

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Victor Hugo Mendoza Saenz
<b>Project Title</b>	Incidence of attacks of the vampire bat ( <i>Desmodus rotundus</i> ) in Chiapas, Mexico: implications on economic activity, public health, and biodiversity conservation.
<b>Application ID</b>	23513-1
<b>Grant Amount</b>	£ 4,888
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<b>Date of this Report</b>	May 26, 2021

**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
Landscape characterization of the study area				This activity was completed. We toured the entire study area to obtain control points (geographic coordinates and corresponding land cover) that were used in the QGIS software for a supervised landscape classification. Some owners did not allow access to their land; however, the support of a local guide was of the utmost importance to generate trust among the producers and gain access to private properties.
Bat sampling				This activity was completed. Many producers supported it because they consider it a relevant issue that encompasses aspects related to cattle health. However, there were areas where we could not access due to security issues and lack of permits from landowners. It is important to identify the social context of the study area and have a local guide for the safety of the work team.
Prevalence and intensity of vampire bat attacks in cattle				This activity was completed. Many producers gave us confidence and allowed the continuous review of their cattle herd. On most occasions, the support of a person on horseback was necessary to help us mobilise and enclose the cattle that were loose throughout the ranch. Once the cattle were confined, we could observe and obtain the data on vampire bat bites on the animals.
Socioeconomic, environmental and management characterization in cattle ranches.				We surveyed producers of cattle ranches. Although we did not obtain all the information we expected, we did obtain the necessary information for our project.

			<p>Many producers supported us; however, others denied their support due to distrust or because they expected an economic payment. Many producers avoided talking about the economic and infrastructure aspects of their ranches. e.g., some ranchers mentioned cattle theft as something common in the region, so they avoided sharing information that puts them at risk. Therefore, in a survey it is important to identify and not insist on those awkward dialogues that can generate mistrust between the interviewer and the respondent, even when a local guide is available.</p>
Workshops			<p>This activity was partially achieved, because not all producers were interested in the workshops or project activities. Being a project that did not promise economic benefit, some producers preferred not to participate / support. However, we identify and work predominantly with producers who do not belong to cattle associations, and who sympathised with the project's objectives, showed interest and availability to support our activities. In the end, we identified that there is a significant number of producers who do not belong to cattle associations, and who do not know which institutions to contact when problems with the vampire bat occur, for which it is necessary to continue working with them and establish a collaborative link with the competent authorities.</p>
Mapping			<p>The experience we obtained in the field allowed us to understand that the maps may not fully express the diversity of contexts in cattle landscapes that influence the risk of vampire bat attacks on cattle. Therefore, we decided to change the maps for a scientific opinion / perspective manuscript that will be</p>

				submitted for publication in an indexed journal. The publication will have a wider readership and is a practical way to explain the complexity of the problems associated with the vampire bat in cattle.
Search for bat shelters				This activity was completed, again the support of a local guide was of the utmost importance for the search for refuge for vampire bats. Shelters (caves) were one of the most important variables in predicting vampire bat attacks on cattle.

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

The difficulties that arose during the project were the insecurity of traveling at night in specific points of the study area, mainly in areas where the ranches are far from the towns. The way we approached it was by camping on cattle ranches during work nights and moving from one place to another only during the day.

Another difficulty was that many ranchers were distrustful and did not allow entry to their land. Although I live in the study region and I know many ranchers, although not from all the towns, the support of a local guide is always of the utmost importance to access many private lands, and to build trust with the producers.

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

- The vampire bat abundance depends on landscape attributes such as the distance of streams in the proximity of grazing areas; however, this relationship is weaker in areas with sparse forest cover, open fields, and agricultural lands.
- Feeding prevalence is primarily influenced by shelters (in this case, cave presence) in the surrounding landscape and by management practices such as extensive grazing, especially in forested areas.
- Part of the problem is dependent on the size of the herd, which positively correlates to the abundance of vampire bat.

**4. What do you consider to be the most significant achievement of this work?**

**5. Briefly describe the involvement of local communities and how they have benefited from the project.**

Local communities granted permits to carry out the project. Several ranchers from local communities participated in the workshops and interviews. Some of them participated in bat sampling, in the search for refuge for vampire bats, in the observation of vampire bat bites in cattle, and allowed the work team to camp on their grounds, thus showing interest in the project.

The main benefits in the local communities were: 1) the economic payment to local guides and people on horseback who supported us to gather and enclose cattle, and 2) the socialisation of information in the workshops on the vampire bat and the strategies to reduce the problematic in cattle, which it is hoped that ranches can put into practice to minimize risks to the health of their herds.

