

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	Kier Mitchel E. Pitogo
Project title	Amphibian and reptile diversity of Mt. Busa, southern Mindanao, Philippines: species distributions along forest gradients
RSG reference	26752-1
Reporting period	March 2019 – March 2020
Amount of grant	£5000
Your email address	pitogo.kiermitchel@gmail.com
Date of this report	March 14, 2020

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
Understand the diversity of herpetofauna in Mt. Busa, their assemblage and habitat association				<p>Our fieldwork resulted in the initial identification of at least 56 species of amphibians and reptiles, 25 species of which are new distribution records in the region, and 11 species are potentially undescribed. Our data shows that amphibians exhibit distinct species composition across a tropical montane forest. Although the statistical analyses are still ongoing, these will surely provide a better understanding of the species' assemblage and habitat associations once done.</p>
Generate baseline information for scientific, management and documentation processes				<p>We produced a species inventory of amphibians and reptiles, with accompanying voucher specimens, for future scientific work. We used the results to provide concrete conservation and management recommendations which will hopefully be considered when crafting the Mt. Busa Biodiversity Management Plan. Sampling sites were also georeferenced for future monitoring of habitat health.</p>
Educate the public about herpetofauna and their importance to the natural ecosystems				<p>We shared the initial results with undergraduate and graduate biology students of a local University in southern Mindanao. Through science communication, I was also able to share in social media some of the species we recorded in Mt. Busa with the hope of educating the public about these taxa. However, all specimens need to be carefully examined and validated first before we can start producing educational materials and photographic guides for dissemination among relevant</p>

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

The weather during fieldwork in July and August 2019 was the main challenge we faced throughout this project. This made travel to my project site more logically challenging and arduous than we expected. When we were camping at the peak, at 2005 m asl, we were caught in a storm brought by the low pressure area that entered Eastern Visayas. This posed field hazards and caused additional workdays for the team. We had to stop doing fieldwork for 3 days until we decided to descend to a lower elevation where winds and rain were milder. We faced similar problems in lower montane, especially that we needed to cross several streams which at that time was risky due to the high water level and strong current.

All fieldworks were cancelled during these weather-related events because the team's safety was of the priority. However, this caused significant budget creep due to additional manpower, workdays, and food required by the situation. This was even made difficult because I was unable to provide a line budget for food and field materials for my local field assistants in the original project proposal. The locals did not have any adequate field gear or materials either to use for fieldwork (e.g., tents, sleeping bags, hiking bags, etc.), so I drastically adjusted the budget to accommodate their needs and the food. Despite these, the project objectives are still met.

Although we did not face security problems during fieldwork, some military officers questioned my motives for doing long-duration repeat-visit fieldwork in the area which made access to my field site difficult.

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

The project is one of the very few comprehensive, site-based, and repeat-visit wildlife studies in southern Mindanao. The outputs of which is helpful to advance wildlife research, conservation, and management in the region. The three most important outcomes of this project are the following:

→ **Inventory of the amphibians and reptiles in Mt. Busa.** The project provides a glimpse of the herpetological community of southern Mindanao which is currently sorely lacking in the scientific literature. We initially recorded at least 56 species of amphibians and reptiles, 25 species of which are new distribution records in the region, 11 species are potentially undescribed, four species are threatened under IUCN Red List, and 18 species are yet to be assessed. This will need a significant amount of taxonomic work in the future. Also, our data will help provide informed conservation assessments, especially for Mindanao endemic species. A detailed report and published checklist will be submitted separately.

→ **Science-based conservation and management recommendations.** Science-based conservation and management interventions on Mt. Busa is now strengthened with the additional information provided by this project. Our field-

based investigation allowed us to provide concrete conservation and management recommendations, particularly on the remaining primary forest patches in the lower elevation which proved to be important habitats for amphibians and reptiles. The management of which will help promote and facilitate sustainable aba o farming practices, on which the locals rely very heavily for income.

→ **Baseline data for monitoring habitat health.** The project results will help facilitate future monitoring activities in Mt. Busa, especially that work to declare Mt. Busa a protected area is underway. The data gathered from permanent sampling plots across an elevational gradient make a good baseline for future ecological and monitoring studies in Mt. Busa, exploring the effects of land-use change and climate change to its now known herpetological community which is a good indicator of habitat health.

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

The roles of the indigenous local community near the project site have been very crucial in the success of this project. All my local field assistants and porters were from the local community. Their familiarity on the terrain and forests of Mt. Busa provided us guidance in identifying potential sampling and camping sites. They helped us measure and record environmental variables and assist in the day and night samplings. Their traditional knowledge, with their free prior informed consent, ensured that all habitat types were well surveyed and secured important specimens for science and conservation.

