Final Evaluation Report

Your Details	
Full Name	Bazylenko Andriy
Project Title	Tree Regeneration in Forest Islets Facing Agriculture Intensification: A Contribution to the Conservation of Threatened Ecosystems in Wet Chaco
Application ID	40909-1
Date of this Report	30 May 2025

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
Effective realization of the field work (access and data collection in the thirty forest islets).		Partially achieved (80%)		The field work was more difficult than expected due to the difficulty of getting in contact the cattle producers. Despite this, it was possible to work with most of the selected islets (25 of 30) and successfully complete the sampling in these areas. I have identified 101 species, of which 81 are trees and 32 are shrubs. All species described in the literature for these environments were found in this study, and no new species were identified for the region. Therefore, we can say that these forests maintain the historically described composition. However, some key timber species, such as *Schinopsis balansae*, *Aspidosperma quebracho-blanco*, and *Myracrodruon balansae*, were found less frequently than expected. Given that the evidence of logging recorded in the area pertains to these species, and considering their high demand by the local timber industry, these species may be more

				vulnerable to overexploitation. The regeneration of woody species showed a marked spatial pattern in forests located on livestock lands. The edges showed a greater abundance of seedlings and young individuals of *Neltuma nigra*, *N. alba*, and *Copernicia alba*. This pattern may be explained by the fact that, on one hand, forest edges are places where livestock seek shade, and on the other hand, the fruits of *N. nigra* and *N. alba* are a regular part of their diet. Thus, livestock could act as dispersers of these species at forest edges.
Printing and distribution of the technical reports and dissemination material to the institutions with which I will interact (Ministry of Environment and Agriculture, universities		Partially achieved (70%)		I have completed and printed the reports for the National Park and the farmers, but since I have completed the data analysis in Buenos Aires, I have not yet distributed them. I plan to do so on an upcoming trip to Formosa at the end of July, when I resume my academic activities in the region.

of Formosa and Laguna Blanca, Tortorelli Botanical Garden and argentinean National Park Administration).				
Oral presentation of my results in the presence of local stakeholders (farmers and ranchers, Ministry of Environment agents and members of universities).			Fully achieved (100%)	I have successfully completed that activity at the National University of Formosa and in the Pilcomayo National Park. The interaction with local agents was very fruitful.
Publication of an academic paper.		Partially achieved (40%)		Since I have successfully completed the sampling and analyzed the data, I have the basis for writing a scholarly publication. However, I have not yet completed this process, which I hope to start soon. I will present a more detailed analysis of the

				results of this project at the Argentinean Journeys of Botany, and the Argentinean Ecology Congress this year.

2. Describe the three most important outcomes of your project.

a) I have made a detailed characterization of the islet forests of eastern Formosa province, being this information novel and important for the region.

b) I have determined the existence of the edge effect on woody vegetation in islet forests. I also discovered that this effect does not occur homogeneously around the islet but can present markedly different characteristics at diametrically opposite edges.

c) The most pronounced edge effect was found in landscapes dominated by livestock activity.

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

In general terms, the project followed the course that had been planned, but it was not without its difficulties. The main difficulty was access to the fields and islet

forests, since in most cases it required a long procedure of enquiries and exchange of messages to contact the owners of the fields and explain the activities to be carried out and their importance. This was solved by increasing the time spent touring the fields and contacting producers, which led to an increase in the time spent on field activities. My stay in the province of Formosa was extended to 8 months. As a consequence, I also spent more than expected on fuel as I often had to return repeatedly to the same field to interact with workers, managers and owners of the ranches. This extension in field activities in turn prolonged the final analysis of the data and made it difficult to distribute the printed material within the estimated timeframe.

