Final Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF 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 – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please DO NOT fill in and submit this form until the project has been completed.

Complete the form in English. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Fátima Natalia Ortiz
Project Title	Ecology and conservation of the nocturnal species *Eleothreptus anomalus* (Yvyja´u tuju) through acoustic monitoring in the wetlands of Ñeembucú, Paraguay
Application ID	40916-1
Date of this Report	9-07-2025

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
To determine the presence of *Eleothreptus anomalus* in wetland sites under high anthropogenic pressure		✅		The presence was suggested with high probability through acoustic records from various locations. However, final taxonomic confirmation is still pending, requiring detailed acoustic analysis, which will be completed now the equipment has been retrieved. The recorders were kept active until the end of August to obtain a more complete sampling that included seasonal variations and possible changes in vocal activity. This longer period helped optimize the monitoring effort invested and has allowed for the generation a more robust dataset that is now being analyzed. The recorders were retrieved in late August and I am in Spain during September to March, where I am conducting analyses to estimate the species' occupancy probability (using the *unmarked* package in *R*) as part of my PhD studies at the University of Salamanca. This analysis will assess the presence of the species and other nocturnal birds recorded at the sampling sites, helping to better understand their distribution in the studied wetlands. It is still necessary to confirm the

				species' presence; therefore, it is too early to draw conclusions about the impact of anthropogenic factors. However, some impacts of human pressure have been recorded, which may influence its presence and behaviour. The upcoming analyses will help to better understand this relationship across the study sites.
To assess the vocal behavior patterns of the species		✅		Representative recordings were obtained at different times. These data will allow for a deeper understanding of the species' vocal ecology, which is essential for its future monitoring. The data are currently being analyzed to identify the vocal behaviour patterns of the species and other nocturnal birds recorded, based on the 399,044 acoustic recordings obtained across 14 sites. About one third has already been processed, while the remaining data are being classified and refined for further analysis. These results will help describe calling times, frequencies, and variations in vocal activity.
To promote awareness and conservation strategies with local communities			✅	Outreach efforts reached more than 5,565 people, strengthening awareness and conservation of nocturnal birds and the wetlands of southern Paraguay. Supporting images will be provided in the Annexes. Multiple activities were carried out with local communities and rural landowners. These instances

				generated genuine interest and helped strengthen ties for future collaborative actions for biodiversity conservation. Two visits were conducted to educational institutions in Caacupé, reaching approximately 1,000 high school students A total of six educational and outreach activities were conducted in: • Pilar, Ñeembucú: 1 • San Lorenzo (FACEN-UNA): 2 • Asunción (CONACYT + International Science Festival): 2 • Pedro Juan Caballero (International Science Festival): 1 • Caacupé: 2 school visits under one outreach activity Printed materials were distributed to teachers and students at different educational levels, local community members, and the general public during outreach activities, with the aim of promoting knowledge and conservation of nocturnal birds and the wetlands of Ñeembucú. The project produced and distributed: • ~500posters • ~600 brochures • Bookmarks, stickers and flyers • 100 official project T-shirts Approximately 20 local collaborators supported the installation, protection and retrieval of acoustic recorders in the

				Ñeembucú wetlands, and students from FACEN-UNA participated in fieldwork, acoustic device handling, logistical support, and preliminary analyses.

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

a) Vocalizations compatible with *Eleothreptus anomalus* were detected in the Ñeembucú wetlands, representing a key milestone for the potential conservation of the species in this region. Although these records required further detailed analyses under final validation, they suggest that these degraded ecosystems continue to serve as relevant habitats for hard-to-detect nocturnal species. This finding reinforces the urgent need for protection before these environments are irreversibly transformed.

b) Over 250 species were confirmed, and around 200 additional records are currently under validation. Among the detected species are several categorized as threatened by the IUCN, including *Xanthopsar flavus* (EN), *Buteogallus coronatus* (EN), and *Amazona aestiva* (NT), significantly expanding the project's impact beyond its initial objective. These findings support the hypothesis that the Ñeembucú wetlands function as true biodiversity refuges within a landscape heavily transformed by human activity. The coexistence of multiple globally significant species in these habitats highlights the urgent need to implement comprehensive and sustained conservation efforts.

c) The outreach activities conducted had a positive impact on rural communities. A renewed perception of both nocturnal and diurnal birds and their ecological importance was promoted—an issue rarely addressed in traditional environmental education campaigns. This shift in perspective, combined with the active participation of local actors, opens doors for the future implementation of community-based conservation projects in the region. The project was even featured in a local digital and print newspaper in Paraguay, as well as on radio, underscoring the relevance of studying nocturnal birds. In total, 399,044 acoustic recordings were uploaded and processed, representing one of the largest databases of nocturnal bird sounds ever collected in Paraguay.

