The Rufford Small Grants Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other 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. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Rafael Reyna-Hurtado
Project title	Conservation of endangered mammals in a semi-dry tropical forest in Southern Mexico: predicting responses to climate change
RSG reference	8271-1
Reporting period	Final report
Amount of grant	£5100
Your email address	rafael.reynahurtado@mail.mcgill.ca
Date of this report	August 30, 2011

1. Please 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
Describe the relationships between water availability and tapir (*Tapirus bairdii*) and white-lipped peccary (*Tayassu pecari*) populations in the Calakmul Biosphere Reserve (CBR) and adjacent lands.			X	We monitored water availability and the presence of the two ungulates in a total of 48 ponds distributed in the CBR and in a communal forest that is adjacent to it. In 10 ponds inside the CBR we deployed 20 automatic cameras to record the two species' presence. Tapir and white-lipped peccary were the most frequent visitors of the ponds during the dry season. Data analysis of the last four dry seasons (from 2007 to 2011) indicated that movements of the two species are highly influenced by water availability. Ponds in Calakmul Biosphere Reserve and adjacent lands play an essential role in the conservation of the two endangered ungulates.
Monitoring of movement patterns in two primate species, black howlers (*Alouatta pigra)* and spider monkey (*Ateles geoffroyi*) and food resources availability.				We studied movement patterns in the two species of primates during dry and rain seasons of 2010 and 2011 for a total of 177 hrs of observations for spider monkeys and 224 hrs for black howler monkeys. Spider monkey' groups moved more frequently and travelled in smaller parties in the rainy season than in the dry season. Black howlers did not change its movement patterns in a significant way across the seasons.
Diseases transmission among domestic pigs and peccary's species.				We have collected 40 samples of faecal material from each species of peccaries (collared peccary and white-lipped peccary) and 50 from domestic pigs. All these samples have come from a community forest where domestic and wild animals share some areas near to the village. This study will be the first step toward a more inclusive study that is being prepared that will include sampling population of peccaries in the CBR.

Parasites evaluation on primates living inside the CBR and in a community forest.				We have collected 32 samples of faecal material from spider monkeys living in the CBR and 20 from spider monkeys living in a community forest. We have not analysed the data yet but that will be the next step. The aim here is to describe differences of the parasites communities present in the same species but living in two contrasting places: the CBR a protected area with no domestic animals and very low human presence and a community forest where human and domestic animals' presences inside the forest are common.

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

We wanted to use more camera traps to cover more ponds, but fast and reliable digital cameras are expensive, so we could not cover all the ponds with camera traps as we wanted, so for additional ponds where no cameras were available we recorded the presence/absence of the two species of ungulates (tapir and white-lipped peccary) using a systematic method of recording tracks on the side of the ponds every two weeks during the dry season 2010 and 2011.

Regarding primates, spider monkeys were very fast and travelled farther during the rainy season, it was very difficult to follow any subgroups for periods longer than 3 hours during the rainy season. To became faster inside the forest our team was composed by three people, one field assistant whose task were to open a trail within the forest and follow the troop, followed by the main researcher collecting behavioural data, and one student who served as assistant recording the plant species and measuring the tree DBH and phenological status of the tree species. In that way the team was faster, however, not always enough to keep continuous contact with the troop or any subgroups for most of the time.

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

1. We have documented that tapirs and white-lipped peccaries' movements are highly influenced by water availability during the dry season. Therefore, ponds are a key element of the Calakmul landscape that plays an essential role during the dry season for the conservation of the two species of endangered ungulates. Management plans of the Calakmul Biosphere Reserve must include a plan to conserve the ponds and to closely monitor the wildlife associated to them.
2. Spider monkeys moved in small subgroups and travelled faster and farther in the rainy season than in the dry season. Their preliminary home range was at least twice larger in the rainy than in the dry season (data still under analysis, so we cannot provide the accurate estimation yet). Groups of black howler monkey moved similarly during the rainy than in the dry season. Individuals of both species congregate in the *Ficus* spp tree during the rainy season when fruits were available. Large *Ficus* spp tree served also as sleeping and resting site for both species of primates. This is the first time that movements of the two species of primates are studied in the same area in two contrasting seasons. We hope that further fine

analyzes of the data under statistical models of animal movement will shed light in the ecological strategy that both species play when food availability changes.

