

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	Galo Buitrón-Jurado
Project title	"Facebook of the forest: Bird-plant mutualistic networks in Equatorial cloud forests"
RSG reference	18164-2
Reporting period	2015-2016
Amount of grant	£ 4989
Your email address	galobuitronj@yahoo.es/gabuitronj@gmail.com
Date of this report	

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
A checklist, abundance estimates and determination of the pattern of diversity of frugivorous and nectarivorous birds in three Venezuelan protected forests			X	We obtained significant records and new localities for three bird species: <i>Tangara rufigenis</i> , <i>Aburria aburri</i> and <i>Mycropygia schomburgkii</i> .
Detailed documentation of the foraging behavior and the importance of different guilds of birds to pollination and seed dispersal.			X	A reference collection of plants used by birds is currently under identification using herbarium specimens.
Identification of critical plant species used in the diet of endemic bird species of frugivorous and nectarivorous birds.			X	
Determination about if closely related species show similar levels of ecological specialisation and how these relationships could help to predict the impacts of the removal of particular species due to human disturbance or climatic change in cloud forests.			X	Climatic change effects were observed and documented, they will be more deeply analysed.
Increase awareness about impacts of disturbances to pollination and seed dispersal networks in Neotropical cloud forests through a blog.		X		Time constraints have limited our contributions to the blog.
Improve forestry plans adding information of mutual networks to accelerate forest recovery in watersheds as Palmichal and cloud forest protected areas.		X		Our project has identified most common tree species in Palmichal, Altos de Pipe and Dinira, and they will be included in the near future in Palmichal forestry efforts. Also, climatic events indicated that endemic tree species could be affected by climatic change.

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

As every field project, some difficulties arose during the fieldwork and they should be explained. Most of difficulties were associated to the complex current economic and political situation in Venezuela. Shortages of food, transportation and the energy crisis delayed the field work, and sadly increase the planned budget especially concerning to food and transportation. All of these were unforeseen difficulties, although fortunately they were solved partially or totally. Transportation had to be arranged using private vehicles considering the difficult access to our study sites and the difficulty to use public transportation. We required to reduce our field effort in the farthest location, Dinira National Park, due to the shortages, delays and time constraints including landslides in the main access road. On the other hand, as previously stated one of our objectives was predicting the impacts of the removal of particular species due to human disturbance or climatic change in cloud forests. During 2016 climatic events were markedly observed in Venezuela including the extremely long dry season with a reduced amount of rainfall in the northern mountains and an increased temperature regime. These conditions affected the flowering and fruiting periods in the Coastal Cordillera, in order to obtain properly amount of data for hummingbird networks, we carried out extra field trips to Palmichal, which permitted to reduce our sampling bias among locations. Additional, difficulties were related to field assistantship because of the great amount of time needed to complete the acquisition of traits from museum collections and herbarium specimens. We solve this problem obtaining help to this task and providing some parts of the field fees, this increase was fair according with Venezuelan economy and the academic preparation of the participant personal. Assistantship from stakeholders was also obtained and it facilitated data collection in Palmichal.

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

1. Our preliminary analysis indicated that ecological convergence seems to be the main process in the structure of bird-plant networks of Venezuelan cloud forests. Consequently, ecological redundancy seems to be key to maintain the high levels of diversity of birds and plants inhabiting these forests. This information should be added to the assessment of these ecosystem for the new red list of world ecosystems of the International Union for nature conservation (IUCN).
2. To increase the local knowledge and sharing of information to local stakeholders is important to promote effective protection of tropical protected areas as Palmichal. Local communities are not completely aware about the importance and value of the native forests for their water supply. One important outcome was to provide scientifically data and advice to Fundacion Civil Palmichal, who is in charge of Palmichal forest reserve. As an outcome of our project there is now an open channel to develop research in Palmichal Reserve by the Center of Ecology of IVIC.

3. Venezuela faces important ecological challenges related to the economic and political panorama. Our project has gathered important data about the ecological condition of cloud forest in the Coastal Cordillera which are the main watersheds but at the same time they lack of update information about their ecological and conservation conditions which is a welcome outcome of our project, especially about the status of several endemic bird and tree species. Our project highlighted the importance of complete assemblages of nectarivorous and frugivorous birds to preserve cloud forest dynamic. Endemic bird species of hummingbirds and fruit-eating birds were key participants in the interactions networks of Venezuelan cloud forests.

