

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	Virginia Moreno
Project title	Conservation of endemic and threatened amphibians in fragmented temperate forests of Chile
RSG reference	10645-1
Reporting period	November 2012 - November 2013
Amount of grant	£6000
Your email address	Virginia.moreno@gmail.com
Date of this report	November, 2013

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) Assess the impact of native forest loss and fragmentation due to exotic forestry plantations on amphibian populations		X		Most of the data has been collected, however I'm still halfway through my last fieldwork season. Once all the data is gathered and analysed, I will be able to fulfil this objective. Preliminary results indicate that some amphibians, particularly <i>Eupsophus</i> sp. and <i>T. bullocki</i> are present in mature pine plantations when these are close to native forest fragments. Mature plantations appear to provide good shelter and food resources. This means that clear-cutting these areas will likely have an impact in these populations living in the pines. It is therefore important that forestry companies are aware of this issue and can take some management measures to avoid this (e.g. rescue and translocation of animals).
2) Study the abundance, habitat use and movement patterns of <i>T. bullocki</i>			X	This was done in one population of <i>T. bullocki</i> with a mixed cover of native and exotic (pines) forest. Seven adult frogs were radiotracked for up to 3 weeks. Important data on habitat and microhabitat use was gathered. Also, a photographic ID catalogue was created which will be used in the long-term monitoring of this population.
3) Development of a Conservation Action Plan		X		Some management recommendations have been developed, particularly for forestry companies. However, as the project is still ongoing, the final Conservation Plan is still being developed.
4) Increase of public awareness			X	There has been a significant increase in public awareness about amphibian declines and <i>T. bullocki</i> in particular. This is not only due to this project, as other researchers, NGOs, national zoo, and media have played a good part too.

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

The genetics aspect of the project had to be delayed for 1 year as the DNA sample collected during the first fieldwork season, which was to be used for the genomic sequencing, didn't have the quality needed. This meant that I had to wait for my next fieldwork season (1 year approx.) to collect another genomic DNA sample. The second sample did meet the quality standards and was successfully used for the development of the microsatellite markers, however this delay meant I had to re-schedule the remaining fieldwork, and due to time constraints I had to drop some aspects. In particular, I couldn't study the dispersal behaviour of juveniles as I had planned, as during this time of the year I was doing the molecular lab work.

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

1) Increased ecological knowledge needed for the effective conservation of *Telmatobufo bullocki*. Through this project we now have a better understanding of this species (present distribution, habitat requirements, life cycle), which was previously largely unknown. We now know that there are at least six remaining populations, and we can focus our work to protect them.

2) Collaboration with main stakeholders, particularly forestry companies. I have approached two of the main forestry companies for collaboration. Both companies are FSC certified and are interested in the protection of the unique biodiversity in their land. I have shared the locations of important amphibian sites, particularly *T. bullocki* populations and they are now aware of these important areas. One important outcome is the future creation of a High Conservation Value Area to protect one of the six known *T. bullocki* populations. The area includes native forest and a mature pine plantation which was going to be harvested soon. Due to the discovery of the presence of *T. bullocki* and other highly threatened species, the harvesting was halted, and the area proposed as a HCVA. This means that this area will receive protection and will ensure the long-term persistence of this population. In the same area, there are at least five other amphibian species, some of them also threatened.

3) Increased public awareness of community and authorities. Through the duration of this project, there has been a good amount of media coverage, and an increased public interest in amphibians and *T. bullocki*. This has been achieved thanks to the collaboration and participation of many other involved people and organizations. Today, *T. bullocki* is an important icon in amphibian conservation in Chile, and it is being used as one of the flagship species for the conservation of Nahuelbuta native forests.

