

The Rufford Foundation

Final Report

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.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details

| | |
|----------------------------|---|
| Your name | Raquel Bone Guzman |
| Project title | Landscape and management factors related to terrestrial mammal conservation in the Golfo Dulce Forest Reserve, Costa Rica |
| RSG reference | 25691-1 |
| Reporting period | 2019 |
| Amount of grant | £ 5000 |
| Your email address | raquelbone@gmail.com |
| Date of this report | 29/11/2019 |

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 |
|---|--------------|--------------------|----------------|--|
| Determine which terrestrial mammal species are present by now -and their spatial distribution- at the Golfo Dulce Forest Reserve (GDFR) | | | | With 11 months of fieldwork, and 70 camera trap stations that have been set across diverse sites across GDFR (Fig. 1), northeast of the forest reserve, near to Piedras Blancas National Park still being sampled. Determining if large mammals like the jaguar (<i>Panthera onca</i>) are able to move through this area is fundamental to assure species continuity in the Osa Peninsula. Functioning as a biological corridor is supposed to be one of the main aims of GDFR. Once we finish these last sampling points, we will be able to determine completely the spatial distribution of our study species. |
| Determine how GDFR landscape and management factors are related to each mammal species occurrence | | | | We have observed how landscape properties like elevation, distance to rivers or slope terrain; management factors like land use (forest patch size, payments for environmental services-PES, agriculture, ecotourism, etc) or roads, as well as threats like hunting and habitat loss/fragmentation seems to have different effect depending on each species life history and their tolerance to disturbance. Models to establish which variables are affecting particularly each endangered mammal occurrence will be conducted as soon as the 1 st year of sampling will be finished. |
| Establish a baseline for continuous mammal monitoring and recommend punctual actions to protect target species to governmental decision-makers, landowners, and local communities | | | | We have identified routes and "hotspots" that each endangered species constantly uses, as well as hunters and illegal loggers. We need to focus on vigilance and monitoring on these particular sites in the GDFR. Efforts must be done with extra staff and more financial support from the government to the landowners and communities so they can actively be involved in wildlife |

| | | | |
|--|--|--|--|
| | | | monitoring and protection. Meeting with authorities and talks to the communities to promote mammal knowledge and conservation within GDFR will be done in the next months. |
|--|--|--|--|



Fig.1. Sampling points/camera trap stations (green dots) across Golfo Dulce Forest Reserve (Yellow line and yellow shadow). Red dots represent stolen camera traps. Blue lines are 4 x 4 km grid.

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

Despite their importance, the protected areas face several difficulties because rangers are understaffed and underfunded, and they are unable to job properly and accomplish with its goal of wildlife conservation. Precisely, the start of the project was affected by these factors; we were supposed to be supported with transportation through the GDFR by the environmental ministry, but this was not possible. Fortunately, I was helped by the University of Costa Rica and the funds provided by the Rufford Foundation to solve this issue.

We knew the Osa rainy season would be hard in terms of logistics. During the rainy season, I could not have access to sites where trap stations were set and, in some cases, the camera trap review was delayed. Also, due to the rain, some camera traps were malfunctioning or stop working even when they were protected from the rain. However, notwithstanding, we have obtained very valuable data because the rainy season had been poorly sampled in the past and constituted an information gap for the mammal species spatial distribution in the place.

The other challenge we have faced during the project is the equipment robbery in the field. We have lost four camera traps. The places where cameras were stolen coincide with sites where there are identified hunting and illegal logging pressures, but this also allowed us to identify these hotspots.

