

## Final Evaluation Report

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| Your Details               |  |
|----------------------------|--|
| <b>Full Name</b>           | Gabriela Velez Rubio   |
| <b>Project Title</b>       | Potential effects of an invasive species on the foraging ecology of green turtle in a relevant feeding and developmental area in the Southwestern Atlantic Ocean |
| <b>Application ID</b>      | 24957-B  |
| <b>Grant Amount</b>        | 10000 pounds   |
| <b>Email Address</b>       | gabriela.veleznubio@gmail.com  |
| <b>Date of this Report</b> | 06/4/2021  |

**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   |
|--|--------------|--------------------|----------------|--|
| Green turtle habitat monitoring, seaweed community diversity study   |              |                    |                | We performed the monitoring of green turtles and got 35 oesophagus and stomach samples. We also performed the seaweed diversity study during 2019 and part of 2020.  |
| Exclusion study of invasive seaweed Grateloupia turuturu   |              |                    |                |  |
| Identify the seaweed species present in the oesophagus contents of alive turtles   |              |                    |                | We already identified this species in the oesophagus of 15 green turtles.  |
| Technical advice for the stakeholders and workers of the CMPAs   |              |                    |                | We gave technical advice to the stakeholders during three meetings. By the end of 2020 we also participated in a few meetings of other coastal marine protected area in Uruguay: Laguna Garzón.  |
| Talk at four elementary schools in the study area and meetings with other local groups.                                    |              |                    |                | We performed talks and interactive activities with elementary schools in Punta del Diablo, La Coronilla and La Paloma with the collaboration of the other members of the COSTA+ group.   |
| Development a visual guide to identify the most common seaweeds in the coast of Rocha.                                     |              |                    |                | We already have the identification sheet of 15 seaweed species.  |
| Create a children's colour book about the importance of the coastal environment for green turtles and seaweed communities. |              |                    |                | We made a book serial about sea turtles, seaweed and other features of coastal areas in collaboration with COSTA+. During June 2021, all these contents will be accessible in the COSTA+ web page. I'll attach the sea turtle book and the herbarium protocol. |

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

This project should have finished by the end of 2019, but during 2020 and first months of 2021 we kept working on our project. The unexpected outbreak of the coronavirus pandemic forced us to postpone some of the activities. We tried to look for alternative ways to meet objectives according to the project schedule, but Covid-19 restrictions were very challenging, resulting in some activities being delayed. But we focused our work to prepare digital educational material and continue our experiments where possible due to the university restrictions.

We needed to delay the start of the seaweed experiment due to the delay in getting some equipment from my university; we kept working on this objective during 2020 and we hope to finish it by the end of 2021.

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

We continued our long-term feeding ecology study of green turtles in Cerro Verde MPA and buffer zone. We started the exclusion experiments with the alien seaweed *Grateloupia turuturu* in two zones, Isla Verde and Cerro Rivero. We registered the alien species in all the monitored months.

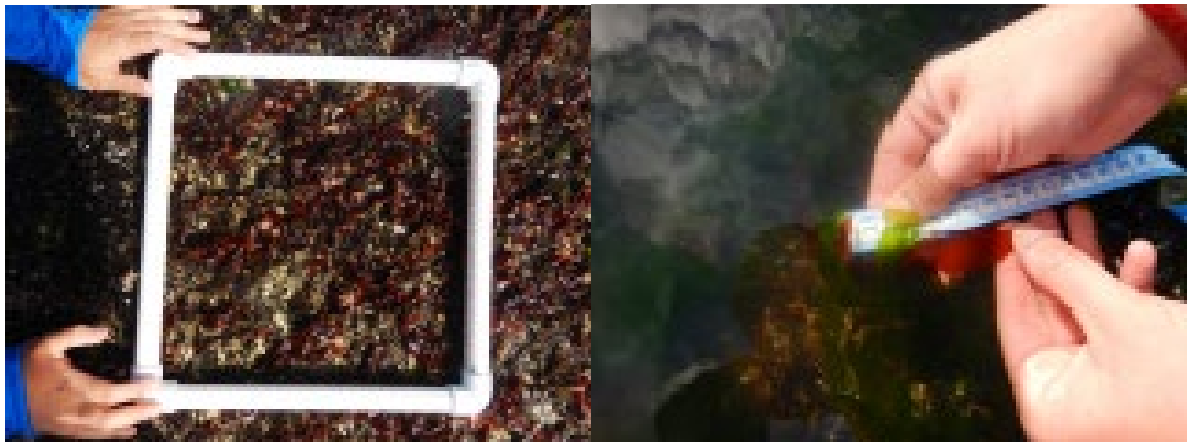


Figure 1: Left) *Grateloupia turuturu* sampling quadrants. Right) measurements go some specimens

We detected for the first time the presence of the alien seaweed species, *Grateloupia turuturu*, in the oesophagus content of 15 green turtles; we also found this species in the digestive content of two juvenile green turtles.



Figure 2: Left) Oesophagi content of a juvenile green turtle (*Chelonia mydas*), the red seaweed on the top left is the alien species *Grateloupia turuturu*. This green turtle stranded death on November 28th, 2019, close to La Coronilla. Right) Detail of the specimen of *G. turuturu*.



Figure 3: Left) Fertile tetra sporophyte specimen. Right) Fertile gametophyte specimen.

