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. 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. 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	Giselle Zambrano González
Project Title	Conservation And Ecology Of Canopy Arthropods In An Andean High Forest Of The Village El Cofre, Totoro-Cauca, Colombia
RSG reference	14219-1
Reporting period	May – December 2014
Amount of grant	£6000
Your email address	gzambranog@unicauca.edu.co
Date of this report	29 December 2014

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
Characterise arthropod fauna in the canopy of an Andean High Forest of the Village El Cofre, Totoró-Cauca, Colombia			X	Characterise the arthropod fauna living in the canopy of this forest allowed us to conclude that these organisms are significantly different. This found diversity is an indicator that this forest is in a good state of preservation. It's amazing the number of families and individuals of each family of arthropods that can be found in just a wooded relict. Therefore it is important to develop a strategy to preserve this diversity focus to over 3000 m.
Generate lists under the denomination of order and family			X	In the period between January and June 2014 were collected 42243 individuals grouped into 24 orders, 155 families and about 366 morpho-species. The orders more abundant forest canopy arthropods in Totoró corresponded to Diptera, Acari, Coleoptera, Hymenoptera, Lepidoptera, Aranae, Collembola and Hemiptera.
Analyse the abundance of communities of arthropods in different microhabitats present in the canopy.			X	In the forest canopy there are a wide variety of microclimates created from various formations which we call microhabitats. In this paper we sampled four of which the foliage (35354/143) where we captured more individuals and families of arthropods, the following were moss (4298/84), bromeliads (2362/76) and trunk (229/26) respectively.
Analyse distribution and the level of association that the arthropods have with the canopy of this forest			X	Although the individual abundance and richness of families did not have many differences into five species of trees, there was a slight difference with the species *Podocarpus oleifolius* where were collected more individuals and families of arthropods (9698/118). This is important because even being a source of diversity is in threat status of Least Concern by the International Union for Conservation of Nature

				(Gardner, 2013) making it a priority for conservation and if it becomes extinct, arthropods would be seriously affected and other organisms that benefit from it. Finally, it can be deduced from these results the good connectivity of canopy that exists in this forest relict by find the same families in the five tree species.
Build a food chain structure of canopy arthropods of this forest			X	Developing this step was very important because as we could visualise which is trophic structure of canopy arthropods that more comes close to this forest. The above allowed interpreting various hypotheses regarding the most important families who contribute the balance of the ecosystem.
Involve the community in understanding and developing a strategy to preserve this forest relict			X	Fortunately the work with arthropod allowed us to involve nearby inhabitants of this relict of forest and the owner of this in a strategy to conserve not only the canopy arthropods, also the whole forest. So it was discussed with children and adults in the community about selective extraction and logging, and how this affects various agencies that play an important role in the balance of this ecosystem. As this forest relict is private, we helped to encourage with this work the owner to have enough arguments to declare this forest relict like a forest reserve private.
Publish all the information in a known magazine for the scientific community		X		This last step is partially achieved because we are in construction of the articles and documents required for publication in a scientific journal of high impact.

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

Fortunately in the development of this project were presented no difficulties in any of the steps taken to fulfill the above objectives. However, events such as weather and transportation to the study area were a bit difficult and delayed the schedule established. This was rectified thanks to get other transportation.

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

1. We characterise the communities of arthropods present in the canopy of a forest relict in the village Cofre, Totoro, Cauca. This characterization allowed us to discover the great diversity of arthropods that are in the canopy of this forest even to over 3000 m above sea level.

2. The generating of lists under the denomination of order and family allowed us to visualise the diversity of arthropods that live in the canopy of this forest. Find 155 families arthropod is an indicator of good condition found in this forest. With these databases we can raise awareness of the diversity of organisms that harbor the high Andean forests in Colombia, supporting the idea of conserving these ecosystems.

3. It was analysed by diversity indices and statistical factors which was the association and distribution of arthropods in the canopy of this forest. We could find that among these variables there is no significant difference, therefore the association and distribution of arthropods canopy of this forest is quite homogeneous, which allows us to conclude that exists in this forest a good connectivity of canopy that allows the interaction of various agencies uniformly with tree tops. This is because this forest is in a state of secondary succession indicating the good condition in which it is located.

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

The community surrounding the forest was directly related to the project. It could discuss with children and adults about the importance of arthropods in the balance of the ecosystem, and as affect the selective extraction and indiscriminate felling of plant material to various agencies which play important roles in the forest. Finally, this paper will serve as a reference to the forest owner who plans to declare it as a forest reserve private.

