Rufford Small Grants Foundation Continuation Grant – Final report

Title: Native forests, wildlife and water in Central Argentina: Fostering public ecological understanding and forest restoration. Argentina.

Summary

Present day Mountain forests of Central Argentina occupy less than 5 % of their previous extension and in some areas they are 90% non-native species. I aimed at contributing to the restoration of native mountain forests, wildlife, water resources and other valuable ecosystem services, by public ecological understanding fostering through conferences and educational material, promoting volunteer participation in forest restoration, promoting the growth of local NGOs and organizing workshops to better integrate the unique, highly specialized knowledge of scientists with the know-how of members of governmental and nongovernmental organizations. With help of the booster RSG we gave conferences, elaborated a documental and other educational material and contributed with several forest restoration projects. We believe that all this intensive activity has contributed to achieve a critical mass of well informed conservation activists.



Forests dominated by privet (*Ligustrum lucidum*) imported from China

Introduction

Native mountain forests of Central Argentina are extremely important due to their unique biota, because they capture carbon, and regulate the water cycle protecting the soils that provide water to streams and rivers year round - even during the long dry season when water is most scarce to over 2 million people. Notwithstanding, forests occupy less than 5 % of their previous extension and in some areas more than 90% of their biomass is composed of non-native species most of



Soil erosion in the higher mountains of Central Argentina

which are very demanding of water. Also, soil erosion is prominent and forest conversion to cropland and urbanization outpace the conservation efforts of underfunded environmental movements. Since 1997, with the help of friends and volunteers we started several example giving land and forest restoration projects that have achieved the restoration of a nice 45-hectare valley in the higher mountains, а 10-hectare municipal reserve, and 6 smaller areas. We have worked on environmental education, published research papers, trained 24 graduate and PhD students, organized 21

courses, 4 workshops, gave conferences, and had regular guest appearances in radio and TV programs 5 to 20 times a year. In 2003 many of us joined the local environmental NGO Ecosistemas Argentinos (<u>http://www.ecosistemasarg.org.ar</u>) thus formalizing our activities.

The lack of public and political understanding of ecological issues is one of the barriers to nature conservation in Central Argentina. Thus, in 2011 when I asked for this RSG aimed to: (1) Promote environmental education through videos, signposts, brochures, conferences and activities with volunteers. (2) Perform forest restoration work in different demonstration sites. (3) Promote the interaction of scientists with NGOs and politicians by organizing a series of workshops for exchanging ideas. (4) Promote the growth of the NGO Ecosistemas Argentinos by boosting activities tending to increase membership and educational reforestation projects developed by NGO members, many of which are school teachers and students. (5) Training of young scientists in applied conservation research by organizing field courses and providing minor research expenses and equipment. (6) Provide a basis to monitor the success of our projects. Hereafter I report on the activities performed during the RSG continuation funds given to me in year 2011, which I asked to spend in two years to be able to use the funds more efficiently.

1. Educational activities

1. 1. Production of educational material

1.1.1. Videos

We have three nice pieces of news regarding documental material:

1.1.1.1. Team member Luis Volkmann and colleagues filmed and edited a beautiful 24 minute documental which may be downloaded from: (1) http://www.youtube.com/watch?v=0KVazBh5KJk or (2) with a higher quality at http://www.youtube.com/watch?v=0KVazBh5KJk or (2) with a higher quality at http://www.youtube.com/watch?v=0KVazBh5KJk or (2) with a higher quality at http://www.youtube.com/watch?v=0KVazBh5KJk or (2) with a higher quality at http://www.youtube.com/watch?v=0KVazBh5KJk or (2) with a higher quality at http://www.youtube.com/33417957. This documental was filmed entirely in the mountains of Córdoba and combines beautiful scenes with a deep message on the conservation of forests and water resources. RSG funded all the necessary steps: trips to film, food and lodging expenses, and editing of the documental.

1.1.1.2. Additionally the Argentine national TV broadcasting service filmed a 20 minute documental on forest reforestation volunteer movements in central Argentina and two of our



projects received most of the time. The documental was broadcasted at least 3 times in the national TV chain, with millions of viewers.

