

## Final Evaluation Report

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Your Details	
Full Name	Felipe de Moraes Carvalho
Project Title	Marine ecosystem impacts of fisheries in Brazil
Application ID	24442-1
Grant Amount	£5,000
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**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
Interview at least 15% of the local fishers			X	
Minimum of 50 measurements of individuals per species per month			X	
Assess at least 50% of the fishing gears used in the Coast of Corals			X	
Participate in at least 50% of the Committee meetings at the Coast of Corals		X		

**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.**

During the first months of fieldwork activities, there were unexpected difficulties to select and hire local field assistants. It was difficult initially to develop a solid collaboration network with local leaders in order to be able to find qualified field assistants from local communities. These issues delayed the start of the data collection process for an approximate period of 5 months from February to July 2018. However, after the PI of the project, Felipe Carvalho, met with local professors and the staff of local governmental agencies (ICMBio – *Instituto Chico Mendes da Conservação da Biodiversidade* and CEPENE - *Centro Nacional de Pesquisa e Conservação da Biodiversidade Marinha do Nordeste*), a broader network with local leaders was established. This allowed us to contact several youngsters who were sons and daughters of fishers and who were willing to learn how to work with data collection processes to conduct landing site interviews.

Another bottleneck the PI faced was having to make the decision of replacing one of the field assistants 1 month after the start of the data collection. After personally supervising his work and reports, it became clear that the field assistant did not possess the necessary expertise and commitment for the project. Again, this issue postponed the data collection process as the new field assistant was only able to start working in September 2018. Therefore, data was consistently collected throughout all coastal municipalities assessed from September 2018 to September 2019.

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

a). Preliminary data analysis has shown that the most heavily exploited species in the Environmental Protected Area Coast of Corals (EPACC), parrotfish (*Sparisoma* sp.), are negatively affected by local fisheries. Using a linear regression between fishing effort levels and catch per unit effort, a significant ( $p < 0.05$ ) and negative relationship was found (Figure 1). The majority of parrotfish are caught by local fishers

using hooks and line, or speargun. However, this species can also get caught with other gear, such as corrals, cast nets, seine nets, and gill nets.