We characterised the specimens of *G. turuturu* at the laboratory to identify reproductive structures. We found fertile tetra sporophyte and female gametophyte specimens. We also did the genetic characterisation. The molecular features are being obtained via DNA barcoding using *rbcl* and *COX* genes - we identified the three species of the genus *Grateloupia* (including the alien species *G. turuturu*) and we are expecting to further contribute to the understanding of the origin and diversity of *Grateloupia* in the temperate Southwestern Atlantic.

Creation in collaboration with the group COSTA+ part of the "Coastal Box" books including different features of Uruguayan coastal areas. We attach the sea turtle book as an example. This will be free to download in the COSTA+ website. This website will be ready by the end of June 2021.

In relation to the visual guide, we already have 15 species sheets ready. We hope to have the final guide by the end of 2021.



Figure 4: Image of two of the books and a protocol from La Caja Costera.



Figure 5: Example of the Seaweed Visual Guide.

We performed some education activities in the “Seaweed herbarium” with scholars of different ages. We also did some virtual activities during 2020. During 2021 we conducted a workshop on seaweed identification in Punta del Diablo.





Figure 6: Talk in an elementary school, Seaweed herbarium workshop and photos of the Seaweed visual workshop.

**4. What do you consider to be the most significant achievement of this work?**

**5. Briefly describe the involvement of local communities and how they have benefited from the project.**

The communities of La Coronilla, Punta del Diablo and La Paloma benefited from the dissemination activities about sea turtles and seaweeds. They have also been participants in the species recognition workshops and will be potential users of the Caja Costera books and the Seaweed Visual Guide. Also, from April 2020 we performed several virtual workshops with our volunteers of local communities to help us to attend to sea turtle standings due to the movements COVID restrictions in our country.

**6. Are there any plans to continue this work?**

We will continue with the green turtle monitoring programme with Karumbé and the seaweed project also with Marine Macroalgae Group. During 2020 we'll have two undergraduate students doing their BSc theses with us. My plan is to continue with my studies on sea turtle diet and seaweed, as well as in the training of young researchers in these research line with little developed in the country.

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

We already present preliminary results at two international meetings - some of them changed because of Covid-19 but we participated in some virtual activities:

- COLACMAR (Latin American Sea Science Meeting) in October 2019. We presented two works:  
 Presence of the alien seaweed species *Grateloupia turuturu* (Rhodophyta) in the Atlantic last of Uruguay  
 Distribution and dinamicé of the seaweed community in the Atlantic coast of Uruguay.
- International Seaweed Symposium (IPS) in March 2021:  
 Morphological and molecular features of the genus *Grateloupia* (Rhodophyta: Halymeniales): key traits to detect invasive seaweed species in Uruguay (33°-35°S).

We shared our results via social media: Instagram, Facebook and Twitter (@karumbeuruguay, @algasuruguay). An also on the website of seaweed group: <https://macroalgas.webnode.com.uy>

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

The grant was used during part of the length of the project, but we have kept some funds to print some of the educational material.

## 9. 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   |
|--|-----------------|---------------|------------|--|
| Creation and Graphics designs for children colour book and seaweed guide/Printing seaweed guide and children colour book | 2000            | 600           | -1600      | We already have ready to use the books and almost finishing the seaweed guide. But we already work with the material in pdf format |
| Supplies for educational activities at schools   | 120             |               | -120       | We used this amount during the activities at the schools   |
| T-shirt with solar UV protection for technicians   | 300             |               | -300       | We bought the T-shirt and used it in all the field activities  |

|   |              |            |              |   |
|---|--------------|------------|--------------|---|
| Underwater digital camara                     | 1000         |            | -1000        | We bought the camera and used it in all the field activities  |
| Portable Multiparameter waterproof            | 1000         |            | -1000        | We bought the multiparameter with the University and used it in all the field activities                |
| Equipment for field and laboratory activities | 1300         |            | -1300        | We bought some equipment, and we have some extra for this year  |
| Boat  | 3000         |            | -3000        | We bought the boat to so the sampling in the Protected areas  |
| Lodging/Food supplies                         | 800          |            | -800         | We used most of the amount, but we have something to use this year                                      |
| Bus tickets/Fuel                              | 680          | 280        | -400         | We used part of the amount but with the pandemic situation we'll use part to print educational material |
| Administrative costs                          | 500          |            | -500         |   |
| <b>TOTAL</b>                                  | <b>10000</b> | <b>880</b> | <b>-9120</b> |   |

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

Consolidate my research group with young researchers and with national and international funding to keep monitoring the green turtle and seaweed community of Uruguayan coast.

**11. 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 include the logo in or social networks, poster and oral presentations in the symposia, in the books and visual guide, big stickers on the new boat and also in UV-protection t-shirts for our team.

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

**Alejandro Fallabrino:** coordinate the sea turtle monitoring activities.

**Marina Reyes:** help with the seaweed and sea turtle monitoring. Participate in the education activities. She is doing her Bachelor thesis associated to this project.

**Daniel González:** help in the coordination of sea turtles monitoring activities

**Carla Kruk:** participates in the seaweed experiment and coordinate the data analysis of the seaweed community analysis



**Lucila Gonzalez:** help in the coordination of the seaweed experiment.

**Ariel de León:** help in the seaweed sampling and genetics analysis. Participate in the Seaweed workshop. He is doing her Bachelor thesis associated to this project.

**Luciana Gonzalez:** help to coordinate the education activities and gave advice with the children books.

### **13. Any other comments?**

Thank very much for these opportunities, for me the Rufford Small Grants suppose a crucial support to keep working with my research lines after finishing my PhD in 2017.