1.1.1.3. Two of the project documental DVDs filmed with previous RSGs is now routinely distributed to schools in the entire province by the provincial ministry of education. Additionally, with the present RSG we have made 1000 copies of each of the above documental DVDs and distribute them mainly to the public assisting to our conferences and to volunteers working in our projects.

1.1.2. Signposts

We elaborated 48 educational signposts distributed in Córdoba city forest restoration area (30), Cuesta Blanca nature reserve (15), and Los Gigantes (3). All the wood used for the construction of the signposts was originated from the cutting non-native invasive trees which were cut into boards and posts using hand and chainsaws. Boards were polished and letters carved by hand. All work including the cutting of trees, hand carrying of heavy logs, sign post carving and putting into



place was performed by volunteer work. RSG funds were used to buy saws, equipment to carve the boards and letters, paint and for transport of the materials and signposts.



Signpost being carved at a school and posted in the forest restoration sites

1.1.3. Brochures

We elaborated three informative brochures and printed a total of 6000 copies which were distributed during volunteer activities to passing people that were interested in our activities, conferences and walks. We also printed 1000 copies of the reforestation bulletin which was updated in 2011 and 2012, also posted in http://www.ecosistemasarg.org.ar/uploads/files/Reforestacion2012.pdf

1.2. Visits to schools

Our team did an enormous effort by doing environmental education activities in 18 schools situated in Córdoba city and in the Córdoba Mountains. The activities at schools ranged from a minimum of giving a conference on the importance of conserving the native forests, wildlife and water in Central Argentina together with leaving our kit with educational material (5 local video documental, 4 books, 3



brochures). An intermediate effort was performed at other schools which were visited from 2 to 5 occasions, for conferences, helping in tree production and advising on the best methods to

produce and plant native trees. In the case of "Pagliari" school the



activities included several conferences, 8 field trips, cutting of non-native vegetation and planting of over 500 native tree seedlings in the school yard and surrounding mountains. The conferences were typically attended by a part or all the students of the schools (age range 6 to 18 year olds) and 2 – 8 professors. RSG funds were useful to pay for the buss fees to go to the schools, for copying the documental, buying books we donated to the schools, printing the brochures, buying the laptop and projector which was used for the conferences. We also paid fees to a very good professional biologist – Irene Lett - to give many of the conferences and follow ups which we could not attend to ourselves.

1.3. Conferences for adults

We gave 16 conferences for adults on the importance of conserving the native forests, wildlife and water in Central Argentina. The audience consisted in general public (12 conferences), scout groups (2), agronomy and biology students (2). RSG funds were used for transport to the conferences when this was not paid by other parties, laptop and projector.



1.4. Outdoor activities with school children and adults

We performed 16 educational trips of 1 and 2 day to forest restoration areas with students and scout groups to learn at the site about forest and soil restoration. RSG contributed with travel expenses for students, project members and in 2 occasions with fees for specialist in outdoor environmental educationalist Mariana Sosa.



2. Forest restoration activities

We contributed to forest restoration of 10 demonstration sites, including the planting with volunteers of native trees, shrub and grass seedlings, collecting and sowing seeds, the removal of non-native plants, fencing to exclude livestock, setting up of signposts and donation of tree and shrub seedlings produced at two project greenhouses (maintained by team member Ricardo Suarez, Daniel and Ronaldo Renison). Seeds are collected from local sources and we produced around 8000 seedlings which



were donated or planted by ourselves in our restoration sites with special emphasis in areas with soil erosion. The sites are: (1) Los Gigantes (31°24'57.00"S, 64°48'16.75"W, 2258 m asl); (2) Cuesta Blanca (31°28'59.40"S, 64°34'48.22"W 748 m asl); (3) Ciudad Universitaria (31°26'2.09"S, 64°11'28.07"W 433 m asl); (4) Camino Cuadrado (31° 7'16.37"S, 64°21'25.31"W 996 m asl); (5) Moreno (31°23'7.51"S; 64°48'2.29"W 1824 m asl); (6) Champaquí (31°57'35.27"S, 64°56'8.32"W 2559 m asl; (7) Pagliari (31°37'16.63"S, 64°41'13.40"W 1613 m asl); (8) Vaquerías (31° 6'50.82"S, 64°27'11.67"W); (9) Cerro Blanco (31°20'53.81"S, 64°39'38.50"W 1284 m asl); (10) Cajones (31°27'8.50"S, 64°48'3.70"W 2309 msnm). Sites 1 through 5 are our most intensive work areas where we used exclusively RSG funds, while sites 6 through 9 are restoration sites in charge of other teams or institutions where we have collaborated with volunteer activities, over 3000 seedlings, advice and equipment.

