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	Andrés Valenzuela Sánchez
Project title	Is chytridiomycosis a threat to the mouth-brooding Darwin's frog (*Rhinoderma darwinii*)?: A disease risk assessment
RSG reference	14460-1
Reporting period	September 2014- October 2015
Amount of grant	£4990
Your email address	andresvalenzuela.zoo@gmail.com
Date of this report	October 2015

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
To provide evidence of chytridiomycosis impact on Darwin's frog at the individual and population level			X	We surveyed nine Darwin's frog populations across their entire distributional range. Each population was visited four times between September 2014 and October 2015. Population size between populations varied from ca. 150 frogs to ca. 5 frogs. Only northern populations were infected with the chytrid fungus (Contulmo and Neltume). Infection status was uncorrelated with population size or season of the year. Return rate was significantly lower in infected individuals (ca. 0%) compared with non-infected ones (ca. 40%), suggesting that the chytrid kills its host. Prevalence varied between 5-30% in infected populations. Non apparent effects of chytridiomycosis at the population level were noticeable at this time interval, but long-term effects could be present.
To construct an epidemiological model of chytridiomycosis in Darwin's frog populations		X		We are gathering data for model parameterisation. We are working in a spatially explicit epidemiological model, which will include frog movements and infection status to explain chytrid epidemiology within a population across time. Until now, we have movements and epidemiological data from four Darwin's frog populations.
To train local qualified people in monitoring of Darwin's frog populations		X		A formal training programme was unsuccessful, mainly because people were not continually available in this timeframe. However, local people (i.e. park rangers, tourist guides, teachers, NGO workers) participated in many fieldwork activities. We have started a collaborative work with three NGOs which are placed in Neltume, Tantauco and Melimoyu (i.e. Fundación MERI, Fundación Huilo Huilo and Fundación Futuro/Parque Tantauco). We were also assisted in our fieldwork activities by the

				Corporación Nacional Forestal (CONAF), especially by the park rangers at the Monumento Natural Contulmo.
Outreach in amphibian conservation and emerging infectious diseases			X	We performed several talks in amphibian conservation addressed to local people, especially children. We have produced a graphic material (Salvemos el bosque nativo /Protect the native forest sticker), which was delivered to the community. Furthermore, by the end of this project we begin a pilot survey to evaluate believes, attitudes and knowledge of people towards amphibians and to measure the effectiveness of our outreach activities.

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

Fortunately, no major difficulties were present in the development of this project. However, one of the proposed outcomes (training of local qualified people in monitoring of Darwin's frog populations) could not be accomplished, mainly because people were not continually available (or have not enough free time) to perform an adequate training. However, we invited local people to fieldwork activities whenever was possible, and we involve them in this project as much as was possible.

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

First, we provide population data on Darwin's frogs across their entire distributional range, including prevalence of the chytrid fungus *Batrachochytrium dendrobatidis*. Second, we found evidence that the chytrid fungus has a negative effect at the individual level in Darwin's frogs, but this negative effect seem to be insignificant at the population level. Third, we conducted an intensive outreach schedule on amphibian conservation in southern Chile. These outreach activities drew attention of additional people who were interested in amphibian conservation, and led to the formation of the NGO Ranita de Darwin, which is addressed to promote amphibian and amphibian's habitat conservation in Chile.

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

Local community participated in outreach activities in many ways, but was also involved in fieldwork activities. First, talks about amphibian conservation in general, and about this project in particular, were conducted in schools and social centres in the project localities. Second, we participated in a summer camp that showed to the kids our work in the field. An additional fieldwork was also conducted in Melimoyu with a small group of children from the local school. Third, we went to the Darwin's frog forests with several people from the local community (tour guides, park rangers, and so on), who helped to our team in fieldwork activities. Despite we were only partially successful in

the training programme (see objective three), local people was directly involved in almost all fieldwork activities. This involvement was appreciated by local people, who several times thanked us by the opportunity of learn something about amphibians or scientific research. Also, many people were amazed when they met the incredible Darwin's frog!