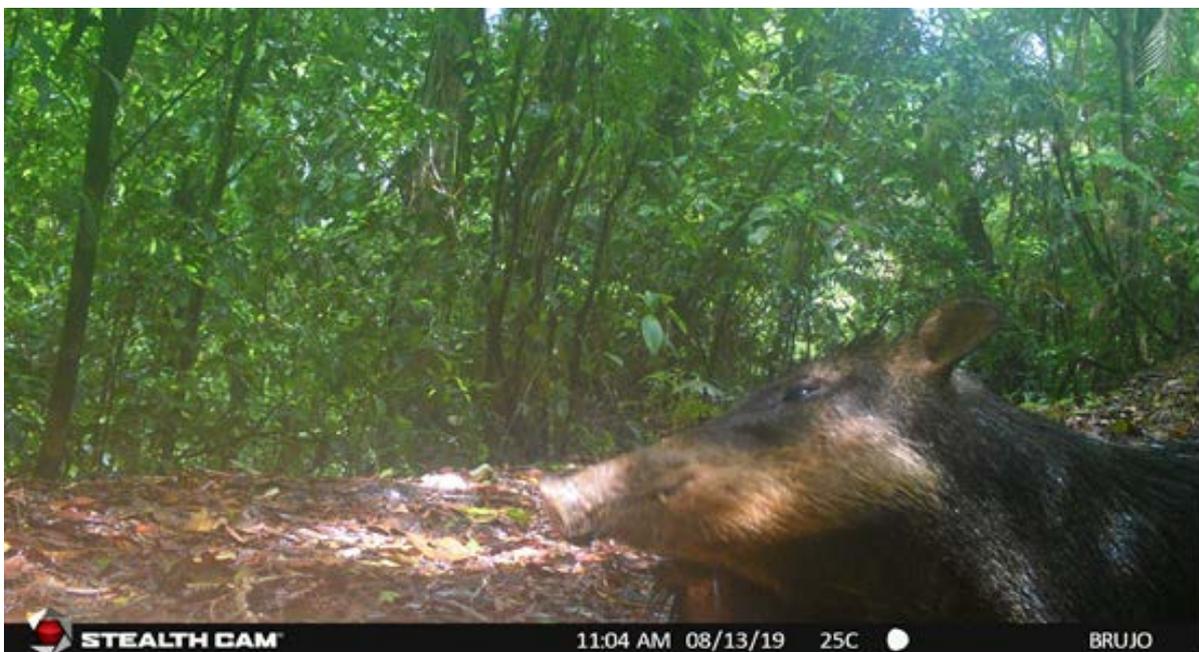
3. Briefly describe the three most important outcomes of your project.

1. Our first valuable result: the confirmed presence and constant habitat use of the GDFR by all target endangered study species, including jaguar (*Panthera onca*), white-lipped peccary (*Tayassu pecari*), Baird's tapir (*Tapirus bairdii*), puma (*Puma concolor*), ocelot (*Leopardus pardalis*), collared peccary (*Pecari tajacu*), margay (*Leopardus wiedii*), red brocket (*Mazama temama*), jaguarundi (*Puma yagouaroundi*) and spotted paca (*Cuniculus paca*). This means the forest reserve, mostly owned by local people, plays a key role in the survival and future of the populations of these threatened species going further than acting as a buffer zone for them.
2. We have spatially identified movement route sites for large mammal species like jaguar, puma, tapir and white-lipped peccary according to particular landscape and management conditions in GDFR. We also found and geo-referenced that some of these sites suffer illicit activities like poaching and illegal logging, which have a direct impact on our species. Given the large size of GDFR (627 km²), we denominated these places like "hotspots" or priority points, where vigilance and monitoring must focus as soon as possible. The maps containing this information and acting recommendations will be delivered to governmental authorities in the next months.
3. The fundamental active participation of landowners/keepers and their families have been determinant in the successful development of this project. Their knowledge of GDFR forest, mammal movements and distribution, and their company in the set of camera traps have helped a lot in the detection of all elusive mammals. Being part of the project and sharing with them camera trap pictures, they have had a very positive and enthusiastic response and their perception about the wildlife living on their land. For me, this is the most valuable outcome of the study. Also, students, professors, drivers from the University of Costa Rica, both from the regional southern campus in Golfito and from the central campus in San Jose, volunteers, rangers, assistants, local activists and researchers have participated and shared the experience of monitoring mammals in GDFR. Learning and listening to their life histories and points of view regarding different actors involved in GDFR wildlife conservation have been crucial to elaborate and

communicate to decision-makers urgent management actions to protect endangered terrestrial mammals and their habitat.



Male (left) and female (right) jaguars during their mating period in "El Descanso", a property owned by a local family in Golfo Dulce Forest Reserve.



The highly endangered white-lipped peccary uses consistently "Finca Paraíso", a property owned by a local family that is struggling to get PES.



Puma registered along time on the same passing route in one Golfo Dulce Forest Reserve "hotspot" site.



