

## The Rufford Foundation

### Final Report

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Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other 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. 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. Please note that the information may be edited for clarity. 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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
<b>Your name</b>	Maria Runnebaum
<b>Project title</b>	Pineapple plantation's Impact on Medium and Large sized mammal Composition and Occurrence in Sarapiquí, Costa Rica
<b>RSG reference</b>	13811-1
<b>Reporting period</b>	July 2013-August 2014
<b>Amount of grant</b>	£ 5926
<b>Your email address</b>	mariaruj@gmail.com
<b>Date of this report</b>	August 19, 2014

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
Analyse medium and large sized mammal assemblages on different human-disturbed conditions to generate information about their activity in agro systems and disturbed areas			X	Thirty different sampling sites where established in forest remnants surrounded by landscapes with different degree of anthropogenic disturbance (pineapple plantation, cattle areas and reforestation areas). In each site we deployed one camera that was moved each month within the same site area to improve capture probability. An additional 15 static cameras were established to compare results with the moving cameras. Altogether, 25 species from 17 different families were captured of 1730 photo/video captures.
Defining forest cover patterns and analysing structural connectivity within the different landscape's remnants			X	We worked with satellite information of the area on ArcGIS 10 to determine the structural connectivity of the different landscapes. We defined different land covers relevant to this investigation: High-Medium Density Forest, Low Density Forest, Pineapple Plantation, Reforestation Area and Pastures. Also we determined the land-use on a smaller scale. For many areas we found that there is not that much fragmentation as there is deforestation, however, the forest remnants maintain a relatively good level of structural connectivity. However further studies are required to determine if there is functional connectivity for terrestrial mammals as well.
Evaluate the conservation value for mammals of this remnants according to the species found			X	Only 13 of the species found were in remnants near the pineapple plantations. Some of the missing ones are important seed dispersers that are a fundamental part of the ecosystem, which is disturbing.

				However many endangered species such as <i>Leopardus pardalis</i> , <i>L. wiedii</i> and <i>Puma yagouaroundi</i> were found in remnants near areas with high disturbance.
Characterise the way mammal fauna has changed since 1950 in the area		X		Due to the lack of and unorganised data, this objective has been a little bit more difficult, however we are on the process of revising all the material that is available

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

The main difficulty that arose was the weather. Even though it was summer, in the Caribbean side of Costa Rica weather is very unpredictable so the investigation had to be delayed a couple of months. Afterwards in many occasions we had extreme rain which made it difficult and dangerous to access some of the sites where the cameras were. Also it damaged some cameras which had to be replaced. A second difficulty were the poachers, we had four cameras stolen and also we had to withdraw the cameras during Easter week since it is “high season” for poachers and we wanted to avoid more cameras being stolen.

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

- We collected important baseline data (currently being analysed) about terrestrial mammal occurrence in forest remnants in the region of Sarapiquí, Costa Rica. The pasture areas and pineapple plantations on which this study took place are adjacent to Braulio Carrillo National Park (which is the largest in the Central Valley of Costa Rica and is part of the Central Volcanic Range Conservation Area) and are considerate buffer areas, so generating this type of information is of great importance for the National System of Protected Areas.
- We were actually surprised to find many species in the forest remnants near the pineapple plantations. Species such as *Leopardus pardalis*, *L. wiedii* and *Puma yagouaroundi* are occurring in these areas with high human disturbance. Even species with complex social behaviour such as *Pecari tajacu* are found in these areas. However many of the species that were found in areas near pastures or continuous forests were absent in the pineapple areas, such as *Dasyprocta punctata*, that even though it is not endangered or even threatened, it’s a crucial species for seed dispersal as well as a primary prey for other animals, so even though we have data that support the presence of different species, we doubt the equilibrium and health of the whole ecosystem in these areas.
- The complexity of the landscape in this area allows endless opportunities for investigation. Our results awoke interest for different projects not only with terrestrial mammals but for other groups as well, such as bats, birds and plants that would complement with our investigations. The results from these projects will generate invaluable scientific information as well as provide Costa Rican and international conservation institutions a better understanding of wildlife in these landscapes. They will be presented to national and

international institutions including those in charge of the management of environment and protected areas.