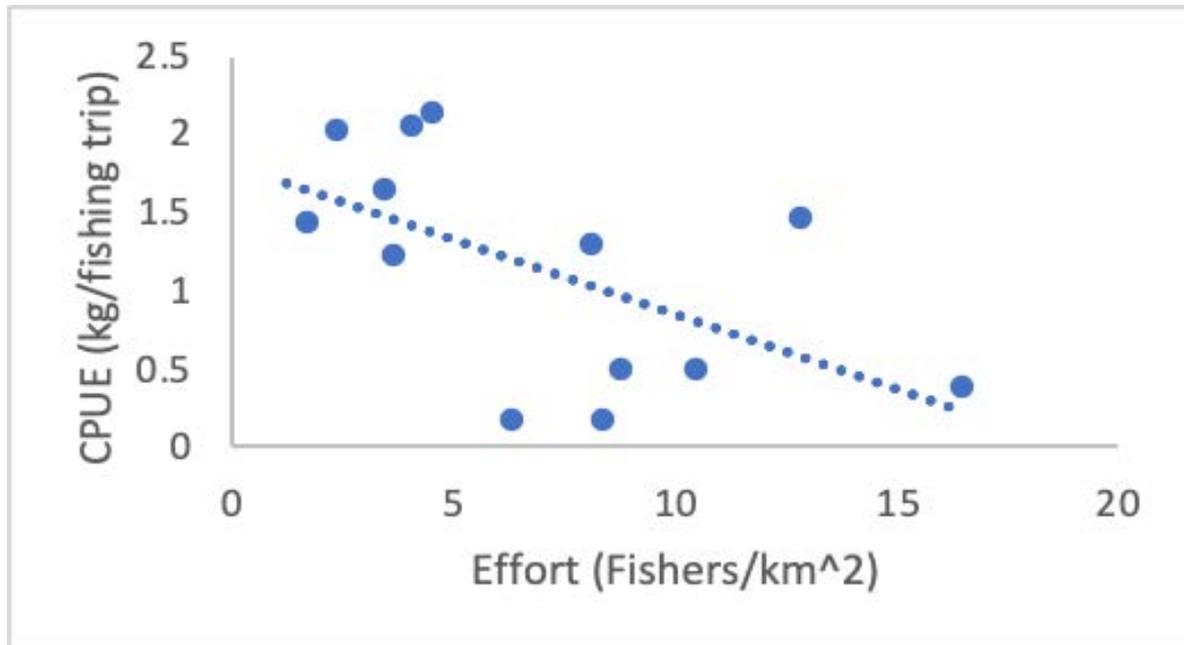


Figure 1: Relationship between fishing effort and catch per unit effort of parrotfish (*Sparisoma* sp.) at the Environmental Protected Area Coast of Corals.

b). Although there is not yet scientific evidence for a significant relationship between fishing effort and the average size of the fish populations locally exploited, this project obtained information on the size composition for more than 17,000 individuals at the EPACC. This representative sample size will allow for a broad and comprehensive status of exploitation for the main species locally exploited.

c). The PI of this project, Felipe Carvalho, has trained and supervised four local field assistants in topics such as fisheries-dependent surveys and fish ecology. This basic training occurred for 2 full-day workshops and over one-on-one tuition while conducting landing site surveys at fishing ports.

Training was later expanded to four undergraduate students at Virginia Tech, the institution where the PI is conducting his PhD research. These four students were responsible for inputting the interview surveys from paper forms into Excel templates. Students also had the opportunity to conduct preliminary analysis with the data inputted, and to write relevant research projects for an undergraduate course in fisheries techniques.

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

The local communities were intensely involved in this project. The four field assistants that worked on the project were locals. Besides, over 95% of all fishers interviewed during landing site surveys were also from the local communities. The PI of this project also made an effort to participate in different meetings in order to convene

with stakeholders (leaders, fishermen, governmental agencies) and better understand the main threats affecting local fisheries, and what are the potential solutions currently being considered.

With this project, local communities will finally have access to fisheries data on their daily activities. Although fisheries are one of the most important socio-economic activities at the EPACC, this region is highly data deficient. This project represents the first initiative to systematically collect landing data throughout the six municipalities assessed.

Once the data analysis is finalized, the results will be readily available to local fishers and governmental agencies. A white paper will be issued addressing the main findings of this project, with a special attention for management recommendations and potential sustainable fishing practices that can be implemented locally.

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

This is contingent on the time frame of the PhD programme of the PI. In general, members from local communities have recognised the importance of this project and have expressed their interest in its continuation. Especially after a large oil spill that took place at the EPACC in October 2019, both the PI and the local communities have further appreciated the importance of continuing this project. The continuation of the data collection proposed by this project would allow for a better understanding of the real impacts of the oil spill to local fisheries. Besides, for the fishers it is paramount to have sound scientific information on the local fisheries production, if they are to plead an economic indemnity after such environmental impacts.

However, given the dearth of resources for continuing this project and the possible short time frame for the PI to finish his PhD research, it is unlikely that this work will continue in the short term.

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

First, results will be shared through four main vehicles. First, workshops will be organised at the EPACC to share the results with local stakeholders. These workshops will be open to the public and we expect the participation of local leaders and fishers, besides the staff of governmental agencies and academia members.

Second, a white paper will be issued in Portuguese to explain the project's background and most importantly advise on the decision-making process for fisheries administration at the EPACC.

Third, as part of the conclusion of the PI's PhD degree, a minimum of three scientific papers will be published addressing the results of this work.

Lastly, the results will also be shared with the scientific community through oral presentations at conferences such as the ones hosted by the American Fisheries Society.

