

Final 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.

Please DO NOT fill in and submit this form until the project has been completed.

Complete the form in English. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Antonio Robério Gomes Freire Filho
Project Title	Endangered Howler Monkey Conservation Project in Northeast Brazil: Population Dynamics, Anthropic Threats and Private Protected Areas
Application ID	41309-B
Date of this Report	14/09/2025

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
Establish contact with managers and owners of the Red-handed howler monkey and Black-and-gold howler monkey study areas.				We were able to contact protected area managers and farm owners to conduct our research in these locations.
Tag the trees that comprise part of the diet of howler monkeys that will be monitored throughout the project.				<p>We installed 10 AudioMoth recorders and 20 camera traps.</p> <p>We were unable to mark the trees used by howler monkeys in all areas. This was only possible in the Caatinga howler monkey study areas. We faced greater challenges in collecting ecological and behavioral data for two howler monkey species. Logistical support to establish a study site and habituate the animals was unavailable. Consequently, we concentrated our efforts on gathering population data.</p>
Continue ecological and behavioural studies on Caatinga howler monkeys.				<p>This objective is being successfully achieved. We are managing to continue ecological and behavioural studies on Caatinga howler monkeys. Currently, we monitor three populations of caatinga howler monkeys.</p> <p>For each species, we conducted a 15-kilometer linear transect,</p>

				<p>resulting in a total sampling area of 45 kilometers.</p> <p>In terms of behavior, the species exhibits patterns similar to others in the genus. Specifically, the animals are most active during the early morning and late afternoon, engaging in movement, vocalization, and social interactions. During the hottest part of the day, they predominantly rest.</p> <p>We are currently analyzing bioacoustic data—an area of study unprecedented for the Caatinga howler monkey. This includes patterns of long-distance vocalizations, nocturnal vocal activity, and both intra- and interspecific variations.</p> <p>Regarding population data, in recent years the area supporting the largest number of groups has experienced declining environmental suitability, and group sizes have been decreasing. However, further refinement of this information is still needed.</p>
<p>Habituation of at least one group of Red-handed howler monkeys and Black-and-gold howlers.</p>				<p>We were able to define the study areas and locate the groups of howler monkeys to be monitored, but we were unable to habituate the groups due to a lack of time (as there were delays in receiving equipment) and researchers with experience in this method. Currently, we have researchers with this experience in the region,</p>

			who were trained during these attempts at habituation and population data collection.
Start long-term studies on Red-handed howler monkeys and Black-and-gold howlers.			Although we were unable to habituate the group of Red-handed howler monkeys and Black-and-gold howlers, we were able to begin ecological studies with these species as well.
Estimate the abundance and population density of howler monkeys in the study areas.			<p>While abundance and population density estimates were obtained for the Caatinga howler monkey, such data for the other howler monkey species will require further study.</p> <p>In the area with the largest number of caatinga howler monkey groups, we recorded 16 groups ranging from 2 to 20 individuals. A population density of 0.09 individuals per hectare. The population density of the two areas is very low when we consider the habitat of the animals in each area.</p> <p>For <i>Alouatta caraya</i>, we located one group (five individuals) and heard long-distance calls from two more groups. For <i>Alouatta belzebul</i>, we located two groups (six and eight individuals, respectively) and heard long-distance calls from five more groups.</p>
Estimate the increase or decrease in howler monkey populations in recent years based on semi-structured interviews.			Based on the semi-structured interviews with 132 people, it was possible to estimate the increase or decrease in howler monkey populations in recent years in the study areas.

			<p>Most respondents in the studied areas reported that the populations are stable. They have neither decreased nor increased. However, they report more frequent sightings such as roadkill or animals appearing alone in backyards. According to the respondents, these sightings may be related to the fires and deforestation occurring in the regions. This population dynamic needs to be studied over time for us to understand it better.</p> <p>Generally speaking, we found there are no conflicts between howler monkeys and humans. However, howler monkeys are still hunted and used as a source of protein in some communities in Maranhão and Piauí. The animals are also kept in captivity and raised as pets. Furthermore, in Piauí, there are reports of the use of the hyoid bone in traditional medicine to treat respiratory illnesses.</p>
<p>Identify existing local threats to target species and the relationship of local community members to primate species.</p>			<p>We were also able to document the nature of human-howler monkey interactions across the studied regions. This included identifying potential conflicts, instances of howler monkey consumption as a source of protein, and cases of their maintenance in captivity. This data on human-primate relationships will be vital for informing future coexistence</p>

