

Final Evaluation Report

Your Details	
Full Name	Sung Ba Nenh
Project Title	Conserving two Cascade Frogs, endangered and endemic in Vietnam
Application ID	39778-1
Date of this Report	29.2.2024

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 investigate the population status				<p>- <i>Amolops minutus</i>: A total of 19 individuals (eight adult males, 11 adult females) were observed. We found individuals in two small streams with many ferns. Adults were found during the dry season. Thus, it can be predicted that the breeding season of this species takes place in the dry season. <i>Amolops minutus</i> was found during at night, between 18:30 and 23:00.</p> <p>- <i>Amolops ottorum</i>: A total of 15 individuals (eight adult males, seven adult females) were observed. We found individuals in five small streams with many ferns. Adults were found during the dry season. Thus, it can be predicted that the breeding season of this species takes place in the dry season.</p>
To investigate the distribution				<p>- <i>Amolops minutus</i> was previously known only from the type locality, namely Ho Thau Commune, Tam Duong District, Lai Chau Province (Orlov et al. 2007). In this study, we discovered additional records of the species in northwestern Vietnam: Ban Bo Commune, Tam Duong District, Lai Chau Province; and Phuc Khoa Commune, Tan Uyen District, Lai Chau Province. Its original description was based on findings in Sa Pa District, with the type locality approximately 10 to 30 km distant from the new records in Ban Bo Commune and Phuc Khoa Commune.</p> <p>- <i>Amolops ottorum</i> was previously</p>

			<p>known only from the type locality, namely Ngoc Chien Commune, Muong La District, Son La Province (Pham et al. 2019). In this study, we discovered additional records of the species in northwestern Vietnam: Ban Bo Commune, Tam Duong District, Lai Chau Province; Trung Dong and Phuc Khoa communes, Tan Uyen District, Lai Chau Province; and Ban Ho Commune, Sa Pa District, Lao Cai Province. Its original description was based on findings in Sa Pa District, with the type locality approximately 100 to 150 km distant from the new records in Ban Ho Commune, Trung Dong, Phuc Khoa and Ban Bo, Commune.</p>
To investigate the ecology			<p>- <i>Amolops minutus</i> was found during at night, between 18:30 and 23:00. The surrounding habitat was the mixed evergreen forest of hardwoods, shrubs, ferns, and arrowroot. They were found at elevations between 2000 - 2300 m asl. The relative humidity was approximately 75–85% and the air temperature ranged from 20 to 30°C. The streams were approximately 5 - 10m in width, 3 - 6km in length.</p> <p>- <i>Amolops ottorum</i> was found during at night, between 18:30 and 22:30. The surrounding habitat was the mixed evergreen forest of hardwoods, shrubs, ferns, and arrowroot. They were found at elevations between 2000 - 2500 m asl. The relative humidity was approximately 75–85% and the air temperature ranged from 20 to 30°C. The streams are approximately 4 - 12m in width, 3 - 5km in length.</p>
Raise conservation awareness for local communities			<p>We have discussed and presented to local people about conservation issues of these two amphibian species</p>

				through public meetings, classroom presentations for local students, and conversations with tourists as well as forest rangers
Evaluation of major threats to the amphibians				Major threats to the habitat and populations of amphibians in northwestern Vietnam are deforestation resulting from agricultural activities, free grazing of cattle in the forest, and wildlife poaching for food.
Provide recommendations for conservation measures				We have sent research results with conservation recommendations to the management of nature reserves and local authorities so they can plan for future biodiversity conservation.

