

Final Evaluation Report

Your Details	
Full Name	Madalena Mesquitela Pereira Cabral
Project Title	Movement Ecology and Population Structure of Giant Mantas in Revillagigedo Archipelago, Mexico
Application ID	34969-1
Date of this Report	13/02/2023

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

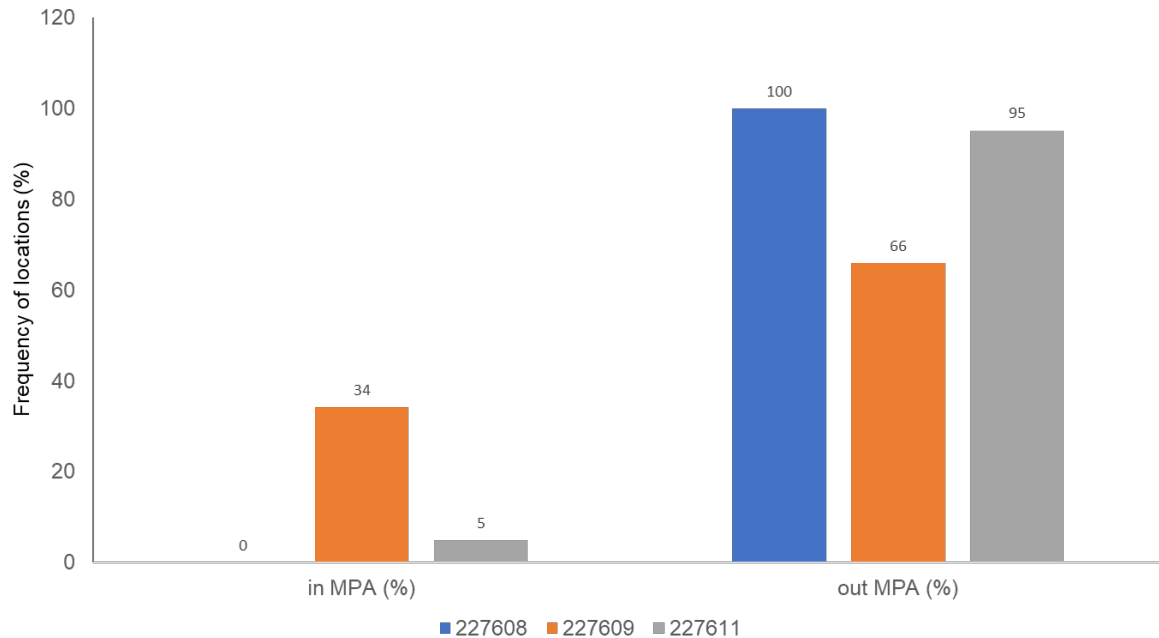
Objective	Not achieved	Partially achieved	Fully achieved	Comments
Tagging of 4 individual oceanic manta rays				All four tags were successfully deployed on four mantas.
Evaluate level of residency of oceanic manta rays in Revillagigedo Archipelago and connectivity with other geographic areas in Eastern Pacific				We have completely novel data that indicates the possible demographic range of this population of oceanic manta ray distribution. Five of seven tagged mantas left the Revillagigedo National Park for other areas in the north and south of the MPA.
Evaluate the movements of this population related to oceanographic and environmental conditions				This objective was achieved in a published paper in Hydrobiologia journal: https://link.springer.com/article/10.1007/s10750-022-05047-9

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

This project has provided very interesting and unexpected data. Before this project we expected that the oceanic manta rays would be mostly resident as indicated in referenced literature. Since five out of seven of our tagged mantas left the Revillagigedo National Park, we now are considering that the demographic range of distribution of this population is wider than initially thought since we had a few individuals which travelled out of the protected area of the MPA. This outcome is very important to understand the habitat use of this species and raises the question if the MPA is effectively protecting this population which is vulnerable to bycatch fisheries pressure outside of the MPA. This data will help to apply for more funding to evaluate further this population's demographic range and will be included in a publication in scientific journal that will be very important to inform park management as well as Mexican and international decision makers and stakeholders.

The most significant achievement of this work is the realization that this population of oceanic manta rays uses two different Exclusive Economic Zones and crosses international waters in between them. Also, the realisation that individuals might spend more time out of the MPA than initially expected, being at risk of bycatch from fishing pressure in the area. This is of most importance for the management and conservation of this population and the resulting scientific publication will most definitely influence management strategies and overall conservation for this species. In time, with enough evidence provided, we will be able to present the case for the

enlargement of the MPA or at least the creation of an ecological corridor and therefore increase the protection of this species.



