Final Evaluation Report

Your Details	
Full Name	Laura Facci Torezan
Project Title	How can urbanization impact mangrove bird diversity?
Application ID	41339-1
Date of this Report	March 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
Understand the impact of urbanization on mangrove bird diversity			X	We were able to secure the necessary co-funding to conduct bird field surveys in 16 mangroves and to assess five urbanization metrics, which allowed us to answer the project's main question.
Raise awareness in local communities about mangrove bird conservation		X		We were able to develop an educational resource with information on mangrove bird species and with guidelines for an urban development that is friendly to mangrove bird conservation. We also successfully held five meetings with local authorities and artisanal fisherman communities to share the project's results, where 500 copies of the educational resource were shared. However, we consider that this objective was partially achieved because we were not able to assess the percentage of increase in the awareness of participants before and after receiving the resource and taking part in the meetings.

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

a). The project improved our knowledge regarding mangrove bird diversity. The birds of southern Bahia's mangroves had never been studied before, so we learned with our project that 117 bird species live in the study area. Among them, there are 21 species (17.9%) of migratory birds. Four species are listed as vulnerable (*Pluvialis squatarola*, *Tringa flavipes*, *Amazona rhodocorytha* and *Touit surdus*) and two are near-threatened globally (*Arenaria interpres* and *Conirostrum bicolor*).

b). We discovered that urbanization on a landscape scale is causing a decrease in bird species richness in mangroves. About 20% of bird species are locally extinct in mangroves that have 50% of urban area in the surrounding landscape.

c). The project raised awareness about mangrove bird conservation and highlighted the potential of southern Bahia's mangroves for birdwatching tourism. During the meetings with artisanal fisherman communities, we talked about species that were of interest for birdwatchers and that could be observed in the mangroves of the study area. Many fisherman that participated in the meetings already guided recreational tours in mangroves and showed great interest in expanding their work for birdwatching tourism.

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

- Initially, we planned to sample 20 mangrove sites. However, we could only find 16 sites within areas that we could access, which still allowed us to properly address the projects main goals.

- The 200 Km stretch of coast from the city of Ituberá (13°44'11.19"S, 39°8'43.67"O) to the city of Canavieiras (15°40'23.62"S, 38°56'35.61"O) that was originally our study area did not compose a gradient of urban area in the landscape. In order to tackle this issue, we expanded our study are in the north until the city of Valença (13°22'4.80" S; 39°3'14.40"O).

- We were planning on accessing some mangrove areas by land, without the need of a boat for all areas. However, access to all sites in the low tide was proven to be impossible without a boat, so we had increased boat expenses that would have been above our budget. We tackled this issue by conducting three bird field surveys instead of four, which did not compromise our study, given that we achieved mean sample accuracy of 97.6% with three field seasons.

- During the second and third field seasons, unexpected heavy rainfall forced us to delay many field days, which resulted in extending these field seasons for longer than originally planned. However, given that we were conducting three bird field surveys instead of four, we had time to accommodate all fieldwork days that were delayed due to heavy rainfall.

- We had some difficulties in stablishing partnerships with local authorities for hosting the meetings about the project's results throughout cities of the study area. However, we were able to conduct five meetings in different cities because we sought partnerships in artisanal fisherman communities.

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

Artisanal fisherman communities were involved in the planning of all meetings organized to share the results of the project. The main benefit that our project brought was drawing their attention to the potential of birdwatching tourism as a source of income. The complete list of bird species of southern Bahia's mangroves that we published as an educational resource was also helpful to boost the recreational tours that they offer in the mangroves.

5. Are there any plans to continue this work?

In the scientific paper that we are now preparing for publication with our results, we share some insights about future research steps. However, there are currently no plans to continue this work because this year I will be commencing my PhD studies

about shorebird migration in the University of Massachusetts (US), but I intend to return to Brazil and resume this work with mangrove communities after my PhD.

6. How do you plan to share the results of your work with others?
We already presented preliminary results of this work in a scientific meeting last year (Brazilian Meeting of Ecology and Conservation). This year we will be presenting the complete work in the Brazilian Ornithology Congress. Moreover, we published an educational resource where we share the results of our project, list some recommendations for urban growth planning and present the complete list of southern Bahia's mangroves bird species. This educational resource was printed (500 copies) and shared in five cities of our study area. We also produced a video to briefly explain the project's main goals, activities and results, to share it with a broader network of people that live throughout the study area.

7. Looking ahead, what do you feel are the important next steps?
We advise that conservation initiatives from now on seek to work closely with city councils to limit urban expansion on mangrove-adjacent areas and to create new protected areas, securing sites where birds can feed and rest undisturbed. Currently only two mangrove protected areas exist in our study area, so we feel that broadening this network would be an important next step to face the loss of mangrove bird species due to urbanization, since protected areas usually have buffer zones where occupation in limited.

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, we used the Rufford Foundation logo in the published educational resource, in the video that we produced about the project, and in every presentation made to share the project's results. Among all these materials, we believe the educational resource and video resulted in some publicity to the Rufford Foundation due to its broader target audience.

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

Laura Facci Torezan: general coordination, financial management, study's design, fieldwork, data analysis, educational resource development, planning of meetings with local communities, outreach activities.

José Carlos Morante Filho: assistance in the study's design, data analysis and educational resource development.

Maíra Benchimol: assistance in the development of the educational resource.

10. Any other comments?
This work would not have been possible without the help of 13 artisanal fisherman that safely led us by boat to every mangrove area that we studied. Therefore, we would like to express our most sincere acknowledgement to: Adecivaldo, Ademar Santos, Adenilton Dos Santos, Alex Sepulveda, "Briga de Gato", Domingos Santos, Edmilson Amaral, Erik Sifú, Jairo Santos, Luciano Goldman, Paulo Dos Santos, Pedro Santos and Rui Cavalcanti (*in memoriam*). We also would like to thank João Pedro Climaco, Stéfhanne Guimarães, Thays Klitzke, Samyle Gomes and Giovanna

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