

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Nicolas Fuentes Allende
<b>Project Title</b>	Effect of Seasonal Humidity on the Competition and Disease Transmission Between Wild Ungulates and Livestock in the Rural Areas of the Highland Atacama Desert
<b>Application ID</b>	37665-1
<b>Date of this Report</b>	27/10/2023

**1. 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
<p>To study the effect of seasonality on different types of interaction (diet and habitat preferences, and disease transmission) between wild large herbivores and livestock in the Highland desert of Northern Chile.</p>				<p>I marked this objective as "Partially" and "Fully" achieved because this Rufford project is part of an ongoing 3-year research/conservation project that I am executing in the highland desert of northern Chile. Despite I fully achieved this objective during this 1st year, because I collected and analysed data from two field campaigns and I generated useful information for improving the management of large herbivores, I still have to perform four more field campaigns during the next 2 years to confirm whether observed patterns correspond to natural or random processes. I hope Rufford can continue supporting my project because I do not have enough funding to fully achieve future activities.</p>
<p>To share scientific information that helps wildlife managers and authorities to mitigate human-wildlife conflicts between farmers and threatened large herbivores in the Highland desert of Northern Chile.</p>				<p>I fully achieved this objective, because during this first year of project I kept a constant communication with environmental authorities, both local and national, and local farmers. I have put special effort into sharing all my findings with both and giving them the opportunity to discuss about my results and how this information could be used for improving management of wild large herbivores. Communication has been done in different ways, informal meetings and interviews with farmers at their crop fields or at their homes, meetings with entire communities at villages' meeting places, zoom calls and meetings at the offices of local and national environmental authorities.</p>
<p>To improve the protection of native large</p>				<p>This is an ongoing objective. So far, I have advised and generated useful</p>

<p>herbivores in the rural areas of the High Land Desert of Northern Chile.</p>			<p>information and conservation tools that managers and environmental authorities can use to improve the conservation of large herbivores. Nevertheless, this is a long-term objective that includes cultural changes and changes in how the local community relates with wildlife, as well as the generation of norms and regulations that regulate this relationship.</p> <p>Despite that, I am super happy about how this project has helped me to strengthen communication and trust with stakeholders, as well as to help me to be part, as an advisor, of the current initiatives that decide the future of the protection of these species.</p>
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**2. Describe the three most important outcomes of your project.**

**a).** Generation and publication of technical information that helps to understand the interaction between wild large herbivores and livestock during the dry and wet seasons, especially regarding disease transmission and habitat preferences. For example, we have found that a big concern for native wildlife and livestock are feral donkeys. Donkeys compete for natural grassland with taruka (*Hippocamelus antisensis*) and livestock (mainly goats and sheep). Additionally, we have found that donkeys are spreading the *Mycobacterium avium paratuberculosis* (MAP), a bacterium that produces chronic diarrhoea in ruminants, in the whole environment. We have also found that interactions between species and human-wildlife conflicts increase during the dry season because resources are scarcer, and that guanaco (*Lama guanicoe cacsilensis*) has very low abundance in this environment. According to local farmers, a plague of Sarcoptic mange caused the population of guanaco to collapse a few years ago.

**b).** Elaboration of infographic posters that include both the findings of this project and the knowledge and worries of local communities. These posters have been shared with local communities, printing and giving copies to them, and the general public through publishing posts about our results on our social media websites.

**c).** Elaboration of a report that identifies all the conservation threats for taruka conservation in Chile, and some ideas and actions to mitigate them. This report includes all the information that I have collected during all my years working with taruka in Chile (period 2007-2023). This report was already presented and delivered to national and local environmental authorities, and it will be released to the general public soon. We are currently working on its design to make it easier and more attractive to read for anyone.

Posters and technical report can be checked here:  
<https://www.dropbox.com/scl/fo/lm1a0cele6pch8iicygcs/h?rlkey=90kwtrlnv2yi1u2ufytp3as0a&dl=0>

**3. Explain any unforeseen difficulties that arose during the project and how these were tackled.**

The main unforeseen difficulties were dead-end roads. During the first field campaign (October 2022), we had a map that showed the rehabilitated roads in the study area, and we corroborated these roads existed using Google map images. Nevertheless, not all roads on this map were currently rehabilitated. We lost a lot of time using dead-end roads, and some of them were also dangerous. During the second campaign (March 2023), we avoided those dead-end roads, but we discovered that the precipitations of the previous rainy season (December 2022-February 2023) destroyed other roads, so we also lost valuable time using dangerous dead-end roads. It is important to note that dead-end roads are a constant unforeseen difficulty every year. Precipitations during the dry season usually damage roads to the point of erasing them, so the only way to know if roads are available or not is driving them.

