

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. 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	Maira Carneiro Proietti
Project title	Conservation genetics and migratory patterns of sea turtles in southern Brazil
RSG reference	13.12.07
Reporting period	03.08 – 08.09
Amount of grant	£2628.63
Your email address	mairaproietti@gmail.com
Date of this report	12.11.09

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
Obtaining green turtle tissue samples			X	A very satisfying number of green turtle samples were obtained and analysed (total = 216).
Obtaining hawksbill turtle tissue samples		X		Hawksbill turtles were disappointingly scarce at the study areas. We were able to obtain only a small number of samples of this species (total = 7). These samples have not yet been analyzed. However, further sampling will be performed and this species will be analyzed when a more robust sample size is obtained.
mtDNA haplotype and genetic diversity determination			X	12 haplotypes were identified for each area, which displayed the expected haplotype and nucleotide diversities of a foraging ground (mixed stock).
Differentiation analyses			X	The two study areas were genetically indistinct, but were different from more distant areas in north Brazil, Caribbean, and North America.
Determination of probable natal origins			X	Through Bayesian Mixed Stock Analysis, it was determined that animals foraging at the study areas are most probably born at Ascension Island (United Kingdom), Aves Island (Venezuela) and Trindade Island (Brazil). Some animals may also be from areas in the Gulf of Guinea (Africa).
Development of novel priors for natal origin analysis			X	We developed a novel prior based on surface drifter trajectories, assuming that hatchling sea turtles depend mainly on surface currents for dispersal. The trajectories of drifters that passed by the main green turtle rookeries in the Atlantic revealed the potential routes travelled by hatchling sea turtles to the Brazilian coast.
Disseminating information through presentations and papers			X	Results were presented at three events, and a short communication was published. Another paper is being concluded for submission.
Information exchange with other			X	Information was shared with other researchers and conservation projects

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

Some difficulties arose during the project. The predicted field expedition for sampling was successfully performed and we were able to conduct an additional expedition for the collection of more samples due to additional financial aid received from PTES. Therefore, sample size was larger than anticipated, resulting in a total of 216 green turtle samples. This increase in sample number was very welcome but contributed to the delay in project completion. As cited beforehand, hawksbill turtles were scarce and only seven tissue samples were collected. These samples are currently stored and will be analyzed when a more robust sample size is obtained. A major setback involved laboratorial problems, and many PCRs had to be redone for sequencing. I had to travel to a different University in order to sequence DNA samples, which also caused delay. Sequencing is a very sensitive procedure and some samples were not clear enough for analysis, and since it was impossible to travel once more for re-sequencing, samples had to be sent to a private laboratory a few times in order to sequence all samples. This also proved to be a setback in project completion. However, with hard work from the project team, it was possible to successfully conclude the project in terms of green turtles.

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

Describing mitochondrial DNA (mtDNA) of green turtles in two important southern Brazil foraging areas, which lacked genetic studies, was one of the most important achievements of the project. Both study areas presented 12 haplotypes previously described in the Atlantic Ocean, with ten being shared between areas at extremely similar frequencies. Another important outcome was the observation that study areas are genetically indistinct in terms of mtDNA, composing one genetic unit, but which should not be treated as one management unit. Finally, the determination of the main stocks that contribute to the Arvoredo and Cassino foraging areas was a very important result. Genetically, it was determined that Ascension, Aves and Trindade Islands are the main contributors to the study areas, and some animals arrive from the African continent. Through the analysis of surface drifter data, it was clear that surface currents favour arrival of drifters passing by Ascension and Trindade Islands. We developed a novel prior for Bayesian Mixed Stock Analysis based on such surface drifter data, which we consider to be more ecologically realistic.

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

Although the project did not foresee direct involvement of local communities, some local people were indirectly involved. At Arvoredo Island, we were in direct contact with the Navy officials responsible for operating the lighthouse, and they accompanied the work and were able to participate in some activities, learning more about sea turtles and the marine environment, and why conservation is so important. Also, activities were developed on board the boat of the diving school (Pata da Cobra Diving) that provided logistic support at the island, and dive staff and divers also accompanied the work and learned more about sea turtles and conservation.

5. Are there any plans to continue this work?

I am currently enrolled in the Biological Oceanography Doctorate programme, and intend to continue research on sea turtle genetics. My thesis project involves green and hawksbill turtles, continuing studies in southern Brazil (especially in terms of hawksbills) but also expanding the study areas to include north-east Brazil and the analysis of different molecular markers. I also plan on continuing the development of more informative priors for natal origins analysis.

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

I have already published one short communication in the journal "Genetics and Molecular Biology - GMB", and presented this work in three conferences. I am currently finishing another scientific paper for submission to journal *Molecular Ecology*. Also, information on the project and link to the GMB paper can be seen at the Pata da Cobra website, http://www.patadacobra.com.br/biologia-marinha/projetos/proietti2009_GMB.pdf.

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 18 months. The anticipated length was 12 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
Supplies for expeditions	£384.00	£746.88 (R\$2517.00)	£362.88	Exchange rate: R\$3.37. Amount was higher than budgeted due to an additional expedition
Disposable skin biopsy punches	£274.00	£284.87 (R\$960.00)	£10.87	Amount was slightly higher due to shipping. Since punches were sterilized and reused, there was no need to buy more units than foreseen in the budget
mtDNA control primers	£179.40	£179.40 (R\$605.00)	£0	Primers were sufficient for all samples
Taq polymerase	£332.60	£660.26 (R\$2225.08)	£327.66	Four units were necessary due to additional samples
Purification kit	£337.23	£773.29 (R\$2606.00)	£436.06	Two units were necessary due to additional samples
Sequencing kit	£1121.37	£1287.00 (R\$4340.00)	£165.63	Amount was higher due to adjustment of kit value in the interval between preparation of budget and acquisition
Separate sequencing reactions	£0	£884.21 (R\$2845.00)	£884.21	Separate sequencing reactions were necessary for obtaining clear sequences for all samples

Total	£2628.63	£4573.54	£2187.68	Additional funding was provided by the PTES
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9. Looking ahead, what do you feel are the important next steps?

The first necessary step is to publish the full results in a scientific journal. The article on green turtle mtDNA in southern Brazil is almost finished and will be submitted to *Molecular Ecology* by the end of the year. Obtaining more hawksbill turtle samples for analysis is also an important step. Other important steps are to continue genetic description of sea turtles in Brazilian waters for identification of genetically-distinct units and natal origins of these endangered animals. Also, the improvement of natal origin analysis through the elaboration of more informative priors is important for a better definition of mixed stock origins. Finally, continuing information exchange with other researchers and conservation projects is essential for taking effective measures for the conservation of these endangered animals.

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?

The RSGF was acknowledged in all materials produced during the project (three posters and two scientific papers). The logo was printed on all posters.

11. Any other comments?

I wish to express my gratitude to the RSGF for the financial support. In Brazil, research for conservation of endangered animals is rapidly growing but obtaining financial support can sometimes be very difficult. Thanks to the RSGF, I was able to complete an important project and obtain my Master's degree.

12. I agree to this report being published on the Rufford Small Grants website

I agree that the report be published, as well as posters and the paper published in Genetics and Molecular Biology. However, I request that the manuscript in preparation for Molecular Ecology (attachment "Proietti2009_MolecularEcology.pdf") is not published on the website, since it has not yet been submitted for publication.