3. The parasites and diseases transmission study that we have just initiated on peccaries and primates will be very important to determine if there are current diseases transmissions on wildlife from domestic animals in the area and vice versa. We expect that peccaries and spider monkeys living in the communal forest will have more parasites and other diseases than those living in the protected area away from domestic animals. We have not analysed the data yet, but that is the next immediate step.

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

We have hired two local assistants and one of them has been continuously involved in the project since 1997. The health of the domestic pigs of the community is being assessed and the DVM in charge has detected other diseases in some domestic species (in poultry). Therefore, we have provided treatment when required with not charge at all. We spoke in a community meeting in July to update them about the outcomes of the project and to ask for feedback. During that meeting a plan was designed to train three people in techniques to study wildlife populations. We have initiated the training as part of our ongoing radio-telemetry study with tapirs and white-lipped peccaries in the community.

5. Are there any plans to continue this work?

We are highly involved in the site and we are working now in the subsequent research steps. Our plan now is to continue with the deployment of radio-collars in individuals of the two species of ungulates, tapir and white-lipped peccary. Currently we have 5 white-lipped peccary and one tapir with VHF radio-collars, and we have acquired 8 satellite collars with a grant from the Mexican Council for Science (CONACYT for its Spanish initials). We have high hopes that these radio-collared animals will produce quality data that will show their most important requirements in terms of habitat features and their ecological strategies when availability of resources changes, this is important as we would like to model the possible response of the species if climate change intensifies and resources availability changes in the area as the current models predicts.

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

We are in the process of writing two scientific papers (one about the primate's study and another about the tapir and white-lipped peccaries' study). We have written a report in collaboration with Pronatura Peninsula de Yucatan (PPY) that includes data from this study in combination with three previous years of data that PPY collected about the visitation rate of wildlife species to the Calakmul' ponds. Product of this collaboration we have also produced a divulgation paper that has been widely distributed in Mexico universities and academic centres as well as governmental and no-governmental agencies working in conservation. You can access the document here: http://www.biodiversidad.gob.mx/Biodiversitas/Articulos/biodiv93art1.pdf

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

We used the funds over one year, however, this study is a long-term monitoring project that started in 2005 with my doctoral study on white-lipped peccary, however without a doubt the support from RSG in middle 2010 was essential to continue the primates study, to boost the parasites study and to continue the tapir and white-lipped peccary monitoring project during the dry season 2011.

8. Budget: Please 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.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Primates' study field expenses (gas and food)	900	878.04	21.95	It was for a period of 6 months at 3000 pesos/month
Monitoring of ponds (study of tapir and white-lipped peccaries) field expenses (gas and food)	900	878.04	21.95	It was for a period of 6 months at 3000 pesos/month
Primates' study student stipend	1200	439.02	760.97	It was for a period of 3 months at 3000 pesos/months, as we got money from another organization to pay the rest of his time
Tapir/white-lipped peccary student's stipend	1200	439.02	760.97	It was for a period of 3 months at 3000 pesos/months
Field assistant primates' study	900	878.04	21.95	It was for a period of 6 months at 3000 pesos/month
Field assistant tapir/white-lipped peccary' study	0	878.04	-878.04	It was for a period of 6 months at 3000 pesos/month
Field assistant primates' parasites collection	0	292.68	-292.68	It was for a period of 3 months at 2000 pesos/month
Field assistant peccaries' parasites collection	0	292.68	-292.68	It was for a period of 3 months at 2000 pesos/month
Total	**£5100**	**£4975.61**	**£124.39**	This amount left is to be used to continue the collection of peccary's faecal samples

Note: the exchange rate was 20.5 pesos each sterling £

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

We are very excited to have the opportunity of radio-collaring tapir and white-lipped peccaries because we feel that studying their movements in close detail will be very interesting to define the ecological strategies that these two highly water-dependent species would do whenever the climate change impacts intensifies in the area. Also investigating the relationship man-pond is interesting because in the way that local habitants use the ponds could affect the species that depend on them. Regarding primates, reinforcing the study of spider monkey troops in the rainy season is essential to complete their home range estimation and to define better the movement patterns during that time. In general, we believe that water availability and scarcity for both humans and wildlife in the area would be essential research topic for the future, especially if the current predictive models of possible impacts of climate change are correct.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

We have used the logo in several oral presentations we have prepared using power point. We will acknowledge the RFS in the two papers that will be produced as part of this project, and in any other product that we will prepare.

11. Any other comments?

We are very grateful with the RSG for the support of this ongoing project and for supporting the conservation of endangered mammals of the Mexican Mayan forest.