2. Describe the three most important outcomes of your project.

a). New recorded: In this study we discovered additional records of *Amolops minutus* in northwestern Vietnam: Ban Bo Commune, Tam Duong District, Lai Chau Province; and Phuc Khoa Commune, Tan Uyen District, Lai Chau Province. We also discovered additional records of *Amolops ottorum* in northwestern Vietnam: Ban Bo Commune, Tam Duong District, Lai Chau Province; Trung Dong and Phuc Khoa communes, Tan Uyen District, Lai Chau Province; and Ban Ho Commune, Sa Pa District, Lao Cai Province. Its original description was based on findings in Sa Pa District.

b). We determined the breeding season and ecological: Both adults of two species were found during the dry season and it can be predicted that the breeding season of this species takes place in the dry season. *Amolops minutus* was found during at night, between 18:30 and 23:00. The surrounding habitat was the mixed evergreen forest of hardwoods, shrubs, ferns, and arrowroot. They were found at elevations between 2000 - 2300 m asl. The relative humidity was approximately 75–85% and the air temperature ranged from 20 to 30°C. *Amolops ottorum* was found during at night, between 18:30 and 22:30. The surrounding habitat was the mixed evergreen forest of hardwoods, shrubs, ferns, and arrowroot. They were found at elevations between 2000 - 2500 m asl. The relative humidity was approximately 75–85% and the air temperature ranged from 20 to 30°C.

c). We determined the population status of *Amolops minutus* and *Amolops ottorum*. The number of individuals of each species found is not much (a total of 19 *Amolops minutus* and 15 *Amolops ottorum* were observed) but it can completely develop well if we protect the habitat of the two these species.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

Unforeseen difficulties	Tackle
Due to the high mountainous terrain in northwestern Vietnam, it was very difficult to carry field equipment and other belongings.	We hired six guides to help transport and carry belongings and equipment.
Had a small accident while exploring	We prepared full medical insurance, medical supplies and medicines to take with us on each expedition. We wore protective clothing and boots when moving in the forest
Some local people didn't understand Vietnamese.	We hired native speakers to speak local languages
Bad weather (Heavy rain)	We brought with us rain ponchos for the expeditions

4. Describe the involvement of local communities and how they have benefited from the project.

- In this study, local authorities attended the project planning meeting with the team.
- 11 people have directly participated in field surveys, learned amphibian survey techniques, and propaganda to raise awareness of local species conservation. They were pioneers in mastering local species investigation, monitoring, and conservation techniques, and they will also be future ambassadors for forest protection.
- 15 community volunteers and community labourers (from four ethnic minorities, Red Dao, Giay, Tay, and Mong) supported interviews with local communities to assess anthropogenic threats to threatened amphibians, participate in threat participation campaigns, (e.g., removing garbage from streams etc.), and support field surveys and threat assessment.

5. Are there any plans to continue this work?

In this study, we have discovered some morphological changes of these two species in the same habitat, so to clarify the taxonomy we will continue with molecular analyses and ecology of *Amolops minutus* and *Amolops ottorum*. Molecular data and diet ecology will be used for writing the paper.

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

The research results will be sent to the management boards of nature reserves and local authorities so they can plan for future conservation. At the same time, we will publish it in academic journals, e.g., *Academia Journal of Biology* (Vietnam), *Herpetology Notes* (Italia), and *Russian Journal of Herpetology*. One manuscript has been prepared, which will be submitted soon, namely, *Feeding Ecology of Amolops minutus* Orlov and Ho, 2007 (*Amphibia: Anura: Ranidae*) from Vietnam.

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

In the future, to effectively conserve biodiversity in northwestern Vietnam as well as two frog species, we need to build specific conservation plans and propagate and raise local people's awareness. There should be many similar projects and more people working together to effectively conserve.

8. 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?

We used the Rufford Foundation logo in presentations of frogs at Tay Bac University and several secondary schools in northwestern Vietnam. We also informed the local authorities, management of nature reserves (Muong La and Hoang Lien), and local people about the support of The Rufford Foundation through this project.

9. Provide a full list of all the members of your team and their role in the project.

Mr. Sung Ba Nenh is a researcher at the Center for Biodiversity & Environment Research, Tay Bac University, Son La Province, Vietnam. In this project, he worked as the leader taxonomist and ecologist of the team, he participated in the field work design, field work as well as education conservation. He worked as the leader in the implementation of citizen science activities. He was also implementing the workshop for the local guides for citizen monitoring of frogs.

