

Final Project Evaluation Report

Your Details	
Full Name	Ana Belen Avila
Project Title	The return of the jaguar: predicting potential community-wide effects of a formidable predator
Application ID	22172-1
Grant Amount	£5000
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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
1. Effect of fear at individual and group level, by analysing body condition, physiological stress, behavioural budgets, daily activity patterns, and social behaviour.				We collected behavioural and stress data from 100 individuals from 10 different groups. Daily activity data of 6 months were obtained. Due to unusual high levels of stress observed in capybaras during captures, I decided to forgo body condition measures.
2. Effect of fear at population level, by evaluating reproductive attributes of capybaras.				Despite our efforts, recording capybara newborns was too difficult and our preliminary figures suggested that the estimates were too biased; thus, we decided to drop this variable from our study design.
3. Effect of fear at community level, by investigating the possible indirect cascading effects on vegetation that capybaras use as forage.				I successfully completed this task by building 10 enclosures and measuring vegetation changes over 1 year.

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

Objectives related to body condition could not be evaluated, given that individuals were stressed a lot when trying to be captured. For the same reason, the animals could not be identified with markings on the ears as expected. In spite of the lack of identification of the individuals, all the other variables could be evaluated. The data were analysed at the group level.

For stress analyses samples were collected and stored successfully. We contacted a laboratory for the analysis of corticosterone, but this analysis could not be done yet, due to permit delays. It will be done in 2019.

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

1) Better understanding of behavioural response of capybaras to predation; for the very first time the reintroduction of a top predator (jaguar reintroduction is planned

to occur in 2 years) is preceded by a study that develops baseline information on the behaviour on what it is predicted to be the main prey (i.e., capybaras).

2). Better understanding and development of clear-cut predictions of the effects of restoring fear (or risk of predation) on the structure of plant communities.

3). Production of ecologically sound information that was fed to the NGO in charge of the reintroduction project.

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

The local community was an essential part for the logistics of our work. There was a constant interaction between both parties. In each field season (n = 5) we updated the community about our activities including a brief presentation of the preliminary results. On the other hand, we advise was given regarding the capture of capybaras and part of the information of the species of interest photographed in the trap fields was given, such as anteaters (*Myrmecophaga tridactyla*) and deer pampas (*Ozotoceros bezoarticus*), which are currently in conservation plans and monitoring. Information obtained about exotic species photographed as feral pigs, which are also in control and monitoring plans, was also offered.

5. Are there any plans to continue this work?

Yes, the next step is to repeat what has been done in the population of capybaras of Iberá that is not exposed to the presence of a predator, in a population of capybaras with the presence of a predator. This year we began to interact with a group of biologists from the Brazilian Pantanal, who are working with ecology of jaguars in a farm with ecotourism. The first meeting was held in September of this year. In this meeting the possible site (Fazenda Caiman, Miranda, Mato Grosso do Sul) was visited for the identification of capybaras of the zone, and the necessary agreements were started to begin our work in the year 2019.

Moreover, in the populations of Iberá, vegetation enclosures will continue to be active, in order to observe the long-term changes (2 years) in the richness and abundance of plant species in the absence of grazing by capybaras. In addition, the analysis of stool samples for the extraction of cortisol, which could not be performed at this stage due to lack of time in the management of agreements with the chosen laboratory, will be carried out. To advance with this objective we contacted to Ayelen Eberhardt (National University of the Litoral, Santa Fe, Argentina) who is working with stress in capybara to make the analyses of our samples and advise us with all associated procedures. Pantanal samples will be added to Iberá samples to evaluate basal stress levels in both populations.

We are going to continue working with the NGO the Conservation Land Trust as the jaguar's reintroduction project progresses.

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

Once we complete data analyses we will share the results with: (1) public via public talks and at least two non-technical articles in a magazine and a regional newspaper; (2) scientific community via presentations in professional meetings and articles in peer reviewed journals; and (3) NGO in charge of the jaguar reintroduction project and wildlife state agencies via technical talks and reports.

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

The field seasons were carried out from December 2017 to August 2017. During this period the funds provided by Rufford were indispensable to complete the data collection. The project will run until December of 2018 to complete the statistical analysis of the data, leaving only the analysis of pellet samples for the next year.

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
Field vehicle gas and maintenance	880	1222	242	In this item, bus passages to the place of study were included for main investigators and field assistants
Food supplies and lodgings in the field	765	748	17	
18 Cameras traps Bushnell Nature View	1260	1241	19	
Portable sound recorders Sony LCD	140	0	140	Instead, two portable speakers were purchased
Portable speaker	120	240	120	
Binocular Bushnell 10x50	130	130	0	
Tranquilizer darts and anaesthetics	155	0	155	Finally, we do not capture animals
Field Supplies	850	1031	181	In this item are mainly the expenses for the assembly of the enclosures and predators models. Also included here the purchase of rechargeable batteries and ladder

				for observation of individuals of capybaras.
Field Laboratory supplies (liquid nitrogen, laboratory tests)	700	35	665	Laboratory analyses will be completed in 2019; the cost of such analyses has not varied, and the funds requested to Rufford will be used as expected.
TOTAL	5000	4647	353	Exchange: 1 pound= 21.66 Argentine peso (October 2017)

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

The next step is working on the design for the comparison with the capybaras of the Brazilian Pantanal. The contrast of these two populations, with and without jaguars, will allow us to improve our predictions about the possible changes that may occur in Ibera after the reintroduction of the top predator in the area.

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?

The logo was used in seminars within my institution and with the NGO in charge of the jaguar reintroduction project. It is planned to disseminate the logo in the works to be presented in congress the following year and in dissemination activities.

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

Members	Role
Carlos De Angelo	Collaboration in planning of field activities, logistics, statistical analysis. Advisor of project.
Maria Jose Corriale	Advice in biology and ecology of groups of capybaras, design of the experiment and selection of variables to evaluate.
Emiliano Donadio	Collaboration in planning of field activities, logistics, statistical analysis. Co-Advisor of project.
Debora Di Francescantonio	Collaboration in identification of plant species
Fernando Folleto	Collaboration in identification of plant species
Esteban Pizzio	Field assistant
Daniel Depaolini	Field assistant
Franco Montejano	Field assistant



Left: predator model. Right: Installing sound speaker.



Left: Collecting behavioural data. Right: Vegetation enclosures.