

The Rufford Small Grants Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Gabriela M Vélez Rubio
Project title	Conservation and research in a high---priority feeding area of juveniles green turtle in the South Western Atlantic
RSG reference	13926
Reporting period	December 2013---December 2014
Amount of grant	£5980
Your email address	Gabriela.velez@uv.es
Date of this report	15/12/2014

1. Please 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
Asses the nutritional dependent on macroalgae of juvenile green turtles			x	We collected all the necessary samples. The results are already published in different symposium and congress. Now I'm working in the manuscript for send to an arbitrated journal.
Characterize the benthic macroalgae community in the MPAs			x	This is the only update of Uruguayan macroalgae since 1999
Collaborate and contribute in the creation and the effective implementation of the management plans in the MPAs		x		We collaborated in the creation of the management plans for the MPAs, but the implementation of the plan was not made yet. The technician of the MPA of La Coronilla is working in this document, and probably has a draft in March 2015.
Conducting marine turtle monitoring training courses to rangers and MPA workers			x	
Promote the sustainable ecotourism.		x		We already put the first sign in the MPAs, but the designer is still working with the field guide and the rest of the supplies

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

We have some problems with ministerial times, for example we continue helping the technician in the creation of the Action Plan for the MPA of La Coronilla but the implementation of this document probably will occur along the 2015. We are also delay with the field guide design, our idea was to have the field guide to give to the tourist during all the summer season but probably we'll start to give it in the middle of the season and we'll prepare a special event for Easter holydays.

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

These main outcomes consist of information considered to assess the green turtle nutritional dependence on macroalgae community. And constitute the first study focus in analysed the ontogenetic diet change in relation with turtle growth in the South-western Atlantic Ocean.

1. Increase the knowledge of macroalgae community (Fig. 1) for research study, for education uses (macroalgae collection in the Regional University Centre of Rocha).

2. The high degree of algae consumption in this study highlights the importance of the macroalgae benthic community of Uruguayan coast, been one of the main feeding grounds for juvenile green turtles when they recruit to coastal areas in the South Western Atlantic. In relation with the turtle size SIAR reveals no differences in $\delta^{13}\text{C}$. But in terms of $\delta^{15}\text{N}$ only the largest group differ significantly from the others groups. The turtles < 55 cm CCL present similar epidermal isotopic signatures probably they had been foraging in a similar areas for not an extended period of time, feeding in Brazilian and Uruguayan neritic habitat performing north-south seasonal movements along the year. The evidence presented here reveals that most of the nutrients assimilated by green turtles presented in Uruguay derived from macroalgae. The contribution of macroalgae to the assimilated nutrients steadily increases as the turtle grow, but there is no sudden change in the ratios of stable isotopes following recruitment. Only the largest turtles (CCL>55cm) had a $\delta^{15}\text{N}$ signal exclusively from Uruguayan macroalgae. According to the seasonal changes in the stable isotope ratios of turtles ranging 35-45 cm CCL revealed that the turtles captured in spring were presented a higher reliance on macroalgae from Uruguay. Additionally, this group of turtles could demonstrate that a small proportion of the stock spent all year in Uruguayan coastal waters. Only this group of turtles reflects in their tissues the characteristic values of Uruguayan feeding ground.

