Final Evaluation Report

Your Details	
Full Name	Tran Van Dung
Project Title	Population size, fine-scale habitat suitability map and conservation on the endangered Guangxi warty newt (Paramesotriton guangxiensis) in northern Vietnam
Application ID	36906-B
Date of this Report	26/02/2023

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
Objective 1: Assessing the population size of P. guangxiensis in Phia Oac – Phia Den NP, northern Vietnam				We proposed to assess population size of *P. guangxiensis* in both non-breeding and breeding season. However, our surveys in breeding season were interrupted due to effects of a typhoon in northern Vietnam. Thus, we estimated the population size of the species in non-breeding season. For breeding season, we only presented the number of detected individuals during field surveys. We estimate the population size of *P. guangxiensis* in Phia Oac – Phia Den NP: N = 1729.87 individuals (95% HPD: 1079.45 – 4351.71).
Objective 2: Developing the fine-scale habitat suitability map for P. guangxiensis in northern Vietnam.				We successfully developed a fine-scale habitat suitability map for *P. guangxiensis* in northern Vietnam at 30 x 30 m resolution. the suitable distribution of *P. guangxiensis* is concentrated in Nguyen Binh District, Cao Bang province with an area about 2,055.11 km^2. Additionally, we estimated that the total suitable area of *P. guangxiensis* inside protected areas in northern Vietnam is about 202.52 km^2, accounting for about 10% of the total suitable area of this species.
Objective 3: Identifying the main threats to P. guangxiensis in Phia Oac – Phia Den NP, northern Vietnam.				We determined that habitat loss and degradation due to rapidly increasing agricultural lands are major threats to the newt population in Cao Bang, Vietnam.
Objective 4: Implementing awareness-raising activities on warty newt conservation in Phia				We organised three meetings for conservation activities in Phia Oac – Phia Den NP instead of one meeting as expected with additionally funding from the Mohamed bin

Oac – Phia Den NP, northern Vietnam.				Zayed Species Conservation Fund. Nearly 200 local people involved our meetings.

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

a). Assessing the population size of *P. guangxiensis* in Phia Oac – Phia Den NP, northern Vietnam

In Phia Oac - Phia Den National Park, we carried out two field surveys in June and October 2022. In the first survey, we identified a total of 104 individuals, 60 males and 44 females. In the second survey, we detected 96 individuals, 40 males and 56 females.

