

## The Rufford Foundation Final Report

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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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
Your name	Gregory James Irving
Project title	Study of fragmentation and forest-dependent avian species diversity on islands in Chiew Larn Reservoir, Khlong Saeng Wildlife Sanctuary, southern Thailand
RSG reference	18976-1
Reporting period	15 January 2016 – 14 January 2017
Amount of grant	£5,000
Your email address	<a href="mailto:girving@fastmail.fm">girving@fastmail.fm</a>
Date of this report	31 January 2017

**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
1) Preparation for research				Completed: Procurement of supplies, hiring of field assistants, preparing of research sites, work-planning.
2) Data capture and entry				Completed: 444 of 450 point counts (96% completed); 108 of 111 habitat surveys (96% completed). Reason for missing data: elephant activity.
3) Data cleaning, analysis, reporting				Innovative method of simultaneous audio recording of point counts reduced non-detections (increased size of dataset) by 11%, but took more time than expected.
4) Publication				After data analysis.
5) Publicity and capacity building				Presentations, with acknowledgement of Rufford contribution at regional and national forums. Trained three locals on bird identification and research techniques. Still work to do in the field in promoting better ecotourism and disseminating the findings.

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

From previous experience, the data capture period usually goes smoothly but the analysis and write-up takes much more time than planned. In spite of anticipating as such, I am well behind my original schedule in reviewing data, cleaning my data, and finally analysing and writing it up.

This was partly due to scheduling: I created my lab's website from the bottom up which will support dissemination of this project (please visit [cons-ecol-kmutt.weebly.com](http://cons-ecol-kmutt.weebly.com)), participated in a month of data analysis workshops that will directly support this project, and prepared for/presented data from this project in two conferences.

I used an innovative method of capturing data, using simultaneous audio recording of my point counts. This greatly strengthens the dataset (see below), but the cost of this method is time – 2 months were required to review 17 hours of audio recordings, 100 point counts, and 5,300 records. This is worth the effort as the dataset is much more robust, with reduced false-detection error.

A few of my point counts and habitat surveys could not be undertaken due to a herd of elephants arriving and giving birth at one of the survey sites. They stayed for several weeks. The missing data is not expected to impact the results, however.

Overall, the fieldwork phase of the project went surprisingly smoothly.

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

#### **1) Advocacy for environmentally responsible hydropower development**

At the invitation of the leading local conservation NGO in Thailand, the Seub Nakhasathien Foundation, I delivered a Thai language presentation covering initial findings from this study. The national event was the 26th annual commemoration of Seub's martyrdom, with the theme "Lessons learned from the wildlife rescue mission at Chieo Larn Dam". My presentation was attended by a standing room only audience of approximately 200 youth, government officers, academics, environmental activists, and other members of the public.

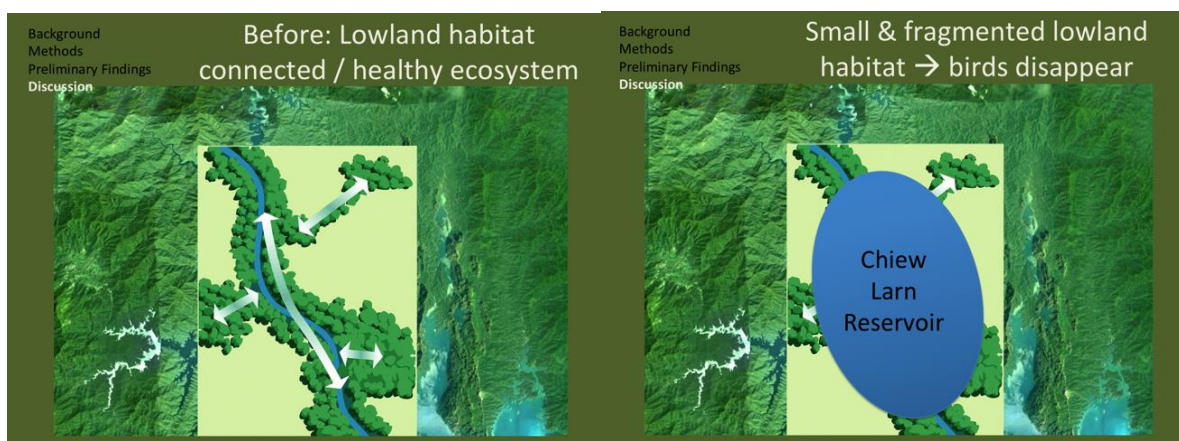


Thai language presentation during 26th Seub Nakhasathien commemoration, 10 September 2016.



