

Final Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF format**. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please DO NOT fill in and submit this form until the project has been completed.

Complete the form in English. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Carine Rosine Tchietchui
Project Title	Extinction risk assessment and conservation measures for <i>Sudanonautes nkam</i> (<i>Magnaoras nkam</i>) a threatened freshwater crab from Yabassi in the Ebo forest, Cameroon
Application ID	44782-1
Date of this Report	27/09/2025

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieve	Partially achieved	Fully achieved	Comments
<p>To investigate Population structure of <i>Sudanonautes nkam</i> (<i>Magnaoras nkam</i>), including gathering data on sex ratios, breeding season, fecundity, distribution and monitoring changes in population levels and habitat</p>			Yes	<p>This objective was fully achieved. We were working at the Eboforest zone which is home to two threatened species <i>Sudanonautes nkam</i> (<i>Magnaoras nkam</i>) and <i>Louisea yabassi</i>. This project help to collect data in both species that was extended objective from my scientific mentors. We reported a total of 59 crabs belonging to two species (<i>Louisea yabassi</i> and <i>Sudanonautes nkam</i>) (see 2a. table 1 for more precision).</p> <p>Population structure of both species</p> <p>The majority of the crabs collected were males constituting 59.3% of the sample size and most abundant growth stage in the population was the sub-adult population making up 55.5%, followed by adult with 32.2%. The estimated population density of <i>L. yabassi</i> ranged from 1 to 4 individuals/transect during our early surveys, while the population density of <i>S. nkam</i> ranged from 1 to 12 individuals/transect and the population consisted mostly of adult and sub-adult individuals. No ovigerous females or females carrying hatchlings were reported so there is still no basic reproductive information available on the number of eggs laid, and the number of hatchlings produced, and when the breeding season occurs.</p> <p>As for the specimens kept in tanks, we registered higher mortality. For now, we still care for those specimens alive in the tanks and have not yet observed any reproduction to report as a result. As soon as we have reproduction, we will write a manuscript to publish this data and will inform scientific community and Rufford Foundation.</p> <p>The water body in Yabassi from which the sample was obtain had an average temperature of 26°C, pH of 6.9, salinity (0) g/kg and conductivity 34.3 S/m respectively. The species of crabs in Yabassi were subsidiary <i>Sudanonautes nkam</i> whose habitat constituted borders of river and under stones without water. The water body from which crabs where collected in Ndokbanguague had an average temperature 26°C, pH of 8.9, salinity of 16 g/kg and conductivity of 30 S/m. The species of crabs in Ndokbanguague were predominantly <i>Louisea yabassi</i> that</p>

			<p>lived in burrows of swamps or marshy area.</p> <p>The population structure of <i>Louisea yabassi</i>, included fewer females (17.9%) than males (52.1%) emphasizing environmental factors had an influence on the species existing in the ecosystem. Whereas, all the age classes (juvenile, sub adult and adult crabs) indicate more adults. Moreover, variation in the population structure by sex were significant as the probability value was derived 0.001, which is significant at the level 0.05 for females and males. Meanwhile, for juvenile, sub adult and adult at age level was 0.038 is significant at the level of 0.05 with respect to the standard probability value reference. The population structure exceptionally for <i>Sudanonautes nkam</i> on the contrary by sex indicate there were more of female crabs (61.3%) than males (38.7%) with a probability value insignificant at 0.127 signifying no variation in population structure as more of males are high-flown than females. Furthermore, all the classes by age that include juvenile sub adult and adult indicates a significant variation of population as probability value of 0.001 is less than the standard 0.05 value.</p>
To study growth and size classes in <i>Sudanonautes nkam</i> (<i>Magnaoras nkam</i>)		Yes	<p>This was assessed from ontogenetic development through morphological variation given in table 2. Amongst the categories <i>L. yabassi</i> and <i>S. nkam</i> there was no relationship between the variables female and male given their average CW of 15.60 mm and CW of 29.95 mm respectively as $p=0.353$. On the contrary, the variables juvenile, sub adults and adult by size classes shows there was a significant difference given average CW of 15.60 mm and 29.95 mm respectively as $P=0.001$ less than the standard $P=0.05$ for both (<i>L. yabassi</i> and <i>S. nkam</i>). The morphological progression of the species by size classes (<i>L. yabassi</i> and <i>S. nkam</i>) and the assessment of the variables females and males by sex, shows that the average mean by size classes of females is greater than that of males for the species (<i>L. yabassi</i> and <i>S. nkam</i>) respectively. On the other hand, the variables by growth aspects implies adults dominated sub adults and juveniles as such a significant difference according to the test of variance give that $P=0.001$ less than the $P<0.05$ by reference.</p>
To investigate threats of <i>Sudanonautes nkam</i> (<i>Magnaoras nkam</i>) and biodiversity of freshwater crabs from Eboforest and surroundings areas		Yes	<p>The key threats to our target species <i>Sudanonautes (Magnaoras) nkam</i> include habitat destruction, exploitation for human consumption, and detergents and other harmful chemicals from washing clothes.</p>

with implication for conservation action plan (educational component)



