

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	Luis Vinueza
Project title	Conservation Ecology of Galapagos Rocky Shores in the Face of Human Disturbance and Climate Change
RSG reference	02.04.08
Reporting period	February 2008-January 2009
Amount of grant	6,000 BP
Your email address	lvinueza@usfq.edu.ec

Date of this report	20 April 2010
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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
1. Understanding the ecological role of marine iguanas, fish and crabs			We have now 3 years of uninterrupted information about the ecological role of these grazers	We understand now that grazers modify algal communities by changing the biomass, species richness, diversity and composition. However, those impacts will fluctuate with productivity and in response to large scale oceanographic perturbations, such as ENSO.
2. Understanding the likely consequences of their extinction			Same as above. Impacts will be context dependent.	At sites of low productivity the extinction grazers would increase the biomass, richness and composition of algal species. At mid productivity. The opposite will happen at sites of high productivity
3. Understanding the interactive effects of temperature, nutrients and grazers on primary productivity			During our three year study we experienced a weak warm El Nino and a strong cold la Nina	We now know that the response of intertidal system to grazers will change with different nutrient levels and temperature experienced during these environmental perturbations. No changes would occur at sites of low productivity, at sites of mid productivity grazers, warmer water and low nutrient levels would

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

I was not able to secure funding to conduct the nutrient addition experiments; however, we were able to get free rides with tourist boats towards our sites for 3 consecutive times. This allowed me to compile some preliminary pilot data; however, no conclusive results were observed.

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

- a. This is the first time we have quantitative information about intertidal sites that experience different environmental conditions in Galapagos.
- b. We now know that Galapagos intertidal systems are strongly affected by temporal and spatial fluctuations of temperature and nutrient levels. These factors modulate the impact of grazers. At sites of low productivity grazers decrease diversity and biomass of sessile organisms and produce communities dominated by few grazing resistant forms. The opposite occurred at sites of high productivity. There, higher growth rates of primary producers are counteracted by grazing, herbivores open space for other species to settle, therefore, increasing diversity.
- c. We also know that intertidal systems at sites of low productivity change little with environmental perturbations such as ENSO, while at sites of high productivity the impact of grazers is more important at this time.

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

A few locals (either born in the Galapagos or permanent residents of the Islands) and other Ecuadorians (from different Universities in the mainland) participated during our surveys. For example, Daniel Sabando, a local, participated as volunteer for me during more than a year. This opened the opportunity for him to continue working for the Marine Lab at the Charles Darwin Research Station even after my departure from the Island.

I also worked in close collaboration with the Charles Darwin Research Station. My work was the stepping stone for further research initiatives that will help us understand better this important system.

4. Are there any plans to continue this work?

Yes, in fact, John Paul Tiernan got a grant from the Rufford Foundation to work on intertidal systems in the Galapagos. He based his research plan on observations made after participating on a few trips with me.

We are also expecting the approval of a new proposal to continue with this work, but now to understand better how fishing might interact with marine iguanas and what locations could be more

resilient to such impacts. We have a very ambitious plan to conduct restoration efforts around the islands.

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

My thesis is finished. I already got my PhD based on this project. We are now working on at least 4 papers, and we hope we will submit them to peer reviewed scientific journals before the end of 2010.

I am also teaching marine conservation biology and marine scientific methods. I am using the results of my research as study cases to teach students how to conduct experiments and how ecological interactions such as those among grazers and their algae can be modulated by environmental conditions.

I am a co-organizer of a Symposium about climate change and marine systems in the Galapagos, this symposium will occur next August 2010 at the Annual meeting of the Ecological Society of America.

I have presented my work during my participation as a Teaching Assistant at Oregon State University.

I have presented my work at local meetings and will present it during the Ecological Ecuadorian meeting in 2011.

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

For a year, from February 2008 to January 2009, at that time, I finished my thesis research field component.

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
Boat rental for 6 days every 4 months at £249 per day ¹	4500	5000	-500	I had to use money allocated to nutrient analysis to covered a boat trip to retrieve the nutrient addition experiment
Nutrients for nutrient addition experiments, including shipping and taxes from the USA to	250	250	0	

Galapagos				
Nutrient collection and analysis (includes Phosphates, nitrates and silicates)	250	0	250	I allocated this money to boat rental, item explained above
Per diem maintenance to cover field expenses at £15 per person per day for 140 working days (one year of work in the field)	1000	1000	0	
TOTAL	6000	6250	-250	

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

Continue doing more research to provide better scientific information for management.

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, on any presentation or publication the support of RSGF is recognized

11. Any other comments?

The support of RSGF was instrumental to conduct my studies

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

Signed (or print name)___Luis Vinueza



Picture one: L Vinueza monitoring the experiment during January 2009



Picture 2: Iguana marina feeding on intertidal algae during low tide



Picture 3. The central square covered by green algae correspond to a cage that excluded grazers on Genovsea Island, picture was taken at the end of experiment, January 2009