2. 1. Site 1 is a 15 years old beautiful restored high altitude native forest of 45 ha surrounded by much degraded grassing fields. This area is accessed by a 3 hour trails and has served for education, research and hands on example giving restoration work and at present we are working at stopping soil erosion in large gullies and up keeping of trekking trails.



2. 2. Site 2 is within a highly visited riverside area which was degraded by tourist activities (vehicle parking, camping and cross country recreational driving). Here we contributed with the local government by elaborating a management plan, setting up educational signposts, cleaning garbage, planting native trees and cutting non-natives and by organizing a volunteer group which every weekend talked to visitors about the importance of looking after the area, while cleaning garbage and tiding up trails, etc.



2. 3. Site 3 is situated at the heart of Córdoba city (aprox 2 million inhabitants) and represents 2 ha of park land belonging to the University of Córdoba. This great acquisition for forest restoration 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, and signposts inform commuters about 8 very important reasons for recreating a forest in Córdoba city, about 8 troubles native forests are going through, and signposts indicating the names of tree and shrub species teaches commuters to recognize them.

Detail of the restoration site in Córdoba City



2. 4. Site 4 runs along a recently constructed road which crosses the mountains and was left without any remediation measures. Every rain season we plant around 3000 native tree seedlings in the most degraded sites. This activity was captured in film during 2011 and inserted as part of a documental which can be downloaded at



http://www.youtube.com/user/cenizasdocume ntal

2. 5. Site 5 is our newest site where we are at present building the fences to exclude livestock. As site 1 this will be a high altitude native forest with the advantage over site 1 that it will be more accessible (only this site will be only 30 minute walk from a road).

2. 6. Site 6 belongs to a project called "Milking the clouds" in reference to how trees capture water on foggy days. This reforestation area is lead by the "Biospheric foundation" and represents the highest reforestation area in Central Argentina at over 2500 m asl, where the mountains "join" the clouds. Our contribution is the production of most of the seedlings they plant and advice.





2. 7. Site 7 is the surroundings of Pagliari school which have with our help incorporated forest restoration activities in their school curricula.



View of Pagliari School and children re-measuring planted Polylepis

2. 8 and **9**. **Sites 8** and **9** are protected areas situated in the mountains, from the University and privately owned, respectively, where we are collaborating with the cutting of non-native invasive trees and planting of natives, always with the help of the volunteer groups.





2. 10. Site 10 is a fairly new site accesses by a trail of 5 hours walking, where we already fenced 50 ha and planted the first 1000 seedlings of native tree species typical of the high altitude forests.



Funds of the RSG were very useful to buy materials for the fencing of three sites (5, 8 and 10), maintenance of existing fencing and greenhouses, equipment to cut non-native species, transport and occasionally we bought food for volunteers in dates and areas where we had difficulties getting enough collaboration – i.e. planting trees is a popular activity while fencing or cutting non-natives are not popular activities.

3. Promotion of the interaction of scientists with NGOs and politicians

We organized a 3 day long regional workshop (11-13 November 2011) where 216 scientists, members of NGOs and politicians gave talks, presented posters and elaborated a document on the current situation of the forests of Central Argentina which was presented to media and government.

During 2011 and 2012 many active groups of people have been formed to attempt to save our remaining forests, two of which deserve a special mention: (1) A forum to advice governmental institutions about conservation issues – now called "Foro Ambiental Córdoba" lead by the conservationist Federico Kopta was formed with extremely good media impact: In 1 year alone

over 100 media articles were published on issues advised upon by the forum. The forum is composed by 40 members including Diego Gurvich and myself, both of which are members of the present RSG team. (2) A group called "colectivo por el bosque" composed mainly but not exclusively by scientist of the University and lead by Dr. Navarro was also very active in forest conservation. All the members of the present RSG team have collaborated with the "colectivo" which organized very similar workshops to the ones we had proposed in the RSG – so instead we collaborated with the "colectivo" workshops. RSG helped with funds to print brochures and we donated over 300 native tree seedlings which were planted and looked after in public parks in Córdoba city to promote the use of native species (and not non-natives as is the current trend).



