The Rufford Foundation

Final Report

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

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. 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. Please note that the information may be edited for clarity. 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	Ana Rita Caldas Patrício
Project title	Impacts of Climate Change on West African Green Turtles
RSG reference	6357-2
Reporting period	December 2014 to June 2016
Amount of grant	£ 4993
Your email address	R.Patricio@exeter.ac.uk, anaritapatricio@hotmail.com
Date of this report	30 June 2016

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
Train IBAP staff on specific field activities			X	Rangers and technicians collaborated in all field activities, used all field equipment purchased for this project and worked in separate teams when autonomy was achieved.
Involvement of local community			X	18 young men from the local communities collaborated in the project during the green turtle nesting season, and were paid a stipend for the time of collaboration. One of the collaborators trained the previous year joined the IBAP staff in 2014, as a full-time.
Investigate the consistency on nest site selection, and nest distribution			X	We increased the number of tagged nesting females: from 200 in 2013 to 600 in 2014, allowing for a robust analysis on the consistency of nest site choice and on the impacts of nest distribution on hatching.
Estimate the level of multiple paternity and infer on the operational sex ratio of the population			X	We sampled nesting females and their hatchlings from 30 nests, during the nesting season of 2014, and conducted analyses in the laboratory: DNA extraction, amplification of desired sequences and fragment analysis. We are now undergoing statistical analysis and writing up results.
Model nesting environments under future global warming scenarios			X	We increased the data collected on incubation temperatures, and on nest distributions (both temporal and spatial), allowing us to model future scenarios for incubation conditions and their impacts with more confidence.

Estimate impacts of predicted sea-level-rise (SLR)		X		We have valuable data from two nesting seasons which enable us to assess the expected impacts of SLR. However, we will complete this data with aerial surveys conducted using a drone and photogrammetry to obtain accurate 3D models of the nesting habitat which will greatly improve our estimates.

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

The laboratory work took longer than predicted, due to the time spent to optimize protocols. Additionally, an extension was requested, as I had the opportunity to go to Príncipe Island, Gulf of Guinea, for 6 months to develop a similar sea turtle conservation project building capacity with the local NGO and community members.

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

1) As with the first RSG, the community involvement was one major achievement of this project; we had great feedback from the youngsters that collaborated with the project, their families and friends. Particularly the younger generations are really keen in collaborating with the IBAP in protecting their biodiversity and in the management of the parks. One of the collaborators from 2013 was in 2014 employed full-time by the IBAP. Other collaborators from 2013 and 2014 were chosen for a training as eco-guides for turtle watching activities.

2) During the field work in 2014 our team saved from certain death 70 adult females and over 1000 hatchlings that had stranded in the intertidal rocks.

3) The continued dissemination of the findings from this project, acknowledging the importance of Poilão Island for the conservation of the green turtle at an international level: oral communications at the 35th International Symposium for Sea Turtle Conservation and Biology, held at Dalaman, Turkey, May 2015, and at the Aquatic & Biodiversity Ecosystems Conference, in Liverpool, UK, September 2015.

4) We have collected sufficient information to deepen our understanding of this population; namely we were able to estimate the pivotal temperature (temperature at which the sex-ratio is balanced), allowing us to predict the expected sex ratio in the current conditions and model future sex ratios under different climate change scenarios of temperature and sea level rise.

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

Similar to the previous field season, we worked with young men from the village of Ambeno, located in the Island of Canhambaque, Bijagós Archipelago. In 2014, the number of collaborators was increased to 18 (compared to 14 in 2013). Each of these young men participated in all the research and conservation activities at the Island of Poilão for a period of 2 weeks, and was given a stipend for that period. They were trained in all the field work and sampling techniques and in evening gatherings we would talk about the biology and conservation of sea turtles, problems of illegal captures in the park, and whichever subject was of concern for them and their way of living. These young men are key to biodiversity conservation as they are the future decision makers. The IBAP always involves the community in all decisions affecting the use of their Protected Areas, so having young generations informed and willing to protect their natural resources will go a long way to improve management decisions and reduce conflict.

5. Are there any plans to continue this work?

Yes. The green turtle nesting rookery at the Bijagós is of world importance and this project was very valuable to better understand the status of this population. However there are key questions that remain to be addressed, such as: 1) How do turtles use the in-water habitat? 2) What are the links between reproduction and foraging sites?; which we hope to address in the near future.

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

1) I have presented results of this project at two International Conferences, through oral communications: at the *35th International Symposium on Sea Turtle Biology and Conservation*, in May 2015, at Dalaman, Turkey. http://www.seaturtle.org/PDF/KaskaY_2015a_Bookofabstractsof35thAnnualSymposiu.pdf, and at the *Aquatic Biodiversity & Ecosystems Conference*, September 2015, Liverpool, UK http://www.aquaticbiodiversityandecosystems.org/

2) As in the previous year, I prepared a technical report for the Institute of Biodiversity and Protected Areas of Guinea-Bissau (IBAP – GB), so they can compile the achievements of this project with their ongoing motorization and present these at regional meetings.

3) I am about to submit a manuscript on the dispersal of green turtles from the major

nesting site at Poilão.

4) With the data gathered through this project, in 2013 and 2014, further scientific work will be published, on the climate change impacts on West African green turtles, including key individuals from the IBAP-GB as co-authors.

5) All presentations and articles will be promoted in the social media through twitter, Facebook and press releases.

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

The actual length proposed for the project was 12 months, which included 1 month of preparation for field work, 4 months of the field work, and 7 months for laboratory and statistical analyses, writing and presenting results.

Because I went to Príncipe Island, Sao Tome and Principe, to coordinate the sea turtle conservation project, taking the opportunity to extend some of activities proposed within this project, I requested a cost-free extension. Therefore the RSG was used for a period of 18 months.

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
Field work equipment, stipends of local collaborators and field work related travelling	2355	1383	+972	We managed to secure funds from other sources (e.g. MAVA Foundation), to cover part of the expenses related to fieldwork
Travel & Subsistence: International Conferences	358	392	-34	Oral communication at the 35th International Sea Turtle Symposium, Dalaman, Turkey Oral communication at the Aquatic Biodiversity & Ecosystems Conference, Liverpool, UK

Consumables: Genetic analyses	2280	3218	-938	Since we manage to cover some field expenses with other source we used the remaining RSG to cover costs of the proposed genetic analyses
Total	4993	4993	0	

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

1) Improve monitoring protocols at neighbouring islands were marine turtles also nest to increase protection and get important data on the nesting success and habitat availability.

2) Complete manuscripts to be published in peer-reviewed scientific journals to further disseminate results of this project.

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

The Rufford Foundation logo has been presented three times in oral communications: at the Centre for Ecology and Conservation of the University of Exeter, at the Aquatic Biodiversity & Ecosystems international conference, and at the 35th International Symposium on Sea Turtle Biology and Conservation. The foundation is acknowledged in the soon to be submitted manuscript attached, as it will be in all subsequent publications inherent to this project.

11. Any other comments?

The Rufford Foundation was a great support to kick off this project which we aim to continue with other funding sources. I also believe that as an early career scientist that receipt of this award has greatly boosted my confidence in securing, managing and delivering projects. It has built capacity in me!

Saving adult green turtle stranded in rocks

Sana, a collaborator from Ambeno village, weighing a green turtle hatchling

Green turtle nest exhumation, team work