

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. 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	Elizabeth CHANG REISSIG
Project title	Disease Risks for Native Deer Species Associated to Exotic Ungulates in National Parks of Northern Patagonia, Argentina.
RSG reference	15445-B
Reporting period	February 2015 to January 2016.
Amount of grant	10,000
Your email address	eli.changreissig@gmail.com
Date of this report	11 March 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) assessment of exotic animal movement to estimate areas of overlap with native deer.		x		During autumn and spring season of 2015, transects lines and registration data of huemul and livestock tracks were performed at the Los Alerces National Park (LANP). We design maps of Cerro Risco area (LANP), where there is a stable population of huemul (nearly 20 individuals) that co-habit with local livestock (nearly 150 individuals). In November and December 2015, we set a total of 18 cameras traps in four out of six transects lines (four to five cameras per transect). At the present, we have been monitoring the study area and plan to continue this fieldwork at least for the period of 2016 year.
(2) analysis of spatial interaction between exotic and native ungulates to determine contact rate and potential source of infection		x		According to our results of objective (1) of assessment of exotic animal movement to estimate areas of overlap with native deer and the objective (3) evaluation of diseases, we plan to analyse the interaction between huemul and exotic ungulates, with emphasis on livestock distribution in Cerro Risco, LANP. We have not yet analysed this data due to we recently set the cameras traps at the field (November/December 2015) and we are waiting for the first results of animal photos in the study area. This data will be analyse together with data of animal tracks at the same area (transect lines).
(3) evaluation of diseases in exotic wild and domestic animals distributed in protected areas which may reflects the exposure of pathogens that can infect native endangered ungulates and rural people.		x		Tissue samples from red deer and wild boar were processing for sarcocystosis and triquinellosis at the National University of La Plata (UNLP, Buenos Aires) and A.N.L.I.S. Institute Malbrán (Buenos Aires). All wild boars sampled in north area of Nahuel Huapi National Park (NHNP) were negative for Trichinella spiralis. Laboratory analysis at NULP showed positive animals for sarcocystosis and toxoplasmosis.

			<p>Faeces samples from cattle and huemul were collected in NHNP (Steffen lake area) and LANP (Cerro Riscoso area). Parasitological analysis was performed at the National Institution of Agricultural Technology (INTA Bariloche). Our results shows that livestock are parasitized with <i>Fasciola hepatica</i>, <i>Eimeiria</i> sp, <i>Dictyocalus</i> sp, <i>Nematodirus</i> sp, <i>Ostertagia</i> sp, <i>Trichostrongylus</i> sp, <i>Cooperia</i> sp, <i>Oesophagostomun</i> sp, <i>Monienza</i> sp. Huemul showed positively samples for <i>Eimeria</i> sp. and <i>Fasciola hepatica</i>. Serological analysis of livestock distributed in LANP will be performed during 2016. At the NHNP (Steffen lake area), blood and faeces sampling was done in 2015. Parasitological analyses were performed on this samples (results mentioned above). In autumn 2016, I plan to perform blood sampling and additional faeces sampling in livestock from LANP. Serological analysis (serum from NHNP and LANP) will be complete in 2016 in collaboration with the National Institution of Agricultural Technology (INTA).</p>
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

I had a delayed in my timescale. During 2015 I could perform several meetings with local people and also National Park's staff. This lead a strength for the conservation aims of my project, regarding the conservation of native ungulates such as the endangered huemul, and the plan to initiate health management that is needed for the livestock that are distributed in national parks. There is collaboration between national park's staff, rural families and governmental institutions such as the National Institution of Agricultural Technology (INTA) and the Argentinean National Animal Health Service and Food Quality (SENASA). However, it is difficult to reach in short time aims like reduction of the number of livestock, implementation of health protocols and improvement of livestock installations for animal practices which undoubted are conservation actions that should be done in Northern Patagonian National Parks. My project aims to achieve conservation actions are based on studies of interaction between native huemul and exotic ungulates, such as livestock. I have not achieved fully my objectives because I depend on agreement and collaboration with rural people who lives in the national park's areas. At Los Alerces National Park (LANP), one of my major study areas, I had my first meeting with local rural families in February/March 2015 and they agreed sampling their animals during 2016. For them it was early to start in 2015 and ask me if I could carry out the sampling in autumn 2016. Is a fact that they do not manage their own livestock during the year (the practices are once a year in late March and April which involve count the animals and tag the juveniles). Livestock are extensively raised with scanty manage practices *in situ* and therefore during 2015 I have not the possibility to sample individuals at LANP. I do collect faeces samples from the ground during transect lines field work at LANP, and also

performed blood and faeces sampling of livestock at Nahuel Huapi National Park (NHNP) as well as tissue collection of red deer and wild boar in authorized hunting areas of NHNP.