Workshop where team member Ana Cingolani gave a talk about the importance of forests to human well being to candidates of 5 different political parties who afterwards answered questions to the public on their environmental proposals

4. Growth of the NGO Ecosistemas Argentinos

To promote the growth of the NGO "Ecosistemas Argentinos" we organized an institutional course, created a brochure explaining the organization's activities and goals, organized walks in the woods for the general public, and finance new forest restoration projects lead by members of the organization.

4. 1. The institutional course was held on November 3 and 4 of 2012 with 40 students which were primary and secondary school teachers together with several conservation activists, while instructors were 5 members of Ecosistemas Argentinos. The topics where about the Flora and Fauna of the mountains of Córdoba and about activities which may be performed to protect them. The preparation of the presentations and the acceptance of the course by the ministry of

education have set the basis for this course to now be held every year. We already have 25 students for the course to be held in 2013, but probably many more will do the course when we set the dates.

4. 2. We elaborated a simple institutional brochure explaining the organization's goals and activities.

4.3. We organized 10 educational walks where trekkers learnt about the biota of their surroundings and on 4 occasions



also collaborated with restoration projects by planting native species and cutting non-native species.

4. 4. Six new forest restoration projects lead by members of Ecosistemas argentinos where financed by the RSG. These projects generated a lot of enthusiasm between members and as a consequence Ecosistemas argentinos has now committed to finance on a competitive basis one small project per year using own funds.

Project 1 in charge of Javier Heredia: bichojavier700@hotmail.com

Javier repaired the Greenhouse of the Municipality of "Villa Giardino" where Javier and collaborators produced native trees of 5 species which were later planted in a municipally



protected area "Reserva Municipal El Portecello" together with volunteers belonging to the local "Ecoclub", firefighters, municipality and foundation "Siembra Tu Arbol". Javier also gave talks in several local schools on the importance of preserving native trees.



Project 2 in charge of Jorge A. Alegre Capó: <u>jorge_alegrecapo@yahoo.com.ar</u> Jorge worked in the construction of a greenhouse to produce native seedlings at a kindergarten



Project 3 in charge of Daniela Tamburini: <u>dtamburini@com.uncor.edu</u>

Project performed in the school "Granadero José Márquez" of Córdoba city. Daniela bought two plastics to repair the greenhouse structure of the school and worked during all 2011 with secondary students to produce native tree species (algarrobos –*Prospopis sp.* - and manzanos del campo *Ruprechtia apetala*). In 2012 the produced seedlings were planted by the students in two plazas situated near the school. The students were very enthusiastic with the activities and learnt a lot about tree production and the importance of planting native tree species.



Project 4 in charge of Diego E. Gurvich: <u>dgurvich@com.uncor.edu</u>

Member Diego Gurvich constructed a green house of 15 m2 in the locality of "Salsipuedes" where he is now producing native trees, shrubs, lines and cactus with the objective of re-vegetating degraded areas and encouraging their use in public and private areas. Diego is also creating a cactus collection for ex-situ propagation and research. He has also written 5 articles for a local newspaper and gave 3 conferences. Diego was also co-author of an influential report on the importance of native forests for water quality and the greater water consumption of many of our non-native tree species, which was published in 8 provincial and national newspapers.



Project 5 in charge of Cecilia Trillo: <u>ceciliatrillo@ecosistemasarg.org.ar</u> Member and president of Ecosistemas argentinos Cecillia Trillo joined forces with the ONG "Los Manantiales" to produce and plant 80 "Sauce Criollos" a native Salix species in "Los manantiales" nature reserve, elaborated and printed 500 copies a poster <u>http://www.ecosistemasarg.org.ar/uploads/files/Pu%20Como%20plantar%20un%20sauce%20cri</u> <u>ollo.jpg</u> The RSG helped with the printing of the poster, for buying wire mesh protectors for the Salix trees which were planted, and with transport expenses.

