Final Evaluation Report

Your Details	
Full Name	Marie Claire Dusabe
Project Title	Rediscovering the critically endangered snails in Lakes Albert and Edward, Uganda
Application ID	38026-1
Date of this Report	16/5/2024

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
Activity 1: Survey of snails in Lakes Edward and Albert to rediscover the critically endangered snails and obtain information on the current diversity and distribution of snail species in the littoral zone and at various depths in the lakes.			√	This objective has been successfully achieved through extensive surveys of snails in Lake Edward and Lake Albert, covering both the dry and wet seasons and various depths of the lakes. Our morphological identification confirmed the presence of the endemics *Gabbiella candida* and *Bellamya rubicunda* in Lake Albert. In contrast, *Gabbiella walleri* was absent in Lake Albert, and *Ceratophallus apertus* was not found in Lake Edward. With DNA barcoding, our study has provided fascinating insights into the possibility of taxonomic misclassification of *Gabbiella candida* within the genus *Gabbiella*. This highlights the limitations of relying solely on morphological identification used in the past. To further improve our understanding, the team plans to extend this project to verify the genus classification of *Gabbiella candida* and determine the presence or absence of *Gabbiella walleri* and *Ceratophallus apertus* in the lakes Albert and Edward, respectively. Extensive fieldwork is necessary to thoroughly sample

				the Congolese parts of the lakes. Additionally, further phylogenetic and evolutionary analyses, along with the utilisation of both mtDNA and nuclear markers, are essential to accurately and conclusively confirm the presence/absence and taxonomic classification of these species.
Activity 2: Measurement of physicochemical water parameters and other selected environmental variables to assess their variation in relation to snail distribution.			√	We have successfully achieved this objective. We accurately measured the physico-chemical parameters and other relevant environmental variables at each sampling point. Based on these measurements, we were able to categorise the sites according to their level of pollution, dividing them into less polluted, moderately polluted and highly polluted categories. The sites in Ntoroko had a high level of pollution, indicating significant environmental disturbance. In contrast, the level of pollution in Hoima was comparatively lower. Butiaba fell into the category of moderately disturbed sites, indicating a medium level of pollution.
Activity 3: Engage at least 500 primary school children at a selected primary school at Lake Albert and educate them about the			√	We have successfully achieved this objective. We visited the Ntoroko Primary School, which is located near Lake Albert in the Ntoroko region. Approximately 600 children were engaged. On the way there, our team composed a song titled "Mwitanzige inyanja yayitu," which translate as "Our

role and importance of snails and the need to protect the lake and its biodiversity in general.				Lake Albert," which is the former and local name of the lake, Mwitanzige. The purpose of our visit was to conduct eeducational campaigns to raise awareness about Lake Albert, its biodiversity, the importance of conserving freshwater snails, protecting their habitat, and to slowly change some of the traditional beliefs and practices that impact the snail populations. The campaign was strategically designed to take place outdoors. Equipped with microphones, we started by singing to engage the children's attention. We then delivered key conservation messages, interspersed with quizzes, competitions, and prizes to keep the children's attention and interest. Purposefully, we asked children questions that created further discussions, reinforcing the messages and inspired the children or encouraged them to know more.

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

a). A map showing the recent geographical distribution of *Bellamya rubicunda* and *Gabbiella candida* in Lake Albert.

b). The possibility of the taxonomic misclassification of the presumed *Gabbiella candida* under the genus *Gabbiella* which needs to be clarified using further analysis.

c). The awareness of biodiversity conservation particularly focusing on snails and lakes was raised among primary school pupils from Ntoroko. Approximately 600 pupils were

engaged. After the campaign, an impressive 97.0% of pupils expressed a desire to become involved in community conservation efforts for snails.

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

The first challenge in this project was obtaining a research permit to work within the protected area which covers a large part of Lake Edward. Fortunately, with the help of Francis Ssenkuba, a member of the project team through Mbarara University of Science and Technology, the permit was obtained.