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

The local community was involved from the beginning, as we interviewed with several farm owners and workers to select the sampling sites. Also in many cases community members joined our field surveys to learn more about the investigation, so we took advantage of these moments to talk about the animals found in their lands and the ecological importance of conserving the remnants and the animals. All of the people we worked with were very cooperative and interested in the project. This project was a big step for many land owners so to thrust their integration in the ACCVC's projects of payments for environmental services (PES).

**5. Are there any plans to continue this work?**

Yes. Now that we know the assemblage of mammals in the different areas, we are interested in continuing with a second phase of the project and learn how these animals move within the remnants and its use, if they are staying within the plantations or are they crossing to other sites. We are interested in using radio-telemetry with different species that were found such as *Eira Barbara* and *Leopardus pardalis*. I believe that understanding how these animals are moving and using the different landscapes is fundamental, so adequate management programmes can be established for sustainable development and conservation.

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

It is our intention not only to divulge our findings in campaigns and presentations at different Universities and communities at a national and international level, but also by journal publications, scientific meetings and my own dissertation.

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

12 months. Initially it was used to purchase the rest of the equipment that we needed such as the computer so we could analyse the sampling sites and then during the sampling period from November 2013 to May 2014. After the sampling period we have been compiling all the information and working with the statistics. The project got a couple of months delayed due to bad weather that made it impossible to sample during August and October 2013. We are currently in the process of analysing data and writing results and discussions.

**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.**

Item	Budgeted Amount	Actual Amount	Diff erence	Comments
Computer	£776	£790	-14	
Mammal Scent attractant	£103	£100	3	

Housing (Main researcher)	£910	£900	10	
Field Work (Tirmibina)	£70	£70	0	
Field Work (La Selva)	£161	£161	0	
Food (Main Researcher)	£1092	£1100	-8	
Traveling to site (Gas, Car expenses)	£812	£750	62	Car travel was cheaper than we expected.
Field Assistant (Food + Housing)	£2002	£2015	-13	
<b>Total</b>	<b>£5926</b>	<b>£5885</b>	<b>£40</b>	Exchange rate: £1= ₡771.05 (at time of receipt of grant)

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

First of all, we need to finish analysing all data collected and publish results, so we can continue our work with the following project.

Based on the experiences of the current project and observing the urgent requirements for conservation in this area, we feel that the following points need to be undertaken as a follow up of this project:

- There is need to integrate a genetics research activity in the area, since we do not know the circumstances regarding gene pool. We know that many species occur in these remnants but we have no idea of their movements, connection or their mating possibilities. We believe that genetic information could give use a big amount of data regarding their health, movement patterns and connectivity.
- Many areas in Costa Rica still remain unsurveyed and have important extension of unprotected forests. The pineapple plantation used in these investigation, although is one largest, it is also one of the few that incorporate organic pineapple crops (almost 50% of their plantations), and are very open into maintaining riparian forest intact within the property. This is not the case with other corporations, so it is of great importance to survey and monitor other plantations that are under different circumstances and in different areas of the country so we can have a more complete idea of the situation.
- There is a significant amount of illegal deforestation for the expansion of the crops and nowadays there is no exact number of what is total national area occupied by pineapple plantations because there is no census or control by municipalities or any other organisation. It is important to generate of historical patterns in land use change and project these for the future so correlations can be made with data about wildlife diversity and abundance and adequate management programs can be established.

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

Yes. During an power point presentation of this project in the University of Costa Rica and also in another presentation I made for a course I received of *Species Monitoring and Conservation: Terrestrial Mammals*; in the Smithsonian-Mason School for Conservation in Virginia, USA. It will be used again during my thesis defence and also if I get to participate in the 95th Annual Meeting of the American Society of Mammalogists in 2015 in Jacksonville, Florida.

**11. Any other comments?**

We greatly appreciate the Rufford Small Grant Foundation for their valuable support in the success of our project. We hope to accomplish even more in the next phase of the project and we hope RSGF will help us again with its accomplishment. Thank you very much for making a difference!