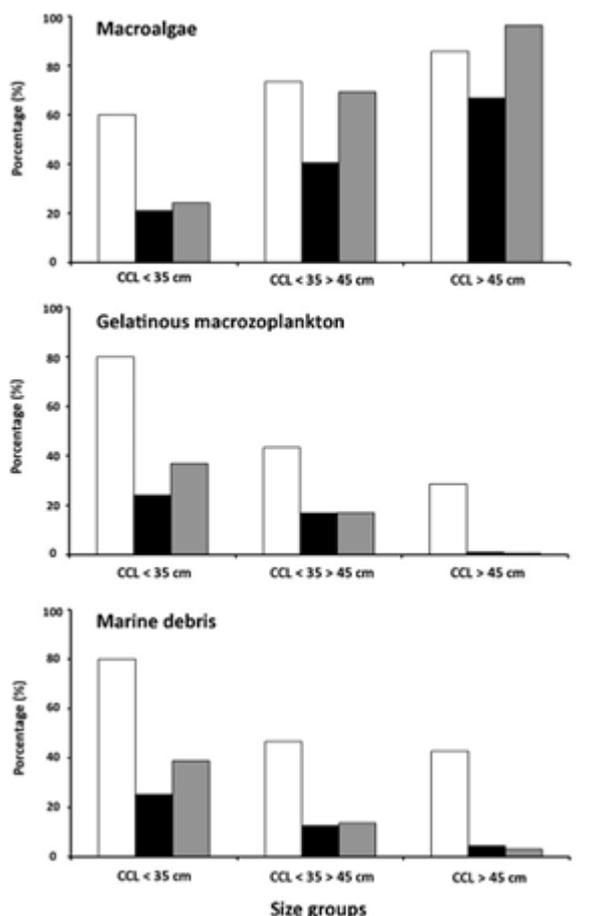


Figure 1: Frequency of occurrence (open bars), Relative Volume (black bars) and % IRI (grey bars) of the main dietary items (Macroalgae, Gelatinous macrozooplankton and Marine debris) in the digestive tract of three different size classes based on curved carapace length (CCL) of green turtles turtle, from Uruguayan coast: < 35 cm CCL (n=10); $\geq 35 < 45$ CCL (n = 29) and ≥ 45 CCL (n = 8).

3. The information about feeding behaviour of green turtles obtained in this project become fundamental tools for knowing the characteristics of the green turtle stock in Uruguayan coastal waters. Such information has been considered as key attributes and indicators of the future evaluating of the management plan in the MPAs of Cerro Verde and Cabo Polonio. Additionally, they constitute an important contribution to the knowledge of this species, obtained according to methodologies used across its geographic distribution ranges. These results will also be an important starting point for future studies to understand the differential behaviour of tropical and subtropical marine species in temperate waters. These marine animals need to adapt their behaviour to a changeable environmental scenario. And the work with the MPAs worker in the creation and implementation of the management plans and gave them the tools to work with turtles in the areas.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

The education and outreach proposal is based on the development of a responsible ecotourism. This is an essential and complementary activity for the involvement of the communities in the protected areas. This activity not only brings development alternatives for the local communities, furthermore, generates visitor's satisfaction and enthusiasm through recreational and education activities in the natural environment.

1. In February and August 2014 I gave a talk aimed at 10 rangers who work in the Cabo Polonio National Park and their coordinators. In February I also gave the same workshop to the MPA of Cerro Verde ranger and workers. The aim of this workshop was to share information about green turtles, present the research I have been conducting and the main results obtained. Also, I presented this research project. Sharing this information with park rangers is essential because they are the people who work in the area throughout the year and have direct contact with residents, local stakeholders, and with the thousands of tourists who visit the area during the summer months (Fig. 2 and 3).

2. the informative panels and Visitors guide for the MPA of Cerro Verde will be a part of the tourism development of La Coronilla and Santa Teresa towns (Fig. 4). I also participated from December 2013 in all monthly meetings of the Specific Commission of Cerro Verde MPA to work on the implementation of the management plan of the area. And I participated as member of the "Tourism Commission" to prepare the tourist plan in the MPA of Cerro Verde. This is very important to involve the local communities of the adjacent towns to the MPAs to perform responsible ecotourism activities in these areas.

5. Are there any plans to continue this work?

Yes, our plan is continue working with the green turtle long-term monitoring in the MPAs where Karumbé is already working. The next step is to include in our monitoring programme the new create MPAs of Laguna de Rocha and Laguna Garzón. Including all these areas allow us to protect all the marine fauna in a coastal protected corridor, and improve the implementations of the conservation strategies. These MPAs ask to Karumbé to give other workshops for rangers and MPA workers. Regarding the feeding behaviour of green turtles, now we want to identify other food resources for the turtle's diet during all the seasons according to the changeable environmental conditions in the oceanic influence coast of Uruguay.

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

The results of this project will be shared in the following ways:

Diffusion to general public

During the summer season (January-April 2015) the results will be share with the tourist that visit the Marine Turtle centre of Karumbé in La Coronilla.

Workshops

In the next few months I will give another talk to new rangers (hired for summer season) and SNAP officials (System of Protected Areas - DINAMA) who are responsible for monitoring the protected areas, to share the information obtained in the current project.