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

There were no unforeseen difficulties that arose during the project. All four tags were successfully deployed. However, there was one tag that for unknown reasons got released from the animal and although it was sending positions daily, we were able to recognise that the positions were too “perfect” and always at the same hour of the day which indicated that the tag was floating and not on the animal. There were two tags that gave us over 6 months of data. This is considered a very good success rate.

Tag ID	Spot	Sex	Deployment Date	Release Date	End Date	Duration	Premature release	Outcome	Notes
227610	SPOT	F	27/02/2022	05/03/2022	18/04/2022	1 month + 2 weeks	premature release	NO	MH
227608	SPOT	M	01/03/2022	07/03/2022	08/09/2022	6 months + 1 week	-	YES	MC
227609	SPOT	M	01/03/2022	04/03/2022	08/09/2022	6 months + 1 week	-	YES	MC
227611	SPOT	M	01/03/2022	26/03/2022	23/06/2022	3 months + 3 weeks	-	YES	MC

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

Local service providers (dive masters and guides) and park visitors have been and will continue to be informed about our findings as well as park management through

presentations onboard liveaboard boats. Benefits include global and local knowledge of oceanic manta ray distribution and presentations that inform and educate park rangers and visitors on oceanic manta ray distribution and risks to their conservation. This project has improved the relationship between management, service providers and the scientific community by supporting the understanding of how all stakeholders can contribute and support manta conservation in and out of park boundaries.

5. Are there any plans to continue this work?

Yes, we plan to continue this project beyond the scope of the PhD programme since we are getting novel information that raises new questions. We intend to apply for more funding for more satellite tags for future research that will inform and influence management policies at a national and international level. The results of this study will be included in the proposal of the expansion of the MPA along with other studies on shark distribution in the Eastern Pacific by MIGRAMAR.

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

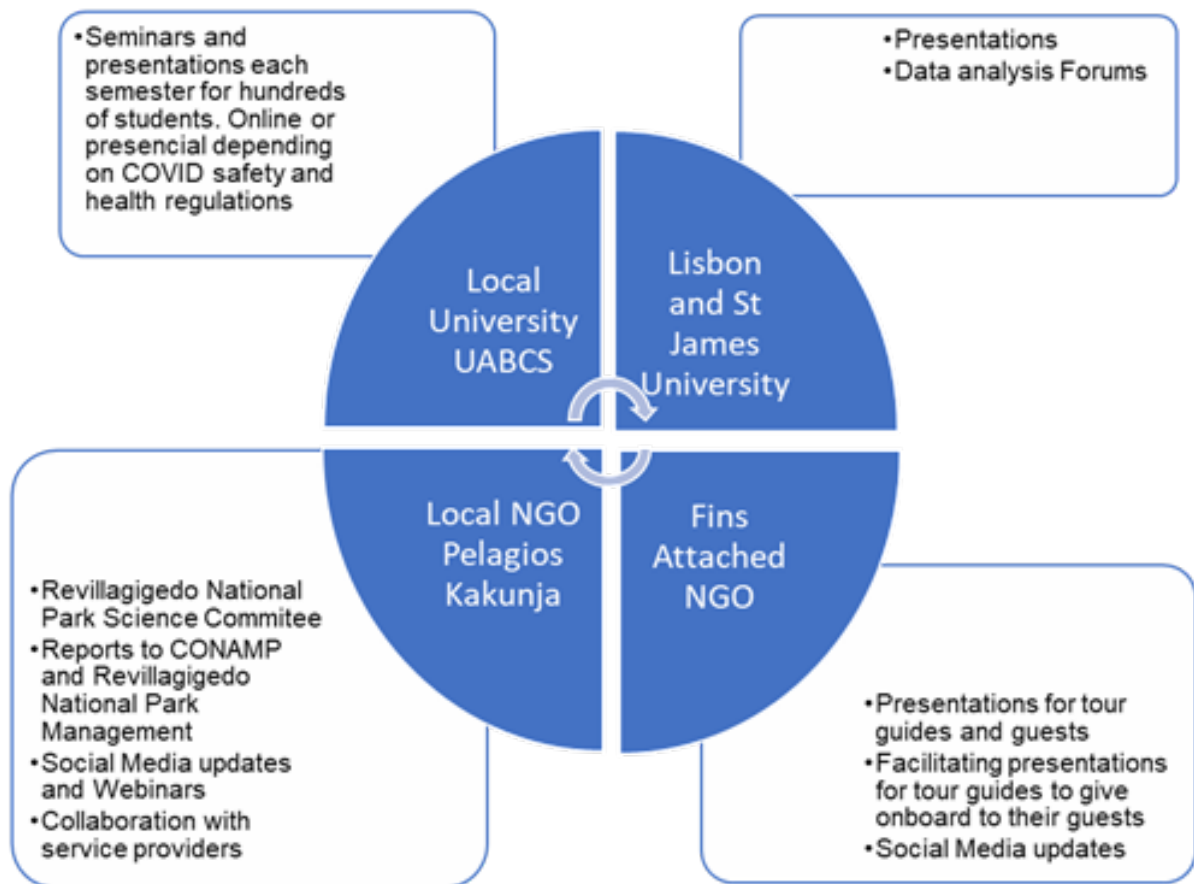
Besides the scientific publication in peer-reviewed journal, a report and presentation were also given to the National Commission of Protected Natural Areas (CONAMP) which contributes to the preservation and sustainability of ecosystems and natural environments, representative of Mexico's biological diversity, through effective, equitable, honest, and transparent planning, management, and administration of the Mexican system of Natural Protected Areas.

