

## 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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

#### Grant Recipient Details

<b>Your name</b>	Enrico Bernard
<b>Project title</b>	Near collapse: investigating the roll of bats as seed dispersers and pollinators in a faunistically depauperated landscape in the Brazilian Atlantic Forest
<b>RSG reference</b>	7857-1
<b>Reporting period</b>	July 2010 – July 2011
<b>Amount of grant</b>	£4880
<b>Your email address</b>	<a href="mailto:enrico.bernard@ufpe.br">enrico.bernard@ufpe.br</a> OR <a href="mailto:enicob2@gmail.com">enicob2@gmail.com</a>
<b>Date of this report</b>	August 8 <sup>th</sup> 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
Seed dispersal by bats quantified and qualified.		X		The project is still collecting seed and faecal samples. The samples already collected indicated a prevalence of pioneer plants in bats faeces, especially those in the genus <i>Piper</i> and <i>Solanum</i> , reinforcing the role those animals have as agents in the local seed rain, and on the dynamics of plant succession.
Pollen dispersal by bats quantified and qualified	X			Surprisingly, only two captures of nectarivorous bats were obtained so far, and none were carrying pollen, making impossible to analyse the pollen load being dispersed. Samplings will continue until the end of the project.
Marking and capture of bats		X		<p>The first field session, scheduled for August 2010, had to be postponed for almost 2 months due to an abnormal rainy season, heavier and longer than expected. The 100-year historical 24 hour maximum rain record was broken in 2010, damaging bridges and roads and making impossible to access the unpaved roads in the working area. On average, there was nearly 30% more rain than the previous years and the rainy season extended for almost 30-40 days beyond normal.</p> <p>I was able to perform capture and marking sessions in October and November 2010 and February 2011, before the beginning of the rainy season, which, once again, turned impossible the access to the area. April 2011 set a new 100-year record and was the rainiest April ever recorded here (nearly 600 mm of rain), and May 2011 was the rainiest May in the last 60 years. Overall, we had 22 species recorded, 141 bats captured, and 113 marked. This is below my target of 1,000 captures and markings, which we expected to be achieved until March 2012.</p>

<p>The home range and mobility of bats in a hyper fragmented landscape determined by telemetry</p>	<p>X</p>			<p>The telemetry sessions expected to happen in the second semester of 2010 were postponed to early January 2011, due to delays when importing the radio-transmitters. Telemetry sessions usually take 15 days and are scheduled according to dark phase of the moon. Once the transmitters are activated and glued to the bats they cannot be interrupted, and last for no more than 14 days. Considering that transmitters are expensive and hard to get in Brazil, the decision to start a telemetry session has to be well planned; otherwise several transmitters can be lost. In January 2011 (which was supposed to be a dry month) I was set to perform the first telemetry session, went to the field and had to cancel the telemetry due to unexpected heavy rains. A new telemetry session was scheduled for February, but had to be postponed again due to health problems.</p> <p>I returned to the field in March, this time with good weather. Surprisingly, I had <b>zero captures</b> of the species selected for telemetry, <i>Carollia perspicillata</i>, which is considered the most abundant species in the Neotropics. In three consecutive nights I had no captures of the species at all, making impossible to track them. With the start of the classes (in mid March) and the rainy season (in April), once again I had to postpone the first telemetry session, which is now scheduled to happen between September 1<sup>st</sup> and 12<sup>th</sup>. Two other telemetry sessions are scheduled for October and November 2011. Any other necessary telemetry session will be performed no later than January 2012.</p>
<p>Dissemination of scientific-based information on bat biology, ecology and conservation, and the effects of forest fragmentation on</p>		<p>X</p>		<p>Considering that the project is late, the objective will be fully achieved just after its conclusion. However, the project was included in the Brazilian activities of the International Year of the Bat. Full and half page articles were published in some of the largest newspapers in Brazil</p>

seed and pollen dispersal.				(O Estado de São Paulo, Correio Braziliense, O Estado de Minas, Diário de Pernambuco, and Jornal do Comercio). Scientific articles will be submitted for publication in peer-reviewed journals as soon as the project is concluded.
Qualified human resources trained in conservation biology, with the execution and supervising of one Masters Thesis.			X	<p>Since the beginning of the project, in the second semester of 2010, the following training were performed:</p> <ul style="list-style-type: none"> <li>- 10 Masters Students in Botany received a 4-hour class on the role of bats in seed dispersion and pollination and the possible effects of forest fragmentation on those ecological services;</li> <li>- Six Masters Students in Animal Biology received a 5-day field training course on bat biology and ecology, with practical capture and marking sessions;</li> <li>- Five BSc. Students in Biological Sciences received a 2-day practical training course in radio-telemetry.</li> <li>- As part of the Near Collapse project, I am currently supervising the Master Thesis of Leandro Pimentel de Andrade at the Graduate Program in Animal Biology, Department of Zoology, Universidade Federal de Pernambuco. The Thesis is focused on the home range and mobility of bats in a hyper fragmented landscape.</li> </ul>

