

Final Evaluation Report

Your Details	
Full Name	RICARDO JESSOUROUN DE MIRANDA
Project Title	Invasive Sun Coral in tropical protected coral reef areas: monitoring expansion and social engagement
Application ID	40622-D
Date of this Report	November 1st, 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
To monitor coral invasions on natural reefs at Alagoas coast.			X	Monitoring of the invasions was carried out at 10 reef sites (including coral reefs and shipwrecks) two times per year along the coast of Alagoas over the two years of the project. In addition to the sun coral invasion, other recently arrived invasive species in the region, such as the lionfish (<i>Pterois volitans</i>), were also monitored. Although the project data showed an expansion in the distribution of both species in the region, sun coral was not found inside the protected areas monitored by the project - only at sites located outside their boundaries, especially on shipwrecks.
To remove any sun coral colony eventually identified in potential new invaded sites inside MPAs (shallower sites).			X	Although sun coral can expand into new areas over a short period of time (months or a few years) within a region, as detected north of the Costa dos Corais MPA (shipwrecks in Recife city), it was not recorded within this MPA nor further south in the Jequiá da Praia RESEX. Since sun coral was not detected within the monitored protected areas, no colony removal actions were undertaken.
To promote meetings for fishermen and			X	Thirty-four interviews were conducted with fishers during

<p>interviews before and after these interventions (meetings) in fishermen community to evaluate local perceptions about invasions and effectiveness of our interventions.</p>			<p>three meetings in the study area to assess their perceptions of invasive species. We conducted pre- and post-survey questionnaires to evaluate whether perceptions changed over time. We also carried out educational activities throughout the project. During meetings with traditional communities, we distributed 100 T-shirts and 100 cups to fishers to enhance awareness, promote dissemination of the topic, and strengthen engagement with local fishing communities. Overall, we found that the presence of sun coral is little known among fishers, except for spearfishing divers, who are more familiar with benthic species and therefore more likely to recognize it. Sun coral was reported only by a few fishers who frequent shipwreck areas, where the species occurs in the region. In general, fishers demonstrated limited knowledge about biological invasions; however, the profile of each fishing community (particularly the type of protected area in which they live) influenced their perception of the invasions. This may also be related to the timing of the arrival of invasive species in each community. We also concluded that the activities carried out in the communities (interviews and meetings) were essential for increasing fishers' awareness of</p>
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				the invasions and their impacts.
To support continually the environment and justice national and regional agencies.			X	Throughout the project, we supported public environmental agencies, including the national authority ICMBio, by contributing to discussions on the issue of invasive species and joining working groups responsible for developing guidelines for management, control, and communication strategies. These groups helped implement measures that are now being put into practice and made available to civil society (such as a management plan to rapidly detect the arrival of the invader and to prevent and mitigate its impacts, including basic visual identification guidelines, procedures for collection and handling of invasive species, identification of invaded areas, establishment of communication channels, among other measures).
To establish communication with civil society by social media posts, lectures and courses in postgrad Program.			X	We also carried out a series of social media publications (on Instagram @coraisdobrasil.br) about biological invasions, as well as other topics important for the conservation of native reef species in the region—such as coral bleaching—with the goal of increasing public awareness of current environmental challenges relevant to coral reef conservation. We understand that biological invasions such as sun coral and lionfish act synergistically with other stressors, including global climate

			<p>change, unregulated tourism, pollution, and more. Therefore, the project sought to integrate the issue of sun coral invasion with other invasions, such as lionfish, as well as with the broader environmental crisis affecting reef ecosystems. We also produced and filmed a documentary featuring specialists and community leaders discussing biological invasions in accessible language for the general public. Additionally, we gave lectures, courses, and graduate-level classes at UFAL on the sun coral invasion (approximately 1,500 individuals were reached through temporary outreach events), and we contributed to the development and publication of multiple educational and scientific materials on the topic.</p>
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2. Describe the three most important outcomes of your project.

- a). Identification and mapping of new invaded reef sites at Alagoas coast.
- b). Development of guidelines and practical actions (in partnership with the environmental agency) for the management and control of biological invasions in Alagoas.
- c). Improvement of traditional fishermen perception about biological invasion and engagement in invasion monitoring and control actions.

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

We encountered some difficulties working within the fishing communities at certain times. Factors such as periods of political transition in the region, internal conflicts among community leaders or public management agencies, and the loss of family

members among fishers made it harder to schedule meetings, conduct interviews, and ensure participation in project activities. As a result, at various points we had to postpone some actions, adjust the schedule to a more suitable moment, or simplify the complexity of the issues to be addressed in interviews and meetings.

In addition, we faced logistical challenges during field expeditions, such as poorly equipped boats or difficult boarding and disembarking conditions for carrying out dives, an ongoing issue in this region of Brazil. To handle these situations, our team demonstrated flexibility, patience, and good humor while working alongside fishers in their boats, always seeking to adapt to the minimum safety conditions available to conduct the dives.