Project 6 in charge of Julio Domínguez: julito c dominguez@yahoo.com.ar

Member Julio Dominguez was extremely active during all the grant period helping as a volunteer in all aspects of our project and in the final stages started his own forest restoration project in an area of Los Gigantes reported in section 2 of this report (site 10). The RSG helped in his particular

project with fencing materials, food while at the field, fencing tools and transport of materials and hundreds of bus trips to the field site.

5. Training of young scientists

Students and young scientist from the University did researches tending to determine the best and most economic methods of restoring forests and reducing soil erosion. Funds were used to pay expenses of graduate thesis of the students Nayara Simoes Macayo, Lucrecia Herrero and Luciana Mestre all of which have graduated the ongoing PhD thesis of Julieta Pollice, Ignacio Ibarra, and Irene Lett, and post-doc research of Romina Torres (who now obtained her own RSG) and Marcelo Chartier. Additionally, project participant Ricardo Suarez organized 6 courses (3 per year) on reforestation and silvicultural techniques using native species. The courses had a



total of around 180 students and many of the attendants to the courses were young scientists starting their carriers.

The RSG help by providing minor research expenses and equipment, and financing part of the expenses of the courses (other expenses were paid with course fees paid by the students).

6. Monitoring of the success of our project

In CAPS is an evaluation of the project measurable outputs:

Objective	Output	How will success be measured?			
(1) Promote	40 signposts DONE	1. In the short run, by the number of people involved in our			
environmental	10000 brochures	environmental education activities, and short			
education	DONE	questionnaires to volunteers to determine to what extent			
	Elaboration of a 20	they learnt about nature during volunteer work.			
	minute film	THE NUMBER STUDENTS TAKING OUR COURSES HAS			
	documentary on	APROXIMATELY DOBLE D WHILE THE NUMBER OF			
	local nature	VOLUNTEERS TO OUR PROJECTS HAS REMAINED FAIRLY			
	conservation	CONSTANT IN THE LAST 5 YEARS. HOWEVER, THERE ARE			
	activities DONE	MANY NEW PROJECTS WHICH DEPEND ON VOLUNTEERS -			
	3000 copies of 4	AT THE BEGININGS WE WERE THE ONLY ONES, SO WE			
	locally-made film	BELIVE THAT THE NUMBER OF VOLUNTEERS WORKING IN			
	documentaries	NATURE CONSERVATION DID INCREASE. WE DID NOT DO			
	(including the new	QUESTIONNAIRES; THIS WILL BE A TASK FOR THE FUTURE.			
	one) DONE	2. In the long run, by a photographic monitoring of all the			
	40 conferences	areas where we have done intense environmental			
	DONE	education activities, "control" areas where no direct			
	50 days of activities	intervention has been done and reference areas that we			
	with volunteers	consider are well preserved. This photographic record will			
	DONE	be useful for comparing what happens in 15 years regarding			
		soil erosion, cover of native and non-native vegetation, etc.			
		WE HAVE TAKEN 2035 GEO-REFERENCED PHOTOS FOR			
		FUTURE MONITORING			
(2) Perform	10 000 planted	1. Monitoring survival, growth and reproduction of 20% of			
forest	seedlings (trees,	the planted seedlings			

