

Final Project Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF 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 – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Complete the form in English and be as concise as you can. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	A. Robério G. Freire Filho
Project Title	Conservation Strategy for Caatinga Howler Monkey (<i>Alouatta ululata</i>), Northeastern Brazil
Application ID	19646-1
Grant Amount	£ 4990
Email Address	freirefilho@outlook.com
Date of this Report	16 th June 2017

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
Select at least four areas of humid or sub-humid enclaves to identify new areas in the state of Ceará with <i>Alouatta ululata</i>				We selected five humid and sub-humid enclaves in the state of Ceará to conduct interviews in local communities.
Conduct at least 100 interviews in the state of Ceará to record or report the species				We carried out 110 semi-structured interviews directed at local communities, between the municipalities of Santana do Acaraú and Ibiapaba Mountain in the state of Ceará, and obtained 17 reports on the presence of the species. We received historical and current reports in the locality of Auiá, a set of enclaves in the state of Ceará. This new occurrence area for Caatinga howler monkeys increases the species' range in a North-easterly direction in the state of Ceará.
Mark at least 100 points in Ibiapaba Mountain to characterize the environmental conditions in the region				120 points were marked in Ibiapaba Mountain and we described the environmental conditions in each region.
Define and quantify regions in Ibiapaba Mountain which have suffered natural vegetation cover loss in recent years				Unfortunately, we did not get to describe the vegetation cover loss in Ibiapaba Mountain. It was difficult to find good Landsat images in the region. Moreover, the method used did not show efficient results. However, we used the Global Forest Cover Loss 2000-2014 (Hansen et al. 2013) to estimate and identify vegetation cover loss in all species' range.
Build a potential distribution map of the species				We used Maxent software to build a potential distribution map of <i>Alouatta ululata</i> and got great results. The

			regions with highest predicted suitability included Ibiapaba Mountain in western Ceará, the Parnaíba river mouth in northern Piauí and north-central Piauí.
Identify which environmental variables influence <i>Alouatta ululata</i> distribution			The environmental variables that most influence <i>Alouatta ululata</i> distribution are: percentage tree cover, precipitation of driest quarter, aridity index and roughness index.
Identify the most important areas for the conservation of the species			We have identified four main areas to preserve <i>Alouatta ululata</i> by using a distribution smoothing method in zonation software: (1) the mangrove region in Northern Piauí (the Parnaíba river mouth); (2) the northwest region of the state of Ceará (Serra da Ibiapaba and other humid enclaves) and part of northern Piauí; (3) a region inside the Caatinga biome in north-central Piauí, between Piripirí and Itauera; (4) a region in northwest Piauí at the border of the state of Maranhão.
Find out the relationship between the local community and the species; the ecological local knowledge of <i>Alouatta ululata</i> in the state of Piauí.			We carried out 105 interviews to characterise the interactions between the local human communities and the <i>Alouatta ululata</i> in the studied region (north-central region of the state of Piauí), we did not detect an apparent conflicting relationship. Nevertheless, there were reports of poaching and medicinal use in three localities.
Identify potential study sites (in privately owned areas) where <i>Alouatta ululata</i> groups could be monitored in the future			We have identified four potential study sites (in privately owned areas) where <i>Alouatta ululata</i> groups could be monitored in the future
Lectures at schools, community centers and universities in study areas			We decided to work in the north-central region of Piauí because we identified this region as one of the most important areas for the conservation of the species. Therefore, we carried out 16 lectures (about 513 youth and adults attended the lectures) at four schools in the municipality of São Miguel do Tapuio to raise awareness in the local

