

Final Evaluation Report

Your Details	
Full Name	Phan Viet Dai
Project Title	Population status, distribution and threats of the endangered forest musk deer (<i>Moschus berezovskii</i>) in Huu Lien nature reserve, Vietnam
Application ID	34990-1
Date of this Report	25/8/2023

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 status of forest musk deer in the Huu Lien NR				In the project, we established 19 camera trap station covering Huu Lien NR with a total of 3904 days. From these efforts, we recorded 11 events of musk deer detection across three stations. Through our captured photos, we identified the presence of a minimum of four individual musk deer within Huu Lien NR. However, owing to the limited number of detections, the successful implementation of the species' occupancy model was not attainable. As a result, we evaluate the achievement of our objective at a partially fulfilled level.
Objective 2: Assessing the distribution of forest musk deer in the Huu Lien NR.				Out of the 19 stations, we detected the presence of musk deer at Stations 8, 12, and 13. Based on these findings, we generated a map illustrating the distribution of musk deer presence within Huu Lien NR.
Objective 3: Identifying the threats to the forest musk deer population and its habitat.				We have identified habitat degradation and hunting as the primary threats to the musk deer population in Huu Lien NR.
Objective 4: Providing appropriate recommendations for forest musk deer management and conservation in the study area.				We provide four main recommendations for safeguarding the musk deer populations in Huu Lien NR. In which we focused on advocating for long-term monitoring of both musk deer and their habitat, as well as raising awareness among the local communities.

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

a). Population size of musk deer in Huu Lien NP, Vietnam

From 19 camera trap stations with 3904 trap days, we recorded only 11 independent detections of musk deer from three stations in Huu Lien NR. In which, we detected two individuals of musk deer in a photo, thus we assumed that there are at least four

individuals of musk deer existing in Huu Lien NR. The finding suggests that the population size of musk deer in the protected area probably very small.



Figure 1. Two individual of musk deer were detected in Station 08.

Based on the detection times, we also found that musk deer mainly active in morning daytime from 6 -12 a.m.

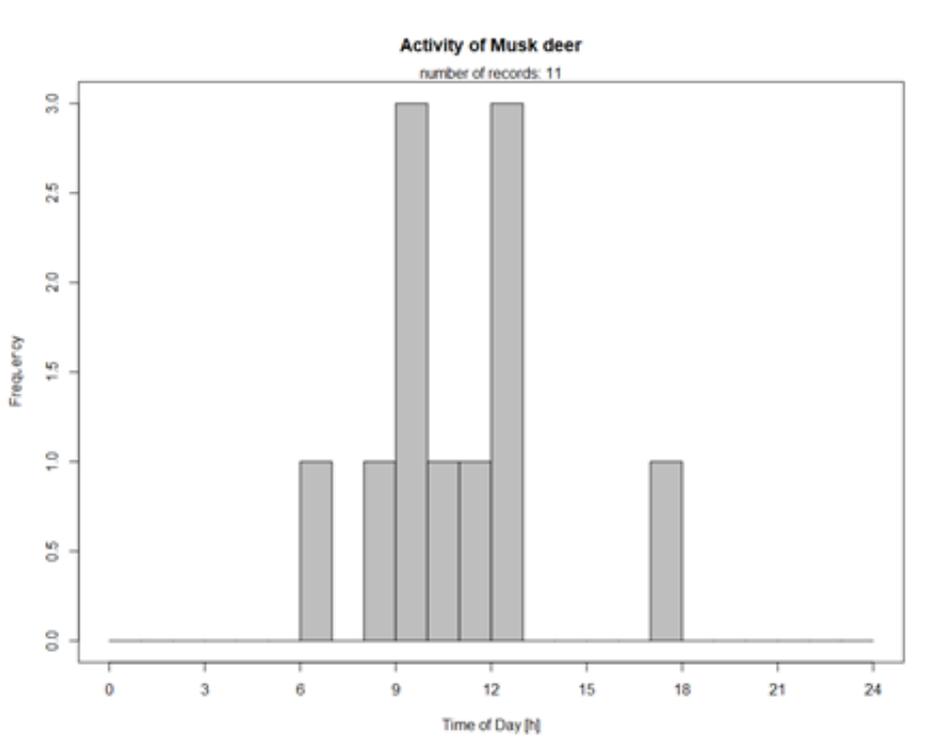


Figure 2. The detection times of musk deer from camera traps.

b). Distribution of musk deer in Huu Lien NR

Our findings reveal that the musk deer detections are predominantly clustered in the southern region of Huu Lien NR, with a specific focus on Stations 8, 12, and 13 (Figure 3). Notably, Station 8 recorded the highest number of detections (eight events), followed by Station 13 (two events), and Station 12 (one event). It is evident that all the recorded musk deer stations are situated in close proximity to the headquarters of Huu Lien Nature Reserve. It might suggest that habitat areas near the protected area headquarters could provide a safer environment for the musk deer.