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

I've interacted with several local community members who are involved in various activities. Regarding the staff of the protected areas. In Pilcomayo National Park, my study contributes substantially to a quantitative description of the forests, as no studies on the vegetation of this park have been found so far. Particularly since it is one of the oldest national parks in the country (founded in 1951). In addition, as this park is subject to permanent burning of the herbaceous matrix by hunters, the description of its forest edges was extremely valuable for them in assessing the consequences of these fires. The administrator of the private reserve 'El Bagual' asked me to write my doctoral thesis when it is finished, and the data collected during this project are essential for me to complete my doctorate properly.

I have not included Biology students from my university (Universidad de Buenos Aires) because the field activities were carried out during their studies. However, I did include six forestry engineering students from the Faculty of Natural Resources of the Universidad de Formosa as iners. This resulted in a very fruitful interaction, as I was able to help them gain a broader view of forests, beyond the timber exploitation of certain species, and it enriched my knowledge of the dynamics and management of local forests.

At the National University of Formosa I gave a talk on International Forest Day for all forestry engineering students, which was also attended by forestry teachers. This was well attended, and in addition to contributing to the knowledge of the functioning of forests, it opened up some debates with the teachers, generating a rich learning experience. An important contribution for this community was to revalue the importance of the biodiversity of these ecosystems with students of a career in which the main focus is on the production of commercially valuable timber.

Regarding the producers, they were generally owners of large fields of between 1,000 and 15,000 hectares. The owners of these lands did not usually live on the ranches, but in the big cities. Direct interaction with them was difficult. In some cases this communication became more friendly and I was able to explain the results of my studies and describe the state of conservation of the forests. In those cases where the forests were degraded, this alerted some producers to the fact that they were interested in recovering these ecosystems, and in those cases where they were in a good state of conservation, it allowed me to reaffirm that their management strategies were adequate, since in many cases they told me that they were interested in taking care of the forests.

5. Are there any plans to continue this work?

I feel that this first approach to the region was the beginning of what I would like to be a more extensive work. Currently I am doing my PhD, so I am interested in

studying the region's ecology and interacting with stakeholders for the next two years, although I would like to be able to work in the conservation of the region after this period.

First of all, I still have to sample five islets and send the reports to the farmers. This will be done while I carry out another objective of my doctoral thesis, which is to evaluate the pollination of a tree species (*Libidibia paraguariensis*) in these islet forests, for which it is necessary to monitor the phenology of this species and revisit the fields on a regular basis. Studying the pollination of these forests will allow me on the one hand to understand if there are limitations for the reproduction of a vulnerable species and on the other hand to broaden the knowledge about pollinators in the region. This concludes the field activities of my PhD, the results of which I am interested in presenting to the National University of Formosa, Laguna Blanca Provincial University, Pilcomayo National Park, El Bagual Reserve and the provincial Ministry of Production and Environment.

Secondly, I am interested in interacting with the community at the University of Formosa. Some professors at this institution have shown interest in teaching a course on sampling techniques and assessment of plant biodiversity in forests. This will allow forestry students to learn to look not only at commercially valuable species but also at the whole community of woody species.

With respect to the Pilcomayo National Park, it is surprising the absence of studies that quantitatively describe the vegetation of its forests, considering that these ecosystems cover about 30% of its extension. I am interested in contributing to a better description of these conserved environments. In addition, the effect of fire on forest dynamics is not known, and this is a topic that I am interested in addressing in a postdoctoral study.

The network of contacts with producers that I have generated with the help of this grant (and which I will expand this year), allows me to interact more easily with both the owners of the fields and their managers. Given that they are livestock producers, their use of the forests is generally reduced to selective timber extraction for corrals, and the sources of anthropogenic modification of the forests are reduced to the effect of intentional fires (to facilitate the regrowth of tender grass) and the livestock that seek refuge in the forests. In the first instance it is important to document the effects of these activities on the forests and then, in the long term, I am interested in studying management alternatives to reduce the impact of these activities on these ecosystems and to propose restoration strategies.