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

This was the most rewarding part of the project. The involvement of the fishing community was strong throughout the meetings, interviews, and field expeditions for monitoring invasions. The exchange of knowledge was very positive—both from our team to the fishers and from the fishers to our team. The community engaged in field logistics, in the dives, in preparing the meetings, in identifying community members for interviews and participation, and in helping to inform others about the invasion problems in the region. The main benefit for the community was the knowledge they gained about the risks and impacts that biological invasions can bring to their livelihoods, as well as learning about strategies to deal with or protect themselves from these risks—whom to contact and what actions to take.

5. Are there any plans to continue this work?

I intend to continue working on the monitoring, management, and control of invasive species, both the sun coral (*Tubastraea* spp.) and other species that have reached the Brazilian coast, such as the lionfish (*Pterois volitans*) and the soft coral (*Chromonephthea braziliensis*). My plan is to propose a new project to evaluate potential solutions that use these species as raw material (sun coral skeletons) or as a food resource (lionfish) as a strategy to reduce their populations and limit their expansion in Brazil. We have partnerships with other NGO projects in Brazil that use sun coral skeletons as raw material, and we intend to expand these collaborations to initiate this joint project.

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

The project results have been and will continue to be disseminated through various channels. Dissemination will include a video documentary that was filmed throughout the project and is currently in its final editing and production stages (scheduled for release in 2026 on Corais do Brasil Instagram and YouTube channel and it will be shared with The Rufford Foundation). In addition, part of the results obtained in the project has already been used to compose five chapters in the book 'A Bioinvasão do Coral-Sol', the most comprehensive work on the subject in Brazil, featuring

contributions from 84 scientists, managers, and environmental consultants (available at <https://zenodo.org/records/16882236>). Furthermore, project data have already been shared across multiple media outlets (see examples such as <https://noticias.ufal.br/ufal/noticias/2024/10/pescadores-aprendem-como-lidar-com-invasoes-marinhas-em-al> and <https://reportermaceio.com.br/ufal-pesquisadores-e-pescadores-se-reunem-em-oficina-para-combater-impacto-de-especies-invasoras-marinhas-no-litoral-alagoano/amp/>), as well as in events, classes, courses, and lectures in the region. Soon, the results from the research developed through interviews with fishers will also be published as a scientific article.

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

Long-term monitoring remains an important action for continuing to assess the progression and impacts that the invasion may cause in the reef ecosystem and in the human communities that depend on this environment for their livelihoods. In addition, it is essential to thoroughly evaluate the social and economic impacts that this invasion has been causing in the region. Finally, it is crucial to propose strategies for using these species as raw material for products and for developing mechanisms that encourage their removal as a way to reduce their populations and control their spread along the Brazilian coast.

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 Rufford Foundation logo was used at various moments and in several project materials. The project produced shirts, cups, and informational leaflets featuring the Rufford Foundation logo, in addition to displaying it in multiple social media posts, presentations, classes, and courses at different events.

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

Ricardo J. Miranda – coordinated the project, collected data, developed questionnaires, conducted interviews and meetings, taught classes, gave lectures, wrote texts, recorded videos and photos, edited videos, organized field logistics, and wrote and published articles and book chapters. Marcio Lima Junior – collected data through diving and conducted interviews. Norah Costa Gamarra – collected data through diving, developed questionnaires, conducted interviews, and participated in meetings. Felipe Alexandre – developed questionnaires and participated in meetings. Caroline Neves – participated in meetings with the fishing community. Arthur Cabral – collected data through diving and participated in meetings with fishers. Janaína Matias – mobilized the fishing community and participated in interviews, meetings, and events. Lili Matias – supported community mobilization and participated in meetings with the community. Vinicius Giglio – developed questionnaires and acted as an advisor for actions in the fishing communities. Eri Sampaio – worked on video recording and editing. Thiago Hara – contributed to documentary production, image and audio recording, and documentary editing. Roque dos Santos – boat operator.

10. Any other comments?

This project was challenging but very rewarding and important for disseminating and expanding the knowledge of traditional fishing communities in Alagoas about the risks and impacts of biological invasions. The support and funding provided by The Rufford Foundation were essential for expanding monitoring, communication, management, and capacity-building actions to address the issue of biological invasions in this important region of Brazil, which depends on the health of coral reefs as a source of income, food, well-being, and recreation. The actions supported by The Rufford Foundation were also crucial for strengthening other ongoing projects in the region that address highly relevant topics closely linked to invasions, such as coral bleaching events affecting native species, which could be monitored alongside invasive species and evaluated together to generate a more complete assessment of impacts on the local reef ecosystem. We thank The Rufford Foundation for its support and hope that this partnership will continue in the coming years.

ANNEX – Financial Report

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Full Name	RICARDO JESSOUROUN DE MIRANDA
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Using the budget provided with your original application, please give a breakdown of budgeted versus actual expenditure. If there is a difference between the budgeted and actual amounts, please explain why.

If there are funds remaining, these should be returned to the foundation. We will provide details of how this can be done.

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.

All figures should be given in pound sterling, indicating the local exchange rate used.