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

Initially, six field trips were planned, but due to the strategic decision to extend the sampling period and optimize spatial and temporal coverage, nearly twice as many campaigns were carried out (10 field trips in total). This expansion enabled more efficient and robust sampling; however, it also generated a massive volume of

acoustic data that far exceeded initial expectations, considerably extending the analysis timeline. The decision was made to keep the recorders active until September 2025, which significantly increased the richness and representativeness of the database for future studies.
In addition, several logistical challenges arose: mechanical failures of the vehicle temporarily interrupted field activities, which were resolved by renting alternative transportation. Heavy rainfall also made access to certain sites difficult, requiring adjustments to the original plan and close coordination with local landowners to maintain the work schedule. This resulted in the accumulation of over 399,044 audio recordings, requiring extensive data management and computational resources.

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

Local communities and landowners were actively involved throughout the development of the project, especially in outreach and awareness-raising activities. Informative talks were held in rural areas, where the importance of conserving nocturnal birds was explained and the progress of the acoustic monitoring was shared. In addition, they actively participated in most of the recorder deployment and retrieval events. These actions contributed to shifting local perceptions, generating greater interest in and appreciation for natural heritage. In several cases, landowners voluntarily granted access to their land, demonstrating a growing commitment to conservation.

5. Are there any plans to continue this work?

Yes. Monitoring will continue until September, with recorders still active in the field. In parallel, a second phase of data analysis is underway, which will strengthen the identification of species such as *Eleothreptus anomalus*. A new project is also being developed to explore habitat occupancy models and vocal activity patterns of other threatened species in the region. Community participation is expected to expand through new educational activities and training for local students.
In September, a trip is planned to the University of Salamanca, Spain, to complete the final stage of the PhD and present part of the project's results. Additionally, funding is being sought to continue the analyses in collaboration with Professor Héctor Rivera at the University of Antioquia (Medellín, Colombia), an expert in bioacoustics.

The results will be shared through various means:

- Presentations at national and international scientific conferences.
- Publications in peer-reviewed scientific journals.
- Outreach materials for communities (posters, brochures, and short videos).
- Reports and communications directed to environmental authorities and NGOs in Paraguay.

  In addition, the project's social media platform, *Melodías del Sur*, will be used to make the results accessible to the general public.

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

- Completing the validation of acoustic recordings to confirm the presence of *Eleothreptus anomalus* and other key species.
- Publishing the results and making them available to institutions responsible for conservation.
- Strengthening collaboration with local stakeholders to promote habitat protection in wetlands and grasslands.
- Seeking additional funding to expand the monitoring network and develop long-term conservation strategies based on acoustic evidence.

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. The Rufford Foundation logo was included in all outreach materials such as banners, posters, brochures, and presentations. The Foundation was publicly acknowledged during community talks and scientific meetings. In addition, regular posts were made on the project's social media pages mentioning and thanking Rufford for their support, ensuring continuous visibility and recognition.

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

- **Fátima Ortiz** – General Coordinator of the project. Responsible for methodological design, fieldwork, acoustic data processing, preliminary analysis, report writing, and outreach activities.
- **Fernando Silla** – Academic Supervisor. Supported the scientific approach design, results analysis, and technical review.
- **Patricia Salinas** – Field Assistant. Participated in the installation and retrieval of acoustic recorders, on-site data collection, and support in community activities.

Involvement of Biology students and graduates:

- **Griselda Zarate** – Provided support in logistics, outreach, and accompanied fieldwork and community talks.
- **Fernando Ortiz** – Provided support in logistics, outreach, and accompanied fieldwork and community talks.
- **Amanda Duarte** – Provided support in logistics, outreach, and accompanied fieldwork and community talks.

10. Any other comments?

This project was an enriching experience both scientifically and socially. It allowed us to generate novel data on little-studied nocturnal birds while strengthening ties with rural communities interested in conservation. We are deeply grateful for the support provided by The Rufford Foundation, whose flexibility and backing were essential in helping us adapt to challenges and seize emerging opportunities. This momentum has been key to the development of the project and encourages us to continue expanding this monitoring network and international collaboration, reinforcing applied research for conservation in Paraguay.

