal consists in developing honey production as a socio-economic activity friendly to forests where white-faced capuchins and squirrel monkeys inhabit. We also help Majagua's farmers with maize seeds. Some farmers of Caisán are willing to plant trees for habitat enrichment.



Figure 4. Farmer of Majagua Civil involved in camera trapping. **Figure 6.** An example of a sign installed as incentive for a farm where forest is protected.

5. Are there any plans to continue this work?

Yes, we will continue with the activities of the Project of the White-faced Monkey Conservation in Agroecosystems. The aims are to collect information on the full range of crop species included in white-faced monkey's diet and their behavioural patterns associated with crop feeding. We are working on phenological sampling of forests adjacent to maize fields, in order to analyse whether availability of wild fruit influences crop feeding patterns. We are currently installing signs on the farms where forests are protected and white-faced monkeys inhabit. The signs are an incentive showing the phrase: "En esta finca se protegen a los monos y su hábitat natural" (Figure 6, in English: Monkeys and their natural habitat are protected in this farm). We are also interested in developing the pilot programme of honey production in Majagua Civil to support farmers' willingness to protect primates' forests.

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

We already shared information about the project via a national TV channel (https://www.tvn-2.com/mundo-verde/Estudio-local-conservacion-cariblanco-Panama_2_5206749334.html) and local radio programmes: "BCP on the Air" and "Amanecer Agropecuario" both broadcasted by Radio Chiriquí. We also presented results of farmers' perceptions at XXII Congress of the Mesoamerican Society for Biology and Conservation in November 2018. We are planning to prepare a manuscript for the magazine of the Faculty of Agricultural Sciences, University of Panama (Agrocultura). Based on the 2-year project, we are planning to prepare two publications for sending to peer-reviewed journals: (1) crop feeding patterns of white-faced monkeys and (2) farmers' perceptions and willingness to conserve.

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 from April to December 2018. Being this project the first stage of a larger one, this period completes the first year of camera trapping. We have planned to carry out camera trapping during two more periods: July – August 2019 and December 2019 – January 2020. Comparing to the period proposed for conducting interviews, we were not be able to visit hard-to-reach communities where crop-raiding by white-faced monkeys is reported. We are making efforts to visit those locations in 2019 in order to conduct focal groups.

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
23 Cuddeback 20MP IR and Black Flash	3100	3507	+407	Because in April 2018 Amazon.com did not have the amount of camera traps we required, half the equipment was bought in Panama. The shipping and cameras costs were higher than listed on Amazon.com.
25 Memory Card – 32 GB	576	261	-315	The difference was used to complete the purchase of the camera traps.
6 Packs Energizer Alkaline AA Batteries (40 batteries)	35	69	+34	Cameras were placed for a second period (December 2018 – January 2019).
Laser distance meter (50 meters)	152	122	-30	The difference was used to complete the purchase of the camera traps.
Fuel for local transportation	333	333		
Educational material for workshops	250	144	-106	The rest will be used in April and May 2019 for follow up interviews and focal groups.
TOTAL	4446	4436	-10	

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

Once the two years of camera trapping have finished, the first next step is to validate the information collected with farmers, in order to compare their perceptions with the ecological data. This step will allow linking scientific efforts with conservation, involving farmers in the analysis and the proposal of solutions in locations where crop-raiding has become a conflict. It is also important to identify locations where white-faced monkeys is still eradicated by farmers and should be a priority for a community-based conservation programme. For implementing a long-term conservation programme is important to involve children through conservation education. We are currently also in conversations with a student of the Faculty of Agricultural Sciences, University of Panama, for starting educational activities in schools located in the study sites.

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, we use the Rufford Foundation logo in the promotional materials that we gave to farmers: calendars and t-shirts. We also use the logo in photographs published in our Instagram profile. During the course of our work we tagged the Foundation in our Facebook statuses' and Instagram stories using the hashtag #RuffordSmallGrants and mentioned in the acknowledgment of congress' presentations and dissertation seminars.

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

Rodny Chavarría is my fieldwork assistant and helps to coordinate this project. He helps setting up cameras, talks with farmers during interviews and also processes photographs and videos from cameras for further analyses.

Sonia Gallina y **Juan Carlos Serio** are my dissertation advisors from the Instituto de Ecología. They help to analyze the results of my work.

12. Any other comments?

Thanks the Rufford Foundation for the support. This small grant was a great help to develop the Project of White-faced Monkey Conservation in Agroecosystems. We thank all the farmers who open their doors to talk with us during the interviews.