

The Rufford Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. 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. Please note that the information may be edited for clarity. 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	María Elvira Casagrande
Project title	Future scenarios of lithium mining expansion and conservation of the Argentine Puna wetlands
RSG reference	81430c-1
Reporting period	December 2017 – December 2018
Amount of grant	£5000
Your email address	elvira.casagrande@gmail.com
Date of this report	December 2018

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
Mining database update				The mining database was completed with records of lithium projects in the Argentine Puna until 2017; including mining companies in production as well as projects in preproduction or under construction.
Field trips				Field trips were made to the sub-watersheds of the Olaroz-Cauchari, Antofalla and Tres Quebradas salt flats. In them, journeys were made where points of interest for the mappings were georeferenced. Additionally, high-resolution images provided by Google Earth® were used for georeferencing; as well as pre-existing salt flats maps (Izquierdo et al 2016).
Temporal fluctuations in sub-watersheds				Temporal variation on lakes area and peatbogs NDVI were measured for the region in the 1986-2017 period.
Mining Companies' information				We contacted relevant actors in the lithium industry in Argentina such as Albermale and Liex companies. During the Puna Forum representatives of these companies will be present. In the forum we will make known the web viewer and invitare the companies to collaborate with information of the mining undertakings that they carry out.
Lithium maps				Lithium maps were developed using the lithium mining database created.
Future scenarios development				The final product "future scenarios" is not yet finished, since all the necessary data to develop them are still being collected and prepared.

Models of threats			Given that the input of these models is the temporal variation in sub-watersheds and future scenarios, this objective will be completed once the scenarios have been obtained.
Web viewer			All spatial information for the web viewer "Natural Wetlands of the Puna" (PHuNA by its initials in Spanish) has already been collected and organised. At the moment, it is being developed by experts from Fundación ProYungas. It includes socio-ecological, spatialised information and in some cases includes the temporal dimension. The viewer will be available as of February 2019.
Scientific manuscript			A scientific manuscript on the temporal fluctuation of wetlands was sent to the journal <i>Regional Environmental Change</i> , currently under review. Additionally, in the book "La Puna Argentina, naturaleza y cultura" (2018) a box entitled "Teleacoples del Litio" by Casagrande & Izquierdo was published. The book is freely accessible through the link: http://lillo.org.ar/revis/cnaturaleza/2018-scn-v24.pdf?fbclid=IwAR3sLEzgeSnoHPiFnY2OLSMCI2ZLeo4qpmlQB6uPObR3wBVkRwX9A2E
Puna presentation	Forum		The forum of the Puna (initially organised for May 2018) was reprogrammed for February 2019. In the forum we will present the developed web viewer, in order to make it known in the field of science, community and business; inviting everyone to collaborate with relevant information for conservation and territorial ordering in the region.

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

We had no unforeseen events during the development of the project other than the lack of time to successfully complete all the proposed activities. Particularly, the last objective which is a multidisciplinary activity and it depends on the coordination and collaboration with different institutions and people. Additionally, we modified the date of this event to combine it with the presentation of the book "La Puna Argentina: Naturaleza y Cultura". HR Grau, J Babot, A. Grau, AE Izquierdo (eds.) on February 2019. We think that combining both activities will enhance them.

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

The three most important outcomes of my project are:

- 1- The obtaining of the temporal variation of lakes area and peatbogs NDVI in a 32-year period through analysis of satellite images and the consequent scientific publication of these results in an international journal. This information is a valuable input to the development of the future scenarios that I'm carrying out currently.
- 2- The creation of the web viewer, which allows making visible and accessible all the information previously and recently generated, useful for conservation of the Puna region. The web viewer will also make it possible for those actors involved in different processes at the regional level to collaborate with valuable information, which will be taken into account in regional decision making in the future.
- 3- Once finished, the future scenarios will be an important tool for the decision making tending to the conservation in the region; as well as scenarios will improve our understanding of environmental implications of lithium extraction in the Argentine Puna.

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

As mentioned before, our team worked on the creation of environmental baselines for the lithium companies Liex and Albermale (with lithium projects in Tres Quebradas and Antofalla, respectively). In this context, links were created with local communities, particularly in Antofalla, with whom we actively work addressing the resolution of socio-ecological problems. In addition, we collaborate with the National Ministry of Environment making guides for the mapping of the wetlands of the Puna region, which will be used as a supply for the National Wetlands Law.

5. Are there any plans to continue this work?

Yes. I will continue this work until I finish all the objectives that were partially realised. In addition, I would then plan to continue making models of potential distribution of key species in the wetlands functioning and relate them to the models generated in

this project to define risk scenarios for the biodiversity associated with wetlands, which is relevant information for planning.

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

My results have been shared and will continue to be shared through many means:

- 1- Publication in high impact journals - currently there are one publication under review in the *Regional Environmental Change* journal, concerning the results of this project.
- 2- The results of my project have been shared through oral communications at * *Primera Jornada Argentina de Evaluación Integrada de la Desertificación: Enfoques y Metodologías Socioambientales*, 25 – 26 September, 2018. Mendoza, Argentina; and * *2as Jornadas del Altiplano Sur: Miradas Interdisciplinarias*, 24 – 28 September, 2018. Tilcara, Jujuy, Argentina. Additionally, the PHuNA web viewer developed in this project will be presented through oral communication at the Puna Forum that will be held in Tucumán in February 2019.
- 3- Realisation of reports of local scope that reach governmental entities with decision-making power as well as members of the community involved.
- 4- The web viewer will be a way to keep the information updated, accessible to all audiences.

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

The Rufford Foundation grant was used during the period December, 2017 – December, 2018. Overall this agrees with the anticipated length of the project although some items will be made in the near future given the lack of time to finalise them.

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
Library, supplies and materials	200	200		
Web Designer	700	900	+200	In the last years Argentina is undergoing a high inflation period for which prices change in a daily basis.
Logistic and	1500	1500		

administrative staff				
Gasoline and vehicle rent	1300	1300		
Food/per diems	1200	1200		
Field Assistant	100			
Total	5000	5200	200	

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

One of the next important steps is the effective communication of the results of this project, reaching governmental entities involved in making decisions concerning the environment. On the other hand, achieving the active participation of local communities and lithium companies could result in a great benefit for the development of measures that benefit the environment, communities and production.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did The Rufford Foundation receive any publicity during the course of your work?

The Rufford Foundation logo is used in the web viewer that is being produced in relation to this project, and it was used in the presentations of the congresses held in Mendoza (*Primera Jornada Argentina de Evaluación Integrada de la Desertificación: Enfoques y Metodologías Socioambientales*, 25 – 26 September, 2018) and Tilcara (*2as Jornadas del Altiplano Sur: Miradas Interdisciplinarias*, 24 – 28 September, 2018). Acknowledges to The Rufford Foundation have been included on the manuscript currently in review.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

M. Elvira Casagrande (project leader)

Andrea E. Izquierdo (scientific adviser)

H. Ricardo Grau (scientific adviser)

Carlos J. Navarro (collaborator)

12. Any other comments?

This project could not have been developed without the support of The Rufford Foundation. I and the working group are grateful that this grant has helped to generate valuable information for the conservation of the Puna ecoregion in Argentina.