Poacher with his dog captured by one of our camera traps that luckily was not stolen.



Illegal logging registered near a camera trap station in November 2019, this activity has a direct impact on the lack of species we got there.



Left: Landowner Lleiner and friend/neighbour Omar, who arrived with his father in first land colonization. Right: UCR Ecotourism assistant Cristian, volunteer Tomás and landowner Jhonson setting a camera trap.

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

As mentioned above, direct contact with landowners/keepers of local communities has been fundamental in my research project. Sharing the mammal photos with them has led to a chain of trespassing the information with their family, friends and neighbours. The photos have been used by landowners/keepers for ecotourism, evidence of wildlife presence for applying to payment of ecosystem services, or even home decorating. On the other hand, direct involvement as monitoring field guides or getting familiar/in charge of camera traps becomes an invaluable “our” project feeling. These sense of commitment with camera traps, photographing tracks they found on the day by day, or any wildlife knowledge sharing, or constant reports constitute priceless local research that also motivates landowners to feel proud of their conservation effort.



Don Alvaro explaining Baird's tapir movement routes between forest and palm oil plantation through this land to UCR Professor Hellen and me.

During the project, we found evidence of lacks and needs for both wildlife and people of this vulnerable protected area. Conservation efforts urgently require more personal and financial support of the Costa Rican Government to landowners and communities so they can actively involve in wildlife monitoring and protection. Presenting this information to authorities, denouncing illegal activities in GDFR as well as helping landowners to get PES, have become a fundamental part of the project.

Besides, communicating talks to promote mammal knowledge and conservation in GDFR and surrounding communities, local schools or universities have been part of the project aims that just started a couple of months ago.



Showing to Palmar Norte school kids how a camera trap looks like and how it works to capture the terrestrial mammal species in the forest surrounding their homes. Photo: Laura Rodríguez

5. Are there any plans to continue this work?

Yes, we plan to continue GDFR mammal monitoring hand in hand with landowners and more students of the University of Costa Rica. The main goal is to get governmental authorities more involved as active participants and to get closer to the needs of local communities and wildlife conservation.

I am also very interested in going further on researching the spatial distribution of large and medium-sized mammals in the Osa Peninsula. We do not know very well how population statuses inside Piedras Blancas National Park are, which directly relates to the effectiveness of GDFR as a biological corridor between this and Corcovado National Park. We also need to determine if animals like jaguars are able to move over and cross to the next important forest patch: Fila Brunqueña. I would like to continue this work on a PhD dissertation, with the help of people, government and organizations like the Rufford Foundation.

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

I already have shared some of the results throughout talks to kids, researching groups, workshops, seminars, and PES authorities. However, my intention is going beyond and participate in meetings with government environmental authorities, make talks to promote mammal knowledge and conservation in each community of the GDFR involved in the project, local schools, UCR south and central campus. Also, I would like to participate in symposiums and disclose the results throughout newspapers, social media like Facebook and Instagram. I am looking at how to produce a documentary about GDFR landowners because they have much to say about their situation as landowners and conservationists and government or NGOs do not put attention to their complaints. Finally, I have to write my thesis and publish it as a scientific paper.

Jaguars from Golfo Dulce Forest Reserve (top left and bottom) captured by our project been showed during the last "Science for Jaguar Conservation Symposium" organized by Panthera Costa Rica, November 2019.

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

The Rufford Foundation grant has been used during the present year, 2019. Given we had some logistics delays to start the project and weather conditions during the rainy season, we still have 2 more months of data collection. Next year I will present the thesis and all publications will be sent to RF.

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 | Difference | Comments |
|-----------------|-----------------|---------------|------------|--------------------------------|
| Equipment | 892 | 892 | | |
| Travel Expenses | 2500 | 2500 | | |
| Field Assistant | 1250 | 1250 | | |
| Transport/Fuel | 358 | 358 | | |
| Total | 5000 | 5000 | | 1.40 £GBP = 1 \$USD = 570 ₡CRC |

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

As explained before, the first next step is to finish data collection. Once we are done, result analysis will be presented and discussed with authorities and shared in a practical way to landowners and communities. Also, we need to go further and impulse and eliminate legal obstacles for PES for local families with no economic resources to legal fight for this. My hope is that my data can be used as support to highlight the importance of PES for landowners to continue with their conservation efforts.