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

I am currently writing two abstracts to be presented at the XL Jornadas Argentinas de Botánica and the XXXI Reunión Argentina de Ecología. Afterwards, and considering the opinions of my colleagues, I am interested in producing two publications. In addition, as I have mentioned, I have prepared the reports of each of the fields I have visited and they will be distributed among the producers on my next trip to Formosa (August 2025).

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

At the level of gaps in the knowledge of the forests of the region I consider that:

- To study the reproduction of woody species of these ecosystems in different landscape contexts. In particular, I am interested in studying the pollination of a characteristic species of these ecosystems, *Libidibia paraguariensis*. This will

expand the knowledge of the pollination of this vulnerable species according to the IUCN Red List, describe the richness and diversity of pollinators in these ecosystems and allow us to understand if there is pollen limitation. But it is so important to study germination (in field experiments and bank of seed studies), dissemination of seeds (and the role of livestock) and the determinant factors of the survival of seedlings.

- Create a forest map that takes into account the heterogeneity of forests found in this study. This will allow for more detailed landscape-scale analysis and assessment of the vulnerability of some under-represented plant communities.
- Install medium or long-term studies such as permanent plots to have better information on the dynamics of the vegetation of these forests.
- Study the relationship between livestock and forests, this implies understanding the role of livestock as seed dispersers, soil compactors and herbivores.
- Study the relationship between the intensity and frequency of grassland fires and the regeneration of vegetation on the edges of the affected forests.

At the conservation and management level, which is important for the future:

- IImprove the dialogue with large livestock producers, many of these fields have forests in a good state of conservation that contribute to the maintenance of regional biodiversity. However, the ranchers are very reserved when interacting because they do not perceive any benefit or the consequences of the study could be transformed into regulations that limit their economic activities. It is important to work on reducing this distance through outreach activities of academic and conservation activities.
- Work more closely with some producers to evaluate how different livestock management practices affect forest biodiversity.
- Maintain a continuous dialogue with the Ministry of Production and Environment of the province and collaborate in the construction of future conservation projects, as well as advise on current ones.
- Incorporate more content in the forestry engineering course that allows the quantification and valuation of forest biodiversity as well as the consequences of different management practices.

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, of course, during the talks I have given at the University of Formosa (Figure 1) and Rio Pilcomayo National Park (Figure 2) I have included the Rufford logo on the opening and closing slides. I have also mentioned the foundation as the organisation that finances my project during the talks. In addition, the reports prepared for the producers include the Rufford Foundation logo (Figure 3). Finally, I have disseminated the activities of the foundation and its importance for my project among colleagues involved in restoration.

Figure 1: Presentation of the results of the project at the Faculty of Natural Resources of the National University of Formosa to students and teachers of forestry engineering.

Figura 2: Presentation of the results of the project at the Rio Pilcomayo National Parkto students and teachers of forestry engineering.

Informe sobre la vegetación de un bosque de isleta ubicado en la estancia "Sol de Mayo", departamento de Laishi, Formosa.

Bazylenko Andriy

Figura 1: Fotografía del interior del bosque de isleta estudiado.

Figure 3: Example of the front page of one of the reports produced for the farmers whose fields were surveyed for islet forests with the Rufford Foundation logo.

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

Initial members:

Torrella Sebastian Andres: Supervisor
Amela García María Teresa: Supervisor
Velazco Pablo: Collaborator in field work and interpretation of the environments.

Members who joined as the project progressed
Javier Adrian Jojot (forestry engineering student): Field assistant
Andrea Noelia Toloza (actress): Field assistant.
Sebastián Azcona(forestry engineering student): Field assistant
Alfredo Sanchez (forestry engineer): Field assistant

10. Any other comments?

This grant was of great importance to me because it allowed me to continue with my research work despite the funding difficulties that the Argentinean scientific system is currently going through. I believe that this work has allowed me a better approach to the region in which I am interested in developing academic studies and conservation projects in the future.