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

This project was part of my research for fulfil the requirements of my doctoral degree and the main emphasis was related to improve the ecological data about the Venezuelan cloud forests. The main benefits of this project delivered to stakeholders was baseline information for improve conservation management. It has been very rewarding in the Palmichal area where our information could be delivered to children from local communities. They received didactic talks and we are committed to deliver additional didactic material to help with environmental education in the primary school "Manuel M. Ramos". These activities have raised the interest of children and their parents in the biodiversity of the reserve and their importance to protect their water supply. At the same time, we have delivered a complete checklist of the bird species recorded and a checklist of the main tree species. Tree species and seed sources identified in our samplings will help to Fundación Palmichal to improve their current forestry plans in the reserve and tourism activities. We expect that taxonomic identification will permit to protect endemic tree species which could be used in forestry plans in Palmichal. Our project has also open new opportunities to research and conservation in Palmichal by IVIC. It will highlight the importance of Palmichal for protect water sources in northern Venezuela. Palmichal is the main watershed for Puerto Cabello where there is a high demand for water supply and consequently there is a strong need to increase the forest area within the basin. Our surveys highlighted marked differences in tree composition among Palmichal and other areas of cloud forest in the Coastal Cordillera and our surveys will help Fundación Palmichal and PEQUIVEN in their efforts to protect sensible areas of the reserve holding important stands of endemic palms. On the other hand, in Dinira our project contributed to increase protection efforts in the southern part of the range where ecological information is lacking. All our reports will be delivered to INPARQUES and Ministerio of Ecosocialismo and Aguas to improve the management of these protected areas. We are working also in the production of identification plates and identification guides to be delivered in the area to facilitate their use for the community and rangers in Dinira and Palmichal. On the other hand, they are now using this knowledge to improve tourist experience in Palmichal but tourist activities in Dinira will be difficult to implement due to the rugged access to the zone and the lack of state support to improve roads and security.

5. Are there any plans to continue this work?

There is still many information obtained for this project to be analysed and published. These activities are in ongoing progress and we expect to complete them in the next months including the editing and uploading of tree species plates and the identification, labelling and delivery of botanical samples. Furthermore, we hope our work will permit to perform new studies for students at the Ecology Center of the Instituto Venezolano de Investigaciones Científicas (IVIC). Most of the equipment necessary to repeat the project remains at Centro de Ecología and we are planning to perform short surveys to other Venezuelan cloud forests in the next months in collaboration with the herbarium personal. During the next month's, scientific publications will be prepared and submitted to complete the extension of results. I will gladly assist any Venezuelan student with interest in study related aspects of bird plant interaction in Altos de Pipe and currently I am advising Anais Bastidas. Similarly, we will provide scientific advice to future questions to Fundación Civil Palmichal and PEQUIVEN. We hope also to complete our outreach efforts throughout the scientific communication in the blog and in national journals.

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

Until now project information has been released in several ways to interested parties. First, didactic plates, photos and field reports has been delivered to Fundación Palmichal and PEQUIVEN for their use in Palmichal Reserve and Puerto Cabello offices. Similarly, formal reports and photos will be delivered to INPARQUES and Ministerio of Ecosocialismo and Aguas for their use in cloud forest protected areas. Botanical samples will be deposited at Herbarium IVIC with duplicates in the National Herbarium for research use. As previously stated, we are currently working in didactic plates about the tree species recorded in the Coastal Cordillera to be delivered online. The major part of the information is planned to be delivered as part of my doctoral dissertation and we are working in three research papers to summarize the results of our research in Venezuelan cloud forests. It has been planned also to present our results in the next Botanical and Ecology Congress in Venezuela in July, 2017. We are also collaborating with the research of students in the USB, UCV and IVIC.

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 RSG fund was used throughout the duration of the fieldwork as planned from November 2015 to October 2016. Nevertheless, the current economic and political situation in Venezuela produced several delays which affected to outreach activities. In this sense, we considered that the actual length of the project will require an additional period (4-6 months) to finish analyses and the publication of scientific manuscripts.

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
GPS devices	252	306	-54.5	
Optic equipment	756	460	296	Part of the equipment was obtained from additional funding.
Computers, drives & accessories	365	661	-428	
Materials (alcohol, bags, vials, batteries, string)	390	290	100	
Food & Hostage	2000	2000	0	
Assistant fees	630	400	130	
Travel expenses	242	513	-308	
Outreach material (poster, didactic plates, copies)	189	160	29	
Scientific communication & prints	126	100	26	Delivery is planned in February 2016
Botanical identification & collection access	0	60	-130	
Total	4950	4950		

1 GBP=1.24 USD

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

During this project, a large amount of data was collected which need to be analysed completely before the submission of my doctoral thesis manuscript. Considering this, ongoing work is being carried out to submit a final draft on August 2017. The most important step to be performed is carrying on the phylogenetic analyses of our bird communities in the IZET laboratory under the advice of Jorge Pérez-Emán. After that, we need to spent time for writing academic papers. Likewise, we are still identifying botanical samples in order to provide a definitive and complete checklist of tree species found in Dinira to INPARQUES.

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?

The RSGF logo was used in all material related to the project included talks, checklist, didactic plates and reports delivered to PEQUIVEN and INPARQUES. RSGF logo was used in the talk presented for the Day of the Earth in Puerto Cabello and in environmental talks in the school "Manuel M. Ramos". We need to add that all information currently published from a previous RSGF grant has been properly

acknowledged (see: Check List 10: 153-155; Ardeola 63: 357-367). Similarly, RSGF is going to be properly acknowledged again in my Doctoral thesis manuscript and in any subsequent talks, presentations or writing publication.

