Final Evaluation Report

Your Details	
Full Name	Daphawan Khamcha
Project Title	The globally endangered Giant Nuthatch (*Sitta magna*): population size, habitat availability and the implications for its conservation.
Application ID	29986-1
Grant Amount	£6,000
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Date of this Report	18 December 2020

1. 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 obtain a relatively precise estimate of the size of the Thai population			✓	The estimated population of giant nuthatch in Thailand was 588 individuals based on a density of 3.7 individuals/km^2 in 159 km^2 of suitable habitat.
To clarify the characteristics of suitable habitat of the Giant Nuthatch as well as the extent of habitat remaining for this species in Thailand			✓	Our data suggests that giant nuthatch prefer drier forests with a more open canopy and a large proportion of mature pine (*Pinus kesiya*) trees (either native or planted), and other larger diameter broadleaved trees. Suitable habitat map of giant nuthatch in Thailand was generated and the suitable habitat remaining was then calculated which was 159 km^2.
To provide training to rangers and research assistants to enhance their knowledge and capacity to engage in active species management		✓		At least three young researchers were intensively trained to enhance their capacity in research skills and knowledge of species conservation. Those trained researchers were able to develop their own research projects. Due to the COVID-19 pandemic we were not able to conduct the training in a big group; we hope to be able to do it in the near future.
To provide quantitative data and clear recommendations to increase information regarding Giant Nuthatch and other threatened species management and conservation			✓	Our quantitative data suggest a clear preference for mature pine habitats either native or planted *Pinus kesiya*, suggesting it may be possible to restore and maintain giant nuthatch habitat in the future. Additional studies in pine plantation as well as mature pine forest are required to improve our understanding of their capacity to support viable populations of giant nuthatch in Thailand. Moreover, due to the increasing of forest fire,

				comprehensive and long-term research on the threats of forest fire is necessary for the long-term conservation and management of these habitats.

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

Firstly, forest fires have been more frequent and more severe in the past decade in Thailand, which makes it difficult to access some areas. A more obvious obstacle of this difficult year, the COVID-19 pandemic. According to these difficulties our fieldwork schedule was tightened to finish before the burning season started (normally around late February to early March) and before the lockdown (mid-March); fortunately we were able to finish our fieldwork in time.

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

1. Our results from comprehensive field surveys estimated that the population size of giant nuthatch in Thailand was 588 individuals with an average density of 3.7 individuals/km^2 in approximately 159 km^2 of suitable habitat at elevations ranging from 1,166 to 1,951 m.

2. Out finding suggests that giant nuthatch prefer drier forests with a more open canopy and a large proportion of mature pine (*Pinus kesiya*) trees (either native or planted), and other larger diameter broadleaved trees. In contrast, we never detected giant nuthatch in denser, wetter, closed canopy evergreen forest habitats: these habitats are likely unsuitable for giant nuthatch.

3. We created a suitable habitat map of giant nuthatch in Thailand and showing the more restricted distribution range than it was historically, having disappeared from most of the southern and eastern parts of its Thai range (Figure 1).