				strategies and supporting conservation decision-making.
Distribute the illustrated mini-guide of the mammals found in the state of Piauí.				We produced a mini-guide on the primate species found in the state of Piauí and distributed c. 150 copies to various local communities, schools, universities, and protected areas.
Identify at least five landowners who are interested in creating Private Natural Heritage Reserves (RPPNs).				We have identified seven farm owners who are sensitive to the creation of Private Natural Heritage Reserves (RPPNs). Three of these have already posted signs on their properties prohibiting hunting and capturing wild animals.
Promote the training of at least 50 local guides and rangers to carry out birding and monkey watching activities in the region.				This was a crucial step in the project. We conducted four training sessions and trained 84 local tour guides and local tour leaders who work in four protected areas in the region. During the training, these professionals learned about best practices for wildlife observation and how this activity can be another source of income.
Carry out environmental education activities and publicize the project in at least 10 public schools, 10 community centers and three universities.				We conduct environmental education and awareness activities for diverse audiences, ranging from children to adults. This process requires us to tailor the content and approach for each specific age group. We visited three universities, fifteen schools and eight community centers, reaching 90 people in universities, 1,500 in schools, and 120 in community centers. The activities included informative and educational lectures, games about primates in the region,

				interactive activities, exhibitions of materials related to the theme, and documentary screenings. These activities were a great success with the participants.
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2. Describe the three most important outcomes of your project.

a). Our research continues to focus on the ecology and behaviour of the three howler monkey species, alongside the collection of ethnoprimate data. Scientific research is fundamental for generating the critical information needed for the conservation of these species. Consequently, the data gathered through this project directly informs conservation decision-making. This scientific information is also being utilized to support academic training. An undergraduate student from the Federal University of Piauí (UFPI) is employing it for a study on the ecological and behavioural aspects of Caatinga howler monkeys, while a master's student from the same institution's Postgraduate Program in Biodiversity and Conservation (PPGBC) is analysing the ethnoprimate data. Furthermore, our work has already contributed a significant finding to the scientific community with the publication of an article documenting the first record of twins and alpha male parental care in Caatinga howler monkeys. The ecological and behavioural data we gathered on these species were instrumental in informing the official listings of endangered mammal species in the states of Ceará and Maranhão.

b). We trained local tour guides and leaders operating in four protected areas. This was a highly significant component of the project, resulting in the training of 84 key local tourism professionals across these sites. This initiative creates a new source of income for residents not yet involved in responsible wildlife tourism. For those already working in the local tourism sector, it allows for the expansion and diversification of the services they can offer. Consequently, this generates income for local communities in a conscious and responsible manner. In this training, we addressed essential topics such as environmental education, the principles of One Health, and income generation through primate watching. We are confident that these trained guides and leaders will now serve as agents for disseminating this knowledge and initiative throughout their communities.

c). Lastly, we have identified farm owners interested in establishing Private Natural Heritage Reserves (RPPNs) on their land. Significantly, all these properties host populations of howler monkeys. This represents a crucial advancement for the conservation of these primates in the region. The support of these landowners will be instrumental, enabling us to conduct essential scientific research and ensure the long-term preservation of the species' habitat. Furthermore, these pioneering properties serve as vital models for raising awareness and encouraging similar

initiatives among other landowners in the area. We are pleased to report that many of these landowners are already actively supporting our howler monkey conservation efforts.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

We experienced delays in importing essential equipment, specifically AudioMoths and camera traps. This process took longer than anticipated, which directly impacted the timeline for collecting certain datasets. Consequently, we were required to request a project extension.

Furthermore, we faced challenges in recruiting collaborators with prior experience in primate ecological and behavioural data collection, particularly at the undergraduate and master's student levels. In response, we focused on training four students to develop the necessary skills to conduct this specialized research.

Access to certain study sites also proved difficult during the peak rainy season. The use of small, two-wheel-drive vehicles was not feasible, making some areas inaccessible and preventing the execution of planned activities. To mitigate this, we relied exclusively on four-wheel-drive pickup trucks during this period.

Several other situations were beyond our control. The aforementioned rainy season also caused frequent and prolonged power outages. The electrical infrastructure in our research areas is highly vulnerable, and the heavy rains significantly damaged the local power grid.

