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

Grant Recipient Details	
Your name	Larissa Sayuri Moreira Sugai
Project title	Acoustic Approaches for the Conservation of Anuran Signalling Assemblages in Brazilian Pantanal Wetlands
RSG reference	19808-1
Reporting period	June 2016- July 2017
Amount of grant	£4975
Your email address	lariagus@gmail.com
Date of this report	7th July 2016

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
Sampling procedure design				I was able to perform a sampling design that accounted for spatial independence among sampling units, while respecting a gradient of environmental structure.
Field validation, selection of ponds, and Measuring habitat structure				I could reach 40 sampling sites (from different ponds) to perform field recordings and habitat measurements.
Recordings of anuran signalling communities				With a rotation procedure, I recorded 40 ponds for at least 3 days in January 2017, with a recording schedule to record two minutes each 18 minutes, starting 1 hour before sunset, and ending 1 hour after sunrise.
Acoustic analysis				Up to date, I have inspected 4,292 minutes of wildlife recordings, searching for anuran species.
Analysis of acoustic structure of anuran communities				Because of the huge amount of data, I can only achieve this goal after I finish to inspect all recordings.

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

1. *Access to the study site*. During the rainy season, the flooding impaired the access to the farm by terrestrial routes. Fortunately, I was able to contact rental services to take us with aircraft.

2. *Audio recorders maintenance*. I had to provide small roofs to protect the recorders from heavy rain and sun. Unfortunately, I could not spend more time checking the integrity of the recorders, and some of them had the microphone's foam attacked by ants, cows, and other animals. Also, we had a risk of fire in an area close to the audio recorders, but luckily, the fire was controlled.

3. *Automatic analysis of acoustic data*. I am manually analysing the acoustic data, as there is no reliable automated species identification at the community level that deals with the conditions on which the recordings of the Pantanal are found: low

signal-to-noise ratio due to varying assemblages of chorusing species, and varying degrees of pressure levels of species calls reaching the microphones.

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

i) Recordings from 15 sites in the rainy season of 2016/2017, resulting in 1.85Tb of wildlife recordings. From this, I identified up to now 25 species distributed in three families, with Hylidae as the most abundant. I am also looking for partnership for the identification of bird songs, once our schedule provided recordings of the dawn and dusk bird choruses.

ii) Divulgation of passive acoustic monitoring as a non-invasive and cost effective method. My project were divulgated in Unesp/Rio Claro, and UFMS, where researchers were introduced to this new method.

iii) Divulgation among the local community about biodiversity conservation, in special, amphibian conservation.

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

In the studied area, I was able to talk to the community living around the farm, and introduce them to our new method of acoustic monitoring. I also provided printed guides of anuran species with some information on the species. Some rural employees got involved, and stablished a chat group in Whatsapp, where they frequently send pictures of amphibians and reptiles, so we can inform which species are, and tell about their natural history. I visited the local rural school, and we plan to promote an interaction with the kids (up to 9 years old) about anuran communication and conservation.

5. Are there any plans to continue this work?

I still have 2 years to complete my PhD thesis. I intend to return to the farm to collect more data on directional acoustic recordings and to perform an interaction with the rural school and the local population.

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

I use the website provided by the Rufford Foundation as a source of divulgation of my project. Besides that, after completing the analysis, I will present my work in congress and classes in the university. I also intend to formulate a website to divulgate the project and results, and to disseminate to the general population with informative material in a more simple language.

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

I used the grant from October 2016 to June 2017. This comprises nine of the 48 months of my PhD thesis, but it helped to cover all the budget I had with fieldwork.

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
Diesel	160	160	0	
Lodging	1620	1620	0	
Vehicle rental	1020	1020	0	
Alkaline Batteries D	475	475	0	
Memory card	500	500	0	
Automated acoustic recorders	12000	12000	0	
Total	4975	4975	0	

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

The next steps will include all procedures committed to complete my thesis. Specifically, i) complete the database on anuran community composition by manually inspecting the recordings, ii) update our database of anuran calls, iii) perform analysis of the drivers of the acoustic structure of this communities, iv) perform an internship abroad with a prominent researcher of the area, v) publish the results, vi) come up with didactical material to divulgate our results.