5. Are there any plans to continue this work?

Yes, there are so many questions to answer yet! First, population studies should last several years to be able to made reliable conclusions about trends or dynamics in nature. Second, we need to increase our sample size in order to provide stronger and confident evidence about the negative effect of the chytrid fungus at the individual level in the Darwin's frog. This can also show us the conditions under which this individual effect can be a threat to Darwin's frog populations. In this order, we need to complete our epidemiological model, which will help us to address this sort of questions and probably introduce new ones. Finally, the work with the local community need to be sustained and increased. We begin at the end of this project a pilot survey to evaluate knowledge, believes and attitudes of local children in relation with amphibians. This survey is intended to be used to measure the effectiveness of our outreach activities (mainly talks) in the improvement of the knowledge, believes and attitudes of the local community towards amphibian's conservation. We are planning to expand this surveys to the whole local community and tourists.

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

We begin to share our work with the community through popular media (e.g. daily newspapers) and outreach activities. We also collaborate in the filming of a BBC documentary of Patagonian wildlife at the Huilo Huilo Reserve. I also participated of the South American Rufford Conference 2015 in Quintay, Chile. At this conference, I presented the partial results of this project. The results of this study will be also shared with local NGOs and Protected Areas to assist their decision making and routine activities. We are working to create a formal, and lasting collaboration with the Huilo Huilo Foundation and Reserve to develop a "Darwin's frog Management Plan" at the Huilo Huilo Reserve (100.000 ha). We plan to share our results with general community through popular media, and with the scientific community through scientific reports (i.e. journal articles). Also, we are planning to write reports in Spanish to appeal for a wider audience in our country such as governmental agencies workers, decision makers, and so on.

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

The RSG covered the period September 2014-October 2015. The whole project will finish by the end of 2016. According this, the present RSG covered a half of the whole schemed project.

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
Fieldwork equipment	140	150	10	Used to purchase a tablet for fieldwork activities (frog identification).

Consumables (fieldwork materials, laboratory material and reagents, etc.)	1218	1260	42	Used to purchase fieldwork materials (swabs, gloves, etc) and laboratory reagents for fungus detection.
Transport (for fieldwork)	2695	2450	-245	Included land and sea transport.
Food and accommodation (for fieldwork)	937	1140	203	
Graphical material (stickers)	0	400	400	We included the production of graphical material about Darwin's frog conservation (stickers) used in outreach activities.
TOTAL	4990	**5390**	410 (provided by another personal fund)	

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

I feel that the next step is to continue with the epidemiological and population monitoring. Also, we need to complete the epidemiological model. This model will provide key information about chytrid dynamics within Darwin's frog populations and will inform management actions on this endangered species. Furthermore, the outreach activities should be maintained and expanded, particularly with the survey implementation. Finally, I am especially interested in the formal collaboration with the Huilo Huilo Foundation (and other key parties), owners of the Huilo Huilo Reserve (ca. 100.000 ha of native forest in southern Chile), because it could guarantee a long lasting protection of Darwin's frog populations at this area and a long term ecological study on this species and their habitat (southern temperate forest).

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 used the RSGF logo in all the conservation talks. Furthermore, we included the link to the website project in the graphical material (protect the native forest sticker).

11. Any other comments?

My team and I are very grateful with the RSGF for the important support to this project. At the South American Rufford Conference 2015 in Chile, I could note that the RSGF has made an important contribution to the development of the conservation task in the region. At this instance I could meet other conservation projects and learn from the conservationists working in many places throughout our continent. This was a wonderful experience.

My team and I deeply enjoyed working in this project. We were astonished by the interest of the local people in Darwin's frogs, and we really enjoyed the outreach activities. The development of this project also attracted the attention of additional people, which led to the recently formation of the NGO Ranita de Darwin. The last was an unexpected outcome of this project, so again, we are very grateful with the RSGF. We are very excited to continue our work in amphibian's conservation and help to save the amazing Darwin's frog!