Mbs. Hoang Thanh Thuong is a researcher at the Center for Biodiversity & Environment Research and a lecturer of Biology at Tay Bac University, Son La Province, Vietnam. Team Role and Activities: She worked as the leader in the environmental education activities of the project, and also participated in the field work, data analysis, and writing activities.

Mbs. Dang Xuan Hoang is a researcher at the Center for Biodiversity & Environment Research and a lecturer of Biology at Tay Bac University, Son La Province, Vietnam.

Team Role and activities: He worked as the leader ecologist of the team, he participated in the field work and contributed to understanding species distribution patterns and participated in writing activities.

10. Any other comments?

We are grateful to the directorates of Forest Protection Department of Son La, Lai Chau provinces, Hoang Lien National Park, Muong La Nature Reserve for support of our field work and issuing relevant permits. We thank Mua AP, Mua TH, Vang AM, Sung AL, Mua AD, Mua AK, Lo VH, Nguyen TT, Pham TC, Dao TH, Lu TV, Vu HT, Sung BM, Sung VH (Lai Chau Province), Hoang LQT, Bui TQ, Tran VH, Lo HH, Lo TB, Lo VH, Lo TD, Bui TD, Hoang NL, Hoang T, Pham TS, Pham AT, Mai TH (Son La Province) for their assistances in the field and interview. In particular, we are extremely grateful to the The Rufford Foundation for support funding this research.