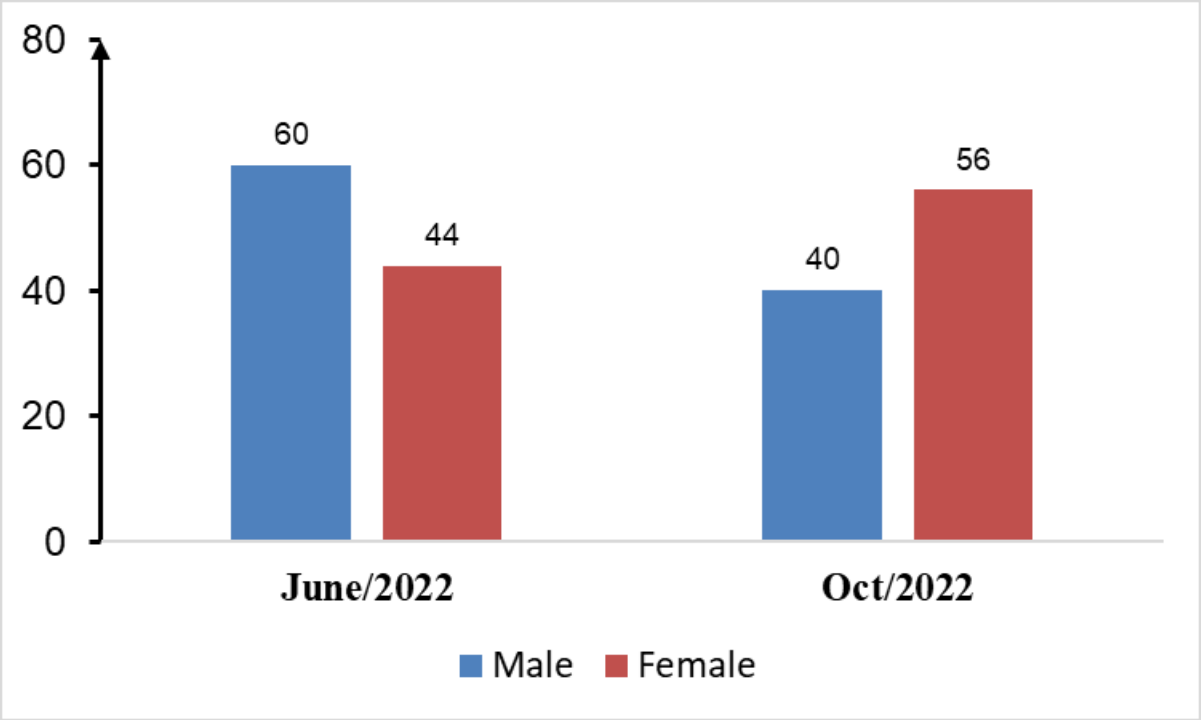


Figure 1. The number of individuals of newt during two field surveys in Phia Oac – Phia Den NP in 2022.

We used a Schnabel estimator (Schnabel, 1938) for capture-recapture model of a closed population using package "Fishmethods" (Nelson, 2023) in R version 4.2.2 (R Core Team, 2022) to estimate the number of detected individuals during field surveys.

We estimated number of individuals in surveyed area: N = 130.08 (95% HPD: 81.17 - 327.23).

Based on GPS data, we surveyed with a length of 15.001 km along rivers or streams, the average stream width in Phia Oac – Phia Den NP is around 3 m, → A surveyed = 0.045 km2. The area of the streams calculated from Digital Elevation Model: 0.60 km2.

➔ We estimate the population size of *P. guangxiensis* in Phia Oac – Phia Den NP:

N = 1729.87 individuals (95% HPD: 1079.45 – 4351.71).

b). Developing the fine-scale habitat suitability map for P. guangxiensis in northern Vietnam

The MaxEnt model showed that the AUC value was 0.991 ± 0.0056. According to Elith (2000), models with AUC > 0.75 can provide a good performance to predict the distribution of species.

The predicted model revealed that the suitable distribution of *P. guangxiensis* is concentrated in Nguyen Binh District, Cao Bang province. In addition, the suitable distribution area of this newt is predicted to extend down to Ngan Son and Ba Be Districts, Bac Kan Province. Specifically, the highly suitable distribution areas are concentrated in Phia Oac - Phia Den NP, Nguyen Binh district, Cao Bang province (Figure 3). The suitable area of *P. guangxiensis* in Vietnam is estimated at about 2,055.11 km^2. The low suitable area is predicted about 1,543.23 km^2 (75.09%), while the medium and high suitable area are estimated approximately 423.90 km^2 (20.63%) and 87.99 km^2 (4.28%), respectively (Figure 2).