ANNEX – Financial Report

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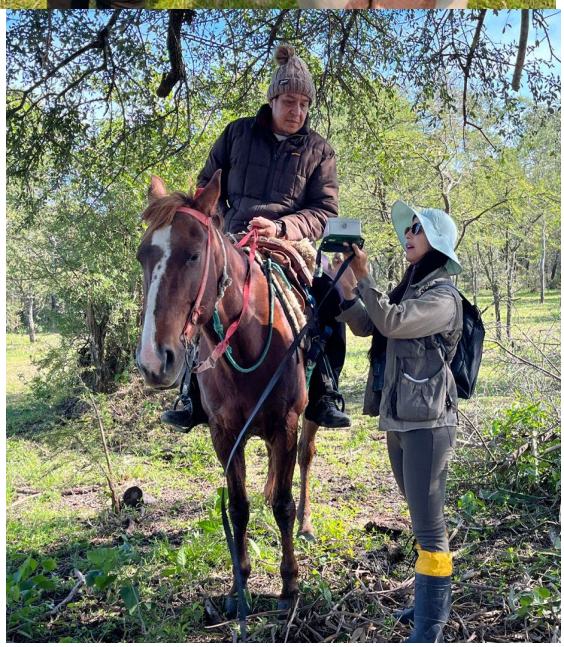
12. ANNEX – Photographic Evidence

1. Talk with local people to explain the functioning of the project and the recorders



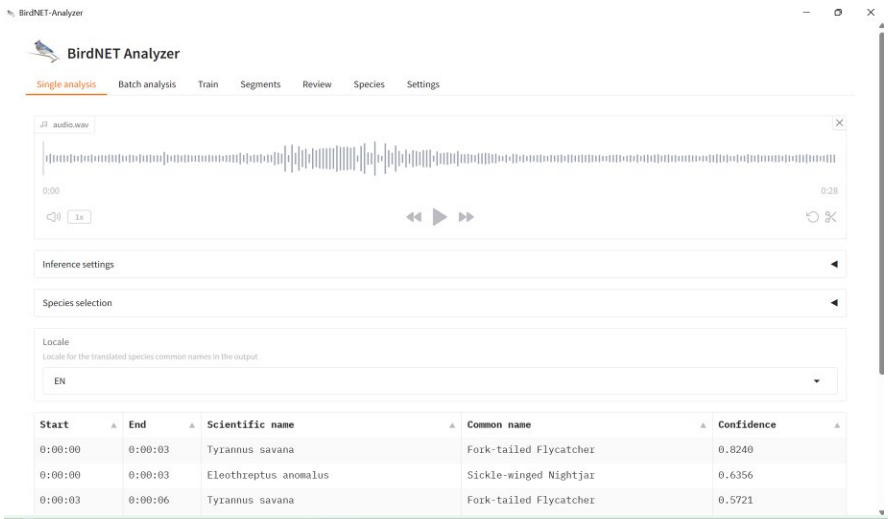
2. Equipment setup prior to field deployment

