

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. 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	Rocio Urrutia Jalabert
Project title	Primary productivity in endangered <i>Fitzroya cupressoides</i> forests in Chile, its environmental controls and the vulnerability of these forests to climate change
RSG reference	11371-1
Reporting period	8 March 2012- 7March 2013
Amount of grant	£6000
Your email address	rociourrutiaj@gmail.com
Date of this report	March 3, 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
Assessment of net primary productivity (NPP) in Alerce forests from the Alerce Costero and Alerce Andino National Parks		x		<p>All the measurements required to provide an annual estimation of productivity in both sites, were taken. However, wood productivity samples were recently taken, so they are being processed at the moment. The delay in this process was mainly because good weather conditions were expected to carry out this intensive sampling (summer). In addition, this sampling had to be coordinated with the National Forest Service and the transportation of samples had to be approved by this Service, so the whole process was a little delayed. Samples were collected during December 2012 in the Costero site, but they could be transported to the laboratory just in February 2013. Samples were collected at the beginning of February 2013 in Andino, but they were recently transported to the laboratory. It is expected to have a complete estimation of annual NPP for both sites in the coming months.</p> <p>A complete climatic and soil characterization, that complements the NPP estimations, was developed for each area.</p>
Determination of the relationship between stem productivity and environmental factors			x	<p>Although there was a delay in the collection of dendrochronological samples. Tree-ring chronologies from sites close by were used to determine the relationship between tree ring width and climate variables at a seasonal and annual scale. Climate data (precipitation, temperature, cloudiness and relative humidity) were obtained from different sources and used to determine relationships. Seasonal climate conditions seem to have a somewhat different effect on tree growth from these two areas.</p> <p>In addition, dendrometer data from five trees growing in the Costero and Andino sites were used to relate growth at a daily basis with environmental variables. The second year of data will be completed next May, so a better comprehension of the environmental factors affecting Alerces tree growth at an intra-seasonal basis will be obtained in the coming future.</p>

Education of small children from rural areas associated to the historical exploitation of Alerce			x	Six workshops were successfully developed in different rural schools from the Andes (four) and Coastal Range (two). A theoretical and practical workshop was carried out in every school. An exhibition especially developed for this purpose was displayed at the schools and a brochure was distributed to the children. The National Forest Service provided Alerce seedlings that were planted at the schools.
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

Due to bad weather conditions it was not possible to undertake all the proposed monthly measurements in each area. In the Andean site it was not possible to reach the area in winter, due to snow accumulation and dangerous road conditions. In some cases, excessive rain, cold weather or strong winds prevented the normal development of activities and an extra fieldwork had to be carried out to complete the measurements.

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

- As soon as the wood productivity data are processed, this project will provide the first comprehensive assessment of net primary productivity in Alerce forests growing in the Andes and Coastal Ranges of southern Chile.
- This project is providing a better understanding of the environmental factors that affect Alerces radial growth at a daily and seasonal-annual timescale. Since this general project is a long term one it is expected to have additional and complementary results in the coming future.
- This project developed for the first time a specific workshop on Alerce and its conservation directed to children from rural areas where this species was exploited in the past.

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

Rural schools (children and teachers) from six different localities associated to the exploitation of Alerce in the past were visited and a workshop on Alerce forests and the importance of their conservation was developed in each of them. The schools were the following:

Andes Cordillera:

Escuela rural Lenca, Lenca, Los Lagos Región
Escuela rural Antupiren, Hornopiren, Los Lagos Región.
Colegio Mauricio Hitchcock, Contao, Los Lagos Región,
Escuela rural Chaicas, Chaicas, Los Lagos Región

Coastal Range area:

Escuela rural Riachuelos, Riachuelos, Los Lagos Región
Escuela rural Mashue, Mashue, Los Rios Región

Children and teachers were very receptive to this workshop and actively participated in the theoretical and practical modules developed during the workshop.

5. Are there any plans to continue this work?

Yes, I am planning to continue measuring NPP in order to have estimations of this variable for different years and establish relationships between total productivity and climate and environmental variables.

