

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	Pablo Andrade Cruz
Project title	Marine Biodiversity of Mainland Ecuador
RSG reference	25174-1
Reporting period	June-2019
Amount of grant	£5000
Your email address	pabl.andrad@gmail.com
Date of this report	3-June-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
Monitor and document the biodiversity of rocky intertidal zones				Benthic surveys, size structure of whelks and occurrence of cryptic species were successfully achieved. The project was able to collect data from seven different sites along the Ecuadorian coast and the documentation of marine life was achieved.
Monitor and document the biodiversity of subtidal rocky reefs with coral patches				Benthic surveys on rocky sub-tidal communities was partially achieved. The percentage of cover was measured for corals. However, it was not possible to conduct fish counting transects due to the logistic and time, regarding some attempts. Documentation of marine life in general was achieved.
Data analysis				This phase, due to the publication of the field guides, is currently on work.
Field-guides: 1) Corals & Octocorals 2) Fishes 3) Molluscs				The corals and octocorals guide is under revision by the USFQ Press. The fish guide is under the last steps of writing and the mollusc guide is 75% finished.
Citizen Science				This activity is on going and the goal is to keep it active with the citizen science project.
Communication of results & publishing				Preliminary results have been delivered in different talks. Also, the documentation of the marine biodiversity has been presented at the XIV Festival of Nature Photography and Video, an event organised by the School of Biological and Environmental Sciences (COCIBA-USFQ). In addition, data obtained from the research will be shared as a technical report at the end of the

			year with the Ministry of Environment of each province. Finally, after the analysis of the data, publishing the results in a journal is the main goal.
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

At the beginning of the project the main issues were bureaucratic struggles in order to get research and collection of specimens' permits from each province, (Esmeraldas, Manabí and Santa Elena). Because of this, the field trips at the beginning were delayed. Another difficulty of our project was regarding logistical problems to reach distant locations, such as the El Oro province.

The collection of specimens was also difficult to perform, since more people were needed to make collections due to the time the activity took. We solved this by inviting USFQ alumni to come with us to the field trips, who had already experience in species identification.

Finally, another difficulty was the lack of taxonomic experts in different fields and the resources for marine species ID that could be used or found. Fortunately, by the creation of the citizen science webpage, we were able to ID several species that were hard to find in online databases.

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

1) *Research advances and contributions:* Data collected in order to monitor rocky intertidal zones (abundance, diversity and cryptic species occurrence), size structure of two species of whelks (*V. melones* and *A. brevidentata*), benthic surveys on rocky reefs with coral patches and, a collection of specimens were made for the Zoology Museum (MZUSFQ).

We also created short intertidal field guides for data collection (intertidal mobile and sessile species including algae), surveys protocols for rocky intertidal zones (to standardise the replications and the surveys of each field trip) and have the materials to keep monitoring in the long-term (underwater camera, quadrants, transect lines, and more).

2) *Citizen Science Project and talks:* during our project one of the main objectives was to upload photos/observations in the portal web www.inaturalist.org/projects to aid species identification. In order to engage people to contribute with their observations, we contacted scuba diving operators in order to promote divers to be part of the project in their website and upload observations. Also, we were able to place infographics in several diving centres. In addition, we participated in talks in order to present the project and to share some information to future and veteran scuba divers. Finally we also gave several talks to students of the Universidad San Francisco de Quito (USFQ, classes related with biology) to reinforce their

participation within the web portal, since many of the students have field trips to the coast of mainland Ecuador.

3) *Publishing the field-guides* for the coast of mainland Ecuador. These guides will contribute to the knowledge of the species that inhabit our coast. Moreover, it may be used as resources for students and researchers in this field. The inventories of species registered will also help for future publications.

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

Since most of our study sites are partially away from main towns, it was hard to find locals to participate in the study. Still the participation from students (USFQ) that are studying marine ecology was important during this project. Additionally, local authorities like the Ministry of Environment in Santa Elena were interested in the project. We shared with them the materials we produced (Section 3.1) to help promoting knowledge and for future collaborations.

5. Are there any plans to continue this work?

Yes. The aim is to publish the data collected from this project in a scientific journal. Also, data gathered by this project will contribute to future field guides for other taxonomic groups than have not been published yet (i.e. macroalgae). Furthermore, the citizen science project, the portal web (inaturalist.org), and social media accounts will be useful to encourage people to use the field guides and will continue functioning.