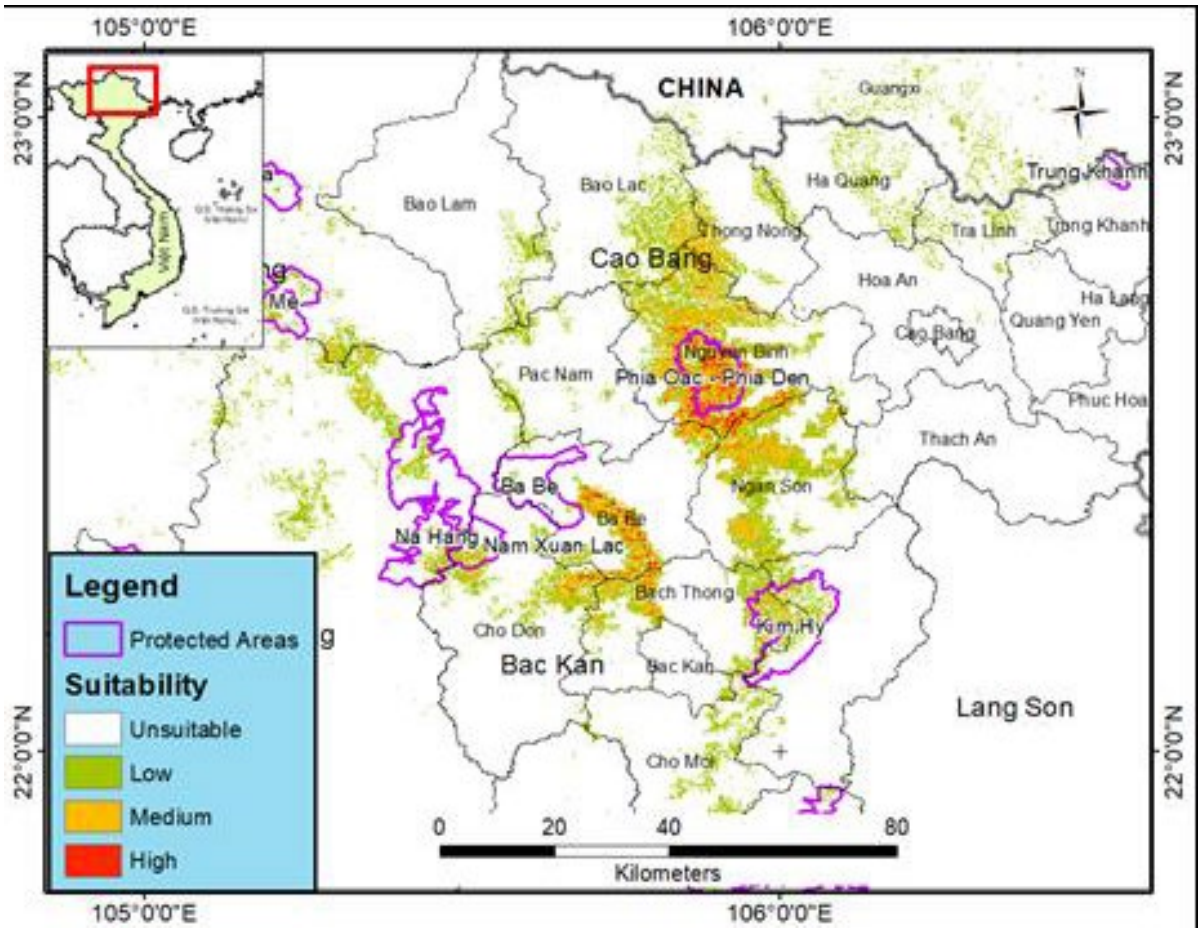


Figure 2. Finer-scale of predicted suitable map of P. guangxiensis in northern Vietnam generated from MaxEnt model.

The distribution model of *P. guangxiensis* predicts that the suitable distribution area of this species is mainly covered by Phia Oac - Phia Den NP, Cao Bang province,

Whereas, a small part is predicted in Kim Ky Nature Reserve, Bac Kan province (Figure 2). The total suitable area of *P. guangxiensis* inside protected areas in northern Vietnam is estimated at about 202.52 km^2, accounting for about 10% of the total suitable area of this species. Specifically, the low suitable area occupies 122.26 km^2, the average suitable area is 50.76 km^2, and the high suitable area is 29.50 km^2 (Figure 3).