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

Local community members have been involved in some of the fieldwork for this project, learning how to survey and identify threatened amphibian species. Also, during fieldwork, local landowners have been educated on amphibian declines and the importance of protecting their habitat. Some local tourist operators related to ecotourism and wildlife observation now have a better knowledge of the amphibian biodiversity in the area and can attract more people interested in wildlife. Also, increased knowledge on the high biodiversity value of the area has empowered local organisations to fight against the construction of a run-of-the-river hydro electrical power plant, which was going

to be built in one of the few remaining native forest patches, which also harbours one of the remaining *T. bullocki* populations. The power company has negotiated since then with the local NGO Nahuelbuta Natural and the project was modified to decrease the impact in 45% to avoid the disturbance of the native forest. Also, the company is offering several compensation measures that will likely benefit the local community.

5. Are there any plans to continue this work?

Yes. We want to continue doing research on *T. bullocki* and other threatened amphibians of Nahuelbuta. Particularly, we want to establish a long-term monitoring of the populations and continue looking for new populations in order to be able to protect them. Some important aspects of the ecology of the species are still unknown (dispersal, reproductive behaviour) and there are plans to continue working on these aspects.

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

Preliminary results have already been presented in local (Third Meeting of the Chilean Herpetological Network) and international (ASSAB Conference, Auckland) scientific meetings. Also, some results were recently presented in a local Seminar in Cañete (Seminario Nahuelbuta: Tierra de Contrastes y Desafíos) where local communities, schools, government authorities (Ministry for the Environment, CONAF), and NGOs were present (e.g. WWF Chile, Etica en los Bosques). I will continue to share results particularly through peer reviewed papers, once they are ready for publishing. Also the final thesis will be available by the end of 2014.

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

The RSG was used between November 2012 and October 2013, as it was planned. Although some aspects of the project are still ongoing, these are funded by other grants (population genetics).

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
Accommodation	770	770	0	
Food	780	780	0	
Air transport	1200	1237	37	Airfare was slightly over the budgeted amount due to changes in the exchange rate.
Field equipment	1600	1600	0	PIT tags were not used, only radio-transmitters. However, all the budgeted amount was spent in field equipment (GPS, waders, dip nets, receiver, antenna, etc.)
Poster and brochure	500	500	0	Only posters were produced. A pdf version of the brochure will be made available, as we decided to

				print more copies of the poster instead.
Documentary production	500	500	0	The documentary is still in the editing stages, and it is rescheduled to be released early 2014.
Petrol	650	650	0	
TOTAL	6000	6037	37	

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

I'm still on my third year of PhD, which means next year (2014) will be my last. During 2014 I have to complete the genetic analyses of DNA samples and write the PhD thesis. There are some important next steps that need to be done in order to protect amphibians in Nahuelbuta and *T. bullocki* in particular.

- Ensure adequate protection and management of all known *T. bullocki* populations. All of these populations are located in privately own forests, and some are currently facing several threats. In order to protect these populations, landowners need to be aware of the threats and actively protect *T. bullocki* habitat. Some areas will need restoration of native forest.
- Continue with a long-term monitoring of amphibian populations. We now know some amphibians are able to live in mature exotic plantations, but we don't know for how long. Harvesting operations will certainly affect these populations and are likely to have a major impact. It is important that all *T. bullocki* populations are closely monitored in the long term to assess the long-term impact of forestry operations. We now have the baseline data and will be able to detect possible declines in the future.
- Survey new locations looking for unknown *T. bullocki* populations. With our better understanding of the species, and new search methods developed during this study, it is very likely that new populations will be discovered. We need to know where these populations are in order to be able to protect them.
- Continue studying the ecology of *T. bullocki*. There are still many aspects of the species that remain unknown. A better understanding means we will be better prepared to protect this species, particularly if we can understand the threats and their synergistic effects. The impact of global change, such as global warming should also be assessed, considering the close association of the species with water resources.
- Move from a species-oriented approach to an ecosystem conservation approach. *T. bullocki* is only one of the threatened species in Nahuelbuta, there are sadly many others? We should work in collaboration with other researchers and local authorities and community to try to restore the native ecosystems and aim to provide improved habitat connectivity. This is a major task, but there are many interested parties willing to work towards this goal.

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, I used the logo in all my talks and presentations. It is also featured in the webpage and in the poster produced. Many people asked about RSG after seeing the logo in the talks. Also, I thanked RSGF in an interview for a magazine.