I would also like to expand the development of workshops on Alerce forests not only to more rural schools, but also to secondary schools in rural areas, since I already perceived the interest of these institutions on these workshops.

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

Two news on the Alerce workshops were published on two Universidad Austral de Chile websites (official and Facultad de Ciencias Forestales website, <http://noticias.uach.cl/principal.php?pag=noticia-externo&cod=55687>, <http://www.forestal.uach.cl/index.php/noticias/676-conociendo-y-admirando-los-alerces-uno-de-los-bosques-mas-antiguos-del-mundo>). In addition a third article was published in a regional online media (http://losriosinforma.cl/index.php?option=com_content&view=article&id=2084:estudiantes-de-mashue-conocieron-el-alerce-costero&catid=1:latest-news&Itemid=48). Unfortunately, the journalist in charge of publishing the workshops on more regional media got sick and could not complete his job. The remaining amount that was not used in the journalist salary (£60) was transferred to the fuel budget for the development of the additional workshop in the rural school Chaicas.

In addition, the results on NPP estimations for Alerce Costero and Andino will be published in scientific journals, as soon as all the data analyses are completed (two publications). A third scientific publication will be on the relationships between tree-growth and environmental variables.

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

Due to the intensive fieldwork required for this project and the remoteness of these forests, fuel and rental costs are especially high. Salaries for assistants are very high too. The RSG was very important to cover these costs, and others, in every stage of the project. However, due to the long-term nature of this project (at least one year of measurements is required) and the intensive fieldwork and processing of samples, the length of the project is usually longer than expected.

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
Transport fieldwork and workshops (fuel)	2200	2500	300	The difference was covered with part of the budget preliminary assigned to the journalist (£60) and with funds provided by the

				Laboratory of Dendrochronology at UACH.
Transport fieldwork and workshops (rental of a 4x4 vehicle)	4500	4700	200	The difference was covered by the Laboratory of Dendrochronology at UACH.
Toll costs	300	300	0	
Materials for the Alerce exhibition (workshop)	600	600	0	
Materials (equipment /instruments for the field)	9000	9000	0	
Materials (dendrometers)	2500	2500	0	
Materials (design and confection of Brochure on Alerce forests for children)	500	500	0	
Soil analysis	1000	1000	0	
Dendrochronological analysis	650	1000	350	The difference is being covered by the Laboratory of Dendrochronology at UACH
Salaries field assistant and workshop assistants	2210	2350	140	The difference was covered by the Laboratory of Dendrochronology at UACH
Salary journalist (workshops)	100	40	-60	This difference was used to cover additional fuel costs
Meals and accommodation fieldwork and workshops	1410	1500	90	The difference was covered by the Laboratory of Dendrochronology at UACH.
Snack for children (workshops)	320	384	64	This difference was covered by the Laboratory of Dendrochronology at UACH.
Total	25,290	26,374	1,084	Approx. exchange rate: 1£ = \$770 (Chilean pesos)

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

I think it is very important to expand this research to other areas with Alerce forests. It is also important to continue monitoring trees with dendrometers (trees of different sizes) to understand potential variations in tree growth responses to climate according to different developmental stages. In addition, it is essential to expand the long-term research on this long-lived species in order to better understand the climate and environmental change effects on this species using a more physiological approach. Finally, it is crucial to develop educational programmes directed to children, young people and the community in general on the importance of Alerce beyond its value as wood. It has been disappointing to realise that there are still illegal cuts going on in some areas, so it is imperative to advance in education to contribute a little bit to decrease this threat.



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 RSGF logo in an exhibition and in a brochure produced by this project (that are already uploaded in the RSGF webpage). Two news items about the educational component of this project were published online in the Facultad de Ciencias Forestales and Recursos Naturales at Universidad Austral de Chile website, and in the main website of this University. A third news item was published on a regional online media. Finally, I made a presentation about the project at the National Forest Service in Valdivia.

11. Any other comments?

I just want to give thanks to The Rufford Small Grants Foundation for the enormous support given to this project.