To analyse the interaction and contact rate between native and exotic ungulates I had planned to establish the frequency of animal observations through the use of camera traps. Unfortunately, I had delays in importing the cameras from United States and delivering it to the city of Bariloche. I waited 8 months (from March to October 2015) to get the camera traps in Bariloche, and it was due to delays in bureaucratic forms and clearance customs at Buenos Aires (Argentina). In November and December 2015, all camera traps were set at the field, Cerro Riscoso area of the LANP.

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

(1) Reference data information about parasitic and viral infections in exotic (cattle, red deer, wild boar) and native ungulates. Necropsies were performed in huemul (n =3) which was found similar parasites (e.g. *Sarcocystis* sp.) that exotic animals host.

(2) Workshops and meetings with local rural families from LANP and NHNP which we discuss the importance of health assessment of their domestic animals and the requirement of regularly livestock management with the aim to prevent diseases (parasites control, vaccination). We will pursue to continue the educational workshops and meetings in both national parks.

(3) Design of maps of Cerro Riscoso area, LANP. This area is being monitored through registration data from transect lines and from study points of our camera traps. The map shows the natural vegetation, transect lines points, and animal track data collected from the transect lines (distribution and frequency of track observation: huemul, cattle, sheep, and wild boar). We still have to evaluate the photos that will be caught during 2016 in the 18 camera traps at Cerro Riscoso, and we are going to upload all these data into the maps (animal tracks and the presence of individuals by photos observation).

(4) We set a total of 18 cameras traps at Cerro Riscoso, LANP. This records (animal photos) together with data from transect lines will be used to quantify the contact rate between native and exotic ungulates (livestock), and evaluate the cross-species transmission (spill -over) that may occur due to a high frequency of interaction.

(5) A peer-reviewed manuscript was published in an international journal and 2 scientific abstracts were exposed as poster in national conferences:

Chang Reissig E, Moré G, Massone A, Uzal FA. Sarcocystosis in wild red deer (*Cervus elaphus*) in Patagonia, Argentina. *Veterinary Research*. 2016. DOI 10.1007/s00436-016-4915-7

Chang Reissig E, Quiroga A, Massone A, Gimeno E, Pastore H, Ramilo E, Izquierdo M, Corvalán F, Lizardo V, Ielpi C, Uzal FA. *Astragalus* sp potential intoxication in huemul *Hippocamelus bisulcus*. 9th Argentina Seminar of the "Charles Louis Davis" Foundation and the 7th Meeting of the Permanent Forum for Veterinary Pathology Teaching, 23 to 25 September 2015, Catholic University of Salta, Salta, Argentina.

Chang Reissig E, Moré G, Massone A, Uzal FA. *Sarcocystis taeniata* in red deer (*Cervus elaphus*) from Patagonia Argentina. VII Argentinean Parasitological Conference, 1 to 5 November 2015, Bariloche, Argentina.

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

During 2015, I had five meetings with National Park staff and local community (four rural families that are settling in the Cerro Risco area at the LANP, and three rural families of Lago Steffen area at the NHNP). All the families agreed to collaborate and perform blood and faecal sampling in their livestock. In NHNP, one rural family agreed with cattle sampling collection in March 2015, however, in LANP, the families just agree with the sampling during March, April, and May 2016. It was impossible to perform the blood and individual faecal sampling before in LANP. In February 2015, I met for the first time these families during a workshop that I gave to them at LANP. This workshop was about wildlife diseases and interaction between native and exotic ungulates, and was my first opportunity to talk about livestock management and health assessment with the local community of the LANP.

5. Are there any plans to continue this work?

- I am planning to continue my project at LANP in order to analyse the status of the huemul population in Cerro Risco area. This area is critical for the conservation of the huemul at LANP. At the present, Cerro Risco shows forest fragmentation (north area) due to livestock overgrazing. We plan to continue this work with National Park staff and the local community in order to reduce the quantity of livestock and implement livestock management. During March, April and May 2016 I will carry out field work at LANP, blood and faecal sampling of livestock, and registration of animal tracks data in transect lines of Cerro Risco. The camera traps set in November/December 2015 will be monitored during all year of 2016.
- I will continue to perform autopsies of native wildlife that accidentally die. Occasionally are found dead individuals in the study areas and autopsies of these animals should be performed for pathological examination and determination of the cause of death.
- I am interested to study the role of carrion birds (eg. condor and vulture) in the dynamics of some parasitological diseases (eg. sarcocystosis and trichinellosis).
- Further, I have also the purpose to work and use the camera traps at the NHNP. Study sites of my interest are south (Lago Steffen area) and north of NHNP (Valle Encantado area) because it has native ungulates (huemul, pudu and guanacos *Lama guanacoe*) and livestock distribution.

