

The Rufford Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford 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 | Solange Vargas |
| Project title | Livestock-Wildlife conflict in Chile's Petorca Mountain: Analysis of a conflict threatening populations of <i>Lama guanicoe</i> in the Valparaiso Region |
| RSG reference | 16647-1 |
| Reporting period | December 2015- February 2017 |
| Amount of grant | £4982 |
| Your email address | solangevargas@gmail.com |
| Date of this report | Mars, 2, 2017 |

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 |
|---|--------------|--------------------|----------------|---|
| Investigate <i>L. guanicoe</i> population density and habitat use in the Petorca Province | | | | Despite the fact that, due to extreme climatic events, it was not possible to sample in autumn and winter, field campaigns to perform population estimates were completed out successfully. Observations were performed along 12 transects in summer and spring (January-February 2016, and November 2016 respectively). Additionally, descriptions of habitat use were developed at the same time as sampling was performed. |
| Characterise the social and economic conflict of <i>L. guanicoe</i> with stock breeders and | | | | We were able to internalise the reality of livestock farmers and the history of conflict with guanacos in the region. Workshops were conducted with each of the local stakeholders (n=3), in addition to workshops involving only the local community. Interviews were also carried out with institutional representatives ((SAG e INDAP) and livestock farmers (Alicahue and Paihuen). There were indications of illegal hunting evident in all sampling periods. |
| Raise awareness and educate local population about the species' ecological role. | | | | Presentations were made in rural schools in areas in close proximity to the study (Alicahue y Paihuen, Provincia de Petorca), and a meeting/workshop was conducted with the local community. Support material for information and awareness about the species 'ecological role and the importance of its conservation. |

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

Regarding field work aimed at generating population estimations, it was impossible to conduct sampling in contrasting seasons to estimate numbers at different times of the year because of extreme climate events. Heavy and repeated snows from autumn until late spring prevented access to high altitude areas until late November 2016. For this reason, sampling for the autumn/winter period was postponed. The second campaign was conducted in Spring 2016. To address the lack of samples in Autumn/Winter, as an additional measure we installed camera traps to monitor animal movements during these periods in easily accessible low lying areas.

With regards to the social component of the project, other difficulties emerged in the early stages. In the first place, it was difficult working with the farming community; due to the fact that they had had negative experiences in the past, particularly the leaders were sceptical of what would be achieved in this study. Consequently, several meetings and discussions were required to establish a climate of trust between the stakeholders and the team.

However one of the biggest challenges we encountered in this respect was appropriate coordination among the stakeholders. Particularly with regards the farmers, who, due to their work on the lands and subject to the rhythms of their livestock, respond to specific needs and at particular times? For this reason it was necessary to adapt our schedule to local rhythms and needs.

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

1) Estimation of population density of *L. guanicoe*:

Preliminary analyses indicate the average density estimated for both seasons is 4.09 ind./km². These results are comparable to those described by a mining company for adjacent sectors. A key discovery is that, at these density values, the guanaco population in our study area appears to be the highest in the central-northern zone of Chile, where densities are typically reported to be significantly lower (e.g. Atacama 0.1 ind./km²).

In terms of habitat preference, all animals were observed at above 2700 m asl in both seasons sampled. Habitat use registers indicate that animals are found primarily in the vegetation layer "Low Shrub Andean Mediterranean" *Laretia acaulis* y *Berberis empetrifolia*. Primarily grazing on dry hillsides, and not in vegas in periods of coexistence with livestock.

Thanks to the camera traps, we were able to observe that animals abandoned lower sectors in august. This is unusual for this species according to descriptions for similar conditions, and by livestock farmers.

We estimate that this first year of data is not sufficient to confidently establish the state of conservation of the species, and we need to continue with the population estimate during, at least, another period of time in order to contrast the data. We do not discount exploring other methodologies, for example, the use of drones in difficult to access sectors.

2) Resolve the origin of the conflict and characterize its manifestation:

The base data collected during the project through interviews and workshops helped to understand the development of the conflict historically. It also underscored that the problem is primarily of a social nature. Effectively, the conflict between farmers and guanacos in this area emerges from a largely ignored socio-economic issue: the loss of livestock farmer's productivity and communication problems between the actors involved. This is driven by a loss of confidence between these actors due to events in the past, lack of dialogue and diverging objectives.