Appendix

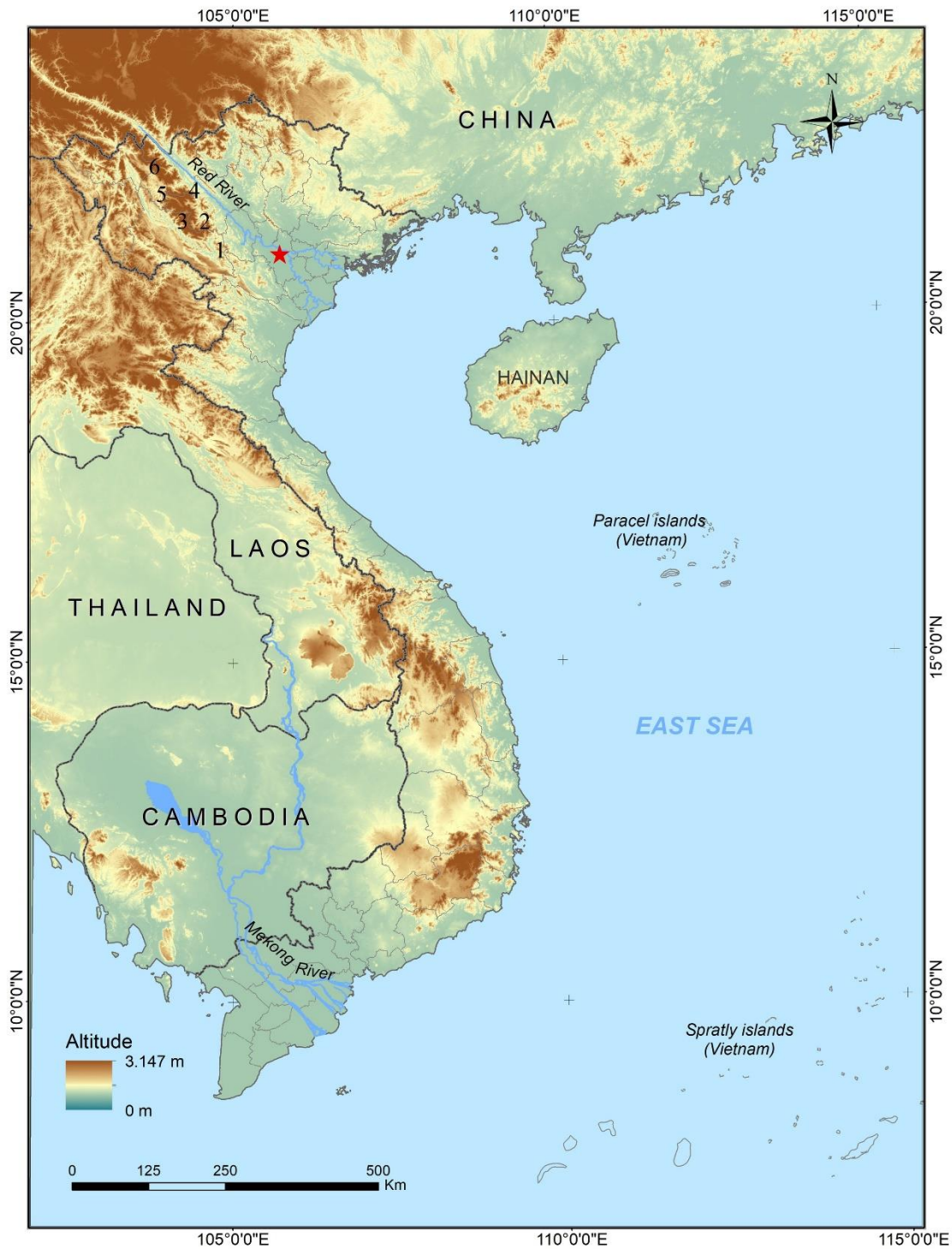


Figure 1. Map showing field survey in Son La Province, Vietnam: 1) Muong La District; and Lai Chau Province, Vietnam: 2) Van Ban District, 3) Sapa District, 4) Tan Yen District, 5) Tam Duong District, and 6) Sin Ho District.



Figure 2. *Amolops minutus* in life. Male. © Sung BN.



Figure 3. *Amolops minutus* in life. Female. © Sung BN.



Figure 4. *Amolops ottorum* in life. Male. © Sung BN.



Figure 4. *Amolops ottorum* in life. Female. © Sung BN.



Figure 6. Habitat of *Amolops minutus*, in Lai Chau Province, Vietnam. © Sung BN.