On the other hand, with the spatial identification of the "hotspots", we need to start focusing vigilance and protection, as well as giving more assistance and environmental education to the neighbour communities to motivate protection instead of poaching and illegal logging.

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

Yes, I include the Rufford Foundation logo in all talks given in PES offices, University of Costa Rica, exchange student programs, local schools and communities. When I finish my talk, especially with UCR students, I motivate them to apply to the Rufford Foundation if they have any conservation idea.

I also shared on social media updates of Rufford reports. All photos that will be released next year for environmental education will include RF logo, as well as talk, poster, and scientific publications.



Example of “Thanks” slide to thank all contributors to the project. This one in specific from activity “Science in everything” with school kids from Southern Costa Rica.

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

Thesis Advisors: scientific guides, contact, logistic and equipment helpers in Osa Peninsula

Eduardo Chacón, UCR Professor, main advisor
Jorge Lobo, UCR Professor, co-advisor
Guido Saborío, SINAC, co-advisor

Landowners/keepers: forest guides, allies in conservation, contact and logistic helpers

Alcides Parajeles and family
Edier, Heizel, Tuco, Eduardo Sanchez and family
Jose Tobias Sibaja and **Doña Mari**
Paulino Steller
Juan Blanco
Claudine and Ghislain from **Finca Purimas**
Juana Jimenez and **Enrique Cambroner**
Junior Alpizar
Victor Galagarza
Gerald Keith
Gerardo Cerdas
Desiderio Soto and family
Eduardo and family from **Ecoturístico La Tarde**
Gustavo, Lorena, Lila and **Misael** from **Albergue La Laguna**
SINAC Rancho Quemado

Ramón Steller and son
Fundación Neotropica
Reinaldo Aguilar
Ileana and Regulo from Refugio Mixto Punta Rio Claro
Doña Mayra from Corcovado Zip Line
Ashley, Joshua and Omar from Finca MICES
Trino Bellanero
Evaristo Bellanero
Sandra Gonzalez and **Douglas Valverde**
Erlin Chaves and family
Roy Jimenez and family
Don Efraín and **Isaac**
Abraham and **Liz** from Hotel Bosque Rio Tigre
Rebeca from Estación Biológica Tamandua
Felipe from Leona Lodge
Javier and **Carlos** from Proyecto Eywa
Jhonson Villalobos from Madreselva
Enrique Obando
Mike from Hostel Corcovado Backpackers
Geovani Solís
Mario Urpi and **"Gato" Pérez**
Marcos Mesén and **Canopy Bosque Mar**
Nari from Luna Lodge
Don Alvaro and **Gregorio**
Sergio Jiménez and family
Katherine Muñoz
Carlos from Suital Lodge
Victor Cerdas and **Jessica Roldán**
Henry Monge and family
Minor and family from Hotel El Descanso
Cristian from Lomas del Sierpe Osa Conservation

Allies: contact, equipment, logistics helpers, field assistants, scientific or field guide, etc.

Lucía Valverde, FBS
Reinaldo Aguilar, local researcher
Juan Diego Araya and **Hellen Solís**, UCR-Golfito Professors
Laura Phillips, **Teodoro Willink** and whole PIOsa team
Arellys Bianco from UCR Osa Golfito Laboratory
Andrea Fallas, **Doña Mireya**, **Jorge** from Neotropica
Anthony Giordano, US researcher
Ronit Amit, UCR professor
Arlet Quirós, local researcher
Nelson Chaves, **Milena Cambronero**, **Jose Miguel Valverde** and **Alvaro Picado**, field assistants
Cristina, **Karina**, **Ericka**, **Mariela**, **Magaly**, **Abigail** and **Cristian**, Ecotourism Students Assistants
Andrés, **Gabriel**, **Elvis** and **Victor**, UCR drivers
Tico Haroutiounian, jaguar photographer

Juan José, Julio and **Iván** from SINAC

A lot of people from Osa Peninsula...

Thanks to all of them!!

12. Any other comments?

I want to thank Rufford Foundation for giving me the trust to develop this project. We have had some delays and difficulties, but we have also obtained very valuable conservation and research results. Thanks to organisations like the Rufford Foundation students like me can develop our own ideas that may not be logistical easy. Thanks for helping people that really love wildlife!