Academic activities

I plan to prepare at least two research articles that will be published in a peer review journals. One is already published in the journal *Marine Biodiversity*

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Vélez---Rubio GM, Tomás J, Míguez---Lozano R, Xavier J, Martinez Souza G, Carranza A (2014) New insights in Southwestern Atlantic Ocean Oegopsid squid distribution based on juvenile green turtle (*Chelonia mydas*) diet analysis. *Marine Biodiversity*. DOI: 10.1007/s12526---014---0272---x

Results were presented in national and international conferences:

1. III Uruguayan Congress of Zoology, Montevideo (Uruguay). 7th-12nd December 2014.
2. 34th International Symposium of Biology and Conservation of Sea Turtle, New Orleans, USA. 9---14 April 2014.
3. The last result will be present in the 35th International Symposium of Biology and Conservation of Sea Turtle, Dalaman, Turkey. 18---24 April 2015.
4. All the information obtained in this Project and in others research in Green turtle feeding ecology will be presented as part of my PhD in early 2016 (University of Valencia, Spain and CURE Maldonado, Uruguay)

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

The RSG was used over a period of 12 month as I was planned.

8. Budget: Please 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.

Item	Budgeted Amount	Actual Amount	Difference	Comments
1. Transportation				
Car rental (100€/day x 80 days)	800	800	0	
Fuel	600	600	0	
Bus tickets	200	284	84	2 extra trips to work with Cabo Polonio rangers
Internal transports	100	100	0	
2. Living Expenses				
Food supplies during research activities (5€ x 160 days, 20 days per month)	800	800	0	
Lodging (50€xmonth)	0	90	90	Partial funding for extra month of monitoring green turtles mortality
3. Field Equipment				
Sample collection consumables	200	200	200	
Equipment for capture green turtles	600	900	300	Extra cost to fix the zodiac boat
Equipment for monitored stranding's turtles	300	300	0	
Stable isotopes analysis (80 samples)	900	1050	150	Extra funds for more turtle preys analysis
Lab consumables	300	300	0	
4. Environmental Education				
Graphic designs	230	230	0	
Printing field guides, posters, etc.	250	0	0	We are waiting for the designers to print the material
Informative panels	600	300	0	In the next month we'll print the panel for Cabo Polonio National Park
Administrative cost	100	100	0	
Total	5980	6054	74	Extra cost were cover by NGO karumbe

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

Increase the knowledge of green turtle feeding habits along the Uruguayan coast and during all the season (finishing my PhD studies in early 2016) to share the findings with the decision makers and government agencies that are responsible of managing the marine resources.

Plan for marine turtles in Uruguay. I and other Karumbe members are currently involved in the preparation of the Base to create the "Action Plan for marine turtles in Uruguay".

Continue with the "Long term monitoring of marine turtles in Uruguay" in Cerro Verde Scientific Base that started in 2001 by the local NGO Karumbé.

Prepare the update of the checklist of macroalgae community from Uruguayan coast. And design the first algae guide of Uruguay.

Finally, given new threats affected marine turtles in Uruguayan coastal waters (new deep-water port in Rocha Department, rising coastal development, port dragging, interactions with invasive species, marine debris interaction, etc.). I am interested to investigate the local movements and habitat use of the green turtle local stock using GPS/satellite instrumentation. In this way it will be possible to provide prior knowledge of the area to generate baseline information that will be key for the studies of the potential environmental impact.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes. We used de RSGF logo in:

- Two oral presentations in the III Uruguayan Congress of Zoology, Montevideo (Uruguay). 7th - 12nd December 2014 (Fig. 5).
- Oral presentations in the First Mini-Symposium of marine debris in Uruguay, Montevideo (Uruguay) 5th December 2014 (Fig. 6).
- Posters (2) presented in the 34th International Symposium of Biology and Conservation of Sea Turtle, New Orleans, USA. 9---14 April 2014. (Fig. 7).
- Talk to Cabo Polonio National Park and Cerro Verde rangers and other MPAs workers.
- The logo was printed in the two big signs for the MPAs (see picture Cero Verde sign).
- As well, the logo will be included in the field guide and other materials, these materials still in design process.
- Also, The Rufford Small Grants Foundation (RSGF) appears in all our acknowledgements in the published articles in peer-reviewed journals.