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

I plan to share the results of our work as scientific publications and also as workshops, meetings, and seminars to local community and national park's staff (e.g. park rangers, technical staff). I am actually sharing my results with colleagues from the Argentinean National Park Administration (APN) and the Argentinean National Council of Science and Technical Research (CONICET), as well as sharing with local rural families. I plan to continue sharing the results of my work with the community of the Los Alerces and Nahuel Huapi National Park. During 2015, I exposed our work in three conferences: (1) Rufford South American Conference, Quintay, Chile; (2) Forum for Veterinary Pathology Teaching, Salta, Argentina; (3) Argentinean Parasitological Conference, Bariloche Argentina. We also published our results in sarcocystosis in a peer-reviewed journal, and now I am writing another manuscript.

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

The RSG 15445-B was used from February 2015 to January 2016. As I mentioned above, I have partially archive my objectives during 2015. I had delays in agreements with local rural families, and also delays in acquirement the camera traps. I partially achieve my timescale in 2015 and I am planning to continue my project during 2016 and complete the analysis of the data from LANP. If the Rufford Foundation allows me, the budget difference left (see next subject no. 8) will be used for the next field trips to LANP and to perform the laboratory analysis of the samples. I have all equipment, disposal, and non-disposal material needed to perform and complete this work during 2016.

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
Disposable material	\$ 750	\$ 709.75	\$ 40.25	It was bought sterile containers, gloves, masks, anti-microbial envelops, nobuto blood filter strips, vacutainers tubes, syringes, needles, slides, alcohol, formalin, etc.
Non-disposable equipment	\$ 650	\$ 658.12	\$ - 8.12	It was bought one portable centrifuge for processing blood samples at the field, and a dremel toll for processing bone samples during animal necropsies.
Laboratory analysis	\$ 1,500	\$ 1,392.02	\$ 107.98	Costs were those of disposable materials used in diagnostic tests, and shipment cost for sending biological samples to the laboratories (INTA, UNLP, Malbrán Institute).
Travel and lodging for principal investigator and collaborators	\$ 3,550	\$ 3,312.94	\$ 237.06	Cost included fuel and car maintenance, food and logistic expenses during field work, and trips to field sites at the Nahuel Huapi, and Los Alerces National Park. Included also travel to UNLP (La Plata city) for processing biological samples; travel to Rufford South America Conference at Quintay (Chile); and travel to the Pathologist Forum at Catholic University of Salta (Argentina).
General office expenses and communications	\$ 300	\$ 205.01	\$ 94.99	Cost included paper, envelopes, publications, photocopies, internet, telephone and airmail expenses.

Developing educational material, training local people, publications	\$ 300	\$ 298.41	\$ 1.59	Cost included educational materials for training local people, and publications: posters, protocols, brochures.
Field work equipment	\$ 2,950	\$ 3,026.13	\$ - 76.13	It was bought 16 Bushnell cameras traps, 16 lockers, and 130 lithium batteries for the cameras. I decided to buy lithium batteries (more expensive compare to alkaline batteries) due to the quality and durability. The difference was taken from disposable material and general office budget.
TOTAL	£\$ 10,000	£\$ 9,602.38	£\$ 397.62	If the Rufford Foundation allows, the difference will be used to continue the project during 2016 (field work in Los Alerces National Park, workshops and laboratory analysis).

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

I believe that further studies are needed to improve the epidemiological knowledge of wildlife diseases and its interaction with human and domestic animals. Continuing studies on health survey, assessment of the distribution (presence and movement) of exotic ungulates and the analyses of interactions with native fauna are necessary to reach conservation actions in natural protected areas such as Argentinean National Parks. My interest is continuing this work for the conservation of the endangered huemul. Its needed to work intensively on red deer and wild boar effects as both species are widely distributed and co-habit with domestic animals (cattle, sheep, pig, dogs) and native fauna (huemul, pudu, guanacos, fox, puma, carrion birds as condors and vultures). Analysing these complex interactions together with the evaluation of social factors would be essential to achieve conservation actions in Patagonia.

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?

I always use the RSGF logo in my oral presentations, printed posters and educational materials given to local people. I also reported to my institution CONICET the support of the RSGF and the previous grants I have received from the Rufford Foundation.

11. Any other comments?

As I mentioned in my update reports to the Rufford, I participated in the South American Rufford Small Grant Conference at Quintay, Chile (May 2015). The network RECONOCE was created as one of the results of this conference, and our group of women researchers are keen to carry on our network ahead in order to share our interdisciplinary knowledge and join conservations aims.

