

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	Ícaro Menezes Pinto
Project title	Do changes in bird assemblages impact local seed dispersal and insectivory in tropical forests?
RSG reference	22426-1
Reporting period	6.15. 2017 – 06. 20. 2018
Amount of grant	£ 5000
Your email address	impinto@uesc.br
Date of this report	14 June 2018

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
Bird sampling in fragments of Atlantic forest in southern Bahia, Brazil				We captured 495 individuals, belonging to 56 species, distributed in 23 families. Of these, 12 strictly frugivorous species, 27 insectivorous species and 17 other species have another type of diet (e.g. carnivorous, nectarivores and granivorous).
Arthropod sampling				We obtained 40 samples of litterfall arthropods and 40 samples of phytophagous arthropods at the 20 sample sites. These samples are being separated and will be identified.
Fruit availability				We counted fruits of more than 60 morphospecies of plants that fruited during the period of the field collections. These samples are being separated for further identification.
DNA Barcoding				For the analysis of samples of regurgitates and faeces of the birds, we are seeking partnerships with other laboratories due to the cut of financial resources made by the Brazilian Government that made the analysis unfeasible using the DNA barcoding technique as having a very high value. Our alternative so far was to start morphotyping part of the samples for identification using a stereoscopic loupe.

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

We had some issues accessing to some sample areas on rainy days, especially on unpaved roads. Due to the intense rains from August to November that made it impossible to collect data, we had to extend the field collections until April 2018.

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

- 1- The most abundant species of frugivorous birds were the red-headed manakin (*Ceratopipra rubrocapilla*, n = 83) and white-crowned manakin (*Pseudopipra pipra*, n = 74) (both of the family Pipridae), while the most abundant insectivorous birds were the wedge-billed woodcreeper (*Glyphorynchus spirurus*, n = 46) and plain-winged woodcreeper (*Dendrocincla turdina*, n = 40) (both from the family Dendrocolaptidae). From the total species captured in the mist net, two are vulnerable to extinction, channel-billed toucan (*Ramphastos vitellinus*) and band-tailed antwren (*Myrmoterula urosticta*). Generalist frugivorous birds were not affected by forest loss, probably because of the low specificity they require in relation to the habitat type and food resources. In general, the species richness and abundance of insectivorous birds were higher in landscapes with lower forest cover.
- 2- This result may be due to the creation of new forest edges, which provides the occurrence of pioneer plants that attract more herbivorous insects. Thus, habitat disturbance leads to an increase in the availability of food resources for generalist insectivorous birds. On the other hand, insectivorous birds and frugivorous specialists were negatively affected by the reduction of forest cover. Specialist birds exhibit high habitat specificity and low mobility. In this way, changes in the spatial configuration of the landscape can affect the movement of individuals among forest remnants due to the low permeability of the matrix.
- 3- When the food resource is seasonal, in the case of frugivorous birds, the sensitivity to habitat loss may be even more severe. Our results demonstrate, that birds are generally influenced by forest cover loss, some groups are harmed (specialist species) while others are favored (generalist species). Under this scenario, it is necessary to know how the functions performed by such groups can also be affected by the changes caused by deforestation. Our next step is to evaluate the trophic networks between frugivorous and insectivorous species and, respectively, plants and arthropods, to verify if the species turnover triggered by deforestation can affect these ecological interactions. As deforestation progresses, we hope that the ecological roles played by these vulnerable species will not be offset by the proliferation of generalist species thriving in anthropogenic areas, which can affect survival and establishment of plants leading to changes in forest structure.

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

Two residents in the municipalities of Una e Belmonte in Bahia State, Brazil, received training in sampling techniques for birds, bats, plants, and arthropods participating in the project as field assistants. These local people are currently working on other biodiversity conservation projects that are linked to UESC. We also present our project to all owners and managers where sample sites are located. Additionally, we

will present the main results of the project to schoolchildren and farm owners, highlighting the importance of wildlife conservation, and how the reduction of selective logging, illegal hunting, and deforestation could be beneficial for them. We hope to design some posters with information of the main bird's species that occur in the region, as well of the plants that these birds consume, in order to encourage the reforestation of native species that are used as a resource by birds.

5. Are there any plans to continue this work?

Yes. This study is an extension of a long-term project entitled "Research Network in the Ecological Functioning of Anthropic Forest Landscapes" (Rede-SISBIOTA). New studies are being conducted in the southern region of Bahia, Brazil, specifically in agroforestry systems, such as cocoa plantations (*Theobroma cacao*) shaded within the native forest that has its thinned sub-forest for planting cocoa seedlings (locally called as "cabruças"). We know the need to understand how tropical forest management influences the richness of native species and the ecological functioning of forests. Part of the field material purchased with The Rufford Foundation will be donated to the Applied Ecology and Conservation Lab of the Universidade Estadual de Santa Cruz (UESC) and will be used in further ornithological studies in the region.