ractoration	chrubs forbs and	SURVIVAL OVER THE FIRST YEAR VARIES BETWEEN 0 AND 90
restoration work	shrubs, forbs and grasses); 1 new fence to exclude livestock of 6 ha; fixing of old fences.	%, WE NEED TO WORK TO IMPROVE SUCCESS OF SOME ESPECIES (I.E. MAITEN) AND UNDER SOME SITUATIONS (I.E. LOW-LAND FOREST RESTORATION).
	DONE	2. Monitoring non-restored, restored and reference basins by measuring biodiversity (birds, plants and fungi), soil properties and water output. OUR OLDEST RESTORATION SITE (15 YEARS) HAS RECUPERATED OVER 20% OF THE FOREST BIOTA AND THE WATER OUTPUT OF THE VALLEY IS 30 % GREATER THAN A CONTROL VALLEY – ALTHOUGH WE CANNOT BE SURE THIS DIFFERENCE IS DUE TO THE RESTORATION EFFORTS AS WE HAVE NO DATA FROM BEFORE THE RESTORATION WORK. WE WILL CONTINUE TO MONITORE AND WILL EVENTUALLY PUBLISH THESE RESULTS.
(3) Promote the interaction of scientists with NGOs and politicians	7 workshops VERY SIMILAR WORKSHOPS WERE DONE BY ANOTHER TEAM – WE COLLABORATED WITH A FEW FUNDS 1 draft manuscript about the Conservation priorities of Central Argentina DONE	 By questionnaires after the workshops – NOT DONE AS WE COLLABORATED WITH WORKSHOP ORGANIZED BY THIRD PARTIES AND THEY DID NOT CONSIDERE THE QUESTIONNAIRES NECESARY By the number of politicians assisting to the workshops (to date usually 1 or less, but we hope this will increment). NO POLITICIANS ASSISTED – NO SUCCESS IN THIS ASPECT By the eventual publication of a MS on the conservation priorities of Central Argentina. THE MS WAS ACCEPTED IN THE LOCAL JOURNAL "ECOLOGÍA AUSTRAL", IT IS IN SPANISH LANGUAJE AND HENCE ACCESIBLE TO MOST LOCAL PEOPLE.
(4) Promote the growth of the NGO Ecosistemas argentinos	 6 walks in the woodlands combined with environmental activities for the general public DONE 2 courses on local flora and fauna 2000 bookmarkers encouraging membership At least 20 new members per year 	 By the number of assistants to the walks. GOOD, AS ASSISTANCE TO WALKS RANGED FROM 15 TO 50 PEOPLE Number of assistants to the course and questionnaire. EXCELLENT, AS WE HAD 65 CANDIDATES OF WHICH WE SELECTED 40. STUDENTS REMEMBERED BETWEEN 60 TO 95% OF THE COURSE CONTENTS. If course students become members of Ecosistemas Argentinos or other Environmental NGOs this will be considered a bonus. NO "BONUS" AS NON OF THE STUDENTS BECAME MEMBERS YET Number of new members gained by the NGO as a result of its project-related conservation efforts. THE MEMBERSHIP TO OUR ONG HAS STAID STABLE, NO SUCCESS. Number of conservation related activities performed by Ecosistemas Argentinos. THEY HAVE INCREASED DUE TO FUNDS FROM THE RSG, IN THE FUTURE IT WILL BE INTERESTING TO MONITORE IF THEY CONTINUE INCREASING OR NOT.
(5) Train young scientists in applied conservation research	2 field courses in restoration ecology Provision of minor research expenses	 By the number of participants in the courses. GOOD, THIS WAS A BIG SUCCESS AND WE HAD TO DO 6 COURSES TO ACOMODATE ALL THE PARTICIPANTS, EACH COURSE HAD STUDENTS WITH 5 TO 10 WERE YOUNG SCIENTIESTS. Number of graduation thesis funded by the RSG. EIGHT

and equipment	THESIS FUNDED.
	3. Number of publications derived from the funding and
	their impact factor.
	From past RSG we published 8 scientific research articles,
	from the present RSG not yet.

7. Report on financial Information

A is mandatory by Argentine law which regulates the functioning of ONGs; all expenses are audited by the treasurer of Ecosistemas Argentinos and by the inspectors of "personerías jurídicas". The accounting of first year of the RSG already went through the process, and the second year is at the moment being audited, we expect the process to be finished by May 2013. The detailed accounting may be found in the Excel file which I attach which includes 1239 expenses. The accounting is in Spanish language, I have added three columns in English where I translate the explanation of each expense, I classify each expense according the RSG request form, and have added the amount spent in UK £. The average exchange rate was UK £ 1 = Arg \$ 6.3955. The expenses were fairly adjusted to what we had planned, with the main difference being that we spent more funds in environmental education and training of young scientists and less in the rest of the items, as shown below.

Asked UK	Used
£	UK £
9770	13506.88
5993	5418.79
1701	328.04
3669	3055.20
2494	2691.46
25000	25000.37
	£ 9770 5993 1701 3669 2494

8. Final considerations

My career in conservation was fuelled in a great measure by the RSGs. My first RSG was my first "large" funding (even though you call them "small"), the ending of my last RSG was perfectly timely, as it already finds me more limited by "time" than by "funds", and already a well known conservationist in my region. Many thanks!!!! **Daniel Renison – ONG Ecosistemas Argentinos**