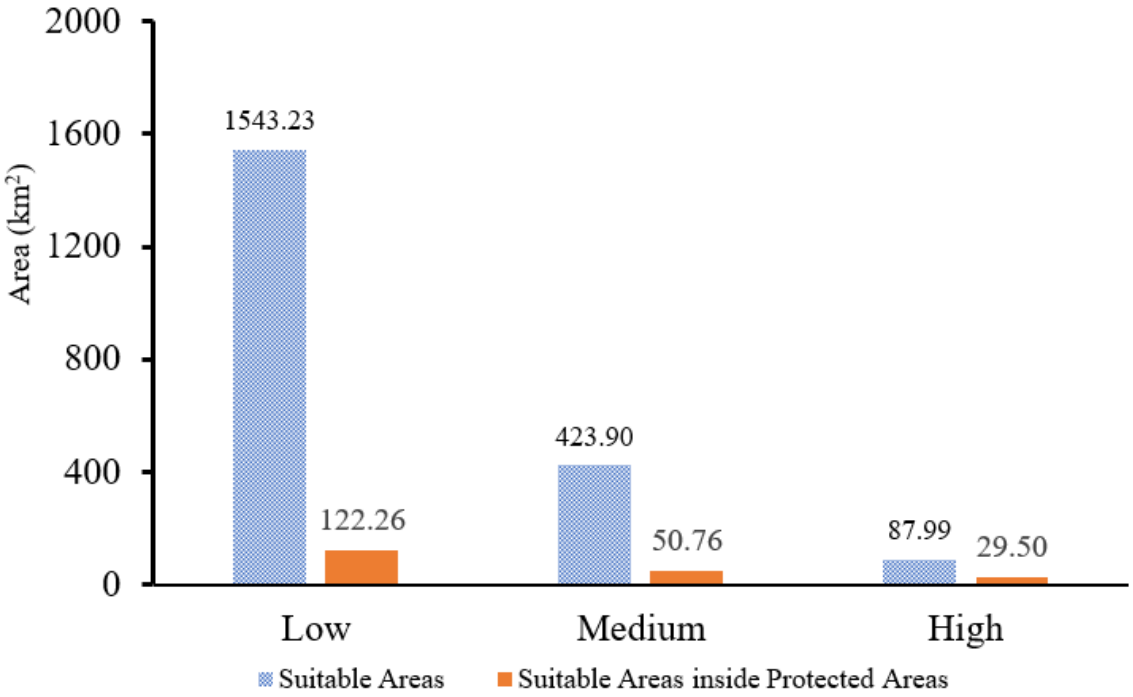


Figure 3. The area of suitable distribution and suitable areas inside protected areas of P. guangxiensis in Northern Vietnam.

The system of protected areas is established to protect and maintain the natural forest ecosystem in the northern mountainous provinces of Vietnam based on its high diversity and endemism. The suitable area of *P. guangxiensis* covered by projected area is very low. A majority area of the suitable distribution area of the species is located outside the protected areas, thus, it is likely that the populations and habitats of this rare newt have not been protected. Expanding the boundaries of protected areas or establishing biodiversity corridors connecting the isolated protected areas based on the appropriate distribution map are effective solutions to protect the habitat for not only the newt but also for other wildlife species.

c). Implementing enhancing awareness activities on warty newt conservation in Phia Oac – Phia Den NP, northern Vietnam

The major threats to *P. guangxiensis* in Phia Oac – Phia Den NP are habitat loss and degradation due to rapidly increasing agricultural lands. We detected at least 21 farming areas inside Phia Oac – Phia Den NP during field surveys. In addition, we also found various pathways inside forest areas, which are used mainly by local people to go to farming lands. Logging, grazing, and collecting non-timber forest products also occurred in Phia Oac – Phia Den, but with low frequency. From interviewing, several local people confirmed that the species could be used in traditional

medicine in an appropriate way. A local family had been poisoned due to improper use of the species as medicine. The demand for this species for medicine is also not great when people only use it for their families, not sell it to the market. Thus, we consider that this is not a major threat to this species.

In the project, we have incorporated with Phia Oac – Phia Den NP to implement conservation activities to raise the awareness of local communities in the buffer zone of the NP, including Quang Thuong village (Quang Thanh commune), Binh Duong village (Phan Thanh commune), and Phia Den village (Thanh Cong commune). In the meeting, our team presented and discussed with local authorities and communities about newt conservation in Phia Oac – Phia Den NP, such as the status of *P. guangxiensis* in Phia Oac - Phia Den NP; why it is necessary to protect newt; the role of local communities in newt conservation as well as biodiversity conservation; and the current regulations of law in the protection of newt and other wild species. We also organised the "Question and Answer part" as a mini test to ask and provide knowledge on newt conservation to local people. Nearly 200 participants from local authorities, forest rangers, and communities in three villages were involved in our meetings and expressed their positive commitments to support newt conservation. Local people also suggested recommendations to our team and Phia Oac – Phia Den NP staff for protecting the newt. Awareness material, posters, and lecture files were distributed to Phia Oac – Phia Den NP and local people.

Figure 4. Principal investigator presented at conservation activities for local communities. Figure 5. Conservation activity in Quang Thanh commune.

In terms of conservation, we consider that the impact of our project on raising awareness among the local population is the most significant. The residents of Phia Oac – Phia Den NP are primarily ethnic minority groups (Dao, Nung, Tay) with limited education and employment opportunities. Interestingly, our meetings were attended by almost 200 individuals from local authorities, forest rangers, and communities, with most participants belonging to ethnic groups. They demonstrated their enthusiastic commitment to supporting newt conservation and provided recommendations to our team and the Phia Oac – Phia Den NP staff for protecting the newt. The director of the Phia Oac – Phia Den NP board provided us with unwavering support throughout our project and expressed a desire to implement various conservation initiatives aimed at raising awareness among the local population.

Figure 6. Our conservation activities had the participation of local ethnic people.
Figure 7. The board director of Phia Oac – Phia Den NP and our team.

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

Due to the impact of Typhoon Noru in northern Vietnam, our second field survey in October 2022, which coincided with the breeding season, was impeded by heavy rainfall. Consequently, we could only gather data on the number of individuals over a few non-consecutive days and were unable to make a comparison of population size between breeding and non-breeding seasons. Therefore, we estimated population size of the newt species by employing the capture-recapture method based on three days of continuous surveying during the non-breeding season.