4. Describe the involvement of local communities and how they have benefitted from the project.

The undergraduate and master's students who collaborated on this project are members of the local communities within our study area. This approach enables us to build local capacity by training a new generation of researchers specializing in wild primate studies.

We also facilitated direct engagement with our research through environmental education and awareness initiatives held in local schools and community centers. These events featured interactive activities designed to encourage participation. Through this outreach, community members gained access to crucial information for fostering healthier interactions with their environment, ultimately helping to curb practices such as hunting, wildlife capture, fires, and deforestation in the region.

Furthermore, we provided professional training for 84 local tour guides and leaders operating in four of the region's protected areas, all of whom are members of the

local communities. This initiative equips them with the expertise to either begin a new profession or expand their existing opportunities within the growing field of wildlife tourism.

5. Are there any plans to continue this work?

Yes, we fully intend to continue the Projeto Guariba. Our core mission has always been twofold: to generate robust scientific knowledge through ecological and behavioural studies, and to actively promote the conservation of these species.

To achieve lasting impact, we recognize the critical importance of engaging local communities by providing valuable knowledge and fostering more sustainable livelihood alternatives. The involvement of local farm owners is also paramount to advancing conservation efforts in this region. While this presents a significant challenge, we are encouraged by the initial support we have received.

Moving forward, our objectives are to:

Continue advanced ecological and behavioural studies by employing technological tools such as AudioMoths, camera traps, and drones.

Expand our capacity-building initiatives by training local community members in other sustainable practices, including native beekeeping (meliponiculture) and agroforestry systems.

Establish a Private Natural Heritage Reserve (RPPN) that safeguards habitat and howler monkey populations. This represents a crucial and strategic long-term goal for the project.

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

Our initial plans for disseminating our findings include the submission of at least two scientific articles to international journals. We anticipate following this with one or two additional manuscripts focusing on specific ecological and behavioural aspects, targeted towards journals specializing in primatology. A further manuscript will be prepared for a conservation-focused journal.

Next year, we also plan to present our work at key national conferences, including the Brazilian Congress of Primatology and the Brazilian Congress of Mastozoology. Furthermore, our results will be formally communicated to the National Action Plan for the Conservation of Northeastern Primates (PANPRINE) to directly inform conservation policy.

To ensure broad public engagement, we will maintain our program of science communication via social media, with a continued focus on our Instagram platform (@projetoguariba).

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

We understand the challenges of maintaining a long-term project, but we believe the next steps are:

Continue advanced ecological and behavioural studies by employing technological tools such as AudioMoths, camera traps, and drones.

Expand our capacity-building initiatives by training local community members in other sustainable practices, including native beekeeping (meliponiculture) and agroforestry systems.

Establish a Private Natural Heritage Reserve (RPPN) that safeguards habitat and howler monkey populations. This represents a crucial and strategic long-term goal for the project.

8. 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?

We are proud to prominently feature The Rufford Foundation's logo on all our project materials, which include t-shirts, mini-guides, banners, and brochures. Furthermore, we formally acknowledge your vital support by displaying the logo at every presentation we deliver. We extend our sincere gratitude for the Foundation's crucial support of our activities.

9. Provide a full list of all the members of your team and their role in the project.

Bruna Martins Bezerra was instrumental in developing the methodologies for collecting ecological and behavioural data. She also played a key role in analysing bioacoustics data, which was essential for deciphering the structure of howler monkeys' long-distance vocalizations. Furthermore, her expertise was crucial in interpreting the ecological and behavioural data gathered from camera traps.

Thabata Cavalcante dos Santos was central to the success of our environmental education and awareness activities. She took a leading role in creating educational mini-guides and in designing and conducting the training programs for local tour guides and leaders. Additionally, all of the project's audiovisual materials were produced under her expert supervision.

Júlio Fernando Vilela provided critical support in preparing field operations and served as the primary liaison for communications with local farm owners, a vital component of our community engagement strategy.

10. Any other comments?

The support from The Rufford Foundation was fundamental to the development of both my master's and doctoral research, providing the critical foundation for the initiative now known as Projeto Guariba. I am currently establishing my career as a professor and researcher at a Brazilian university, with the goal of training a new generation of scientists in this region.

While long-term conservation work presents significant challenges, I am confident that effectively promoting the preservation of these species in our study area is an achievable goal. None of this would have been possible without the dedication and collaboration of local community members, farm owners, protected area managers, and students, to whom I extend my deepest gratitude.

ANNEX – Financial Report

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