			<p>community. We also presented the project to the municipality's environmental secretary and biology students at universities in the region. In all of the lectures, we talked about the importance and conservation of the species and its main threats. Moreover, we have kept in touch with local farmers and obtained their support to develop additional research in the region.</p>
<p>Proposing conservation strategies for species based on the results obtained</p>			<p>We identified that just 21% of the most important areas for the conservation of <i>Alouatta ululata</i> are in protected areas. Moreover, most of the protected areas allow the sustainable use of natural resources (forest cover loss is a problem in these areas) and we believe that the existing protected areas need to be managed with greater efficiency. Therefore, it is necessary to create new protected areas ("fully protected" units or "sustainable-use" units), mainly in the north-central region of Piauí. Stimulating the creation of Private Natural Heritage Reserves (RPPN) is also an important tool to preserve the species. Moreover, it is important to keep in touch with local farmers and get their support to develop additional research in the region.</p> <p><i>Alouatta ululata</i> are hunted for personal entertainment, as a food source or for medicinal purposes in some localities of Ceará and Piauí. Therefore, it is necessary to implement environmental education programmes to raise awareness in the local community about the importance of Caatinga howler monkey conservation.</p> <p><i>Alouatta ululata</i> is a poorly known and endangered primate species endemic to north-eastern Brazil. Thus, we need to develop more research about its ecology, behaviour, bio-acoustic and population genetics. This</p>

				research should address climatic aspects because North-eastern Brazil (semi-arid region) has very marked seasons.
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

N/A

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

a). The potential distribution map of *Alouatta ululata* and most important areas for conservation of the species:

We have achieved good results in building the potential distribution map of *Alouatta ululata* in Maxent software. We have been able to identify regions with suitable habitats for the species, but there is still no confirmation of the species in some regions. In addition, we were able to increase the species' range in a north-easterly direction in the state of Ceará, from reports and records in the locality of Aiuá. We used zonation software to determine which areas were the most important for the conservation of *Alouatta ululata*. We have identified that the north-central region of Piauí and areas on the border between the states of Piauí and Maranhão are extremely important because they house many *Alouatta ululata* populations, have suitable habitat and are outside protected areas. We intend to submit at least two papers containing all the results obtained during the project.

b). Conservation priorities for the endangered Caatinga Howler Monkey:

We concluded from the results that the creation of new protected areas is necessary for the preservation of the species. Only approximately 21% of the most important areas for the conservation of *Alouatta ululata* are within protected areas. These areas can be created by the government or by private initiatives (Private Natural Heritage Reserves (RPPN)) mainly in the North-central region of the state of Piauí. Moreover, it is also important to inform the local community about the species and to work on environmental education in communities. In many areas people know of the species, but do not know that it is an endangered primate species endemic to north-eastern Brazil.

In addition, *Alouatta ululata* is a poorly known and endangered primate species endemic to north-eastern Brazil. Thus, we need to develop more research on its ecology, behaviour, bioacoustics and population genetics in order to better understand *Alouatta ululata* and to provide more in-depth knowledge on the species. This research should consider climatic aspects because north-eastern Brazil (semi-arid region) has very marked seasons.

Alouatta ululata was included in the National Action Plan for the Conservation of Primates of the Northeast. The National Action Plan aims to ensure the presence of at least five viable populations for each target species in different ecosystems, increasing the area and connectivity of the habitats of these species and reducing

socio-environmental conflicts in areas of occurrence. The results obtained in this project will be fundamental to the National Action Plan along with our participation in decision making for the conservation of *Alouatta ululata*.

c). Establishing partnerships with local farmers to carry out monitoring of *Alouatta ululata* groups in the future:

The participation of the local community is fundamental for the conservation of the Caatinga howler monkeys. We have been able to establish partnerships with some farmers to carry out long-term projects on their properties. Such partnerships are very important because farmers can function as agents of local awareness based on their attitudes to preserve the species. In addition, these partnerships can encourage the creation of private reserves (Private Natural Heritage Reserves (RPPN)). We were able to maintain partnerships in the North and North-central regions of Piauí and in the Northwest region of Ceará.

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

We carried out sixteen lectures at schools of the municipality of São Miguel do Tapuio (more than 513 young people and adults had the opportunity to attend the lectures). These lectures served to raise awareness among the local population about the importance of environmental preservation and to report the existence of an endangered primate species endemic to north-eastern Brazil in the municipality in which they live. These people often feel proud to attend the lectures and to know that there is a species that needs to be protected in the place where they live. Moreover, we also used some members of the local community as field guides during fieldwork.

