

# Final Evaluation Report

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Your Details	
Full Name	Rodolfo Assis Magalhães
Project Title	Participatory monitoring of the Brazilian three-banded armadillo in northeast Brazil
Application ID	38574-1
Date of this Report	27/11/2024

**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
Deliver a one-day training course in camera trap operation and GPS			X	The training course focused only on camera trap operation because the audience was more interested in this topic, so we decided to focus on it and provide a more complete training on camera traps. The residents also asked for a second course on this topic, completely practical and in a real fieldwork situation, which is expected to be delivered in the future.
Assess the relative abundance of the three-banded armadillo and its predictors using camera traps			X	<p>We could successfully assess the relative abundance of the three-banded armadillo and other four xenarthrans and the respective predictors. We, however, did not use records of large felids and the occurrence of termites in the models due to model fitting issues using those covariates.</p> <p>We trained 2 residents to perform camera trap deployments, 3 residents to set camera traps, and 1 resident to retrieve and store camera trap data so that they are now able to carry out camera trap surveys completely by themselves.</p>
Conduct two environmental education activities in local schools			X	We conducted three activities, (Sumidouro, Boa Vista, and Mangabeira). In Sumidouro, our volunteers suggested running an event at the headquarters of the Association of Rural Producers, while in Baixio and Boa Vista, activities were conducted in primary schools, as planned.

Present and discuss the project in follow-up meetings of the National Action Plan (NAP) for the Conservation of the three-banded armadillo			X	The project coordinator participated in four meetings with NAP representatives. The project was discussed in all of them to some degree, but specifically, during the first meeting, a presentation about the project was given to the members of the NAP.
Run one community workshop to present project results to Sumidouro residents	X			We have not conducted the workshop yet because we approved another project that allowed us to continue similar activities (e.g., monitoring using camera traps) so the workshop is expected to be conducted around July 2025.

## 2. Describe the three most important outcomes of your project.

**a). The three-banded armadillo (TBA) population increased from 2022 to 2024** (Figure 1). The results of our assessment of relative abundance and its predictors showed that, since we started monitoring the TBA population in 2022 until the beginning of 2024, its population increased, while the population of other armadillos have not changed significantly. While the monitoring spanned only two years, this result is consistent with what would be expected from an outcome of our conservation efforts since 2021 to protect the species in our study area.

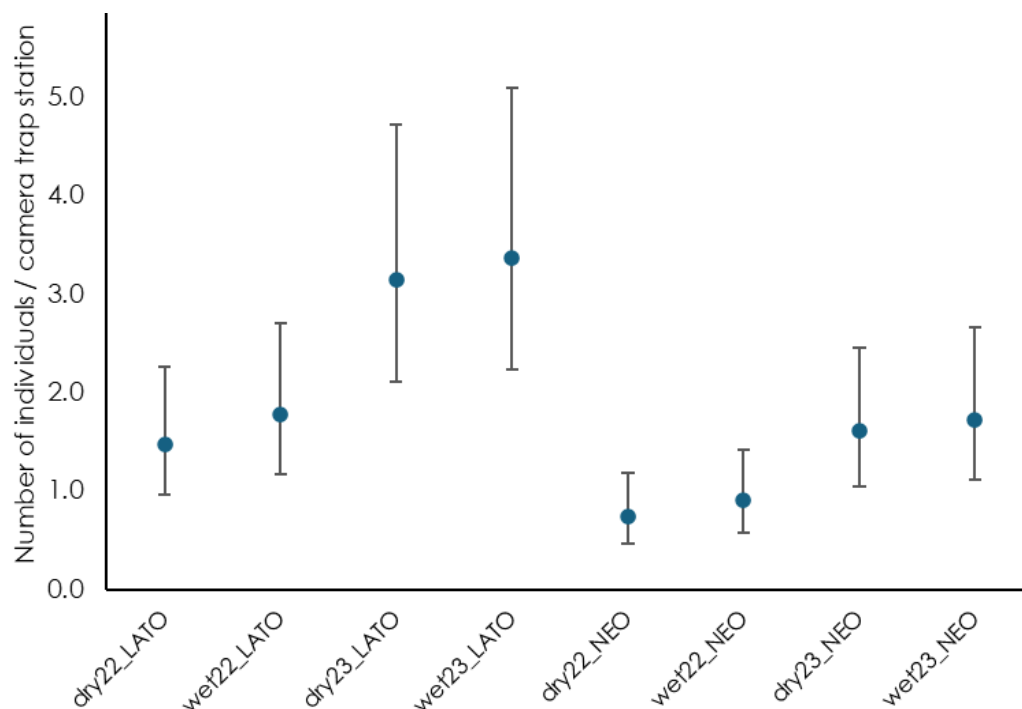


Figure 1: Abundance estimates of the three-banded armadillo for each combination of survey (dry or wet seasons of 2022 or 2023) and soil type (Latosoil or Neosoil). Error bars represent 95% Confidence Intervals.