**4. Describe the involvement of local communities and how they have benefited from the project.**

Local communities are strongly involved in this project. The interaction and problems that they have with wild large herbivores are a big concern for them, so they are interested in this project because they are looking for a way to solve the current situation. I have constant communication with local leaders, we usually talk using WhatsApp and phone calls, and I always visit all of them once in the field. They share with me their worries and their personal observations and impressions of what they see in the field when I am not there, and I always tell them my plans and share my findings and personal impressions with them. According to what they have told me and my personal impression, they know I am their ally, and that my motivation is finding a way of healthy coexistence between them and wildlife. They have benefitted from this project because they consider their voice is heard and spread with the general public, and that someone is finally working for solving/mitigating this human-wildlife conflict.

**5. Are there any plans to continue this work?**

Yes, I want and need to continue this work. As I previously postulated, the successful conservation of large herbivores in the rural areas of the highland desert is a long-term process. This demands: i) increasing the availability of technical information that helps the conservation management of large herbivores in the area, ii) a cultural change in local communities where they increase tolerance toward wildlife, and iii) the existence of norms and regulations that allow and regulate the coexistence between local communities and large herbivores. I started working in the area for this purpose when I was an undergraduate student in 2007, and I will continue working for that until accomplish healthy coexistence.

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

I am already sharing my findings and products of this work with others. Sharing information to generate discussion and general involvement is one of the main purposes of this project. So far, I have followed five different ways of sharing information:

1. Publishing information on the social media websites of “Sudamerica Diversa” Foundation ([www.instagram.com/sudamericadiversa](https://www.instagram.com/sudamericadiversa) [www.facebook.com/sudamericadiversa](https://www.facebook.com/sudamericadiversa)).
2. Printing infographic posters that include technical information, findings from this project, and the knowledge and impressions of local communities.
3. Making technical reports that contribute to the elaboration of conservation plans of threatened larger herbivores in Chile.
4. Making audiovisual material to share and explain the situation in the project area to the general public (<https://www.youtube.com/watch?v=mxszy8XrhzY>).
5. Publishing findings in scientific journals and presenting at scientific conferences (I already sent two manuscripts to the IUCN Deer Specialist Group Bulletin, and I will soon send manuscripts about my findings to scientific journals. I will give two oral presentations in the Argentinian Mammal Conference this November 2023).

## **6. Looking ahead, what do you feel are the important next steps?**

In my opinion, the next steps should include:

1. Continue monitoring the interactions between livestock and wild large herbivores in the area to improve its current understanding, and therefore to improve its conservation management.
2. Continue sharing findings and the current situation with the general public in order to increase engagement and motivate politics and environmental authorities to take care of this situation.
3. Test different types of deterrents for large herbivores to find the best one that helps to reduce their damage on crops. This will help to increase the tolerance of local communities toward them and improve coexistence.

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

Yes. I have always used the Rufford Foundation logo in all the technical reports and dissemination material that I generated during this project, both digital and physical

material. I have also always acknowledged Rufford support to all the people and institutions that I have had to talk about this initiative, and I will continue doing this because this project is not ending now. I am very grateful for Rufford support, so I will always make public your support.

**9. Provide a full list of all the members of your team and their role in the project.**

**Dr Nicolas Fuentes-Allende.** Person in charge of the Project, specialist in large herbivores ecology.

**Benjamin Moreno.** Field assistant in vegetation assessment (Field Campaign October 2022).

**PhD(c)Andrea Castillo.** Field assistant in vegetation assessment (Field Campaign October 2022).

**Diego Nuñez.** Field assistant in vegetation assessment (Field Campaign March 2023).

**Constanza Muñoz.** Field assistant in vegetation assessment (Field Campaign March 2023).

**Dr Esperanza Iranzo.** Field assistant monitoring large herbivores. (Field Campaign October 2022).

**Camilo Salazar.** Field assistant monitoring large herbivores (Field Campaign March 2023).

**Facundo Mercado.** Film student documenting the conservation project (Field Campaign March 2023).

**Aira Faundez.** Botany in charge of plant identification.

**Dr Pablo Valladares.** Researcher in charge of supervising field activities.

**Dr Carla Orellana.** Researcher in charge of supervising diet analysis.

**Dr Paulo Corti.** Researcher in charge of supervising monitoring programs of large herbivores.

**Dr Miguel Salgado.** Researcher in charge of supervising identification of *Mycobacterium avium paratuberculosis* in faeces.

**Dr Carlos Landaeta-Aqueveque.** Researcher in charge of supervising identification of parasite in faeces.

**10. Any other comments?**

As I previously postulated, this project will continue for at least 2 more years, and I need Rufford support. I do not have enough funding to neither accomplish field

activities nor to buy the equipment that I need to accomplish future objectives. I hope Rufford can continue supporting me, I will always be grateful for that, and I will make all the publicity that you need. I hope you can continue contributing to us.



