Final Project Evaluation Report

Your Details	
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Project Title	Effect of landscape structure on canopy structure and arboreal mammals
Application ID	23706-1
Grant Amount	£5,000
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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
Landscape structure characterization			☑	I georeferenced the different landscape attributes at each of the 20 sites and have started processing the data on GIS software.
Canopy vegetation characterization			☑	I successfully established 100 plots (5 x 20 sites) at rainforest fragments where I measured all the proposed vegetation variables (plus canopy coverage, tree density, and tree DBH).
Arboreal mammal survey			☑	I successfully installed a single rope climbing system on 100 trees, which allowed me to register vegetation variables, install one camera trap at each site (changing their location once a month at one of the five trees per site) and monitor arboreal mammal presence through 10 months (still active for 3 more months).
Workshop with rural communities			☑	I conducted an environmental education workshop with primary school children (243 kids) at the ejidos where I worked. I presented them a PPT presentation explaining the importance of epiphytes, lianas and arboreal mammals, and how these are affected by habitat loss on the landscape scale. At three schools we did not have electricity, so I gave the presentation using the board. At one ejido I conducted a field trip to a nearby rainforest fragment where I work.
Concluding PhD thesis, publishing findings on high-impact journals, presenting results at national and international meetings		☑		Since I received the Rufford Grant 1 year ago, I have been doing fieldwork, collecting and organising data. I have recently begun analysing my data which will allow me to write the first manuscript of the contemplated four papers that will be

				produced from this thesis. However, finishing my thesis is scheduled for 2020 (as stated in my proposal), and the publishing of the findings on high-impact journals will also take some more time.

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

There were countless difficulties during my project, which I find hard to summarise here; however, I will present what I think where the five main ones. First, my lab did not receive certain funding that was intended to aid this project, so we had to readjust the budget, and bought 25 camera traps (one per site and five spare ones in case they stopped working or got robbed) instead of 40. This allowed me to use the rest of the funds for paying my local guide's salary and financing the gasoline required for this project.

The next difficulty I faced was that, without previous warning, my local guide migrated to the U SA. Migration to the USA is common in this region since there are very limited economic opportunities, and large families unable to economically sustain themselves. However, before leaving, my first local guide arranged for a second guide (who knew well all the sites I work at) to help me with my project. So, after a couple of days we continued our work as usual.

Another difficulty was that eight cameras stopped working for different reasons. This would seriously compromise my project since I would have to stop in order to obtain more cameras and thus postpone the results. The good news was that 1 month before the fifth camera broke, IdeaWild approved my project and sent me six new camera traps.

Yet, another difficulty arose when my laptop stopped working. I had backed up some of my data on a hard-drive, but not all of it (not to say personal documents). This happened once I had finished the canopy vegetation survey, so I had some "free" days every month. I tried to solve this problem at Tuxtla, Chiapas' capital city, but it was of no avail. Sadly, this event overlapped with a family emergency, so I took a flight to Mexico City and tried to fix my computer there. The specialist told me he could not save my computer, but that he could extract the information; it would just take him some more weeks. I could not wait that much, I had to go back to service my cameras. But luckily a friend lent me a laptop, which allowed me to go back to Chiapas while I had my information recovered. Today all my files are saved.

Finally, this has been an extremely physically and mentally demanding project. Since the break of dawn till dusk, I am involved in physical work, hiking hills up and down, and finding ways in order to install the system that allows me to climb trees (an entire challenge by itself). I have lived in one of the poorest regions of Mexico for 8t months, with very little communication with any known person outside the *ejido* (communal land tenure) where I live. I have also seen how dramatically fast the

rainforest is being lost, and has made me eager to find ways to help with the conservation of this region. However, this experience has also been incredibly gratifying and has made me have a deeper understanding of the problems and necessities of the region I want to help conserve.

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

1. A vegetation structure characterization of the forest fragments of the Lacandona rainforest, done at the landscape scale. The information gathered on this project allows us to understand the impacts of habitat loss on the remaining vegetation stands; key base information that can help predict the long-term vegetation recovery route of the forest fragments. Moreover, this information can help us relate the role of vegetation structure on other functional groups (i.e. arboreal mammals), a great advance in canopy ecology.

2. The first arboreal mammal survey of the forest fragments of the Lacandona rainforest. This project emphasises the importance of forest fragments for the preservation of biodiversity. Preliminary results suggest that although vegetation structure does change in response to landscape heterogeneity, many arboreal mammal species manage to survive even in small isolated forest fragments. This is highly valuable information since it sheds light on the "single large vs several small" conservation debate, and provides us a deeper understanding of the biology of arboreal mammals.

3. Rural community workshops at the *ejidos* where the forest fragments of this project are located. Although these communities live surrounded by rainforest, most of the kids I worked with have never entered the rainforest, and therefore there is a great lack of awareness of the value of their land. Since all the forest fragments of the Lacandona rainforest (and of Mexico) have an owner, raising the awareness of the importance these sites is of great conservation concern.

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

This project involved hiring two local guides who have directly benefited economically. These guides also learned how to install a single rope climbing system on a tree and how to act in case an emergency occurred while someone is up on the tree. They also learned the theory of how to climb using the single rope climbing technique but refused to practice it because of fear of heights. They also learned how to use a GPS, and acquired particular knowledge of forest canopies. A family of four was also directly benefited economically since I paid for rent and food.

Moreover, this project required the involvement of 12 ejidos, and of 20 landowners of the sites where I worked at. With the workshops, I intend to give back to the ejidos some the knowledge generated on this project.

