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	Mauricio Seguel
Project title	Invasive species at Guafo Island: parasitic diversity, density and distribution.
RSG reference	13225-1
Reporting period	December 2013-June 2014
Amount of grant	£5728
Your email address	mseguel@uga.edu
Date of this report	6/30/2014

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
Evaluate the identity, prevalence, and load of pathogens carried by introduced rats			X	All the data has been obtained and now we are classifying and processing this information for further presentation of the results.
Identify if the occurrence, prevalence, and diversity of pathogens in introduced rats on Guafo Island is less than in typical mainland rat populations		X		We have the data on the occurrence and diversity of parasites in the Guafo Island rat population, however we still have to find references on the Chilean mainland population of black rats. There are a few studies on rats parasites in mainland, most of them not published, therefore we need to contact these researchers to share data and probably make some analyses together.
Determine the estimated density and distribution of rats and cats at Guafo Island.			X	We determined density and distribution during three field seasons and also identified three main sites that concentrate high densities of rats, two of them associated with human activities.

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

We had a medical emergency while in the field. One of our volunteers has to be rescued by a helicopter because of gastrointestinal illness. Fortunately she recovered after a couple of weeks but all that process delayed our field work and required investment of additional resources. Although we know that field conditions at the island are rough and we have to be prepared for these type of eventualities it is always hard to deal with the fact of being completely isolated and with a medical emergency. Fortunately our emergency plan worked and thanks to the support of the Chilean Navy the group could continue working and our volunteer recovered.

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

- We were able to share in the field with the local fishermen our experiences and results on previous work on invasive species in the Island. We have seen how the practices of carrying pets (cats and dogs) on boats has abounded as well as the attitude towards rats thanks to this "in situ" work. However the management of garbage is something that needs to be improved and that it will take additional efforts to solve.
- Thanks to previous sampling during 2012 and 2013 we have seen a dramatic drop in the density of rats during the 2014 season. However distribution has remained unchanged. This drop in black rat density was associated with an increase in the casual encounters with the endemic long-clawed mole mouse (*Geoxus valdivianus*), an almost blind mouse that can be found in the dense forest floor. In the absence of significant changes in climate conditions

from one season to the next we suspect and increase in the number of predators (e.g. birds of prey, cats), depletion of food resources during the winter or increase in diseases prevalence and severity. However the increase in the prevalence of the parasitic cysts of *Taenia taniformis* in the livers of rats suggest an increase in cat population density since that parasite can only be transmitted by felids to the rats. In conjunction with this we recorded for first time cats hunting during daylight and numerous tracks in one of the penguins colonies of the island.

- We clearly identified the most important places in terms of rat density. Two of these sites correspond to places associated with human activities. This highlight that education on adequate management of food supplies and garbage is essential to avoid rat increase in these places.

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

Through our extension project "Prevenir la propagacion de especies exoticas es proteger la fauna del sur de Chile" we shared some of the results of this project with local schools where teachers and middle school students participated in forums where we presented and discussed information with them, highlighting the responsibility of all of us in the adequate care of pets to avoid interactions of them with wildlife and management of residues to avoid propagation of rats to places with delicate ecosystems.

Additionally the help that we had from local fishermen contributed to share our experiences with them. We taught them how to properly set traps in campsites to capture rats and talked to them about the risk of diseases transmission to humans to change their attitude towards this type of invasive species. They were very enthusiastic and helped in the capture and logistics of our work, helping us to reach distant places of the island.

5. Are there any plans to continue this work?

We plan to continue with the screening of density and distribution of rats because of the dramatic changes that we observed between seasons. We think that it is crucial to determine which factors could be modulating this rat population. Additionally is critical to determine the cat density and distribution by direct methods since the number of this invasive species is apparently rising and the potential impact of cats on native birds and rodents could be greater than of rats. It is also urgent to find a solution for the waste management of fishermen in the Island as this is directly related with the density of invasive species and also it could be affecting other megafauna because of the increasing pollution with plastic materials. We plan to apply for additional funding to the Rufford Foundation and other sources to continue addressing the critical points previously identified.

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

We still can improve our sharing of results with the local community by the use of local media. We plan to visit local newspapers and radio stations to let them know of our results and the importance of this type of work and the community support for the conservation of the local biodiversity.
With the scientific community we have started sharing our results in local congresses and conferences. Additionally one manuscript regarding a parasite possibly transmitted from rats to fur seals has been accepted for publication and another two manuscripts, one on the diseases of rats at Guafo Island and the other on the density and distribution of rats in the Island are under preparation.

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

As expected, most of the funds provided by the Foundation were used during the field work. Most of the lab work has been funded by the Universidad Austral de Chile.

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
Sampling and work materials	1886	1890	-4	
Meals	1075	1100	-25	
Transport and freights	2251	2200	51	
Campsite equipment	443	443	0	
Mainland expenses	0	400	-400	We had to wait 5 days until we got a boat to the island. We had to pay for place to stay, food and transport for the crew. Covered by the collaborators of the project
TOTAL	5655	**6033**	-378	

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

It is crucial to disseminate this type and other similar work in the zone to political authorities to see the possibility of long standing conservation measures such as marine protected areas and also to implement policies on the management of waste and garbage in boats that travel to pristine environments.

Additionally is important to strength the data on human impact in these places through the introduction of invasive species. Is especially important to determine the role of cats in the ecology of the island.

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?

We have used the printed logo in our supplies and boxes with equipment that we transport. The RSGF have been acknowledged in all submitted publications and abstracts presented at meetings.

11. Any other comments?

Our research group greatly appreciate the support of RSGF for the accomplishment of this project.