We collected evidence of illegal hunting in all field campaigns, which was submitted to SAG to pursue legally. The evidence collected in this respect suggests an activity deeply rooted in the traditions of the local community. We believe that the main driver is the high palatability and economic value of the meat. In addition, it was evident that hunters not only originate in local communities, but in some cases travel long distances from other towns in the Petorca Province.

3) Positively change the perception of L. guanicoe by local populations:

To encourage a change of perception of guanaco, we conducted a range of presentations and workshops involving both adults and children. The interactions were positively received by students (136) and the non-livestock farming community. Despite the fact that the work with the livestock farmers proved to be the most challenging, we consider it a significant advance that plans to hunt the species as a control measure were abandoned, and the word "plague" was dropped as a reference term. Although farmers continue to view the species as one of the main problems affecting productivity, they are nevertheless now disposed to exploring different avenues to addressing the issue. However, to achieve even more fundamental modifications in perception and behaviour, it is necessary to implement initiatives directed at engaging with changing farmer's beliefs regarding the guanaco.

4) Propose management solutions to mitigate the conflict and protect and preserve *L. guanicoe* populations.

Following a workshop at the end of 2016, an important milestone was that the main actors understood that possible outcomes of the conflict must consider proposals that include both ecological as well as livestock production aspects.

As the main achievement in this respect, a working group will be established that integrates both axes, including all current and futures actors in the short term (for example INDAP (Agricultural and Livestock Development Institute of the Ministry of Agriculture). The role of this group is to facilitate decision-making and encourage applications for projects and funding.

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

The farming community was initially sceptical of the work. Only after several meetings did they express a formal commitment of their participation, and confidence increased over time. By the end of the work, they demonstrated real commitment to the team, and reiterated their intentions to continue working with us.

5. Are there any plans to continue this work?

Population estimates will continue in two seasons, using the current method and another method will be evaluated for the winter season. Continuing this estimation will permit the development of a medium term trend for the study area. Additionally, in the short term I will commence measurement of the herbivore community as a doctoral topic.

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

We have already shared the new data with other specialist researcher's members of the South American Camelid Specialist Group (GECS). In addition, we will give a final report to SAG and the farmers. We also plan to publish part of this work in specialised magazines and scientific journals.

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

Funding was utilised from December 2015 (first exploratory field trip) until the end of February 2017 (closing ceremony of the project). We extended the original chronogram by 2 months, for which it was necessary to modify the budget.

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 |
|------------------------------|-----------------|----------------|---------------|--|
| Equipment | 700 | 578,94 | 121,06 | |
| Food and subsistence | 1284 | 1242,35 | 41,55 | |
| Travel | 126,85 | 847,11 | -720,26 | I moved 320 km from my original living location in the initial stages of the project, which elevated transport costs of the project significantly; to offset this it was necessary to use part of the budget allocated for expendable material |
| Accommodation | 634,25 | 706,99 | -72,74 | Accommodation turned out to be more expensive than originally anticipated |
| Expendable material | 702,11 | 245,62 | 456,49 | |
| Workshops/interview material | 1481,37 | 1302,54 | 178,83 | |
| Communications | 52,85 | 58,76 | -5,91 | |
| TOTAL | 4982 | 4982,31 | -0,31* | |

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

There is significantly more work remaining, since this is just a first approach to conservation of the guanaco population of Valparaiso Region. We will continue sampling this year, probably adding new transects. However, additional studies on competition and grazing pressure are required. Additionally we believe that in-depth work is needed to investigate changes in the livestock farming community's perceptions regarding guanaco, and work that addresses livestock productivity.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

The RSGF was used and will continue to be used in the environmental education products developed. The RSGF support is referred to in all official reports produced, as well as in all papers to be submitted to scientific and non-scientific journals.

Our work in the local press:

<http://www.soychile.cl/Quillota/Sociedad/2016/11/30/432802/Fin-a-los-rumores-estudio-academico-permitira-conocer-el-numero-de-guanacos-en-Petorca.aspx>

<http://www.ucvmedios.cl/ucv-radio-noticia.php?nid=28694>



Figure 1: Poster and leaflets made for the project

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

12. Any other comments?

Firstly, I would like to thank RSGF - this funding was critical to initiating advances in an area of research that has been little addressed in Chile to date; there is a scarcity of national funding available for these types of studies. We were able to begin previously non-existent interactions between relevant actors, and which we hope will be only the beginning of an ongoing process.