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, I acknowledge this grant in a publication which is now in press:

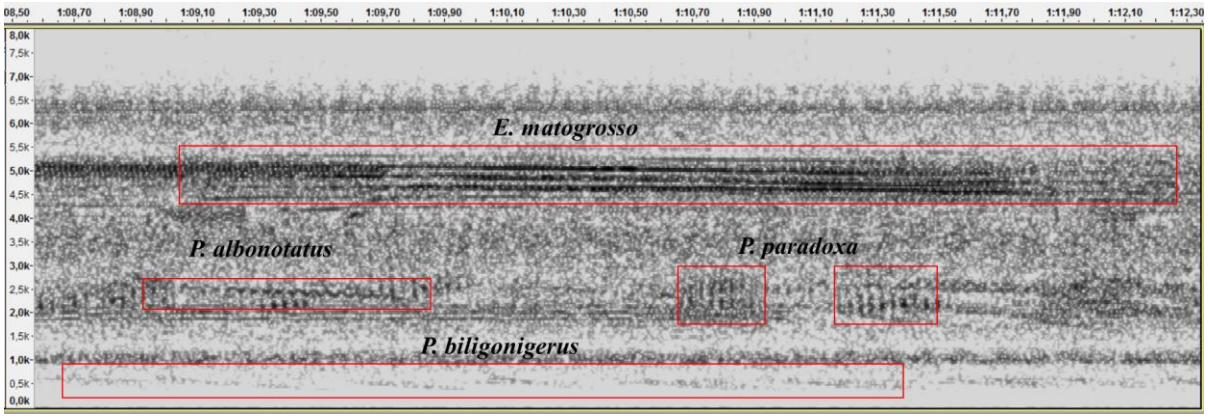
Sugai L.S.M., Souza G.N., Sugai J.L.M., Silva T.S.F. In press. Scinax nasicus (lesser snouted treefrog). Predation by Trachycephalus typhonius. Herpetological Review.

11. Any other comments?

This grant was indispensable for the success of the main step of my project. I was able to perform all the fieldwork and to stablish important partnership with researchers and conservation practitioners in the Pantanal, and all of them were very satisfied with the pace that the project is going on. I thank for the opportunity and confidence deposited in this project.

Audio recorders deployed on Barranco Alto farm, with associated temperature data loggers. The devices were placed at approximately 1.5 m above ground, in trees or wooden stakes, and always oriented toward the ponds. I also installed a small roof to protect the recorders from intense rain.

Directional recordings of individual anuran species (a-b) and different environmental structures on the margins of the ponds in Barranco Alto farm (c-d).



Anuran species detected by spectrogram inspection from a recording from 25th January 2017, 21:47 UTC -04.

Some of the recorded species in Barranco Alto farm. a) Dendropsophus elianeae, b) Hypsiboas raniceps, c) Pseudis paradoxa, d) H. punctatus, e) Lysapsus limellum, f) Physalaemus albonotatus, g) Elachistocleis matogrosso, h) Scinax fuscomarginatus, i) Leptodactylus chaquensis.

Preliminary list of identified vocalizing anuran species in audio recordings from automated acoustic recorders, number of individuals recorded with directional microphones, and number of individuals with measured snout-to-vent length (SNV) in Barranco Alto farm, south Pantanal.

Family	Species	Directional recordings (DR)	DR with SVL measures
Hylidae			
	Dendropsophus elianeae	11	6
	D. minutus	9	7
	D. nanus	19	7
	Hypsiboas raniceps	8	7
	H. punctatus	-	-
	Lysapsus limellum	1	-
	Pseudis paradoxa	6	-
	Phyllomedusa azurea	2	2
	Scinax fuscomarginatus	2	1
	S. nasicus	11	7
	S. acuminatus	2	-
	Trachycephalus typhonius	-	-
Leptodactylidae			
	Adenomera diptyx		
	Physalaemus albonotatus	10	5
	P. biligonigerus	4	3
	Leptodactylus latrans	-	-
	L. chaquensis	-	-
	L. labyrinthicus	-	-
	L. elenae	-	-
	L. fuscus	7	6
	L. podicipinus	4	-
	Pseudopaludicola motorzinho	2	-
Microhylidae			
	Elachistocleis matogrosso	4	-
	Chiasmocleis albopunctata	-	-
	Dermatonotus muelleri	4	1

The Team