**b). Environmental education and awareness activities improved the popularity of TBA** (Figure 2). We conducted three environmental education activities with children from three communities (Sumidouro, Boa Vista, and Mangabeira) and evaluated the most liked species before and after each activity. Before the activities, the TBA was the most liked species only in Sumidouro, as expected, since it is the community where we have been conducting most efforts for TBA conservation since 2022. After the activity, it became twice as popular in Boa Vista and Mangabeira, while remaining similarly popular in Sumidouro (Figure 3).

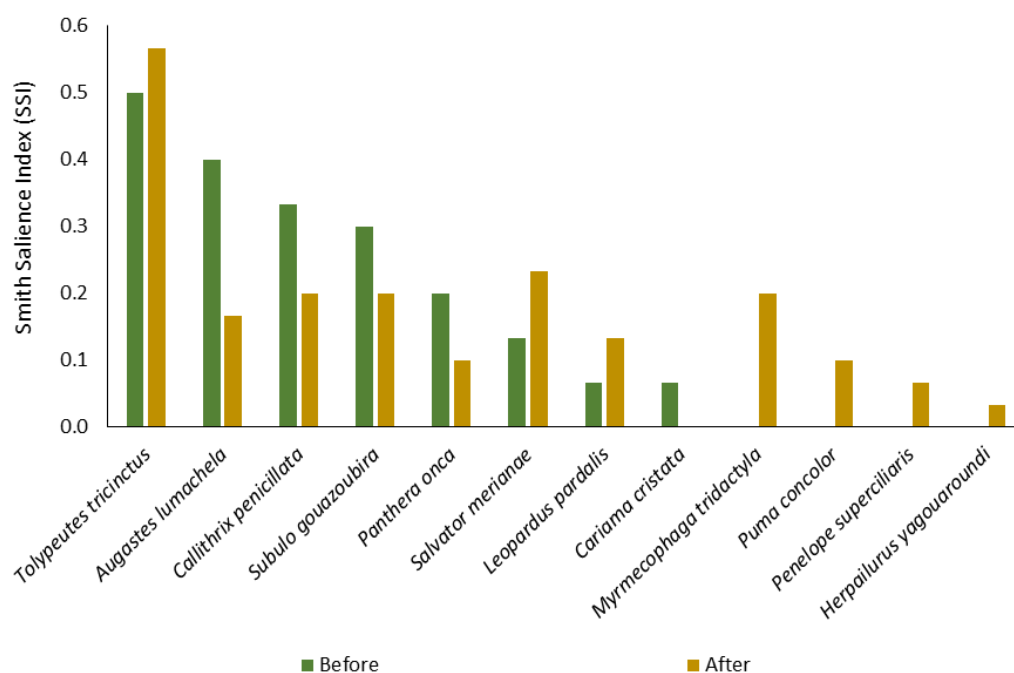


Figure 2: Most liked vertebrates as perceived by children of three local communities before and after environmental activities. SSI measures the cultural consensus among children regarding the relative popularity of each species. Note that SSI increased for the three-banded armadillo and that four species (three of them threatened) were included after the activities.

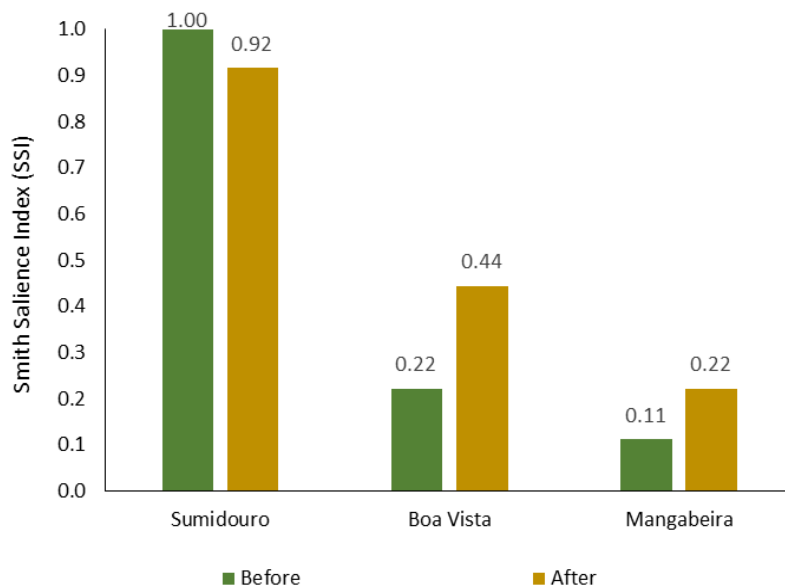


Figure 3: Popularity of the three-banded armadillo in each community before and right after the end of environmental education activities. SSI measures the cultural consensus among children regarding species' popularity. Note that SSI slightly decreased in Sumidouro because other species were considered popular but doubled in the other communities.