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

The project has been shared from the beginning with the information gathered and with the data compiled; several talks were given to students in different classes. Also, photographs taken from this project were presented at the XIV Festival of Nature Photography and Video, an event organized by the School of Biological and Environmental Sciences (COCIBA-USFQ). We plan to continue doing the same, as these events are repeated every year (classes or festival) with up-to-date information.

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 activities occurred during the 12-month period (June 2018 – May 2019). At the beginning the project was planned to start between March/April, but since the process took a while (approval of the Rufford Small Grant) and also funds to come through, we started with the project officially in June 2018.

Field trips were delayed for a short time due to collection and research permits. Also as mentioned before, the corals and octocorals guide is under the last revision by the USFQ Press, the fish guide is under the last steps of writing and the mollusc guide

is 75% finished. So the process of editing the field guides turned out to be much longer than we had anticipated.

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
Underwater camera and SD card	315	341	+26	
Portable external hard drive	40	47	+7	
Field materials		680	+680	Since we sampled several sites, we had to buy and prepare new materials, like transects, quadrats, waterproof datasheets, etc.
Food	1300	1200	-100	
Lodging	1300	1200	-100	
Transportation	290	316	+26	
Diving	1300	1090	-210	
Local field assistant	434		-434	Difficult to find someone committed to conduct research
Extra expenses (Research permits, info-graphics, and more)	21	126	+105	We didn't take into consideration the expenses for research specimens' collections permits, and info-graphics
TOTAL	5000	5000		Date of conversion (17-May-2019) from US dollar to sterling pounds \$1,00 = £0,79

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

A) To continue with the citizen science project in order to keep gathering data on the distribution and occurrence of marine flora and fauna in mainland Ecuador. Also, continue with environmental communication through social media accounts in order to share the photos and videos gotten from the field trips.

B) Once the first field guide will be published, we will undertake the programme we proposed to monitor the achievement of our work. This includes encouraging the field guide users to write to us in order to get comments about the field guide. As

suggested by Lawrence and Hawthorne (2006), we will add a note in the first guide, inviting the users to send their comments and observations to the authors. The note will request the following information:

- Name, occupation and address of the person providing the feedback;
- Reason why this person is using the field guide;
- Aspects and features of the field guide that the user likes;
- Features that the user finds more problematic;
- Specific species that the user has found difficult to identify when using the guide and why;
- Suggestions for improvement.

Such an evaluation can highlight ways in which future field guides or projects could be improved. This knowledge can help us to identify any necessary changes for the other guides.

C) Research wise, and after seeing the state of the coral reefs in the area, we would like to conduct coral surveys and experiments on thermal tolerance in El Pelado Marine Reserve, Isla Salango, Isla de la Plata and any other site with significant coral reefs. This will give us an idea of their resistance and possible resilience to climate change.

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 Foundation logo was/will be used in the following products:

1. Infographics displayed in scuba-diving centres.
2. Talks and presentations of the project for divers and students.
3. All four field guides (corals and octocorals, fishes, molluscs and macroalgae) will also include the logo.

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

Pablo Andrade: data collection in the field; in charge of logistics, research and collection permits; collection of specimens (for the Zoology museum MZUSFQ), citizen science project manager and speaker.

Margarita Brandt: data collection in the field and data analysis; collection of specimens (for the Zoology museum MZUSFQ).

Fernando Rivera: data collection in the field, species ID of corals and fish.

Priscilla Martinez: data collection in the field, species ID of corals and molluscs.

Franklin Checa: data collection in the field; collection of specimens (for the Zoology museum MZUSFQ), citizen science project co-manager and speaker.

María José Guarderas: data collection in the field.

María Cecilia Terán: design and edition of field guides.

Soledad Luna: design and edition of field guides.

Kate Clark: data collection and photography for mollusc guide, mollusc specialist.

Valentina Gachet: data cleaning and edition for mollusc guide.

12. Any other comments?

Keep contributing to research and conservation. Thank you for the opportunity!



Diomedes Sapsucker (*Elysia diomedea*). ©Franklin Checa



Redhead Goby (*Elacatinus puncticulatus*). ©Pablo Andrade



Species collection for the Zoology Museum (MZUSFQ). ©Pablo Andrade



Presentations. Photos: © Franklin Checa & © Margarita Brandt,