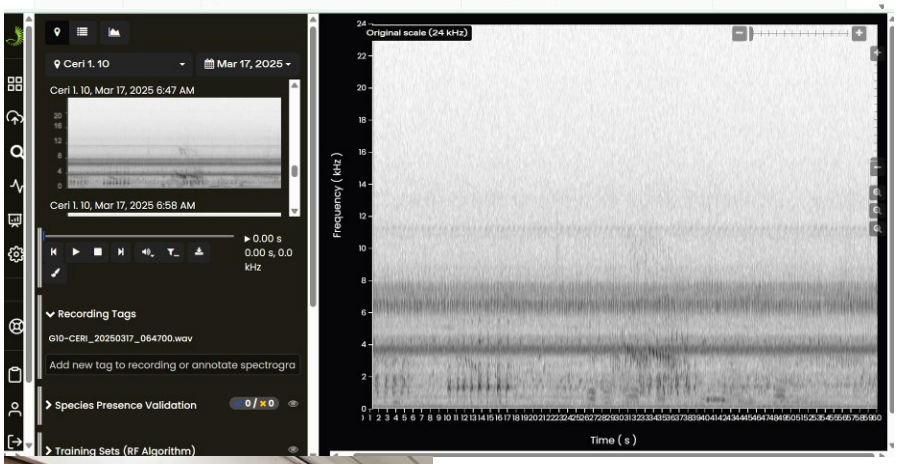
3. Deployment of recorders in the field

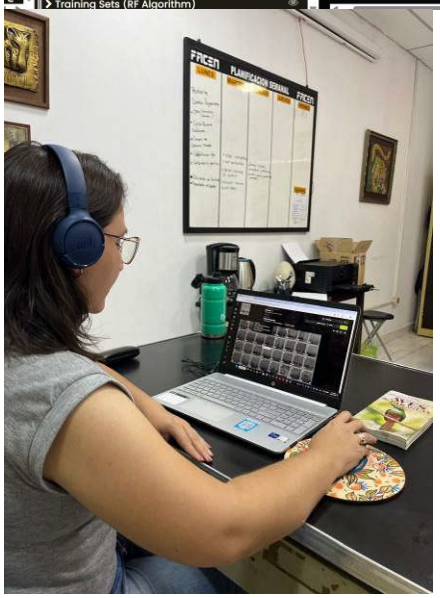
4. Students and graduates assisting with field trips

5. Recorders deployed

6. Data processing and analysis







7. Observation and photographic capture of Buteogallus coronatus

8. Educational talks

Official clarification note on the reporting period

Although the initial implementation period of the project was set until July 2025 for the submission of the first final report to The Rufford Foundation, several outreach, environmental education, and community participation activities included here were conducted after that date. These actions were necessary, relevant, and highly valuable to further strengthen social engagement with the *Melodías del Sur* project, ensure the long-term sustainability of conservation efforts, and maintain strong collaboration with participating communities and institutions. Therefore, they are considered complementary and essential to fully achieving the project's objectives.

Expanded information, including dates, venues, and supporting photographs, will be provided in the Annex section.

Throughout the project, several environmental awareness and scientific outreach actions were carried out in different cities of Paraguay, focused on the conservation of nocturnal birds and the wetlands of southern Paraguay.

1) Educational talks and workshops

A total of six educational and outreach activities were conducted, with direct participation from the general public, rural communities, and university students:

1. "Songs of the Night: Discovering the Nocturnal Birds of the South"

Location: Pilar, Ñeembucú

Participants: ~21 members of the general public

2. "Bioacoustics of Nocturnal Birds: Exploring Their Sounds and Ecosystem Services"

Location: Asunción

Participants: ~20 attendees, followed by an observation activity

2. **Educational Talk – FACEN-UNA**
   Location: San Lorenzo
   Participants: 15 university **students**

