

Second Rufford Small Grant to Daniel Renison

Restoration of *Polylepis* mountain woodlands in the high Córdoba Mountains, Argentina.

Final report on project, December 2007

by Daniel Renison
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Summary

The restoration of *Polylepis* mountain woodlands is a high priority because their distribution is greatly reduced, they hold many endemic species, and protect river basins which provide water to millions of people. In 1997 I started restoring *Polylepis* woodlands in the high Córdoba Mountains, but more initiatives are necessary. I asked for my second RSG of 5000 £ to promote other people to start similar projects. For this, in the last year our work team: (1) Involved over 140 local volunteers to plant 12 000 seedlings, build protecting fences, re-vegetate erosion gullies, construct and set up signposts, and to control invasive weed species; (2) Organized and gave 3 woodland restoration workshop for a total of 51 students from the countries of Argentina Bolivia and Ecuador; (3) Did other educational activities like 25 conferences at schools and municipalities, distribution of 1000 reforestation bulletins and 200 restoration videos specially elaborated for the occasion, and did a new web page at www.reforestacion.com.ar; (4) Did research with the help of students who started to develop restoration protocols for two other woody species associated to *Polylepis* woodlands: *Maitenus* seedlings (wet-cold seed treatment) and *Escallonia* seedlings (no treatment-but very small embryo which is difficult to transplant). As a result of the second RSG our team has become well know and are regularly invited to give conferences. We have also contributed to at least three new *Polylepis* forest restoration projects (Argentina and Bolivia). We know forest restoration is not easy and some of these projects may fail, but some will keep active and we have faith that thanks to our efforts more new projects are yet to come.



Detailed report

(1) Volunteer work

During the last year we involved over 140 local volunteers to produce and plant 13 000 seedlings (mostly of *Polylepis* but also 400 *Maitenus* which we were able to produce for the first time), re-vegetate erosion gullies, make and set up signposts, and a little control of invasive weed species (*Rubus*, *Salix*, *Pinus*, *Cotoneaster*, *Rosa*). We already planted 12 000 seedlings, and have 1000 more to plant en January 2008.



BEFORE

AFTER

Erosion gully before and after restoration work



Thanks to the funds from the RSG, I was able to pay: (1) part of the volunteer expenses during field work – including seed collection, planting and other volunteer jobs (fuel, vehicle maintenance, buss tickets and food), (2) greenhouse expenses, (3) Communication and organizational expenses like phone calls, post office and advertisement printouts to get volunteers.

(2) Restoration workshops

In Argentina many "restoration" jobs are being done with exotic species which are becoming or may become in the future invasive weeds. This is why I decided to teach restoration techniques with native mountain species in workshops which consisted of a combination of conventional classes, restoration activities and research simulations. While preparing the RSG workshop I was invited to and gave a 4 day restoration workshop in Cochabamba, Bolivia (December 2006), where *Polylepis* forest restoration is badly needed. This was a good practice and a nice start for the restoration workshops.



I later repeated the workshop in Argentina during January 2007 together with invited professors Romina Torres and Carla Coutiers, and in November 2007 with a special chapter on invasive exotic species prepared by invited professors Paula Tecco and Melisa Giorgis.



Thanks to the funds from the RSG, I was able to pay for: (1) travel and stay fellowships to assist to the workshops for Ariel I. Ayma-Romay nuestros_montes@yahoo.es (Cochabamba, Bolivia); Julieta Tordoya aguiladedios@gmail.com (La Paz, Bolivia); Verónica Sandoya S. cvss2000@yahoo.com.ar (Quito, Ecuador); Gustavo Aguilar gaguilar@apn.gov.ar (Buenos Aires, Argentina), and José Luis Tisone

infofcn@gmail.com (Tucumán, Argentina). (2) Minor food, travel and stationary expenses.

(3) Other educational activities

Our team gave 25 conferences at schools and municipalities about the importance of mountain forests, our restoration activities and opportunities of participation. Team member Julio Dominguez also traveled to northern Argentina to give several conferences in the Andean region, including 5 workshops at schools. Julio has committed himself to environmental education and will be involved nearly all of the year 2008 to this activity in Central and Northern Argentina.



We also distributed 1000 reforestation bulletins and 200 restoration videos (in Spanish) specially elaborated for the occasion by team member Luis Volkmann and which has a duration of 20 minutes and ends asking the public to have a positive attitude towards nature conservation and do all possible within their means to preserve our natural capital. We also elaborated a new web page at www.reforestacion.com.ar

Thanks to the funds from the RSG, I was able to pay for: (1) All traveling expenses to give the conferences and workshops. (2) Video elaboration costs, (3) Web fee. (4) A portable electric power generator to be able to use

computer and projector at our restoration area during the workshops and other educational events.

(4) Research in restoration protocols

For the first time student Carolina Costa was able to produce substantial amounts of *Maytenus boaria* seedlings. A combination of contact with native earth and cold seems to improve germination, though germination percentages are still low and seem to vary according to region of origin.



Student Carolina Costa and *Maytenus boaria* seedlings



Escallonia cordobensis fruits, and seedlings as photographed under microscope.

Funds from the RSG II were used to pay research expenses of students Carolina Costa, Marcos Landi and Gabriela Valladares. Funds from RSG I and II are acknowledged in six scientific publications to which they contributed. These are available on request to the author at danielrenison@ecosistemasarg.org.ar
(1) Aronson, J., D. Renison, O. Rangel-Ch., S. Levy-Tacher, S., C. Ovalle, & A. Del Pozo 2007. Restauración del Capital Natural; Sin reservas no hay bienes y servicios. Ecosistemas 16(3): 15-24. Número especial de la Revista Ecosistemas.