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

The preliminary results of the project were shared in March? at the II Workshop of Applied Ecology at the Universidade Estadual de Santa Cruz (UESC), Ilhéus, Bahia, Brazil, and will be presented in September at the XXV Brazilian Congress of Ornithology 2018. Part of the collected data will be published in the series " ATLANTIC BIRD TRAITS: a dataset of bird morphological traits from the Atlantic Forests of South America" of the journal Ecology. Also, we will present the project in other scientific journals. Additionally, we will prepare a poster with the main results to be presented in to the owners and workers of the farms, and to the schoolchildren of the municipalities of Una and Belmonte, as an activity of environmental awareness. Finally, the results of this research will be part of two chapters of a doctoral thesis at the UESC.

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

We used RSG funds for the sampling of birds, arthropods and to measure the availability of fruits in the Atlantic forest of southern Bahia. Activities using the GSR funds were carried out between July 2017 and April 2018. Database analyzes and manuscript submissions for submission to journals in the field of ecology and conservation will be completed by 2020.

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
Field assistant	£2000	£2000	0	
Daily car rental	£0	£0	0	
Fuel (gasoline)	£800	£800	0	
Fieldwork food supplies	£500	£0	0	
Garmin GPS MAP Oregon 600	£3	£0	0	
Headlamp	£0	£0	0	
Batteries (for GPS)	£76	£40	£36	We replaced AA Duracell batteries with rechargeable batteries. The money saved will be used to fund the printing of the poster that will be presented in the scientific event XXV Brazilian Congress of Ornithology 2018.
Digital camera	£188	£0	0	
AAA Duracell Batteries (for headlamps)	£235	£0	0	
Mistnests (12m)	£860	£0	0	
Accommodation and alimentation in scientific event	£130	£130		This value will still be used in the scientific event that will take place in September 2018.
Registration on scientific event	£65	£0	0	
Transportation to scientific event	£100	£100	£100	This value will still be used in the scientific event that will take place in September 2018.
Field Shirt with University and Project Financiers ID	£43	£0	0	

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

We believe that the next steps for the project are: (1) data analysis, (2) writing new publications and the doctoral thesis, (3) disseminating results in educational didactic material to increase access to information outside the scientific community, and (4) maintain the contact with the owners of the farms. This last step is to orient and continue creating awareness of the importance of native species and preserving

the forest in the region, as well as the role of birds and other taxonomic groups in maintaining the forest. Furthermore, it is important to apply new studies based on projects aimed to conserve the Atlantic Forest, in addition to providing information to elaborate laws aimed at the management and conservation of biodiversity.

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. The logo of The Rufford Foundation was shown at the presentation held at the II Workshop of Applied Ecology of the State University of Santa Cruz (UESC) and will be included in the poster to be presented at the XXV Brazilian Congress of Ornithology in 2018. The logo of The Rufford Foundation will be recognised in all future publications of the project results such as scientific papers, reports, folders, abstracts and lectures at conferences. Also, I used The Rufford Foundation logo on shirts that I designed to wear in the field.

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

The team consists of:

Icaro Menezes Pinto M.Sc. - Bachelor in Biological Sciences and Master in Ecology and Conservation of Biodiversity by the State University of Santa Cruz (UESC), Brazil. He is currently a Ph.D. student in Ecology and Conservation (UESC). This project is his doctoral thesis. In addition, he will be responsible for the analysis of the database, preparation of the scientific papers and presentation of the results to the academic and local community.

Dr. José Carlos Morante-Filho - visiting professor of the Biology at UESC who contributed with my research advising and me and given a training course on bird sampling using mist nets. Also, he provided field equipment such as precision scales and stereoscopic loupes, and he will give recommendations and corrections on reports, scientific manuscripts and on my doctoral thesis.

Dr. Deborah Faria - professor of the Biology Department at UESC who contributed to the sample design of the project, support with the vehicle of the laboratory of Applied Ecology and Conservation Lab. She will also contribute to the correction of reports related to the project.

Dr. Eliana Cazetta - Professor of the Biology Department of the UESC who contributed with the provision of field equipment such as pachymeter, binoculars. She will also contribute to the correction of project reports

Albérico Queiroz M.Sc. - He is currently a Ph.D. student in the Ecology and Conservation Program at UESC. He contributed to the sampling of birds and arthropods.

Alan Silva Franco - A local field assistant who was hired to help to collect the bird and arthropod data.

Mr. Jovelino - A local field assistant who was hired to help to collect the bird and arthropod data.

Júlia Perez Cabral M.Sc. - Júlia was a volunteer trained during the period from August to September 2017. She received a training course for bird sampling conducted by Ícaro Menezes and assisted in the sampling of bird data, arthropods and confection of plants exsiccates with fruits.

12. Any other comments?

I am very grateful for the financial support of The Rufford Foundation that made possible carry out most of the field activities. I am very happy to have successfully completed the surveys and to be able to continue this project that is very important for the conservation of Atlantic Forest birds.



Left: Albérico Queiroz, Matheus Cruz undergraduate student and Ícaro Menezes installing the mist networks in one of the sample areas of the Atlantic forest of southern Bahia, Brazil. Right: Ícaro Menezes removing from the mist net an individual of the species White-crowned Manakin.



Left: Júlia Perez Cabral, trained volunteer measuring an individual of the species Boat-billed Flycatcher (*Megarynchus pitangua*). Right: Project team and undergraduate students at a sampling site.



Left: Channel-billed Toucan (*Ramphastos vitellinus*) captured in mist nets.



Right: Blue-backed Manakin (*Chiroxiphia pareola*).