Conservation action plan (educational component)

Community engagement was successful and was help to reduce habitat destruction by altered agricultural practices through a targeted education program aimed at including those in the local community that live and work closest to the sites where *Sudanonautes nkam* (*Magnaoras nkam*) was discovered. There, threats from farming practices have been reduced because the farmers have now changed their practices to take account of the presence of freshwater crabs on their land following the education sessions that I delivered. My approach has reduced the immediate threats to the habitat and has stabilized the populations *Sudanonautes nkam* (*Magnaoras nkam*).

The content of the educational messaging was structured to highlight the need for protection and the advantages that increased numbers of visitors will bring. I have brought local people to understand that most freshwater invertebrates including the freshwater crabs found in Eboforest zone are unique, and are not found anywhere else in the world. These crabs are semi-terrestrial and are found in a range of habitats from small permanent streams to unstable shallow waters and wetlands. The freshwater crabs need to be protected from extinction by stopping the intensive agricultural practices that degrade the natural vegetation and destroys the habitat, and by ending the use of pesticides that result in pollution and harm to aquatic organisms.

The local community have made aware that actions will bring lasting benefits in the form of hosting and guiding tourists and scientists from other regions of Cameroon and from all around the world that are attracted there by their interest in Eboforest zone intact natural tropical ecosystem and the unique wildlife that is found there.

Our two educational workshops were restricted to Chief house (chiefdom) with few people, due to local authority

			<p>restrictions, who argued that this was because of a presidential election that took place on October 12, 2025 in Cameroon. To overcome this, we intensified the on-going educational component, meeting all people individually (people who use the water of the species' habitat, women (and children) who wash the clothes, farmers, foresters and hunters, and other key people (traditional authorities) to help us in this strategy.</p> <p>We monitored our ongoing educational component during the fieldwork by evaluating and assessing any changes that may have been made in the agriculture activities there (i.e., have any new agricultural areas been created?). My research assistants and local guides also monitored the activities of fishermen, farmers, foresters, hunters, women and children who use the habitat for our target crab species.</p>
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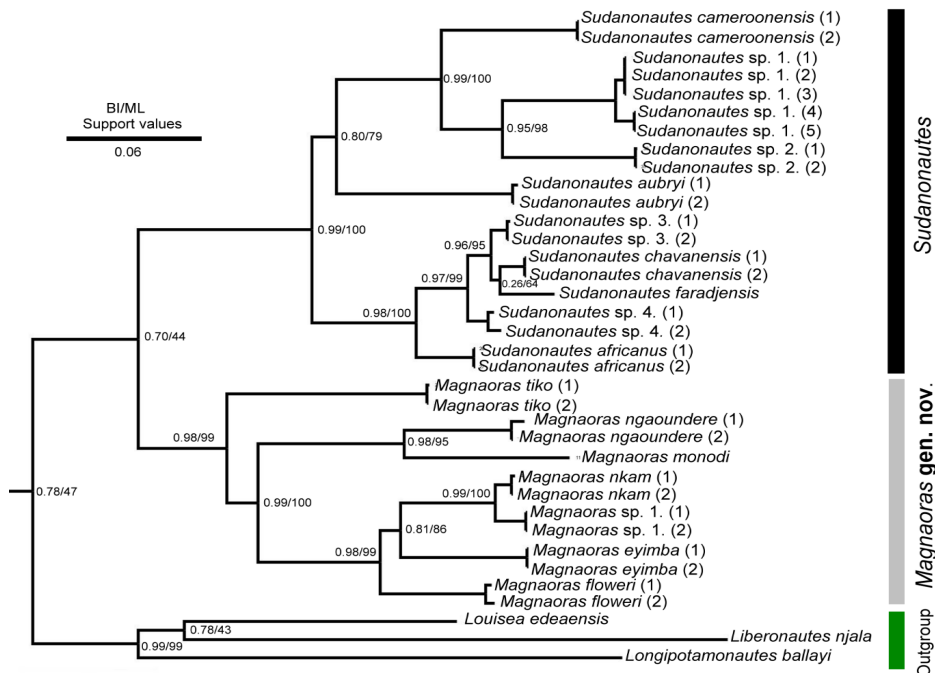
2. Describe the three most important outcomes of your project.