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

Considering the delay in the timeline of the project, the total fieldwork period was extended from 12 to approximately 18 months – from March 2018 to September 2019.

However, the grant was only used between March 2018 and to May 2019. This is very similar to what was anticipated in the original project, which was from February 2018 to April 2019.

**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
Measuring Boards	200	200		
Scales	640	400	-240	Scales were cheaper than initially considered. Anticipated budget was converted to accommodation.
GPS	160		-160	GPS was borrowed from the local University partner. Anticipated budget was converted to accommodation.
Air ticket from US to Brazil	1120	1120		
Food	2880	2800	-80	
Accommodation		480	+480	Since the study area is located in a highly touristic region, housing prices were greater than initially considered. This required more expenses destined to accommodation.
<b>TOTAL</b>	<b>5000</b>	<b>5000</b>		

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

In the short term, the priority is to finalise the data analysis and have the results ready to be shared. In the medium term, results will be shared given the four main vehicles

described above: workshops with local communities, white paper, scientific papers and scientific conferences.

In terms of improving the local management of fisheries at the EPACC, I would highlight some key points as next steps. Management efforts can be improved with a greater involvement of local fishers and communities since the planning stages. Although the governmental agency, ICMBio, has strongly involved the communities in meetings regarding the elaboration of management measures (i.e. spatial closures), there is a need for a greater participation of local fishers in such meetings, and other related activities (monitoring, enforcement, etc.).

**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?**

Not yet. However, once the final results are available, the PI will display the Rufford Foundation logo in all the materials used for sharing the results: decks in oral presentations at scientific conferences, presentations to local stakeholders, white paper, besides a written acknowledgement in the scientific papers.

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

**Dr Leandro Castello** is the PhD advisor of the project PI. He is a professor at the Department of Fish and Wildlife Conservation, Virginia Tech. Dr Castello adopts an interdisciplinary approach and critical thinking in regard to research questions that can influence policy and fisheries management. Dr Castello has directed this project to the dynamics of tropical fisheries and their impacts on marine communities and fish populations. Dr Castello's critical thinking and focus on fisheries science and management is fundamental for this project, ensuring the quality of information being generated and its application to policy-making and traditional livelihoods.

**Dr Beatrice Padovani Ferreira** is a Professor in the Department of Oceanography at the Federal University of Pernambuco, Recife, Brazil. Dr Ferreira has provided access to suitable fieldwork facilities. Dr Padovani has also helped supervising the PI and the work of local field assistants who collected the data for this project. Dr Padovani has a lot of experience with research at the Environmental Protected Area Coast of Corals. Her participation in this research ensured the application of suitable methods for surveying fishing effort levels in coral reefs.

**Luiz Eduardo Chagas Santos** was the field assistant at the municipalities of Passo de Camaragibe, São Miguel dos Milagres, and Barra de Santo Antonio. He is a young fisherman, who took the opportunity to learn more about the science behind fisheries monitoring and management. He was the most engaged field assistant and conducted the greatest amount of landing site interviews. Besides finishing high school, Luiz has also taken technical/professional degrees.

**Gideão de Lima Santos** was the field assistant in the coastal municipalities of Porto de Pedras and Japaratinga. He was the youngest field assistant with only 20 years

old. He had previous experiences with fishing techniques, and species identification. Gideão also finished the high school degree. He was replaced by Jerlanny Pamela da Silva during the last three months of data collection. Jerlanny also had previous experiences working for the Governmental Agency ICMBio while conducting a census of fishing activities at the EPACC. While working for the project, Jerlanny was also finishing her undergraduate degree in Nursing.

Finally, Lays Pereira do Nascimento was the field assistant in municipalities of São José da Coroa Grande and Maragogi. She recently received her graduation in Biology at the Federal University of Alagoas, which made her the most technically qualified field assistant. Her father is one of the most experienced fishers in the community of Barra Grande (Maragogi). She has plenty of knowledge regarding small-scale fisheries, with a special focus to social sciences and participatory management.