5. Are there any plans to continue this work?

We want to continue this work. We plan to involve students of master in biology science to continue with the investigation. The next step will be to identify the material at the species level to report new distributions and new species found. So also sample new tree species of importance to the community in order to have arguments to regulate their indiscriminate felling. It also we plans to do the same project at different heights to compare the diversity of canopy arthropods that may exist in each of these. Finally it also we plans to make several works on the canopy of this forest to register and give more arguments for declaring this as a forest reserve.

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

It plans to unveil the results of this research to the scientific community through four steps. The first is to make a socialisation of the results to research group at the University of Cauca involved, residents near to the studied area and anyone interested community. The second step is to make a presentation at an oral modality in the 42nd Congress of the Colombian Society of Entomology. As a third step we will publish these findings in two high impact journals, one national and one

international. Finally it is planned prepare a book showing the diversity of families of canopy arthropods in a relic of high Andean forest.

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

We use the RSG in the period between January and December 2014. Although there were some difficulties with the established schedule due to the climate of the region and transportation to the study area, this at no time affect the development and completion of sampling. Therefore we can conclude that it has complied with the time set for the development of this project. The last thing that remains is the socialisation and publication of these results because we are in the construction of the necessary documents to meet this objective.

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
10 Malaise traps, Dimension: H. 160 x L. 180 x W. 110 cm	816	820	-4	This occurred because the product was imported and the exchange rate of badge generated the difference
10 Bait traps for Lepidoptera (Van Someren)	521	525	-4	This occurred because the product was imported and the exchange rate of badge generated the difference
3 Hama Modular in aluminum BioQuip, Ø 40 cm, Soporte 120 cm	50	58	-8	This occurred because the product was imported and the exchange rate of badge generated the difference
80 Maphail trap	365	370	-5	This occurred because the product was imported and the exchange rate of badge generated the difference
2 Black Diamond Big Gun Climbing Harness	140	143	-3	This occurred because the product was imported and the exchange rate of badge generated the difference
3 Blue Water Figure 8 Belay Device	31	31	0	
4 Petzl Ascension Ascender	191	195	-4	This occurred because the product was imported and the exchange rate of badge generated the difference
1 Blue Water II Plus Static Climbing Rope - 11.3 mm (300 ft)	178	181	-3	This occurred because the product was imported and the exchange rate of badge generated the difference

10 Black Diamond RockLock Screwgate Carabiner	89	93	-4	This occurred because the product was imported and the exchange rate of badge generated the difference
1 Garmin eTrex 20 Worldwide Handheld GPS Navigator	107	111	-4	This occurred because the product was imported and the exchange rate of badge generated the difference
1 Canon PowerShot SX50 HS Digital Camera (Black)	417	425	-8	This occurred because the product was imported and the exchange rate of badge generated the difference
5 Tweezers with Magnifier	23	23	0	
1 AmScope 20X-40X-80X Digital Binocular Stereo Microscope with Top & Bottom Dual Light Illumination System 2.0MP USB Imager Digital Camera	282	570	-288	This occurred because were acquired two stereoscopes to facilitate the work of identifying and cleaning and not one as had been proposed. Also it should be noted that these products were imported and the exchange rate of badge generated some difference
Materials for the preservation: Alcohol, Beakers, Plastic bottles, Ziploc bags	202	202	0	
5 tickets (Popayán- Vereda el Cofre, Totoró-Popayán) (3 People	695	360	335	This difference was because initially had proposed transport to the NNP Alto Fragua, but for reasons previously informed, we change of place. This new place was a little closer, whereby the money left over was used in the other items.
Housing (3 People) and Feeding (3 People)	1726	1726	0	
Transportation of the gear "freight"	126	126	0	
Bibliography: Guides, books and keys for the identification	41	50	-9	This occurred because the product was imported and the exchange rate of badge generated the difference
TOTAL	£ 6000	£ 6009	-£ 9	

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

As mentioned above the next step is to continue with the disclosure of the results in events and publications in high impact journals. We will also publish a book to teach the families of canopy

arthropods of this forest. We want to contribute to the conservation of this place developing new research to serve as a basis for declaring this forest as a forest reserve.

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?

The RSGF logo has been used on several occasions. The first was in an oral presentation where the methodology to develop in this work was proposed to the community. The second time was in the IV Colombian Congress Zoology. It plans to use soon in an oral presentation to be held in 42nd Colombian Congress of Entomology and in a book to teach the families of canopy arthropods of this forest. Finally we will use the RSGF logo in the articles of high impact journals in which the results will be published.

11. Any other comments?

We greatly appreciate the support of the RSGF team for the development of this research project. It would have been very difficult to meet the above objectives without the help of RSGF. We want to thank to the owner of this forest and your community by we allowed develop and complete this project successfully. We hope to have ready the publications of results very soon to make them known to the wider community.