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

The involvement of local communities was crucial to the success of our project. Our field surveys, which included around 60 survey days, involved six local guides in Nguyen Binh district, namely Mr. Hoang Van Kim, Mr. Ban Tuan Truong, Mr. Ngo Van Minh, Mr. Duong Van Hau, Mr. Duong Van Ly, and Mr. Hoang Van Huan. The staff of Phia Oac – Phia Den NP also provided us with full support and participated in our activities, for example Mr. Trieu Van Duong and Mrs. Be Thi Cuc. Moreover, the participation of 200 local people in our conservation activities in the buffer zone of Phia Oac – Phia Den NP was particularly important. In addition, our project provided educational opportunities for an undergraduate student at Vietnam National University of Forestry. Mr. Ma Khanh Tung will use the data from our project to write his graduate thesis.


Figure 8. Local guides during our field survey. Figure 9. Local people received presents during meeting.

5. Are there any plans to continue this work?

Yes, there are. We are planning to raise fundings for a long-term monitoring for the populations of newt in Phia Oac – Phia Den NP. The knowledge about home range and other ecology characteristics of the species is still very limited. Additionally, the conservation activities also need to implement in other villages in the buffer zone of the national park.

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

Dung Tran presented result of the project on predicting suitable habitat of *P. guangxiensis* at 5th National Scientific Conference on Herpetology in Vietnam hold by Vietnam National University of Forestry in September 2022. The result is also published as an original article: Tran Van Dung & Kanto Nishikawa (2022). Modelling the suitable distribution of the Guangxi Warty Newt (*Paramesotriton guangxiensis*) in Northern Vietnam. Forestry Science and Technology Journal, No.5-2022, page 83-91, in Vietnamese with English abstract https://doi.org/10.55250/jo.vnuf.2022.5.083-091. We are also preparing other manuscripts on the results of the project to submit to scientific journals. Additionally, we also shared the results with students in Vietnam National University of Forestry, Vietnam (VNUF).


Figure 10. Sharing result of the project at 5th National Scientific Conference on Herpetology in Vietnam.

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

We propose the following tasks for future steps:

- Increasing awareness among communities, schools, and local people in other villages surrounding Phia Oac – Phia Den NP.
- Conducting long-term monitoring for a minimum of 3 years to evaluate the population dynamics of *P. guangxiensis*.
- Evaluating the precise impact of expanding agricultural lands on the habitat of *P. guangxiensis*. Currently, knowledge about the species' behaviour (e.g., home range, daily activity time) is limited. The newt's activities may be closely tied to changes in their living environment.

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?

Yes, we used logo of The Rufford Foundation in all materials that related to the project during field surveys, and meeting with local community. The fund also is acknowledged in our presentation at 5th National Scientific Conference on Herpetology in Vietnam, and our scientific articles.

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

Tran Van Dung (Principal investigator): Mr. Dung Tran directly participated in all activities of the project: planning, contact with local authorities, interview, field survey, data analysis, writing report, and presentation.

Ta Tuyet Nga (team member): Mrs. Nga supported Mr. Dung Tran in planning, interview, and raising awareness of local communities.

Mr. Giang Trong Toan (team member): Mr. Toan joined the project as a technical member. He participated in all field surveys.

