Final Evaluation Report

Your Details	
Full Name	Adrián Ciprés Chávez
Project Title	Relationships between the landscape and the mangrove bird assemblages in the central coastal strip of Veracruz, Mexico
Application ID	30606-1
Grant Amount	£ 1,750
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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 characterize the landscape at multiple nested spatial scale: local vegetation, fragment, and landscape.				The characterisation at the local vegetation scale was suspended in summer 2020 until it was possible to go out into the field due Covid-19. The field work was carried out in late fall 2020.
To classify the birds assemblages associated with mangroves in two non-breeding and one breeding seasons.				The bird survey in non-breeding season was carried out in early winter 2020 and 2021. The breeding season in 2020 was suspended until it was possible to go out into the field due Covid-19. The field work for breeding season was carried out in summer 2021.
To identify the predictor variables with the greatest relative importance on bird assemblages.				

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

The COVID-19 pandemic was the only difficulty for the characterisation at the local vegetation level and bird survey in breeding season 2020.

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

a) Characterise the surface of land uses and the mangrove structure in the central coastal strip of the state of Veracruz. I found landscape dominance of agricultural land use and human settlements. I found black mangrove dominance (*Avicennia germinans*). In general, a mangrove forest in mature stage according to its basal area and average height carried out by quadrat plots (Appendix 1).

b) Know the birdlife status associated with mangroves at breeding and non-breeding seasons carried out by fixed radius transects (Appendix 2). I recorded 21 bird species under some category of risk according to Mexican (NOM-059-SEMARNAT-2019) and international environmental standards (IUCN; Appendix 3).

c) Know the ecological relationships between the multiscale landscape and the birds associated with mangroves classified by diet type in the central coast of Veracruz. The variables selected from the landscape scale (landscape diversity; percentage of mangrove and agricultural land use cover), had greater relative importance for the assemblage of birds associated with mangroves than the local scale.

Recommendations for conservation of mangrove-associated birds:

- Conservation strategies should be interrelated with territorial planning and coastal urban development in an integrated manner with baselines of nested multi-scale approach in ecological research.

- Mangrove forests are a reservoir of food resources for the neotropical resident and migratory bird assemblage, but also refuge and foraging sites for other wildlife groups, such as terrestrial and aquatic invertebrates. So, beyond the conservation of mangrove habitat for birds in the central coast of Veracruz, the conservation of habitats associated with this marsh ecosystem, such as other wetlands and tropical forest, is crucial.

- This provides managers with an environmental protection scheme focused on the mangrove, but with buffer zones that include these associated ecosystems and their scale of analysis.

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

The links have formed principally with Civil Associations (A.C.) and local community groups. These associations and groups helped us in the monitoring of birds, as well as support for the stay by the technical team in Mandinga, Veracruz. The association "Birds and Nature AC" had involved us in bird sightings in Arroyo Moreno and the group of birdwatchers "Monitores Mandinga" supported us in the stay of the technical team, facilitating local communication with others interested in the project. In this way, the links will continue to grow during the research project, to strengthen bird conservation efforts on the region.

5. Are there any plans to continue this work?

Yes, although there are opportunities to collaborate with different social actors and financing for a research project with a participatory science approach.

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

First, for communication between scientists, the publication of a scientific article. Second, for scientific dissemination, the creation of a guide to common birds in the locality and, if possible, the use of tools such as infographics, workshops and talks to the communities. We have published a scientific note derived from the record of birds in the mangrove swamp. Activities with the local communities of Mandinga, Veracruz are pending.

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

The Rufford Small Grant was used over 5 months: January-February 2021 and May to July 2021. We did not use the grant earlier because of the Covid-19 pandemic period.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Administrative management	300	13	-287	Administrative management was not charged due to the type of financing at the university: self-financing events. The charge was for financial and banking services. The money from this item was distributed in the field work.
Observer support	250	480	+230	I required more technical support in bird survey.
Boat strips	600	496	-104	I reorganized the budget for boat strips.
Foods	300	370	+70	Prices have risen.
Local travels	300	401	+101	Prices have risen.
Totals	**1750**	**1760**	**+10**	1£ ~ 25.63 Mexican Pesos (MXN)

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

Generate conservation strategies for the mangrove forest and its associated ecosystems through collaborative work between the scientific community, civil associations, governmental agencies and organised society in the central coast of Veracruz, Mexico.

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

I use the logo of the Rufford Foundation only presentations related to master´s research. In scientific publications we will mention Rufford Small Grants funding.

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

Adrián Ciprés Chávez: Coordination, investigation, capacitation, and field technician.

Beatriz Bolívar Cimé: Investigation.

Jordi Toto Cobix: Field technician for research.

Axel Fuentes: Field technician for research.

Paula Pineda: Field technician for research.

Monserrat Guerrero: Field technician for research.

Enya Astrid Córdoba Cuevas: Field technician for research.

Irving Chávez: Field technician for research.

Oscar Andrade Sánchez: Boat support.

Alejandra Saucedo Platas: Local lodging support.

María Lujarda: Local lodging support.

Edward Allan Ellis: Spatial analysis support for research.

Ernesto Ruelas Inzunza: Birds survey and analysis support for research.

Cecilia Cruz López: Statistical analysis support for research.

12. Any other comments?

I am very grateful for the support of The Rufford Foundation, without which the research could not carried out. I wish your financial support could continue for more research and biocultural conservation projects.

Appendix 1. A: Coordinate taking for verification of land use by supervised classification. B: Placement of square plots on mangrove fragments to characterise mangrove structure. C: Diameter at breast height of mangroves for estimation of structural variables. Diameter at breast height of mangroves for estimation of structural variables. D: Estimated tree height.

Appendix 2. Field team visually and aurally recording birds in the mangrove forest and noting their relative abundance along fixed width transects.

Appendix 3. Some bird species recorded in the mangrove forest under some category of risk. A: Black-collared Hawk (Busarellus nigricollis), B: Bare-throated Tiger Heron (Tigrisoma mexicanum), C: Great Black-Hawk (Buteogallus urubitinga), D: White-fronted Parrot, E: Lesser yellow-headed Vulture (Cathartes burrovianus), F: Crane Hawk (Geranospiza caerulescens).