Local community members involved in the project received financial compensation for rendering services, the amount of which was reviewed and approved by the community's tribal chieftain. Since most of them did not have appropriate gear for fieldwork, the budget was adjusted to accommodate these needs, and some of these field materials and gears were donated. More importantly, through our visual materials, people are becoming more familiar with the amphibians and reptiles in their territory, especially the herpetological species that are most often overlooked. This helps increase the local community's appreciation for these wildlife species.

5. Are there any plans to continue this work?

The project results contribute to the goal of addressing the knowledge gap on herpetological diversity in southern Mindanao which is one of the largest gaps in Philippine herpetological diversity research. While the results are promising and helpful in crafting conservation plans for Mt. Busa, these are still a piece of the puzzle that require additional scientific works to fill the gap and see the clearer picture. Only when site-based and repeat-visit herpetological surveys in other major mountains and habitats in southern Mindanao (e.g., Mt. Matutum, Mt. Parker, Mt. Latian) are undertaken, can the goal of understanding the herpetological community of southern Mindanao be fully achieved. Thus, plans to work on these mountains are in place.

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

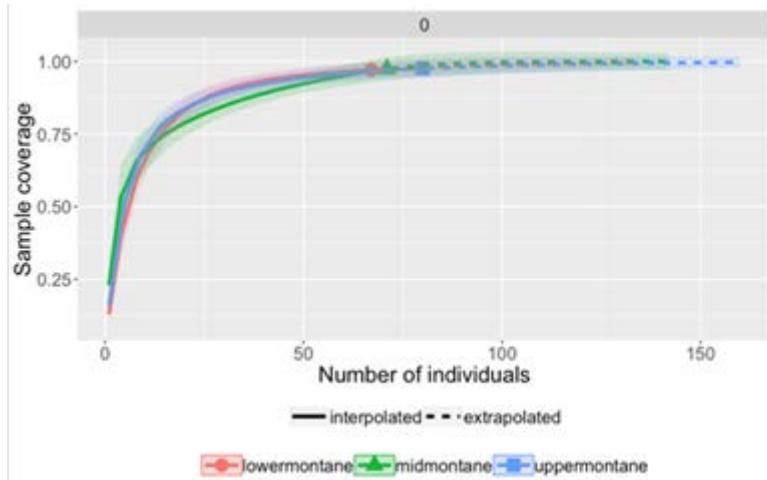
The initial results of the project, with concrete conservation and management recommendations, were shared with the Local Government Unit of Kiamba and the Mt. Busa Technical Working Group for their perusal. This is timely and relevant because Mt. Busa has just been declared a Local Conservation Area, and work to declare it a protected area is underway. The results will help strengthen the conservation importance of this mountain which will aide in crafting a science-based management plan. I am in contact with the people involved in this endeavour to provide scientific contributions when needed.

I shared the initial results of the project to the undergraduate and graduate biology students through a public seminar and focus group discussion, respectively. I offered help whenever they decide to study amphibians and reptiles, and wildlife in general, in southern Mindanao. I am also active in doing scientific communication in social media to share the amphibian and reptile species we recorded in Mt. Busa. Through this, I hope to increase public awareness about these mostly underappreciated Philippine wildlife taxa.

I am currently writing publishable articles to share the project results to the scientific community and increase our understanding of Philippine herpetology. The peer-reviewed checklist of the amphibians and reptiles of Mt. Busa is expected to be published by the end of this year. Education materials based on peer-reviewed scientific articles will also be printed for distribution to relevant stakeholders. I also hope to present the results of this project to scientific conferences or symposia.

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 used throughout the proposed duration of the project. The funds were mainly used for fieldwork between May and August 2019 and, partly, in February 2020. The coverage-based rarefaction curve below shows that almost 100% coverage was attained for all forest types, suggesting that all were sufficiently sampled during our 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
Extra batteries for cameras and headlamp	£274	£287	+£13	
Education materials	£265		-£265	The production of education materials will be done once a peer-reviewed checklist is published. I will seek additional funds from the DENR and work with the ad-hoc Mt. Busa Technical Working Group on this
Workshop expenses	£500	£66	-£434	The public seminar was held at the local University. It offered a free venue, so I only had to pay for snacks
Transportation	£500	£513	+£13	Hired private vehicles to transport field materials
Subsistence payment for research assistant	£388	£433	+£45	Additional days were incurred for laboratory work (e.g., specimen processing and maintenance)
Subsistence payment for local field assistants	£1563	£1000	+£563	Had to reduce the number of field assistants to accommodate other needs
Headlamps	£133	£183	+£50	Bought extra headlamps for local field assistants
Kestrel 5500 weather meter	£242	£186	-£56	Found a cheaper unit online
Spherical densitometer	£84	£80	-£4	
Global Positioning System eTrex Touch 35t	£221		-£221	A fellow Rufford grantee lend me the GPS he used for his project (24911-1)
Documents/permits	£27	£35	+£8	Included initial reports
Accommodation	£250	£169	-£81	Reduced the amount paid to accommodate other needs
Laboratory supplies	£553	£624	+£71	Needed more ethanol for specimen processing and maintenance