In May 2023 this project will be presented along with other fisheries professionals from Central America, South America, and the Caribbean in Cancun, Mexico for the inaugural Latin American and Caribbean Fisheries Congress (LACFC). The event aims to demonstrate the incredible volume of high-quality fish science being conducted throughout the Caribbean and Latin America.

Below is the initial diagram for this project's outreach plan:

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

Our next step will be to analyse the data according to fishing pressure and bycatch risk as well as time spent in and outside of the MPA boundaries. We will also be applying for funding for more satellite tags to be able to estimate the proportion of the population that leaves the MPA, assess the actual risk for this population in a best-case-worst-case predictive scenario and MPA effectiveness for the conservation of this population of oceanic manta rays.



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 used and will continue to use The Rufford Foundation's logo in all academic and general public/park visitor and CONAMP presentations, as well as mentioning that the funding was used to buy four tags that made our study possible. The scientific publication that will result from this study will mention The Rufford Foundation in acknowledgements and funding.

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

Dr. Hector Reyes, PhD advisory and supervision and academic outreach.

Dr Mauricio Hoyos, local NGO Pelagios Kakunjá, had the role of supervising field work of tagging procedures.

Dr. James Ketchum, local NGO Pelagios Kakunjá, has the role of supervising data analysis of satellite tagging. Being the Director of the scientific advisory board of

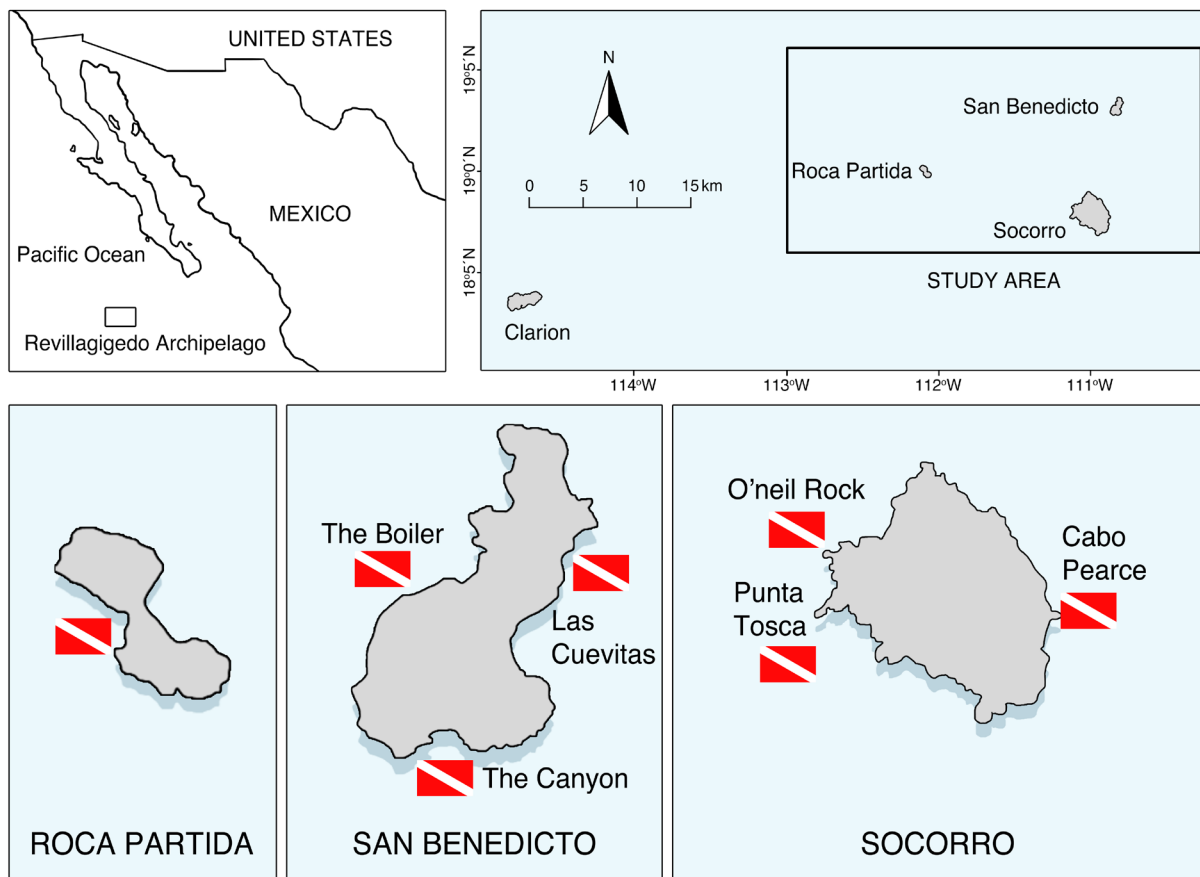
Revillagigedo National Park he is able to influence the decision making of park management based on our findings.