Another challenge encountered was in the molecular lab, given the unpredictable nature of PCR, which required extensive troubleshooting to obtain reliable results. In addition, taxonomic misclassifications and the lack of references in GenBank were further obstacles.

To overcome these challenges, the team members propose to extend the project by conducting a comprehensive survey including the Congolese side and performing phylogenetic and evolutionary analyses. These measures would facilitate the accurate taxonomic classification of the studied species.

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

In this project, we conducted an awareness campaign at Ntoroko Primary School to educate pupils about biodiversity, focusing on snails and lake conservation. The campaign was designed to encourage participation with fun activities such as singing a song composed by our team members with a message about protecting snails and lakes. Following the key messages about conservation, we organised a competition to get pupils actively involved and awarded prizes to the winners.

At the end of the campaign, enthusiasm was high, and everyone expressed a desire to become champions of snail conservation. We kept in touch with the principal, who informed us that the song composed during our campaign will continue to be sung in school. She also noted that the pupils are more engaged with biodiversity topics, particularly snails and their habitats, as part of the integrated science module.

Looking ahead, we wish to establish a snail conservation youth club at Ntoroko Primary School. This club would be involved in various conservation activities, such as beach clean-ups to collect plastic bottles, further contributing to environmental protection.

Moreover, we also worked with two local research assistants who were very excited to learn more about sampling and the important role of biodiversity and lakes conservation.

5. Are there any plans to continue this work?

Yes, we plan to continue this work. It is clear from the detailed report that this project needs to be extended to obtain a clearer picture of the status of the species studied. For example, *Gabbiella walleri* and *Ceratophallus apertus* could not be found yet. Extending the sampling sites to the Congo side of the lakes would help us to determine their presence or absence. Moreover, there is still a possibility of taxonomic misclassification of *Gabbiella candida* in the genus *Gabbiella*. Detailed phylogenetic and evolutionary analyses are required to determine its genus. In terms of community engagement, we would like to continue this project by establishing a snail conservation youth club for the sustainable conservation of biodiversity and lakes.

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

At the end of this project, the results will be shared with the International Union for Conservation of Nature (IUCN) to update the information on the Red List status of snails in Lakes Edward and Albert. A comprehensive report will be submitted to the Ministry of Water and Environment (MWE) of Uganda and the Uganda Wildlife Authority. Additionally, the team members will publish the results of this study in a peer-reviewed journal. Furthermore, we aim to present our findings to fellow researchers in workshops and conferences to reach a broader audience.

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

The most important steps for the future are extending sampling sites to the Congolese side of the lakes to determine the presence or absence of *Gabbiella walleri* and *Ceratophallus apertus*. The use of both mitochondrial and nuclear makers is necessary and a detailed phylogenetic and evolutionary analysis is required to solve the puzzle of the taxonomic classification of the species *Gabbiella candida*.

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?

1. During the campaign to raise awareness of snails and lake conservation, we created a banner with the Rufford logo and key messages about protecting biodiversity and the lake. The photos were shared with The Rufford Foundation in the progressive report.

2. During the environmental education campaign, we gave the teachers and the principal T-shirts with the Rufford logo.
3. The questionnaires (see the appendix) we gave to the pupils for the evaluation have Rufford logo.

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

List of members	Role in the project
Julius Tumusiime	Snail sampling and environmental education campaign
Francis Ssenkuba	Snail sampling and environmental education campaign
Prof. Grace Kagoro	Advisor of the project, snail sampling and environmental education campaign
Prof. Christian Albrecht	Conceptualization of the topic, advisor of the project and reviewed the report.

10. Any other comments?

Thank you to The Rufford Foundation for supporting this project. The funding of the project 'Rediscovering the critically endangered snails in Lakes Albert and Edward in Uganda' has provided important insights into the species studied and has been successful. We hope to continue work on the Endangered Gastropods of Lake Edward and Lake Albert to further reveal their presence or absence, uncover the challenges of taxonomic misclassification to produce a tangible and reliable result that will be shared with the IUCN.