"Let us utilise the construction of dams such as this as lessons learned for the future."

Hydroelectricity is gaining increasing importance by policy-makers in Thailand and across Southeast Asia. This is a mistake, as the few remaining in-tact forest blocks are the last reserve for a host of globally threatened species. Particularly in hilly terrain, hydroelectricity obliterates crucial lowland and riparian habitat. Moreover, riparian systems act like the human vascular system, allowing the flow of individuals and species throughout the forest. What remains are small isolated pockets of lowland forest separated by an impermeable water matrix and edge habitat. This bodes poorly for the persistence of several remaining species.





The evidence gained from this work is a surprise to me, and has greatly influenced my views. As a result, I am now a life-long advocate against hydropower development. I had expected to find Sundaic and other lowland avian species at the research site. At a minimum, I expected to find a host of species that adapt well to disturbed habitat. What I found was an arid landscape defined by steep hills, disturbed habitat, and totally lacking any lowland forest. The resulting avian community in the research area is highly depauperate and nested, comprised of fewer than 100 resident forest species. Dozens of species that should have been present were never recorded during a thorough search, comprising 444 point counts over a 4-month period. I did not overlook these species – 74 hours of audio recordings make this clear. Previous studies in this site showed “near complete extinction” of small mammals on islands. I found a similarly depauperate avian community on islands and mainland sites up to 500 m inland from the shoreline.

2) Innovative methodology is a first for the region

Simultaneous audio recording of point counts was a very helpful tool for improving the quality of my data, particularly in this situation where 98.5% of records were made based on audio detection alone (I rarely actually saw the bird). Using my .wav files, records noted as “unknown” species during point counts in situ were identified back in the lab from the audio recordings. In addition, many species were overlooked entirely and could be added to the dataset for species richness estimation. 2% of records were mid-identifications, which can add “false positive” bias and cannot feasibly be dealt with during analysis – my method succeeded in reducing this. Simultaneous audio recording increased my overall ability to properly identify birds from 82% to 93%, which will also reduce the variance in my dataset.

3) Publication in international peer-reviewed journal

Publication of research in an international peer-reviewed journal is a requirement for earning a master's degree at my institution. I am presently in the process of cleaning my data, but expect to conduct analysis, write-up, and submission to a respected international journal by the end of May 2017.

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

My field team was relatively small, comprised of 2-5 persons at any given time. All members of the team were from the local community. Core members of the team are particularly well-placed to build upon their experience while working on this study. My field manager is a boat driver with 25 years of research experience and

intimate knowledge of this forest block. A keen outdoorsman and local advocate for conservation, he vocally participates in meetings related to tourism, Khao Sok National Park, and Khlong Saeng Wildlife Sanctuary, pressing for responsible ecotourism and natural resource management. He is a life-long learner with a keen curiosity, and though he knows the plant and mammal community quite well, this was his first exposure to avifauna. Through members of my committee a bird guide was donated to him, which he studied frequently while together in the field. I also procured a basic set of binoculars for him through RSGF so that he may continue his self-learning. A trolling motor (also called "motor guide") was procured through Rufford for undertaking water transects, and this was donated to him so that he can continue to provide guiding services, in a quieter manner that does not disturb wildlife. Other core members of the team were a youth from the local community who gained important research exposure, as well as a member of the Khlong Saeng Wildlife Sanctuary staff who is from the local community and interested in learning more about avifauna and related research.