4. Project presentations at Escuela Dr. Raúl Peña and Colegio Nacional de E.M.D. Caacupé

Location: Caacupé

Participants: ~1,000 high school students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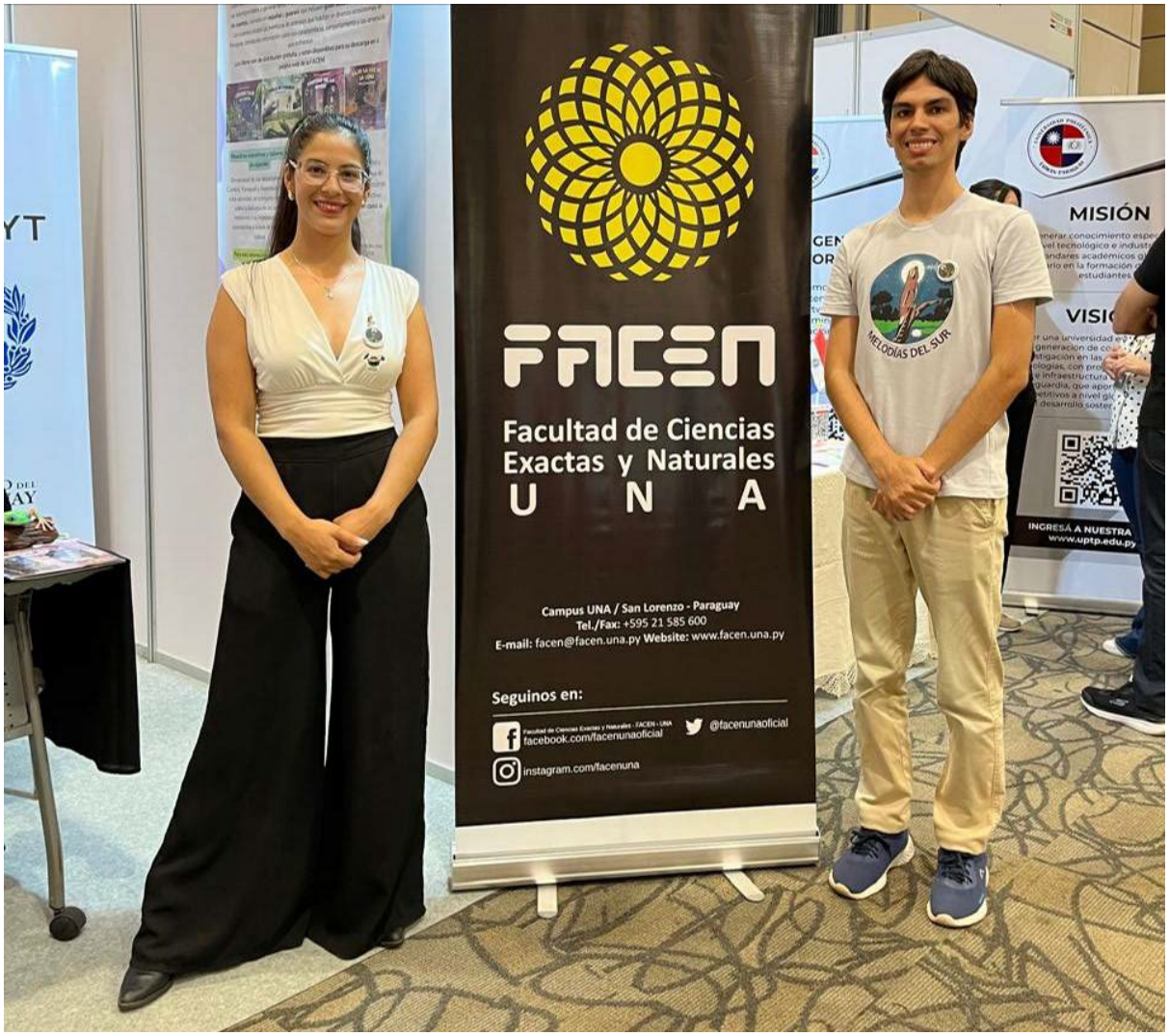
DR. RAÚL PEÑA

5. Talks at the National Council of Science and Technology (CONACYT)
Location: Asunción *(national event)*
Participants: ~200 people visited our stand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6. 12th Science Week – FACEN-UNA

Location: San Lorenzo

Participants: more than 4,300 verified attendees


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Guardianes de la noche

2) Participation in conferences, festivals, and media

• 3rd International Science Festival of Paraguay
Activities: Outreach on acoustic monitoring and guided bird observation
Participants: thousands of people engaged in science activities across festival venues

• **IX Meeting of Researchers of Paraguay and Colombian Congress of Bioacoustics and Ecoacoustics**
Participation in **two scientific events**, one national and one international, enabling **research dissemination** and increased visibility of the project within high-impact academic settings.

• **Interview on SUR FM 104.7 radio station**
Public communication focused on wetland conservation and the role of acoustic monitoring in protecting nocturnal birds.

Strengthening the academic, social, and media reach of the project

3) Educational and promotional materials produced and distributed

To broaden the project's outreach and strengthen community ownership of its actions, the following educational and promotional items were produced:

• ~1,500 posters
• ~600 informational brochures

- Themed bookmarks
- Project stickers
- Printed and digital flyers
- 100 official T-shirts featuring the *Melodías del Sur* logo

These materials were distributed across all community and academic activities conducted under the project.


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4) Community participation in fieldwork

The project received direct support from approximately 20 local collaborators, including ranch owners, foremen, and field workers, who assisted in the installation, protection, and retrieval of acoustic recorders in the Ñeembucú wetlands.

This joint effort demonstrated strong community engagement and a shared commitment to the conservation of nocturnal wildlife in the region.


Nikon

5) Student involvement in research

University students were actively engaged in the project through:
- Support in fieldwork activities
- Handling of acoustic technology
- Educational outreach and logistical assistance
- Participation in preliminary data analysis

This involvement greatly contributed to the strengthening of scientific skills among young researchers interested in biodiversity studies.

Overall social impact of the project

- More than 5,600 people reached directly and indirectly
- Integration of urban and rural educational sectors
- Participation in national and international events
- Community empowerment in conservation actions
- High visibility of nocturnal birds and southern Paraguay wetlands

The *Melodías del Sur* project positioned itself as an initiative of high social and educational impact, promoting citizen science, strengthening knowledge on biodiversity, and fostering respect for vulnerable ecosystems in the country.

9. Some challenges encountered during the project