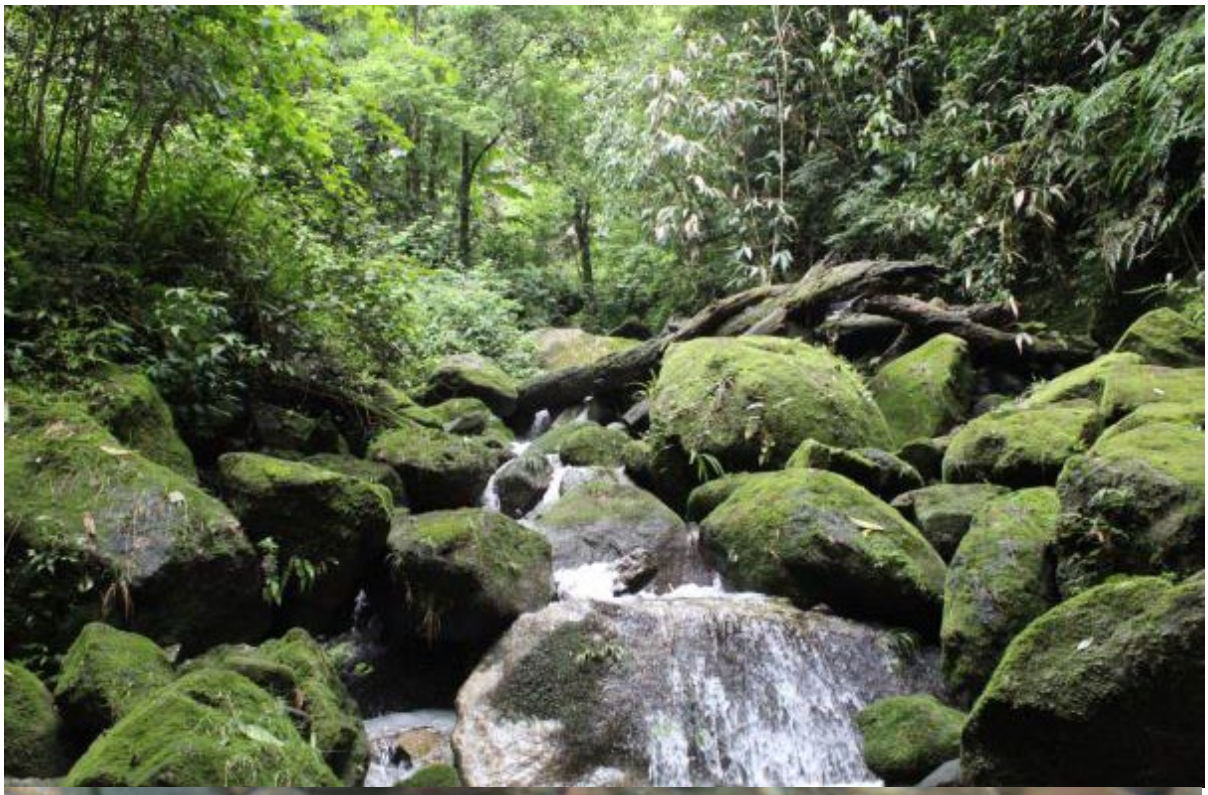
Mr. Lau A Ky (additional member): Mr. Ky participated in field survey and supported conservation activities.

Mr. Trinh Van Thanh (team member): Mr. Thanh supported us in field surveys.

Mr. Trieu Van Duong (additional member): Mr. Duong is a staff of Phia Oac – Phia Den NP, he participated in our field surveys and conservation activities.

10. Any other comments?

We would like to thank The Rufford Foundation, and The Mohamed bin Zayed Species Conservation Fund for providing funding for the project. We attached other photos during our project.




