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	Liliana Poggio Colman
Project title	Ecology and conservation of leatherback sea turtles in Brazil
RSG reference	520018-1
Reporting period	October 2017 – February 2019
Amount of grant	£4956
Your email address	l.p.colman@exeter.ac.uk
Date of this report	5 August 2019

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
Training of TAMAR staff and local community				We trained local community members, TAMAR staff, students and volunteers involved in leatherback turtle conservation in sampling and monitoring techniques, including the deployment of satellite tags. We also organised an integrative workshop with ~30 people to disseminate the outputs from the project and promote research collaborations.
Information on reproductive parameters				The data collected in this project contributed to generate a better understanding of reproductive parameters from this leatherback population. We recently published an Open Access paper in Endangered Species Research https://www.int-res.com/articles/esr2019/39/n039p147.pdf (Colman et al. 2019, with acknowledgements to Rufford) using 30 years of nesting data to provide estimates of population trends. This paper also shows that there are many research gaps that still need to be filled in order to achieve a more complete knowledge of this population and to achieve effective conservation. Information on population size, remigration intervals and survival are particularly needed to create effective management plans. Our future plans include to continue conducting successful community-based conservation work and to fill these research gaps. Particularly, we will start using Passive Integrated Transponders (PIT tags) as an alternative tagging method to provide more reliable estimates from mark-recapture studies. This was not achieved in the period originally planned in this project, however, we have secured some funding for 1 more year of research (2019-2020), where we will run this pilot tagging programme for the first

				time in this population. We will apply for a second Rufford award to fully maximise the legacy of the current work.
Estimate sex ratios of offspring				We deployed 29 dataloggers recording leatherback nest temperatures, which provided novel and important information on sex ratios of offspring being produced in Brazil. Preliminary results were published in Colman et al. 2018 https://ore.exeter.ac.uk/repository/handle/10871/36862. A manuscript for publication in a peer-reviewed scientific journal is currently in preparation.
Investigate the spatial ecology, habitat use and movements - tracking				Four satellite transmitters were deployed in nesting females and provided key information on internesting and post nesting movements. Several media materials were produced (see below in Item 3c). The local community was highly engaged during this activity. Preliminary results were published in Colman et al. 2018. A manuscript is currently in preparation.
Investigate the spatial ecology - stable isotopes analysis				Sampling, processing and analyses completed; chapter in PhD dissertation published (Colman et al. 2018) and manuscript in preparation. Further research will contribute to increased sample sizes and more powerful analyses.
To promote environmental awareness				Hatchling releases and participation of local community members during night patrols contributed to promote awareness within the local community. We have also disseminated the project results in international conferences, as well and in social media (see Item 3c), contributing to the message of conservation being promoted and shared broadly.

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

We had initially planned to use PIT tags as an alternative tagging method for leatherbacks in Brazil. However, with delays in the tracking equipment and the upcoming of the nesting season, we decided to focus in training and deploying the satellite tags only. As by the end of the project period we still had some remaining funds, which coincided with a cut in funding from Brazil, we were granted a no cost extension by Rufford and used the remaining funds to cover subsistence costs for L Colman while conducting analyses and preparing manuscripts and funding applications.

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

a) I worked together with TAMAR in Brazil conducting the training of local community members, staff, students and volunteers in sampling and monitoring techniques, as well as leading weekly meetings where we would present the results of our research and discuss the biology and conservation of marine turtles and their environment. These young people are key to biodiversity conservation, as they will be the future field biologists leading conservation work and also decision making in Brazil.

We also organised and hosted, in partnership with TAMAR, a workshop to present and discuss tracking projects that are being undertaken in Brazil, including hawksbill, olive ridley and leatherback turtles. Professor Brendan Godley from the University of Exeter, UK, shared his expertise and joined the Brazilian participants from several TAMAR stations, and the team actively participated during the night patrols to deploy the satellite tags.

Team Operação Gigante, who participated in the efforts of deploying four satellite transmitters in leatherback turtles in Espírito Santo, Brazil. November 2017.

b) We successfully conducted night patrols to tag females during the nesting season, with the help of local community members. We recorded and protected leatherback turtle nests, tagged and sampled seven nesting females for stable isotopes analysis, as well as deployed thermometers within nests to investigate the nest environment and the sex ratios being produced. The preliminary results from this research has been published on my PhD dissertation (Colman et al. 2018) and manuscripts are currently being prepared for publication in peer-reviewed scientific journals, with some interesting findings that will contribute widely for a better knowledge of this population.