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

The delay experienced by this project is a proof that climate change is real. In 2010, my first field session had to be postponed for almost 2 months due to an abnormal rainy season, heavier and longer than expected. The 100-year historical 24 hour maximum rain record was broken last year, damaging bridges and roads and making impossible to access the unpaved roads in the working area. On average, there was nearly 30% more rain than the previous years and the rainy season extended for almost 30-40 days beyond normal. In 2011, one telemetry session had to be postponed due to unexpected heavy rains in January, which was supposed to be a dry month. The rainy season started in April, once again breaking some historical records: the rainiest April in the last 100 years, the rainiest May in the last 60 years. Considering that the project area has no paved roads and that the traffic there is composed by heavy-duty tractors used in the sugarcane industry, accessing the area was a logistic problem and some field session had to be postponed due to that. As a result, this project is 6-8 months behind its original schedule. Efforts are being made to compensate the delay. Alternative areas, with similar ecological conditions (Atlantic Forest fragments surrounded by

sugarcane crops) but easier access, are being considered. One of such area was already identified and we currently have the ok from the sugarcane company to visit it.

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

Considering the project is still under execution, the expected outcomes were not fully reached yet. However, I would like to mention the training component of this project as an important outcome. So far, 16 MSc. and eight BSc. students received formal training in conservation biology, bat biology and ecology and radio-telemetry associated with this project, and this number will increase until the conclusion of the project. Moreover, part of the project (telemetry and mobility) evolved to a MSc. Thesis in the Graduate Program in Animal Biology at Universidade Federal de Pernambuco, under my supervision. By the conclusion of the project, I expect that at least two other outcomes will be reached: the production of the first data on home ranges for bat species in a hyper fragmented landscape surrounded by sugarcane plantations; and the role bats are playing as seed and pollen dispersers in such context.

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

The project originally did not involve any local communities.

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

Yes, the project is not considered concluded yet and all field and laboratory activities will be performed beyond the original schedule.

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

The project was included as part of the Brazilian activities of the International Year of the Bat, resulting in a very good coverage by some of the largest newspapers in the country. As soon as we obtain the first telemetry data on home range and mobility, we plan to publish other general articles. Scientific articles will be submitted for publication in peer-reviewed journals as soon as we conclude the project.

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

The grant started to be used in September 2010, for equipment acquisition, and is currently under use. Since some of the field activities programmed are late and will be concluded in the next months, the grant was not completely spent yet. See below for details.

**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. Rate used: £**

Item	Budgeted Amount	Actual Amount	Difference	Comments
Mist nets	549.00	-549.00	0.00	Fully spent
Radio-receiver + antenna and cables	700.00	+700.00	+700.00	Not spent, since a radio-receiver was borrowed from Dr. M. Brock Fenton (Western Ontario University, Canada). The amount will be used to acquired more transmitters for the second and third telemetry sessions
Radio-transmitters	1650.00	-1650.00	0.00	Fully spent for the first telemetry session.
GPS	150.00	-150.00	0.00	Fully spent
laptop	610.00	+610.00	+610.00	Not spent, since a laptop was donated by the university to be used in the project. The amount is reserved to be used as field expenses in the next telemetry sessions.
stereo-microscope	850.00	+850.00	+850.00	Will be acquired in the next 30 days.
Night vision scope	160.00	-160.00	0.00	Fully spent
Radio (walkie talkie)	210.00	-210.00	0.00	Fully spent
<b>Total</b>	4880.00	-2720.00	+2160.00	1 = R\$ 2,61

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

I need to intensify our capture and marking efforts in order to increase faecal and pollen samplings, and to maximise the chance of recaptures. The execution of at least two telemetry sessions is crucial in order to gain data on home range and bat mobility in the area. The telemetry sessions are a priority, since they will provide more data on the use of the fragmented landscape.

**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 logo was projected in all training sessions performed so far and will appear in the photos related with the telemetry sessions that will be conducted soon. The project was included in the Brazilian activities of the International Year of the Bat, receiving good publicity. Full and half page articles were published in some of the largest newspapers in Brazil but the journalists focused their pieces on the implications of forest fragmentation on bats. Unfortunately, they did not mention any of the institutions supporting the research.

**11. Any other comments?**

I would like to apologise for the delay, but the factors affecting the execution of the research were out of my control. I can guarantee that all necessary efforts are being made to compensate such delay.