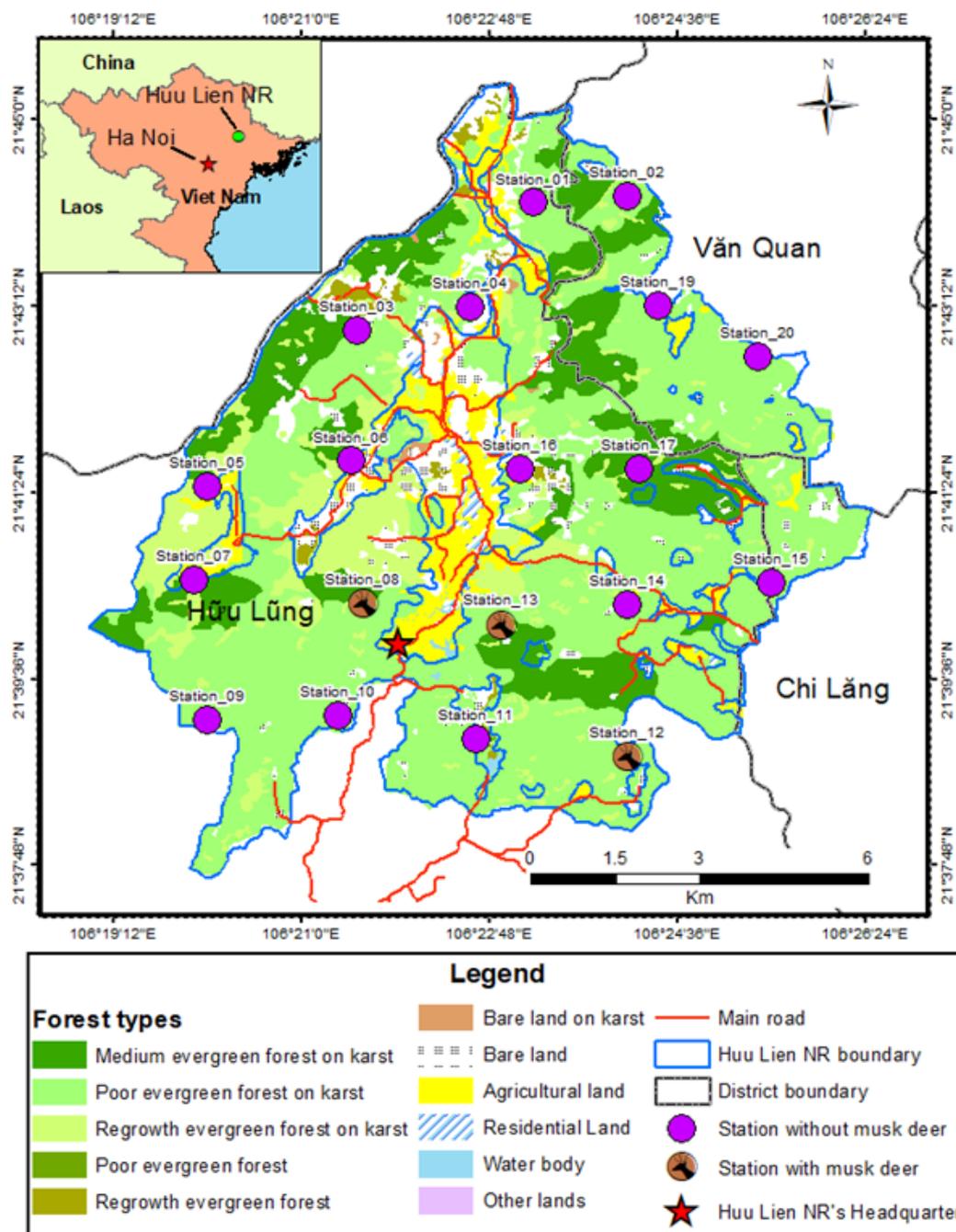


Figure 3. The map of camera trap station detecting musk deer in Huu Lien NR.

c). The main threats to musk deer in Huu Lien NR

During the field survey, we identified that there are two main threats to musk deer, including habitat destruction and hunting.

