

The Rufford 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	Herrero María Lucrecia				
Project title	Conservation of mountain soils: developing techniques for establishment of native species in degraded areas.				
RSG reference	17915-1				
Reporting period	September 2015 – September 2016				
Amount of grant	£5000				
Your email address	lucreherr@gmail.com				
Date of this report	4 th November 2016				



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. To contribute to knowledge about the communities of plant species most frequent and abundant in degraded areas.			yes	We determined the composition, density and biomass of plant species associated with degraded areas in 45 gullies in grassland. We also determined the composition of woody species in the forest, in edge and centre of one mine abandoned. Also, in gullies will be studied the lichens in summer of 2017 (January-March). So we will give continuity to the study in gullies in other taxonomic groups.
2. To study the techniques for growth and survival of seedlings in degraded soil conditions.			yes	We tested different restoration techniques: fertiliser application (N: P: K), watering and inoculation with arbuscular mycorrhizal fungi (AMF).
3. To assess whether facilitation is a promising strategy for the restoration of degraded areas.			yes	To study facilitation, we analysed the use of nurse plants for restoration of degraded areas. In a vermiculite mine in the Vaquerías Nature Reserve, we performed three treatments. We planted six native woody plant species in three different places (unvegetated places, under the canopy of <i>Cortaderia selloana</i> and under leaf litter of <i>Cortaderia selloana</i>). Also, we performed one treatment of facilitation with five native plants species in a high mountain site. In Sierras Chicas of Córdoba, we performed one treatment under the canopy cover of Kageneckia



			lanceolata shrubs.
4. To train a team of volunteers at seedling production and planting techniques.		yes	Over 50 volunteers were trained in planting techniques, mostly teachers and local people interested in environmental topics. And over 20 volunteers were trained in seedling production, mostly student. Additionally, some volunteers participated in a control study of non-native plant invasion that was carried out in the Vaquerías Nature Reserve by the PhD Benjamin Marsal.
5. To transference of results and educational talks.	yes		We performed volunteering in all existing restoration projects. We provided information on our experiments to practitioners. Including volunteering of forest restoration project which we lead at the university campus: <u>https://www.facebook.com/BosqueNativo</u> <u>Unc/</u> . We performed five participatory talks in schools. Moreover, we made recreational activities for kids to learn to recognise native plant species. In addition, we made a practice for sowing and planting native species with students at schools. We organised 10 conferences on "Issues in Ecology". Researchers and professors from the National University of Cordoba spoke about diversity, ecology and conservation of native forests, their biota and restoration. The proposed experimental plantations were made with help of volunteers. We performed during the plantation days short lectures of flora, fauna and techniques for interpreting the natural heritage. In addition, participants obtained knowledge of the methodology for plantations of native plant species and treatments that



	can be applied for each species. We bought booklets for native plants and birds identification (50 copies). We used the results of our experiments for
	presentations on scientific meetings.

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

At the beginning of autumn (April 2016) an early frost took place, due to that we could not perform the technique of plants coverage with anti-frost fabric. In replacing we performed inoculation with Arbuscular Mycorrhizal Fungi (AMF). On the other hand, due to that data collection on restorations techniques from one year was scarce, still we didn't develop the printed educational materials. We changed the printed education materials for booklets and books for native plants and birds identification. Additionally, we used Prezi online to create two presentations free for high school students and teachers:

(1) <u>http://prezi.com/tznlani3e95i/?utm_campaign=share&utm_medium=copy</u>.
(2) <u>http://prezi.com/1sfgomi6zy7l/?utm_campaign=share&utm_medium=copy</u>.

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

(1) We have planted more than 4000 native plants in degraded areas of Córdoba Mountains and in Córdoba city. Survivals were: in "Los Gigantes" 60%, in Vaquerías Nature Reserve 82% and in Sierras Chicas of Córdoba and in Cerro Blanco Reserve 90%, 1 year after planting. Also, survival in Córdoba city was approximately 100%. We have increased our knowledge about restoration techniques with these species and we will understand more at the end of our research. It is a very important item because many people are interested in reforestation with native species and are contacting us for technical assistance.

(2) Around 200 volunteers actively participated in the plantations. Their participations in the conservation and restoration activities are very important to stimulate the formation of new conservation leaders. In Córdoba city, volunteers generated two reforestation works, parallel to the project: native forests reappearance at the university campus. Project which we performed at the National University of Córdoba campus: <u>https://www.facebook.com/BosqueNativoUnc/</u>.