An experienced member of my committee, who conducted his PhD fieldwork in the same site 25+ years ago, visited the site and provided in situ training of the entire team on undertaking the habitat structure component of the study.

Further activities with the local community are planned once data is analysed. Planned activities are developing posters / brochures on responsible ecotourism, in support of national park and wildlife sanctuary staff, presentation / discussion of guidelines with local boat drivers and guides, and presentation of the research results to wildlife sanctuary and national park staff.

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

This project has led to additional fieldwork that is being undertaken in the Khao Sok – Khlong Saeng Forest Complex. This includes a study of seed dispersal on the islands and mainland sites, which should assist to elaborate the mechanisms behind the impoverished ecosystem which was confirmed in my study among birds and in previous studies among small mammals. A second study is to ascertain the presence of galliformes in the forest complex, aside from the 3-4 species already known to persist.

I am also advocating for others to undertake follow-up study of Sundaic lowland avifauna in the small isolated pockets of suitable habitat to study such aspects as population viability.

I do not plan to revisit the site for further fieldwork, aside from what has been elaborated above. For my PhD, I am presently planning to study the distribution of

the near threatened Mrs. Hume's Pheasant (*Symaticus humiae*) in northern Thailand and Myanmar. This will inevitably involve community outreach and capacity building, as hunting pressure and local knowledge of the species are core aspects of the study – particularly during the first year of fieldwork which will map out species distribution.

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

I have already presented at two conferences. On 30th June 2016, I shared results at the Conservation Asia 2016 conference in Singapore, the first joint meeting of the regional chapters of the Association for Tropical Biology and Conservation (Asia-Pacific) and the Society of Conservation Biology (Asia). The second conference presentation was the 26th Seub Nakhasathien commemoration as described above under heading 3).

From project outset, I have discussed with the chief of Khlong Saeng Wildlife Sanctuary my desire for transparency and feedback of findings for use by local management. He has been quite receptive of this proposal from the onset. This would take place after a manuscript has been submitted for publication, by June 2017.

Finally, having worked for over a decade as a public health programme manager, I have a special appreciation for the importance of publication in peer reviewed journals. This is also a requirement for achieving MSc in my present programme, and I am presently working full time on this process.

Photos from the study have been shared on the lab's website. In addition, once the study has been written up, I plan to display the study in the "research highlights" section and under the "publications list" of the same website, and share these for the RSGF website.

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

One year is too brief for this project, which will require approximately 18 months to fully complete. Ongoing activities are noted above within headings 1), 2), and in the financial report below.

**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
Lead Researcher Remuneration	1,239	1,000	239	
Travel / accommodation	472	478	-6	
Boat rental, incl. fuel	2,301	2,189	112	An additional field visit is planned with other funds
Visibility consultant / visibility materials	187	0	187	Planned IEC materials such as brochure, posters
Equipment repair	24	7	17	Audio recorder repair will exceed this amount
Survey materials	68	86	-18	
Digital audio recorder, microphone, electronic equipment	292	259	33	Microphone power unit replaced; new batteries for recorder
Publication fee for peer-reviewed journal	147	0	147	To absorb once data analysed and written up
Computer monitor	44	99	-55	Facilitates sonogram review and data mgmt.
Beginners binoculars / motor guide	226	208	18	Used in data capture and donated locally
<b>TOTAL</b>	<b>5,000</b>	<b>4,327</b>	<b>673</b>	Budget will be fully utilised by June 2017

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

Data analysis, write-up and publication; feedback to local government counterparts; feedback to those involved in tourism, including guides and boat drivers, with brochures and/or other educational materials developed jointly with national park and wildlife sanctuary administrators.



**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?**

I did not utilise the RSGF (or any other) logo in my two presentations; however, appreciation for Rufford support was explicitly included on the PowerPoint slides. Logo will be included on brochures, posters, and any other materials that are yet to be developed.

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

**12. Any other comments?**

Rufford Foundation has been instrumental in the success of this project. The flexibility, timeliness, and understanding of RSGF has been greatly appreciated. These attributes fill an invaluable niche among agencies that support small conservation initiatives.