Leatherback turtle data being collected by the team in Regência, Brazil

c) We successfully deployed satellite transmitters in four nesting females. The data provided important information regarding their inter-nesting habitats (the area the turtles use during their nesting period) and also post-nesting migrations. These can give us insights into their behaviour, including where they would be more susceptible to threats such as fisheries bycatch. The turtles were tracked for up to 180 days, with their movements being widely shared in the local community, nationwide in Brazil, as well as internationally. The four nesting females were very charismatic within the village. Their names were chosen by the local team, representing important characters from their local indigenous culture, as a way of bringing local traditions and turtles together. Their routes were followed, and several media materials were produced, raising environmental awareness towards the conservation of marine turtles and marine habitats. The Rufford Foundation was mentioned in the media material produced, including some examples below and many others in platforms such as Instagram, Twitter and Facebook:

- https://www.exeter.ac.uk/news/featurednews/title_663915_en.html
- http://www.tamar.org.br/noticia1.php?cod=853
- http://www.icmbio.gov.br/portal/ultimas-noticias/20-geral/9304-na-rota-das-gigantes
- https://www.funbio.org.br/gef-mar-monitoramento-por-satelite-para-conservacao-de-especies/
- https://www.youtube.com/watch?v=4dV8LYw2W3g

- http://www.nationalgeographic.com.es/naturaleza/actualidad/brasil-a-tristan-acuna-itinerario-fubica-tortuga-marina-hembra_12826/1
- https://phys.org/news/2018-06-turtle-tagged-brazil-uk-territory.html
- http://blogs.exeter.ac.uk/exetermarine/2017/07/03/marine-turtles-of-brazil-education-research-and-conservation/
- http://seculodiario.com.br/36634/10/tartarugas-gigantes-capixabas-sao-monitoradas-via-satelite

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

The local community benefitted greatly from our project. We provided training to teams involved in conservation in Brazil, as well as to students and volunteers (~ 30 people). This will help to build local capacity and contribute to the formation of young conservationists in Brazil.

Additionally, the local community also got engaged in night patrols and the tracking programme. The movements of the tracked turtles were followed by many people, being a real frenzy in the little town of Regência, and reaching international levels through websites and social media. I believe that this contributed significantly to raising awareness as to the presence and importance of leatherback turtles in that area.

Finally, Regência is a small fishing village in Brazil, with approximately 1000 inhabitants. During fieldwork, we tried to benefit the local community by using their various services, such as local suppliers, petrol station, bed and breakfasts and restaurants. In this way, we also helped the economy of that little village, bringing them some much needed income from research and visitors.

5. Are there any plans to continue this work?

Yes. I am very much looking forward to continuing conducting successful community-based conservation work and to fill research gaps needed to develop effective management plans for the critically endangered southwestern Atlantic leatherback turtle population.

I have currently secured partial funding for 1 more year of research activities (2019-2020) from the US Fish and Wildlife Service, in partnership with Fundação Pró-Tamar in Brazil. Among the proposed activities, we plan to perform fisheries surveys to better understand their potential for interaction with leatherback turtles, and to tag nesting females using PIT tags for the first time in this population, to better estimate key parameters such as population size, clutch frequency, remigration intervals and survival.

We plan to apply for a Second Rufford Small Grant to cover some of the costs associated with fieldwork in Brazil, during the nesting season. This will help us to collect data on priority areas for the species and to ensure protection of the leatherback turtle population in Brazil.