(3) Successful promotion of the interaction of scientists with students of the schools (age range 6 to 18 year olds), professors and people that were interested in our activities to learn about forest and restoration.

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

Local people participated of the different stages of the reforestation project. Mostly of them, in the project situated in Córdoba city, it represents 2 ha of park land belonging to the National University of Córdoba. This forest restoration area is visited daily by hundreds of students, professors and general public who commute through the area. Volunteers gather every 1st and 3rd Friday of the month to work in the forest restoration.

Also, the plantations in the abandoned mine at Vaquerías Natural Reserve contribute to the future restoration of soil, vegetation, and water sources that protect the basin of the Vaquerías stream, which provides water to Valle Hermoso population (around 3000 people). Alike, the plantations in Los Gigantes and Cerro Blanco Reserve will contribute to the restoration of water sources, because which are part of the Provincial Water Reserves that brings water to Córdoba City population (around 2 million people).

We repaired the greenhouse at the university, where together with collaborators we produce seedlings of native trees to give to schools, protected areas, municipalities and local people. We also gave talks in several local schools on the importance of preserving native trees.

With this project, we got more information about the best restoration techniques. Thus, we can transmit this knowledge to students, teachers, local environmentalists, NGO activists, and municipal leaders.

5. Are there any plans to continue this work?

Yes, of course. We plan to continue working with native plant species in Córdoba Mountains, studying the best techniques to restore degraded areas. Promote the development of conservation projects where scientists, educators, government and non-government institutions work together to protect and restore our mountain ecosystems.



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

We shared the results of the previous reforestation experiments at the "V Congreso Regional de Conservación de Bosques y Cuencas Hídricas" (Regional Congress of Forest and Watershed Conservation), in November 2015 in Río Ceballos. Also, we shared the preliminary results of the plantations experiments in the "VI Reunión Binacional de Ecología, XXVI Reunión Argentina de Ecología, XXIII Reunión de la Sociedad de Ecología de Chile" in September 2016 in Misiones, Argentina.

Alike, we plan to communicate our work with the scientific community through three scientific publications of our research. And, we will continue sharing our experiences with local community through talks and educational conferences, and volunteering in plantations projects.

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

We used the RSG in a period of 12 months.

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
Field trips (fuel and bus	£1000	£851	+149	We used additional funding for
tickets)				trips.
Seedling production	£100	£258	-158	We expended more money than
expenses and				expected, because we made an
greenhouse				extension to the greenhouse.
maintenance				
Germinator and	£50	£73	-23	
seedling production				
Planting materials	£250	£262	-12	
Partial payment of food	£1000	£1418	-418	In our work of planting, they
and travel for				participated more volunteers than



volunteers				expected.
Camping accessories	£400	£448	-48	
Soil analysis	£740	£550	+190	We analysed a smaller quantity of
				soil than expected.
Anti-frost fabric	£70	0	+70	We replaced by inoculation with
				Arbuscular Mycorrhizal Fungi
				(AMF).
NPK Fertilizer	£30	£30	0	
Design and printing of	£600	£625	+25	
education material				
General expenses	£300	£320	-20	
(stationary, telephone,				
photocopies)				
Presentations on	£100	£150	+50	
scientific meetings				
TOTAL		4985	-15	

Exchange rates over the 12 months averaged \$16.11 argentine pesos to the sterling. Exchange rates ranged from \$13.68 at Rufford application to \$18.54 today.

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

- Continue monitoring the restoration experiments (reforestation, control soil erosion), at least 3 years. And, add new species and techniques.
- Evaluate new restoration techniques by targeting ecological process, because the aims of ecological restoration should move beyond merely enhancing seedling establishment.
- Continue sharing the experience with students, teachers, local environmentalists, NGO activists, and municipal leaders in order to promote the reforestation with native species.
- Perform educational materials about the restorations techniques.

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, we used the RSGF logo in different places:

• Scientific conferences (national meeting of biology students ENEB, Ecology topics, Science in the Native Forest).



- Congress posters, were we exposed the preliminary results of restoration (Binational Ecology Meeting, V Regional Congress of Forest and Watershed Conservation).
- School talks.

11. Any other comments?

RSG was a great opportunity to develop restoration activities framed in research projects. It was an instance in which we could share knowledge with local people about Córdoba mountains environmental problems and forest conservation and restoration importance. We are grateful for this opportunity. Many thanks!