The Rufford Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford 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

Your name	Sven Batke
Project title	Ecology and Distribution of Vascular Epiphytes in Tropical Montane Forest in Honduras, Central America
RSG reference	13405-1
Reporting period	06/06/2013 – 12/06/2014
Amount of grant	1500 Pounds
Your email address	batkesp@tcd.ie
Date of this report	12/06/2014

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
To acquire an epiphyte species list of Cusuco National Park that can be used to highlight the parks importance as a conservation area.			x	Our survey investigated over 7000 individuals of epiphytes (including parasites, stranglers, vines and lianas) from 218 different species (or 20.1 % of the total known flora of the park). Our species list is currently been used in a RED application for the park. Moreover, we found over 10 different species of epiphyte that had not previously been recorded from Honduras; this including a new fern record from Mesoamerica (published in the American Fern Journal; Batke and Hill 2013).
To assess the effect of high energy weather events (i.e. hurricanes) on the forest canopy environment.			x	We used highly sophisticated weather models to predict the past impact of hurricanes in Cusuco NP. The results of this were published in the journal PlosOne (Batke et al. 2014). We used the model to identify structural and micro-environmental alterations in the forest canopy. The results of this were recently accepted in the journal of Tropical Ecology (Batke and Kelly 2014 *in press*).
To assess the effect of hurricanes on the composition and distribution of epiphytes across the canopy.			x	The above-mentioned model was also used to identify diversity and compositional changes in epiphytes across the canopy. Two papers have so far been written (Batke and Kelly 2014 *unpublished*), which we aim to submit soon to international ecology journals for scientific review.
To compose a bio-geographical comparison of epiphytes in Honduras and other Central American countries.			x	We summarised, for the first time, epiphyte records from all of Honduras. In collaboration with Dr. Alfredo Cascante Marín, we are currently writing a bio-geographical comparison of epiphytes in Honduras to other Central American countries. It is expected that this paper will be submitted for review soon.

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

Finding funding throughout the project was difficult. We had particularly difficulties to raise money to visit local and international herbaria to identify our species. We were often told by funding agencies that our project did not align with their funding guidelines. It was mainly due to the generosity of my department and small funding bodies such as the Rufford Foundation that we were able to 'complete' this project.

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

a) The data is currently being used to complete a PhD research thesis. The final thesis is expected to be submitted by the end of August 2014.
b) The data has and will provide important floristic baseline information to the park. We increased the number of known plant species from Cusuco NP by approximately 25%.
c) We demonstrated for the first time (in prep.) how micro-environmental canopy alterations from past hurricane events can shape epiphyte communities along a disturbance gradient.

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

Throughout our sample season we (in collaboration with Operation Wallacea) employed a great number of local people that helped us to successfully complete this project. For example, we had a local guide who helped us to locate and access particular tree species across the park. Also, we worked closely together with a botanical team from Tegucigalpa, who helped us with the species identification. The local community benefited in two ways. Firstly, our employment supported the local communities by transferring knowledge and skill. Secondly, we provided humanitarian and finical aids, which among others have been used for local construction project in the village of Buenos Aires, Honduras.

5. Are there any plans to continue this work?

We are currently in discussion to organise another expedition in early spring 2015. As our project focused mainly on holo- and hemi-epiphytes, we would like to extend our survey efforts more to other prominent epiphyte groups (incl. climbers and stranglers). We would be collaborating with another botanical team lead by D.L. Kelly from Ireland, who is investigating the terrestrial plant flora in the region. We also aim to extend our survey area to other nature reserves in Honduras (details are currently being discussed).

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

To date we have published three papers in per-reviewed international journals. An additional two papers are currently being prepared for submission. Moreover, we are collaborating with other scientist from Belfast, Dublin and the USA on three additional publications. Our work has also been publicised in the media, featuring one radio interview, one news article and a short educational project video. The video is now being used by the Trinity College Dublin to promote the Plant and Environmental Science courses. Finally, we presented one poster at the international ecology

conference (INTERCOL), presented on the Scottish Tropical Ecology and Biodiversity conference (STEB) and on the Irish Plant Science Association Meeting (IPSAM).

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

The Rufford grant was only used for the fieldwork season between June-August 2013. The duration of the project was mostly limited to the deadline of my PhD thesis.

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
Dublin to San Pedro Sula return flight	2247.3	1730.3	517.0	Was partially covered by a TCD travel grant (250 pounds). The remining amount was covered by the Rufford Foundation (**1480.3 pounds**)
Excess baggage	133.56	282.0	-148.44	This was covered by the courtesy of British Airways.
Hotel (Night in San Pedro Sula before departure)	177.27	183.7	-6.43	This was covered by an additional grant from the Royal Geographic Society London and the Rufford Foundation (**19.7 pounds**).
Tax (Airport tax San Pedro Sula)	73.35	51.0	22.35	This was covered by personal funds.
Bus (transfer to Trinity College Dublin)	5.1	5.1	0	This was covered by personal funds.funds.
Bus (Tegucigalpa to San Pedro Sula; return)	3.52	7.2	-3.68	The actual amount doubles as I decided to bring my assistant (Nicholas Hill) to the Herbarium in Tegucigalpa. This was covered by personal funds.
Hotel (three nights in Tegucigalpa)	167.16	1493.9	-1326.74	We (including my assistant) decided to stay an additional two days, as we wanted to make most of the herabrium collections in Tegucigalpa. My assistant was not accounted for in my orgiginal budget.
Post (Posting of herbarium specimens from Tegucigalpa to Dublin)	250.33	260.7	-10.37	Using FedEx delivery service. This was covered by the Botany Department (TCD).
Food	1650	1650	0	This was covered by Operation Wallacea.

Transport between camps	94	56.0	38.0	This was covered by Operation Wallacea.
Herbarium visit London Flight to Gatwick return	63.91	98.72	-34.81	This was covered by the Botany Department (TCD).
Accommodation London	340.9	368.0	-24.1	This was covered by the Botany Department (TCD).
Other transport London	35.79	28.9	6.89	This was covered by the Botany Department (TCD).
INERCOL 2013 conference	663.7	663.7	0	This was covered by the British Ecological Society and TCD.
Total	5905.89	6879.22	973.33	The actual expenditures differed mainly because I decided to take my assistance to Tegucigalpa to help me with the plant identification.

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

- Submit my PhD thesis by August 2014.
- Submit another 2-3 papers to international journals
- Continue my epiphyte research in Honduras. I would like to collaborate more with the local botanists in Honduras. I am planning to run a climbing/epiphyte-survey course in the Tegucigalpa next year. I am currently looking for financial support, as insurance and equipment costs are very high. It might be possible to coordinate a country wide epiphyte sampling effort. Moreover, I would also likely to produce a short identification key of the epiphytes from Cusuco NP. This key could be used by students that visit the park through Operation Wallacea and the local community.
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10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes. The logo was used in three conference presentations. Also, the Rufford Foundation was acknowledged in three of my publications (Batke and Hill 2013. The American Fern Journal; Batke et al. 2014. PlosOne; Batke and Kelly 2014 in press. Journal of Tropical Ecology).

11. Any other comments?

I would like to thank the Rufford foundation, as well as other funding sources, for their financial support. Without their contribution this project would not have been possible. Also, I would like to thank my supervisor Dr. Daniel L. Kelly for his support and Nicholas Hill for his dedicated help during the fieldwork.