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

The results of this work were part of a PhD recently completed by L Colman at the University of Exeter, UK. The PhD dissertation is Open Access and available for download at the website: https://ore.exeter.ac.uk/repository/handle/10871/36862

The first chapter of the PhD has been published in Endangered Species Research as an Open Access article (Colman et al. 2019, https://www.int-res.com/articles/esr2019/39/n039p147.pdf) and has been featured in the media, as well in social media (Instagram, Facebook and Twitter):

University of Exeter website
http://www.exeter.ac.uk/news/research/title_723571_en.html

Projeto TAMAR's website
http://www.tamar.org.br/noticia1.php?cod=917&fbclid=IwAR3hdPVlFuYBaveBQN-orgoEXWmOZvLuowq6LtcKsAFjhVpYcfrBqUTiJpQ

The remaining 3 chapters of the PhD are already being prepared for publication in peer reviewed scientific journals. I have also recently written an article entitled "Ecology and conservation of leatherback turtles in Brazil", which is currently in press at the journal Testudo, from the British Chelonia Group. In this article we synthesise the results from this work and also discuss further actions for the research and conservation of leatherback turtles in Brazil.

We have also delivered two oral presentations at international conferences (International Sea Turtle Symposium 2018 and 2019), where The Rufford Foundation was acknowledged, and the results of this research shared with the international scientific community.

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 grant was used from October 2017 to July 2019. We initially planned the project for one year, however we were able to fund some aspects of our research, meaning that some funding remained unused by the end of the first year. That coincided with funding cuts in Brazil, resulting in the extension of the period of the grant and the remaining funds were used to cover LC's subsistence until July 2019, when this project was completed.

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
Quad bike rental	1150	522	-628	We found a cheaper local supplier
Petrol	828	482	-346	Fundação Pro-TAMAR helped with some petrol
Accommodation	368	370	+2	
Local community research assistant	368	256	-112	We did not need assistants for as many days as we initially thought
Fieldwork equipment and consumables	400	695	-396	PIT tags were not purchased
Return tickets UK-Brazil	1150	988	-62	Difference caused by fluctuation on ticket prices
Return train tickets within the UK	100	96	-3	
PIT Tag applicator and reader	518		-518	
Micro-chip (PIT Tag)	74		-74	
TOTAL	**4956**	**3409**	**-1547**	

We were able to fund some aspects of this research, meaning a modest remaining balance was left (~ £1500). The budget was then amended following support from Prof Brendan Godley and approval from Rufford, using the remaining funds to greatly enhance the legacy of the Rufford Project whilst looking after my welfare due to funding cuts in Brazil.

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

The next steps are to secure continued funding for monitoring and research of leatherbacks in Brazil, aiming the long-term protection of this population. We will continue working with Fundação Pró-Tamar, and using funding secured from the US Fish and Wildlife Service. We will write grant applications seeking for additional support to conduct fieldwork in Brazil, including a Second Rufford Small Grant.

The preparation and submission of manuscripts for publication is also key for providing data to be used as scientific evidence to develop effective conservation strategies for the Southwestern Atlantic leatherback turtles.

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

The Rufford logo was used in all presentations done in Brazil and at international conferences. The Rufford Foundation was also mentioned in news on websites and social media. We also acknowledged the Rufford Foundation in scientific manuscripts (Endangered Species Research) and articles (Testudo, British Chelonia Group) wrote.

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

Professor Brendan Godley and Professor Annette Broderick, from the Centre for Ecology and Conservation at the University of Exeter, UK (https://www.exeter.ac.uk/cornwall/research/facilitiesandcentres/cec/), were the project supervisors. They have coordinated the experimental design and also collaborated in all research conducted and resulting manuscripts.

Mr. Joca Thomé, National Coordinator at Centro TAMAR/ICMBio, Brazil, assisted with permits, fieldwork, logistics and supervision of all research and resulting manuscripts.

Fundação Pró-TAMAR (the Brazilian Sea Turtle Conservation Programme) has a research station within the study area and assisted with transport, fieldwork logistics, staff and volunteers. Members from Fundação Pró-TAMAR were also actively involved in data collection, analyses, write up of manuscripts and publication. The local community members, trainees and volunteers who collaborate locally with TAMAR also participated in fieldwork activities.

12. Any other comments?

I am truly grateful for the funding provided by the Rufford Foundation. It was essential for achieving local community training, conducting fieldwork and data collection, which contributed to the protection of leatherbacks in Espírito Santo, Brazil. I hope we can continue conducting research/conservation and education outreach work in Espírito Santo, Brazil, further developing collaborations among the Fundação Pró-Tamar, University of Exeter, UK, and The Rufford Foundation, seeking for long-term conservation of this population.


Atlantic Ocean
Brazil
T. da Cunha
End
Start