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

Yes, the problem associated with the vampire bats is very complex. It is necessary to continue working together with the producers, it is necessary to strengthen the collaboration links between researchers, government/private institutions and producers. To cite an example, in this project we identified that the majority of ranchers do not know who to contact and how to proceed when suspected or positive cases of bovine rabies occur, which reflects the need to continue the project, continue providing advice to producers and strengthen working together. In addition, in this first phase of the project we have realised that other lines of research are necessary to reinforce our understanding of the problematic vampire bat-cattle interaction.

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

The results of this project have been and will continue to be shared through talks/workshops with farmers and the general public. When it is the case, the information will be shared in conferences or related events. In addition, the results of this research are part of a doctoral thesis, which will be available to the general public and students who wish to consult it.

The results of this research will also be shared through scientific publications, which will be submitted in national and international indexed journals. The first publication "Abundance of the common vampire bat and feeding prevalence on cattle along a gradient of landscape disturbance in south-eastern Mexico" was recently accepted in the Mammal Research journal, indexed in the Journal Citation Reports.

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

The Rufford Foundation grant was used over a 26-month period (January 2018 - February 2020). We only exceeded the expected time scale for 2 months (January 2018 - December 2019), due to logistics and adjustments to the initial sampling period.

**9. 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
Chargers and rechargeable batteries	66	39	-27	Only two lamps were purchased, it was not necessary to purchase the four budgeted lamps.
Payment of a field guide	1490	1670	+180	We made an adjustment to the activities, and the days sampled per month were reduced and therefore, it was required for fewer days to field guide. However, additional payment to local guides was necessary to search for vampire bat shelters and people on horseback to enclose cattle.
Alimentation	2383	2140	-243	We made an adjustment to the activities, and the days sampled per month were reduced and therefore, fewer days were required for food expenses.
Payments to cross in the reservoir of a hydroelectric dam	199	28	-171	Due to logistical issues and lack of permits in the study area, it was not necessary to cross the hydroelectric dam to carry out the project. However, prospective visits were made before the decision was made to exclude this study area.
Gasoline	750	970	+220	The price of gasoline in Mexico has risen considerably in recent years. At the beginning of the project, the budget per litre was 17.15 MXN (£ 0.7) at the beginning

				of 2018, and at the end of 2019 the price per litre was 21.5 MXN (£ 0.89).
Vehicle maintenance		340	+340	Vehicle maintenance was not included in the initial project budget, however, it had to be done every 6 months.
Material for workshops and surveys		47	+47	The material for workshops and surveys was not included in the initial project budget, however, it was necessary to carry out the field activities.
<b>TOTAL</b>	<b>4888</b>	<b>5234</b>	<b>+346</b>	<b>Local exchange rate used: 1£ = \$25.7 MXN</b>

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

- Continue with the advice and training of ranchers, to promote an epidemiological surveillance system and identification of areas with greater vulnerability.
- Continue strengthening the collaboration links between producers, institutions and researchers.
- Continue research on the ecology of the vampire bat and its attacks on cattle.
- Establish the bases for putting into practice cattle management that allow reducing cattle-vampire bat interactions based on the characteristics of the landscapes.

**11. 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?**

The Rufford Foundation logo was used in the workshops and surveys applied to the ranchers. I also used it in the presentations of progress to the work team (Steering Committee), and it will be used in the presentation of the defence of the doctoral thesis. In addition, The Rufford Foundation will be mentioned as the main source of funding in scientific publications derived from the project.

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

**Victor Hugo Mendoza Saenz:** Responsible for the project, in charge of carrying out the field work, data collection and analysis, as well as the redaction of documents. Main social link with producers and local authorities.

**Dario Alejandro Navarrete Gutierrez:** Academic tutor, supported the methodological design of the project, and collaborator in the redaction and analysis of documents.

**Cristian Kraker Castañeda:** Support in academic advising, field methodological design and collaborator in the redaction of documents.

**Romeo Alberto Saldaña Vazquez:** Support in academic advising, field methodological design and collaborator in the redaction of documents.

**Guillermo Jimenez Ferrer:** Support in academic advising, and collaborator in the redaction of documents.

**Eylin Sio Fan Siu:** Support in field activities.

**Gerardo Domínguez Vera:** Support in field activities and workshops.

### **13. Any other comments?**

We appreciate the financial support given by The Rufford Foundation to our project, which was complemented with equipment donated by the Idea Wild Foundation, and our own financial resources.