5. Are there any plans to continue this work?

Academically, this project is part of a larger project of the Ecology of Fragmented Landscape Lab (UNAM), which aims to identify species responses to landscape changes. Therefore, the results and information gathered in this project can be related to responses of other species at the landscape scale since several projects work on the same forest fragments I worked with in this project. Also, since this project is part of my PhD dissertation, I regard this project as the beginning of my career as a landscape and canopy ecologist, and as a conservationist.

Moreover, living at one of the ejidos for a year has made me fond of the rainforest and the people, and I intend to keep on working on the conservation of the region and aiding its inhabitants. This experience has allowed me to further understand the interests of the communities and to have a wider perspective of the local economy of the region; thus, it is my intention to use this knowledge in order to design conservation strategies in the region on the not so distant future.

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

The findings of this project will be published on high-impact scientific journals. We plan to publish at least four scientific papers by the end of the project (2020). I also plan to present my results at national and international meetings (such as the International Congress for Conservation Biology, the annual meeting of the Association of Tropical Biology and Conservation, and the Mexican Botanical Congress). Moreover, I have already began presenting my results in workshops with rural local communities of the different ejidos of the Marqués de Comillas Municipality where the project took place. Finally, I plan to share my findings with the National Protected Areas Commission (CONANP, Mexican Government), other local decision makers, and NGOs working at the region.

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

Around half of the grant ($3,679 USD plus shipping) was used on the 2nd month after receiving it, only for buying camera traps. The rest of the grant has been used throughout my field work to pay my guide's salary and gasoline in a more or less consistently way. Therefore, the grant has been used almost as anticipated, just with a two-month delay and with an initial readjustment of the budget (25 camera traps instead of 40) which was consulted with the foundation prior to any changes.

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	Project Budget £	Rufford Budgeted Amount £	Actual Amount £	Difference RBA v AA £	Comments
25 Bushnell Trophy Cam HD Low Glow (Originally budgeted for 40 cameras)	4,900	4,900	2,825	-2,075	We created our original budget counting on the funding of an institutional aid; however, this was not approved, reason why I had to reduce the number of camera traps per site in order to pay for my field assistant salary and local transportation. (this difference was used to pay for field assistant salary and local transportation)
Unieye Laser Range-finder	100	100		+100	
Field assistant salary	1920		1940	+1940	At the beginning of the project the exchange rate of British pound to Mexican pesos was 1£ = 25.14 Mexican pesos, but the current rate is 1 £ = 24.75 Mexican pesos. The guide was always paid 4,000 Mexican pesos monthly.
Local transportation	1,560		1163	+1163	At the beginning of the project Mexican gasoline was £0.65 per liter, but on last few months it has been £0.81. However; I have been using around 120 L monthly instead of the budgeted 200 L.
Transportation to the area	1,196		372	+372	Instead of four round trips, I made one round trip.
In field accommodation*	456		484	+484	Difference due to past and current exchange rate. Accommodation has always been 1000 Mexican pesos monthly.

In field food and supplies*	684		1018	+1018	I had originally budgeted to spend around £57 per month (original pound exchange rate), but I am actually spending around £85 per month (current exchange rate).
Car maintenance*			606	+£606	Since my personal vehicle is in heavy use, I have spent around £40-60 monthly for car maintenance.
TOTAL	10,816	5,000	8408	+3408	March – agreed change to underspend of Rufford Grant.
Current exchange rate: 1 £ = 24.75 Mexican pesos 1 £ = 1.30 USD 1 gasoline L = £0.81			**Exchange rate at the beginning of the project:** 1 £ = 25.14 Mexican pesos 1£ = 1.33 USD 1 gasoline L = £0.65		

*Payed by CONACyT personal scholarship.

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

I think one of the next steps would be to design applied conservation actions that help protect the forest fragments while part of them are sustainably managed and, thus, provide an income to the owner of the land. This implies working directly with the land owners and creating a common initiative with conservationists. These actions could have a greater chance of success with the support of the government through the design and implementation of conservation policies. Therefore, another next step would be to work with governmental institutions and share our results in order to raise awareness off the importance of forest fragments.

10. 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 logo was used during the workshops with the local communities as part of the PPT presentation. I plan to print the logo on every meeting and presentation where I present my work. I have also talked about the Rufford Foundation any time colleagues or other interested people have asked me about the funding of this project.

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

Audón Jamangapé- First local guide. During the first two months, Audón helped me with logistics, getting permission from the landowners so that I could work on their

properties, he helped me establishing the plots, and installing the single rope climbing system used on the focal trees.

Adolfo Jamangapé García- Second and definite local guide. From the third month till today, Adolfo has helped me with logistics, helped me establishing the plots, installing the single rope climbing system used on the focal trees, gave me advise selecting the focal trees, and helped belaying me while I gave service to the camera-traps on the trees every month.

Marta Aguilar- Provided housing and cooked for me throughout my project.

Dr. Víctor Arroyo Rodríguez- As my PhD main tutor, Víctor helped me to conceive the project, has monitored my work in field, and will help me with data analysis and the process of publishing the results of this thesis.

Dr. Mariana Tarín Toledo Aceves- Dr. Toledo, lent me her climbing gear and bigshot, helped me design the project and gave me advices concerning the epiphyte and liana surveys.

Dr. Ellen Andresen- Dr. Adressen helped me to design the project and gave me advices concerning the arboreal mammal survey.