(2) Menoyo, E., Becerra, A.G., Renison, D. 2007. Mycorrhizal associations in *Polylepis* woodlands of Central Argentina. *Canadian Journal of Botany* 85: 526-531. RSG1 financed this project almost entirely, through Eugenia Menoyo's tesina work.

(3) Renison, D., Cingolani, A. M., Suarez, R. Menoyo, E., Coutsiere, C., Sobral, A., I. Hensen. 2005. The restoration of degraded mountain forests: effects of seed

provenance and microsite characteristics on *Polylepis australis* seedling survival and growth in Central Argentina. *Restoration Ecology* 13: 129-135. RSG1 contributed with the cost of all field trips to do measurements.

(4) Teich, I., Cingolani, A.M., Renison, D., Hensen, I., Giorgis, M. 2005. Do domestic herbivores retard *Polylepis australis* Bitt. woodland recovery in the mountains of Córdoba, Argentina? *Forest Ecology and Management* 219: 229-241. RSG1 contributed with the cost of field trips to do measurements.

(5) Renison, D., A. M. Cingolani y R. Suarez. 2002. Effects of fire on a *Polylepis australis* (Rosaceae) woodland in the mountains of Córdoba, Argentina. *Revista Chilena de Historia Natural* 75: 719-727 (RSG1 contribution was paying for the publication).

(6) Renison, D. y A. M. Cingolani. 2002. Evaluation of *Polylepis australis* (Rosacea) seedling survival and growth to choose seeding plants. *AgriScientia* XIX: 63-66 (RSG1 contribution was paying for the publication).

(5) RSG2 finances

The 5000 pounds deposited in my account were converted to \$28943.21 (Argentine money) at an effective exchange rate of 5.71 (I discounted transfer tax). I kept all the bills associated to the RSG expenses and entered them into an Excel archive which I attach (Renison 2007.xls). Receipts are available on request, I will be happy to send all of them to RSG headquarters. Below is a summary.

	Spent (UK pounds)
Greenhouse and field supplies (earth, spades, plastic covering, etc.)	255
Research (expenses of student tesina, lab supplies, iron bars to mark seedlings)	237
Office supplies (photocopies, ink cartridge, paper)	56
Web page (maintenance and up-date fee)	86
Volunteers (food and transport for volunteers, a presentation in meeting, camping materials)	450
Education (Electric generator, printouts, travel)	735
Video (Travel, video camara adquisition, fees)	653
Transport (numerous trips to collect seeds, plant trees and do research by team members and close volunteer collaborators).	551
Payment for specialized work (Fence maintenance, teacher assistant, help with germinator and leading volunteers – Mainly Julio Dominguez)	713

(6) Project evaluation and future prospects

As my main objective in this project was that other people start similar projects, in the long run the evaluation of my project should include the question: How many new projects have I promoted? This is a hard question to answer: In the short run, because forest restoration projects are difficult to develop and slow to start. And in the long run, because even if new projects start, it is impossible to know if they would have started anyhow without the efforts of my team and myself to promote them. But here go a few encouraging facts:

(1) A group of environmentalists who live 70 km SW of my home town contacted me at the start of this project because they wanted to do "something for our mountains". Several members (but mainly Geronimo Segura jeronomosegura@hotmail.com and Nicolás Fioretti nicofioretti@gmail.com) assisted to our volunteer trips and second restoration course. As a consequence they have (unsuccessfully) sought funds and (successfully) initiated their own *Polylepis* restoration project – produced seedlings and planted over 400 in the mountains (using stone fences!). Below are the pictures they have sent me. The project even withstood a serious accident due to a fall of Gerónimo Segura while coming back from a plantation – after 2 months in the hospital and 6 months of re-habilitation he is ready for new plantations!



(2) Two workshop assistants, Ariel I. Aima-Romay nuestros_montes@yahoo.es and Milton Fernandez mfernand@fcyt.umss.edu.bo are at the moment seeking funds to start *Polylepis* restoration projects in the area of Cochabamba, Bolivia.

(3) Carla Coutiers (her thesis work was funded by RSG1) is currently doing a Doctorate on *Polylepis australis* reforestation methods under my guidance.

(4) Volunteer and biologist Romina Torre is doing her doctorate under my guidance developing reforestation methods for three tree species of the lower Córdoba Mountains.

(5) Volunteer and project member Julio Dominguez, who was very active in the present RSG and lived almost all the year 2007 helping us in all aspects of the project, is planning to spend year 2008 doing environmental education work to promote *Polylepis* forest restoration in Central and Northern Argentina.

(6) I will myself be seeking a RSG third renewal in 2008 and plan to ask for a RSG booster grant in 2009 to continue doing and promoting conservation related activities. I have promoted RSG applications throughout Argentina (and Bolivia), and am proud of viewing the RSG world map in the web with a dark colour in Argentina (meaning lots of grants have come to my country) – as five of the awarded RSGs have been directly promoted by myself, and still others could be coming (i.e. Bolivia).

Many thanks to the RSGs team, welcome to ask as many questions as you like.
All the best,



Daniel Renison Students and professors from the Umberto Iliia school, visiting our main reforestation area 10 years after they started to help in the project. All trees and tussocks observed in the picture were not there when they started working in our project.