5. Are there any plans to continue this work?

Yes, the project was very important for the accomplishment of my master's degree and I intend to continue working with *Alouatta ululata* during my Ph.D because it is a poorly known and endangered primate species endemic to north-eastern Brazil. I have plans to monitor Caatinga howler monkey populations and to develop research on its ecology, behaviour, bioacoustics and population genetics in order to better understand *Alouatta ululata* and to provide more in-depth knowledge on the species. Moreover, we intend to continue with lectures and environmental education activities in other areas as an attempt to involve the local communities in the preservation of the species in the north-central region of the state of Piauí. We also intend to keep in touch with farmers in the region and encourage the creation of protected areas (Private Natural Heritage Reserves (RPPN)).

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

We intend to submit at least two articles (this is very important for a poorly researched species). The first one was submitted at the end of May entitled "Endangered Caatinga howler monkeys (*Alouatta ululata*) in North-eastern Brazil: Distribution expansion, local knowledge and attitude toward the monkeys". Our

results will be shared and discussed on the XVII Brazilian Congress of Primatology (Pirenópolis-GO, Brazil, August 2017) and IX North-eastern Meeting of Ethnobiology and Ethnoecology (Teresina-PI, Brazil, November 2017). I will participate in round-tables about primate hunting in north-eastern Brazil at the XVII Brazilian Congress of Primatology. Moreover, we also will share our results in the next meeting of the National Action Plan for the Conservation of Primates of the Northeast (September 2017) and keep a Facebook page (Projeto Guariba) open to society.

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

The RSG funds were used from May 2016 to May 2017 and we executed the proposed schedule.

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
Car rental	1040	1376	-336	The car rental was a little more expensive than we hoped and spend more days in the fieldwork.
Gasoline	494	494	0	N/A
Accommodation in fieldwork	520	400	+120	We were invited to spend some days of the fieldwork in different farms of the region by owners.
Food in fieldwork	440	350	+90	In many situations, we were invited by local community to have lunch, dinner or both.
Photo camera	258	642	-348	We decided to dedicate more money for a great photo camera and did not buy the telescope. A great photo camera was more practical than a telescope in this kind of fieldwork.
GPS	138	80	+58	We decided to buy a simpler GPS because we did not need an equipment with so many functions in this project.
Tripod	35	35	0	N/A

Telescope	200	0	+200	We redirected this fund to a greater photo camera.
Binocular	125	88	+37	We found a good and cheaper binocular.
Fieldwork subsistence for applicant	600	600	0	N/A
Subsidy to field collaborators and/or guides	520	400	+120	We had the help from local community on some occasions and this subsidy was managed to the car rental.
Communication materials	520	500	+20	We spend a little less with communication materials (cheaper posters).
Materials for presentations and lectures	100	100	0	N/A
TOTAL	4990	5065	-75	

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

I feel that we must continue the work of environmental education (disseminate information about the species and show the importance of its preservation) in the North-central region of Piauí. Moreover, it is important to start long-term monitoring of *Alouatta ululata* groups focusing on get more information on the ecology, behaviour, bioacoustics and population genetics of the species. Such surveys will help to maintain contact with the region's owners and the local community, facilitating the creation of private reserves in the future. Therefore, we believe that the continuation of the project by the submission of a proposal for a 2nd RSG and my research during my PhD are the most important steps towards the preservation of this endangered primate species.

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?

Yes, we used the Rufford Foundation logo in all the communication materials produced during the project. The Rufford Foundation logo was used during our lectures at schools and at universities. We will use the Rufford Foundation logo in conferences at the XVII Brazilian Congress of Primatology (Pirenópolis-GO, Brazil, August 2017) and IX North-eastern Meeting of Ethnobiology and Ethnoecology (Teresina-PI, Brazil, November 2017). Furthermore, we will always mention and thank the Rufford Foundation in papers and any kind of public material.

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

12. Any other comments?

I am completely thankful for the Rufford Foundation and for their support of the project. I believe we have obtained good results and that the project will help to preserve this poorly known and endangered primate species endemic to north-eastern Brazil. All these results are due to the financial support provided by the Rufford Foundation. The Rufford Foundation is an extremely important foundation for the conservation of different groups of endangered species worldwide and is responsible for the training and / or enhancement of many conservation researchers.