+ Habitat destruction: During field surveys we found that a minimum of 10 mountaintop sites have suffered destruction due to the exploitation of *Cupressus tonkinensis* roots. Presently, the tree's wood is exceedingly scarce in its natural habitat, with only the root system persisting atop the lofty peaks of karst mountains. Consequently, local communities have resorted to mining activities to fracture rock formations and extract the tree's roots. The activity has had a profound impact on the musk deer's habitat, leading to significant destruction (Figure 4).



Figure 4. Top of karst mountain were destroyed due to explosions.

+ Illegal hunting: The interview results showed that some mountainous villages continue to exhibit the practice of utilising homemade guns for hunting purposes. During field survey, we did not record animal traps. However, the camera traps did capture numerous instances of individuals accessing the reserve. Furthermore, one of the recordings depicted a deer with a visibly injured leg, strongly indicative of a gunshot wound (Figure 5).



Figure 5. An injured musk deer in Huu Lien NR (Captured photo from video).

We consider the results of musk deer detections and their distribution to be the most important aspect of our project. The findings revealed an exceedingly small musk deer population within the protected area. It is both necessary and urgent to initiate conservation efforts aimed at safeguarding the endangered musk deer in Huu Lien NR.



Figure 6. An individual forest musk deer in Huu Lien NR captured by camera trap.

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

During 2021, Vietnam experienced significant COVID-19 restrictions due to the widespread prevalence of positive cases across the nation. As a result, obtaining fieldwork permissions became challenging. Consequently, our field survey had to be postponed by approximately six months. After receiving the necessary permissions to access Huu Lien NR, we proceeded to carry out the remaining project activities in alignment with our original plan.

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

The engagement of local communities plays a vital role in the success of our project. During our field surveys, local individuals provided invaluable assistance to our team in setting up camera traps. Noteworthy contributors include Mr. Trieu Van Su, Mr. Ly Van Bam. The management board of Huu Lien NR extended their wholehearted support and actively participated in our field survey; notable among them are Mr. Pham Van Cap, Mr. Ho Hoan Kiem, and Mr. Trinh Hai Chau. We also conducted training sessions for Huu Lien NR's staff to equip them with the skills for utilising camera traps in wildlife species survey and monitoring.



Figure 7. Local guide was setting camera trap. Figure 8. Local peoples and nature reserve's staff during field survey.

5. Are there any plans to continue this work?

Obviously, yes there are. We are planning to raise fundings for a long-term monitoring for the populations the musk deer in Huu Lien NR. Additionally, we expect to implement activities to raise awareness of local communities to protect the threatened musk deer and their habitats.

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

We have shared all project results with the management board of Huu Lien NR. Some of our photos have been featured on the Huu Lien NR website (available at: <http://khudutruthiennhienhuulien.com/tin-tuc-su-kien/31/tang-cuong-cong-tac-bao>)

ton-da-dang-sinh-hoc-khu-rung-dac-dung-huu-lien/291.aspx). Additionally, we are currently in the process of preparing a manuscript detailing our findings for submission to a scientific journal.

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

We outline the subsequent tasks for the future stages:

- Undertaking a minimum 3-year-long monitoring initiative to assess the population dynamics of musk deer within Huu Lien NR.
- Enhancing awareness among local communities, schools surrounding Huu Lien NR.
- Evaluating the influence of habitat degradation on the musk deer population, with special attention to the utilisation of mining for exploiting *Cupressus tonkinensis*'s roots.

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?

Certainly, we incorporate The Rufford Foundation logo into all project materials. Moreover, we have introduced The Rufford Foundation to the management board of Huu Lien NR.

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

Phan Viet Dai (Principal investigator): Mr. Dai Phan have a responsibility for all project activities, including planning, liaising with local authorities, conducting interviews, field surveys, data analysis, report writing, and presentations.

Mr. Tran Van Dung (Additional member): Mr. Dung provided essential support to Mr. Dai Phan in planning, conducting interviews, and raising awareness among local communities.

Mr. Trinh Van Thanh (team member): Mr. Toan contributed as a technical member of the team, participating in all field surveys.

Mr. Trinh Hai Chau (team member): Mr. Chau, a staff member of Huu Lien NR, actively participated in our field surveys.

10. Any other comments?

We would like to thank The Rufford Foundation for providing funding for the project. Additionally, we extend our gratitude to Dr. Andrew Tilker for his invaluable guidance and advice throughout the project. A special thank you also extends to the Leibniz Institute for Zoo and Wildlife Research for their kind provision of camera traps. We attached several photos of other wildlife species recorded from the project.