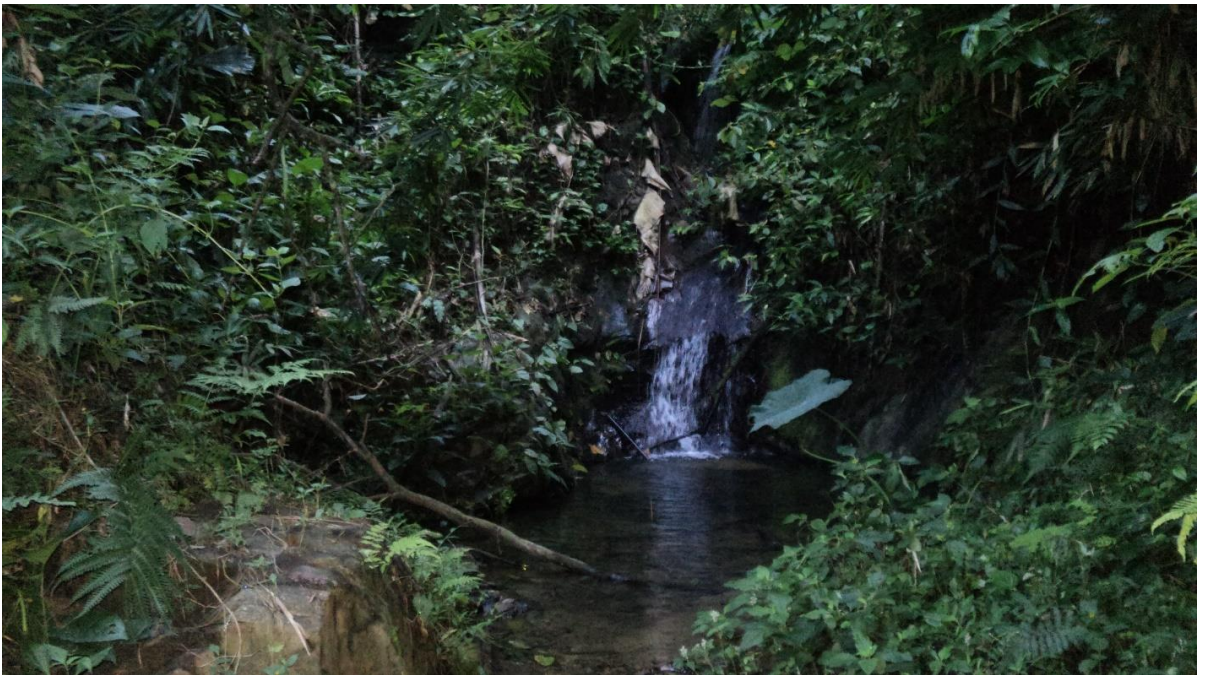


Figure 7. Habitat of *Amolops ottorum*, in Son La Province, Vietnam. © Sung BN.



Figure 8. Field survey in Tam Duong District, Lai Chau Province, Vietnam.

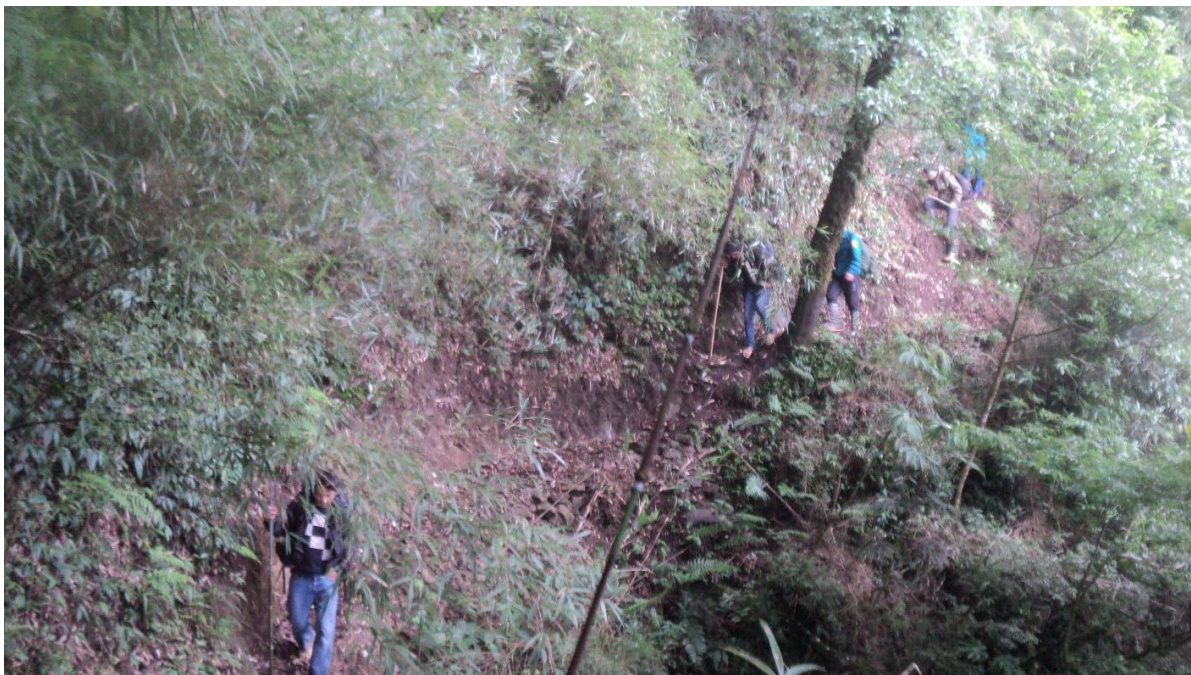


Figure 9. Field survey in Tan Yen District, Lai Chau Province, Vietnam.