CHUNG TAY
BẢO TỒN CÁ ĐỘC TẠI
VỌC PHIA ĐẮC – PHIA ĐÉN


BAN QUẢN LÝ KHU RỪNG ĐẶC DỤNG PHIA OẮC - PHIA ĐEN
HUYỆN NGUYÊN BÌNH
CHUNG TAY
BẢO TỒN CÁ CÓC TẠI
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NHÂN DÂN CÁC DÂN TỘC XÓM CÓC B
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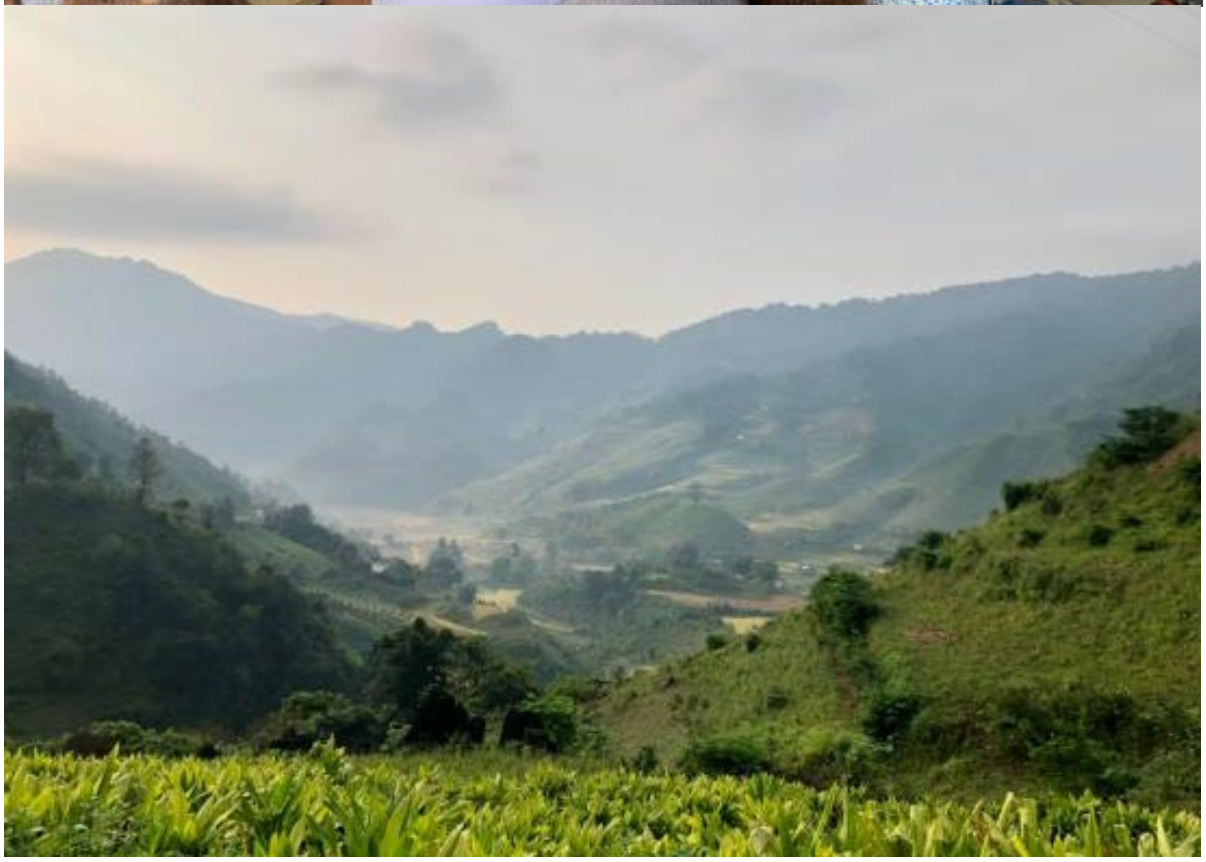
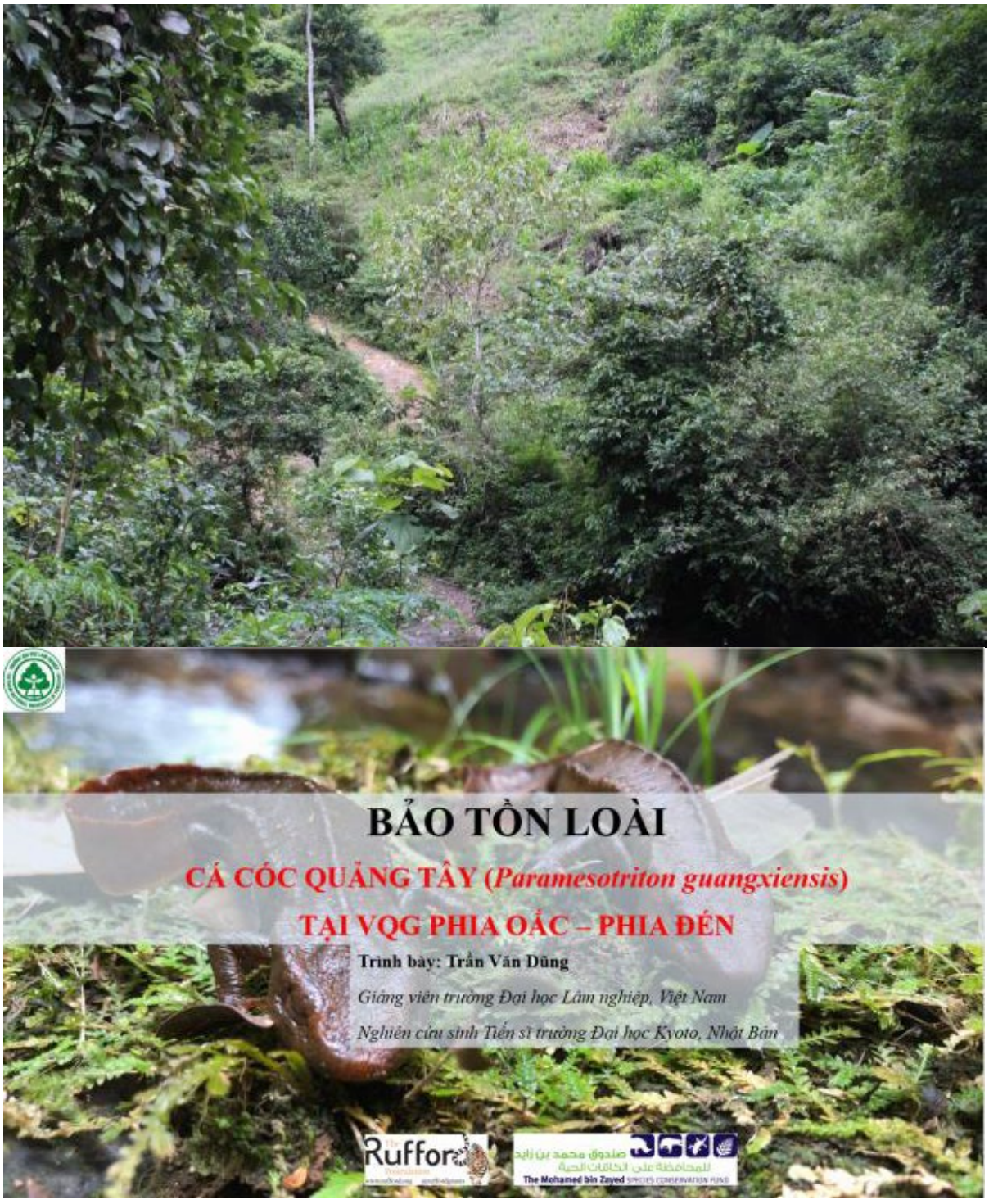
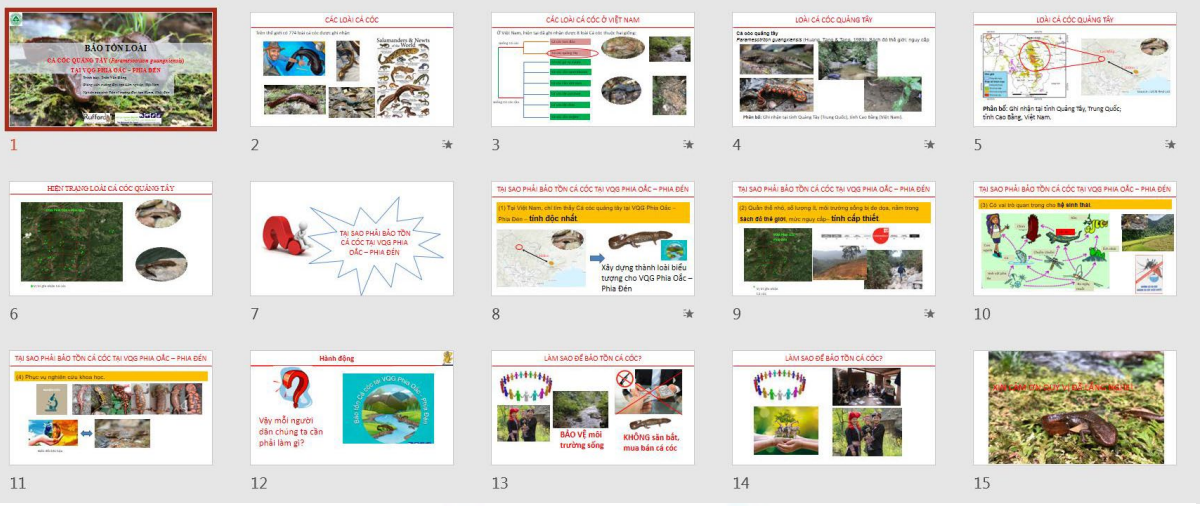



BẢO TỒN LOÀI
CÁ CÓC QUẢNG TÂY (Paramesotriton guangxiensis)
TẠI VQG PHIA OẮC – PHIA ĐÉN
Trình bày: Trần Văn Dũng
Giảng viên trường Đại học Lâm nghiệp, Việt Nam
Nghiên cứu sinh Tiến sĩ trường Đại học Kyoto, Nhật Bản
The Mohamed bin Zayed


BẢO TỒN LOÀI
CÁ CÓC QUẢNG TÂY (Paramesotriton guangxiensis)
TẠI VQG PHÍA ÁC – PHÍA ĐÉN
CÁC LOÀI CÁ CÓC
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TẠI SAO PHẢI BẢO TỒN CÁ CÓC TẠI VQG PHÍA ÁC – PHÍA ĐÉN
Hành động
Vậy mỗi người dân chúng ta cần phải làm gì?
LÀM SAO ĐỂ BẢO TỒN CÁ CÓC?
BẢO VỆ môi trường sống
KHÔNG săn bắt, mua bán cá cóc


Bảo tồn Cá cóc tại VQG Phía Ác - Phía Đén