**c). We provided training in camera trap operation to 19 residents, who now can work as field assistants in conservation projects and for the wind farm company in the area, broadening their job opportunities** (Figure 4). Five residents from local communities received further training to set and clean camera trap devices, deploy cameras in the field, and retrieve and store videos from the memory cards of camera traps. Hence, all camera trap surveys are now conducted solely by residents.



Figure 4: Residents of local communities practising camera trap deployment during the course on working with camera traps delivered in August 2023 at the headquarters of the Association of Rural Producers of Sumidouro. Aldair A. Nogueira (on the right with a green

shirt – project uniform) is now the person responsible for coordinating camera trap setting and cleaning.

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

Changes in the budget due to unforeseen costs were the most challenging aspect of the project. We experienced some different needs than expected throughout the project. Specifically, we included equipment such as one smartphone and uniforms in the budget. However, we have not needed those, while we were experiencing the need for other equipment, such as memory cards, external hard drives, and camera traps (because some were damaged). Hence, we had to work on the changes in the budget and request approval, which we fortunately had. However, if we did not have the approval, our project could be compromised. I believe budget changes were only possible because we managed the budget carefully during the entire project.

Another unforeseen difficulty was the bureaucracy in accessing the wind farm area due to the company's compliance politics. We had to spend a lot of time negotiating with wind farm managers about how we could enter the area periodically to install and remove cameras, especially in the instances when the activities occurred without the presence of the project coordinator. This was solved by conducting meetings with managers and discussing all the possibilities. Now, we are allowed to enter the area with fewer restrictions because we are recognized as a partner of the wind farms and because field assistants are recognized as members of local communities, so they have the right to access the area.

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

Local communities are a fundamental component of the project, so it only exists because of them. All the project's objectives and activities were discussed with members of local communities beforehand through periodic meetings since 2022, and a local action plan for the conservation of the TBA was built participatorily in the same year. During the Rufford project, residents of local communities participated in two planning meetings to discuss current objectives and activities and propose others for future projects. Some residents also participated as volunteers, assisting in the conduction of environmental education activities, while others attended those activities. Residents also attended a course about working with camera traps. Finally, some residents participated in the project as field assistants, conducting camera trap setting, deployment, and data retrieval.

### **5. Are there any plans to continue this work?**

Yes. Actually, between 2023 and 2025 we are already extending this work with other sources of funding, including further samplings using camera traps, development of handcraft inspired by the TBA by a group of craftswomen in Sumidouro, planning of ecotourism in the region, delivering courses to build capacity, and capturing TBA individuals for health assessment.

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

Our results are periodically shared with residents of local communities during community workshops. We also plan to produce digital content to publish on social media and share with residents in messaging apps. The data from the camera trap monitoring are expected to be publicized as part of three scientific papers planned for the project's coordinator PhD. Results have also been and will be continually shared in presentations given by project members at different events. Finally, results are periodically shared with the NAP and incorporated into it.

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

From 2025 onwards, we intend to move towards the second phase of ecotourism planning (establishing and publicizing tourist itineraries, and training residents). We also expect to continue our monitoring by camera traps to have a better understanding of the TBA and other xenarthrans' population dynamics and improve confidence in the positive effects of our conservation efforts towards TBA population size. We plan to start tracking TBA individuals using GPS to better understand the species behaviour, which is largely unknown, especially in the Caatinga. Finally, we expect to keep conducting outreach activities in local events and environmental education activities in local communities as well as period planning meetings and community workshops.

## **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?**

Yes. The project coordinator gave five presentations in which the Rufford logo was presented in the acknowledgement section. We also used the logo in notebooks produced for attendants of the courses we have been delivering since 2023 in the communities.

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

Rodolfo Assis Magalhães: project coordinator, responsible for conceptualizing the project structure, planning, supervising, and conducting the activities.

Rodrigo Massara: contribution to project planning and assistance in planning statistical analysis.

Marcus Rowcliffe, Tim Newbold, Chris Carbone: Rodolfo's supervisors during his PhD at University College London and the Zoological Society of London. They assisted in data analysis.

Flávia Miranda: president of Instituto Tamanduá. Contributed to project conceptualization and was responsible for overseeing the project, helping Rodolfo to manage its activities and budget.

Flávio H. G. Rodrigues: assisted in project conceptualization and planning.

Maria Auxiliadora Drumond: assisted in planning social activities.

Cosme da Rocha, Olavo Santos, Lourivaldo A. dos Santos, Lourivaldo Camilo: field assistants that were responsible for camera trap deployment throughout the project.

Mirele Nogueira and Isa Mara: local assistants responsible for assisting in camera trap setting and cleaning as well as volunteers in environmental education activities.

Ana Caroline Paes: local assistant responsible for curation of camera trap data.

Aldair Nogueira: local assistant responsible for coordinating the activities of setting and cleaning camera traps.

Eunice Araújo: teaching specialist responsible for coordinating environmental education activities together with the project coordinator. She worked for the company Vetor Socioambiental, which was a project partner in those activities.

Maria Dourado: project volunteer who helped deliver one of the environmental education activities.

**10. Any other comments?**

No.