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

Before conducting the survey in each study site, we set up a small meeting with the chief, forest rangers and/or park staff and villagers to gathered information about studied species and area. Due to a very tight schedule, we were not able to spend much time with the rangers and local people. After finishing the survey, they were given briefly results and information about the status of giant nuthatch which is an endangered species in the area and understand more about the importance of conservation work.
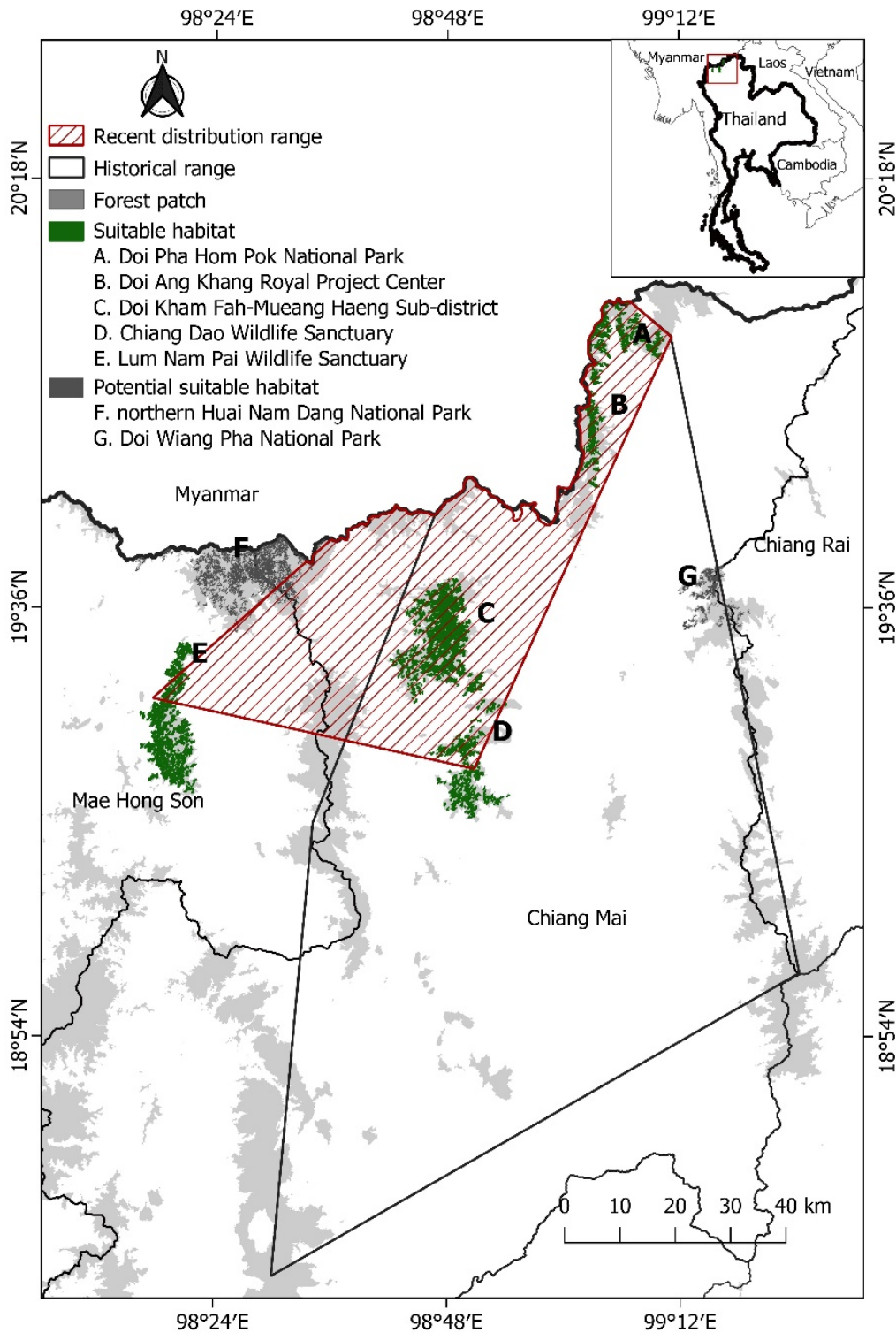
Figure 1. Map showing the extent of suitable habitat remaining for giant nuthatch (*Sitta magna*) in Thailand and the recent distribution range (2016–February 2020) (hatched area) compare to the historical range (larger polygon).

5. Are there any plans to continue this work?

We are planning to continue the study on:

- Identify the main characteristics of the breeding habitat of giant nuthatch.
- Assess the effects of habitat characteristics and other factors on nesting success of giant nuthatch.
- the adaptative significance of the relationships between pine plantation and giant nuthatch, as well as key factors essential for its conservation.

We will develop contacts and collaborations with researchers from Myanmar and China to plan/develop a global scale assessment of the giant nuthatch population.

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

- We plan to share the results of our work through several national and international conferences.
- Our manuscript on the population size, habitat availability and the implications for giant nuthatch conservation in Thailand has been submitted to the *Oryx-the International Journal of Conservation*.
- The final report of the project will be submitted to Department of National Parks, Wildlife and Plant Conservation (the organisation directly responsible for conservation and management of wildlife and habitats in Thailand) and local offices of each protected area studied including nearby local organisations in order to provide information for management and policy making.

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

The Rufford Small Grant covered our expenses from the beginning until the end of the project. We were able to finish our project as expected.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
1. Transportation for fieldwork: car rental and fuel	£1860	£1790	-£70	The actual cost was lower than expected.
2. Accommodation during fieldwork for 4	£960	£530	-£430	Some protected areas facilitated our stay during the

persons				fieldwork.
3. Develop habitat maps: SPOT satellite images which covers the forest/protected areas of 4,000 km^2 including 2 provinces (Chiang Mai province and Mae Hong Son province)	£2600	£3100	+£500	The cost of this item was higher than expected as larger forest cover area was required. This amount was recovered on other items of the budget.
4. Training: The Giant Nuthatch survey methods training for young researchers. The cost including food, accommodation, and travel	£295	£295		
5. 5% university overhead	£285	£285		
Total cost	**£6000**	**£6000**		The exchange rate on 8 January 2020 was 39.56 Thai Baht for £1

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

This work has shown that besides mature natural pine forest, mature pine plantation is a key habitat for giant nuthatch. Thus, for effective long-term management, detailed demographic study of giant nuthatch associated with pine plantations is urgently required.

Additionally, the extent of available habitat in China and Myanmar, while potentially much larger than Thailand, remains almost entirely unquantified. Thus, we highly recommend further investigation of the habitat remaining for giant nuthatch in Myanmar and especially in China.

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

The Rufford Foundation logo was used in all our presentations. The Rufford Foundation will be acknowledged in every publication derived from this project.

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

Daphawan Khamcha was the main researcher of the project. She was the project manager and field leader. She is responsible for data analysis and publications.

Rongrong Angkaew contributed as field researcher. She is responsible for habitat classification.

Andrew J. Pierce contributed as field researcher.

George A. Gale contributed as project advisor. He helped conceptualized this project and oversaw work progress on and off the field.

All members contributed to the publications.

12. Any other comments?

We would like to thank the Rufford Foundation for supporting this project, without which this work would not have been successful.