Dr Tiago Marques, Provided support in the area of Ecological Statistics.

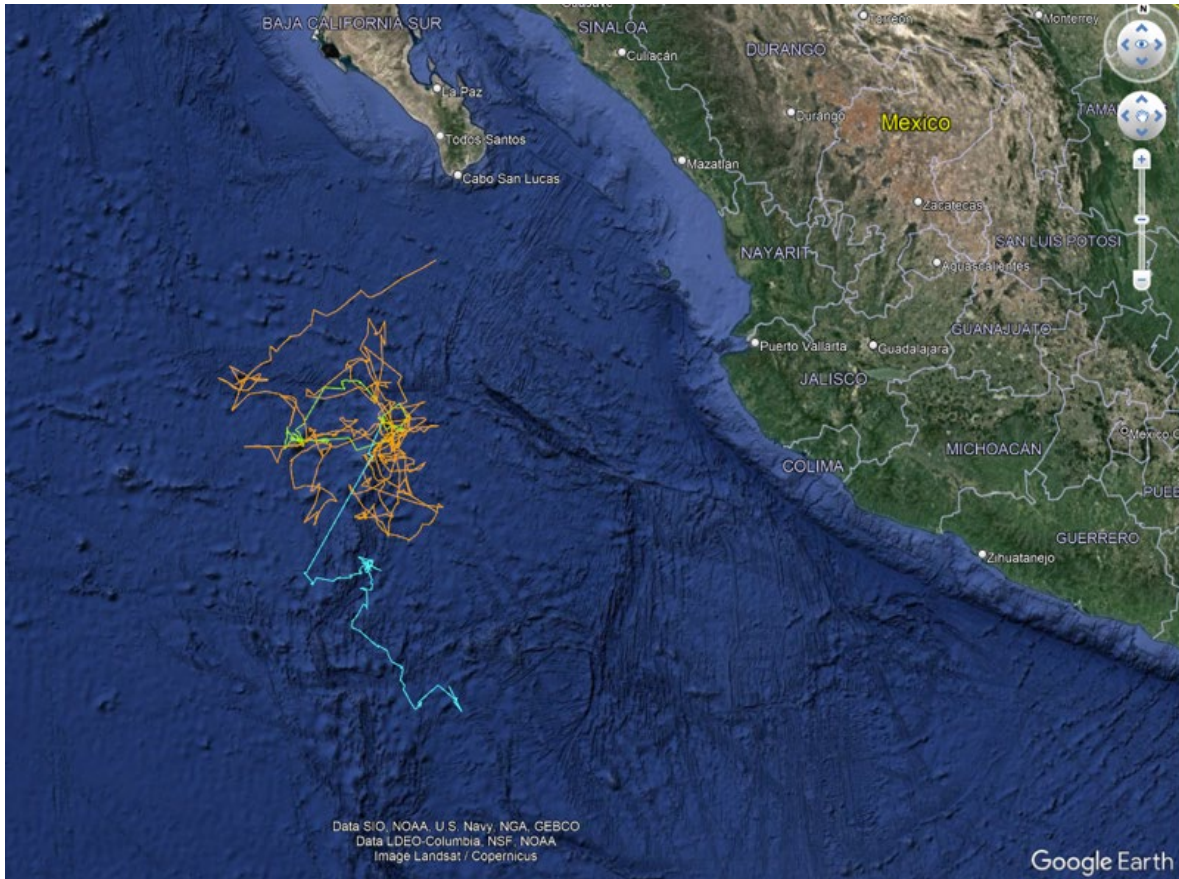
Dr. Joshua Stewart, Manta Trust Associate Director, has been collaborating with the project on experiment design and planning. He has also agreed to provide complementary tagging data from previous years for comparison.

10. Any other comments?

We would like to apply for a 2nd Rufford Small Grant since we feel this project was a success and we thank The Rufford Foundation for the opportunity and trust in our project.



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