

## 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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

#### Grant Recipient Details

<b>Your name</b>	Constanza Susana Weinberger Illanes
<b>Project title</b>	Metapopulation analysis of south American sea lion, <i>Otaria flavescens</i> , in Chile: spatial distribution, conservation and management.
<b>RSG reference</b>	11.07.08
<b>Reporting period</b>	26 months
<b>Amount of grant</b>	£5567
<b>Your email address</b>	<a href="mailto:cweinber@bio.puc.cl">cweinber@bio.puc.cl</a>
<b>Date of this report</b>	09/06/10

**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
Determine the phylogeography of <i>O. flavescens</i> and its metapopulation structure in Chile.			X	The results are in process of publication. Almost all of the sub-objectives were achieved, but some with different results than expected. Briefly, in this investigation we found that <i>O. flavescens</i> in Chile is formed by two metapopulations.
Examine the spatial distribution of the species in Chile.			X	The spatial distribution of the species in Chile seems to be more dynamic than expected for phylopatric species, with constant colonisation of new patches and changes in abundance of individuals in the existent colonies. One important result is that the abundance of colonies and individuals decrease with distance from the two most abundant colonies.
Investigate the influence of net primary productivity (NPP) and fishery in the spatial distribution of the species.			X	There is not a linear relationship between NPP, fishery and the spatial distribution of <i>O. flavescens</i> in Chile. The NPP has a positive influence in the abundance of individuals and colonies of the species and also over fishery, producing an overlay between them.
Evaluate the genetic connectivity pattern of the species' metapopulations from Chile, and determine the species dispersion kernel.		X		This Objective could not be achieved as we expected. We thought there would be a linear relationship between geographic and genetic distance, because of the phylopatric behaviour of the species, but there is not a clear relationship between them. The results of the genetic analysis suggest long distance male dispersion, and genetic structure determined by female phylopatry. These results did not allow the determination of the dispersion kernel for the species. It had to be estimated.
Develop a spatially explicit metapopulation model for <i>O. flavescens</i> in Chile.			X	The model determines the importance of the abundance of individuals in the main colonies for the persistence of the species in Chile.

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

N/A

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

As above

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

This project will be considered for the government management plans of the species that aim to reduce the sea lion and artesian fishery and salmon farming interference.

**5. Are there any plans to continue this work? Finish the project.**

This project will be finish in the near future with the design of conservation and management strategies clearly justified.

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

I had already shared preliminary results of the project.

I had exposed some results at the Meeting of Aquatic Mammals Specialists of Latin America that took place in Uruguay in October 2008: "Spatial characterization of the distribution of *Otaria flavescens* in Chile".

I also exposed some results at the workshop "Estado y situación de *Otaria flavescens* en su área de distribución" (*State and Situation of Otaria flavescens in its distribution area*), that took place in Chile in Subpesca, the Fishery Secretariat in June 2009: *Metapopulations of the Southern Sea Lion in Chile*. The main conclusions of the workshop were published in a book, for which we wrote a chapter: "Identificación de stocks" (*stocks identification*). Matías Feijoo, Larissa Rosa de Oliveira, Constanza S. Weinberger. This book is written in Spanish because our main goal is to show the status of the species to the local community and government authorities.

The results of this work will be published in scientific magazines to share those results with the scientific community.

Also, one copy of this Ph.D. Thesis and a final report will be given to Subpesca and CONAF, the two government identities that has legislation on the species in Chile. The first one is very interested in this investigation for the monitoring phase of the new implemented management plan. CONAF manages some sea lion protected areas, and this work will help to know the importance of those sites for the persistence of the species.

**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 for 14 months (November 2008 – January 2010), the same period compare to the anticipated length of the project, but 8 months less than the actual length. This was because there were difficulties with the DNA amplification.

**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 equipment	£ 666	£1163	£ 497	We needed 30 more arrows and 20 more arrow tips in the sampling period
Central and south sampling travel (gasoline, lodging, food)	£ 1209	£ 1709	£ 500	We had to stay 1 week more in the south than expected because of climate conditions.
Arica (north Chile) resampling travel		£ 500	£ 500	We had to go back to the biggest north sea lion colony, because the first time the sea was very bad and we could not obtain a significant number of samples. The second time we could.
Fishing boat service (central, south Chile and Arica)	£ 336	£ 1060	£ 724	In some places of Southern Chile the boat service prices change drastically, because prices are adjusted for foreign tourists. Also the bad weather made it more expensive than usual.
Microsatellite fragment analysis and laboratory reagents	£ 3357	£ 1135	£ 2222	£600 in Microsatellite fragments analysis, £535 in laboratory reagent. I need a better TAQ Polymerase than I thought at first, which is much more expensive. The difference was financed by the Institute of Ecology and Biodiversity (IEB).
<b>TOTAL</b>	£ 5567	£ 5567	Conversion: £ 1 = Chilean\$ 900	

**9. Looking ahead, what do you feel are the important next steps? At the moment finish the project.**

The first important step is to publish the project results. After that I plan to resolve some questions that emerge from this investigation.

**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. In the Aquatic Mammal Congress in Uruguay 2008 and in the Otaria Workshop in Chile 2009.

**11. Any other comments?**

This investigation represents an important ecological knowledge of the southern sea lion that is a key species in the Chilean coast. This knowledge has important implications for the conservation status of the specie in our country.

The development of this project let me to insert in new and different areas of the ecological science that will be elementary in the future of my scientific career.

The Rufford Small Grants was an essential contribution in the development of this project. Thank you very much!