TOTAL	£5000	£3576	-1424	The remaining balance will be contributed to the production of education materials.
Medicines		£17	+£17	
Memory cards		£38	+£38	
Camera lens (for macro)		£213	+£213	High-quality photos are crucial for publication of articles and education materials. It was difficult to borrow a good camera to bring to fieldwork
Goods (food and meals)		£548	+£548	Included all the food and meals consumed before and during fieldwork
Other field materials		£60	+£607	Had to provide appropriate field gears for my local field assistants for our fieldwork. Their comfort and safety were of utmost priority
			+1423	

*A detailed cash movement monitoring sheet with accompanying receipts is available upon request * Exchange rate: 1 GBP = 67.92932 PHP

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

An important step post-fieldwork is to use the data gathered to inform policy and management interventions for the strengthened conservation of Mt. Busa. We will work with concerned agencies on these and on the establishment of monitoring protocols to check for the effect of land use in Mt. Busa using amphibians as indicators. Communication, education and public awareness campaigns should be done in parallel to foster collaboration among relevant stakeholders for the active conservation of amphibians and reptiles in Mt. Busa.

Our results provide us a glimpse of the herpetological community of southern Mindanao, although more areas are needed to fully understand how different the herpetological community in the region from the well known north-eastern and central portions of the Mindanao island is. Hence, site-based and repeat-visit studies should be done in other areas in the Busa range and in other major mountains in southern Mindanao to answer the long overdue question in Philippine herpetology.

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

The Rufford Foundation logo was included in all my presentations and reports. We will also fully acknowledge the great contribution of RF in my thesis manuscript and all scientific articles resulting from this project. In all my social media posts about the project, I always acknowledge and tag RF, whenever appropriate.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Aljohn Jay L. Saavedra is my research assistant who helped me plan for and conduct all the fieldwork. His knowledge on plants, particularly on Philippine orchids, has helped increase the conservation relevance of the project results. We are planning to publish a separate checklist of threatened orchids we recorded. He is also responsible for most of the beautiful photos taken from my fieldwork.

My main local field assistants were **Lorenzo Sinandon, Dennis Usong, Romeo Katil, Fiding Sulan, Roger Derilon, Junjun Dagang, Jessie Gayang, and Elmer Soldavillo**. All them assisted in all aspects of the fieldwork, from identifying sampling and camping sites, measuring habitat variables, to doing diurnal and nocturnal samplings. Their local knowledge of Mt. Busa and its wildlife was very helpful for the success of this project.

Kristina Sinandon was our cook during our stay in Sitio Tulad. She ensured our safety while we were in the community, provided us accommodation, and prepared healthy meals to keep us energized and motivated for fieldwork.

My thesis advisory committee, **Leticia E. Afuang, Anna Pauline O. de Guia, and Maria Eleanor B. Aurellado** ensured the scientific merit of the research component of this project. Their advice and expertise helped me formulate the research question, design study, implement fieldwork, and analyse data.

12. Any other comments?

The biodiversity of southern Mindanao, Philippines has always been underrepresented in scientific literature due to persisting political and insurgency problems that hinder biologists from exploring our region, not to mention the logistical difficulty people face when doing fieldwork in this area. Although more work needs to be done, this project provides a significant step to understanding the wildlife diversity in southern Mindanao, particularly in Mt. Busa, where one of the last remaining primary forest blocks in the southern Philippines can be found. We hope that young Filipino wildlife biologists can take inspiration from this work and continue exploring the few remaining yet diverse forest habitats in the Philippines despite the many risks we face in the field.

This is the first research project I led as an early career wildlife biologist, which I consider a great feat, especially coming from a region where access to higher education and grant opportunities is viewed as difficult and challenging. The Rufford Foundation did not only support the team's professional growth but also provided the opportunity for southern Mindanao's wildlife diversity to be appreciated. In this respect, on behalf of the project team and all the people involved, I would like to extend my gratitude to The Rufford Foundation for your generous support on this project. We are looking forward to working with you again soon. It has always been my wish to document the wildlife diversity of Mt. Busa and have it afforded legal protection. Thankfully, we are a step closer to making these happen.