- a). This project was very crucial to investigate population structure and growth for *Sudanonautes nkam* (*Magnaoras nkam*) for the first time and complete data for *Louisea yabassi* that also found in Eboforest zone where we were working. These data are useful for an IUCN Red List assessment that I'm now doing with Dr. Pierre A. Mvogo Ndongo (Cameroon) and Prof. Neil Cumberlidge (USA).

Table I : Size of crabs collected in the study (number and percentage)

Variable	Category	Number	Percentage (%)
Species	<i>Louisea yabassi</i>	28	47.5
	<i>Sudanonautes nkam</i>	31	52.5
	Total	59	100.0
Sex	Female	24	40.7
	Male	35	59.3
	Total	59	100.0
Age	Juvenile	7	11.9
	Sub Adult	33	55.9
	Adult	19	32.2
	Total	59	100.0

- b). This project has also help to discover two new *Sudanonautes* species and one new *Magnaoras* species that were confirmed by morphology and molecular analyses. I and my scientific mentors are working on a manuscript to publish this scientific information.



A phylogenetic tree validated by my scientific mentors Dr. Pierre A. Mvogo Ndongo & Prof. Neil Cumberlidge

As a results, I and my team collected the following new species: *Sudanonautes* sp.1 from Eboforest near Yabassi and from Bedimet Island of Lake Ossa and *Magnaoras* sp. 1 from Eboforest near Yabassi; *Sudanonautes* sp.3 from Bedimet Island of Lake Ossa and Yaounde; and *Sudanonautes* sp.2 from a small threatened area at Ambam in South Region of Cameroon, represented in this tree but was collected trough the pilot project conducted by my camerade, Menye Ndongo Louise Charlene. As well as these crab species, we have also collected threatened species of freshwater molluscs of the genus *Potadoma* confirmed by Dr. Thomas von Rintelen and Dr. Bert van Boxclear

- c). Community engagement was successful and threats to the habitat of *Sudanonautes nkam* were drastically reduced through a targeted education program aimed at including those in the local community that live and work closest to the sites where *Sudanonautes nkam* is found.

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

The most unforeseen difficulty was to visit local school to sensibelize young students from there. This aspect was very expensive for us, as the authorities from local school were convinced that we have a large project that we also need to provide them with the money. We tackled that by sensibelize young students we encountered everywhere at the locality of Eboforest.

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

The local communities involved in this project include farmers, local authorities (chiefs of village) and two field assistants and guide who were people originating from the villages around Eboforest near Yabassi. I was able to work with the field assistants who had previously worked with Dr. Pierre A. Mvogo Ndongo during his pilot project (completion grant from Rufford) in the Eboforest zone. I was one of the students were trained by him.

The communities helped us to accomplish this project in the following points described below. In the ongoing education component, the chiefs of villages and their assistants helped us to reach people that regularly use the forest around the place where *Sudanonautes nkam* is found for their livelihood. Our field research assistants and guides were very active in helping us to collect scientific data and to educate local people using local and national languages. Local farmers provided us with constructive advice, showing the specimens of crabs and their holes and enabling us to meet other people in their home and explain our project to them. But the real problem we encountered is that people assumed we have large funding to do such activities.

To try to compare threats to other localities, we visited other localities such as the Islands of Lake Ossa Wetland reserve and Yaounde Campus and collected important comparative data that will be necessary for future conservation actions in this biodiversity hotspot.

5. Are there any plans to continue this work?

Yes. The monitoring strategies set up during this project will be efficient for long-term conservation *Sudanonautes nkam* (*Magnaoras nkam*) by conducting other pilot projects from Eboforest near Yabassi. In this respect, we plan to develop conservation action plan for the new *Magnaoras* species or *Sudanonautes* species newly collected during this work. For this, I have proposed to conduct other pilot projects at the same forest (2nd proposal in Rufford Foundation) near Yabassi.

Please note that the new name of *Sudanonautes nkam* is *Magnaoras nkam*. During my first project, I and my team did activities to protect this threatened crab species from extinction and the ecosystem it depends from.

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

The results and recommendations from this proposed project were shared with local people (younger and senior), during educational component in the field, in Eboforest near Yabassi. The results of this project will also be presented at the national level in Cameroon (Bioscience, seminars, etc.). I currently working on the manuscripts that have the data reported during this project and that also described new collected species, therefore, International scientific community through articles and publications. Both of my scientific mentors Dr. Pierre A. Mvogo Ndongo

(Cameroon) and Prof. Neil Cumberlidge (USA) are members in the IUCN SSC Freshwater Crustacean Specialist Group. I shared with them the data and we are working to assess the red list extinction for *Sudanonautes (Magnaoras) nkam*. I'm learning from them.

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

The important next step is to develop a conservation action plan for the new *Magnaoras* species and *Sudanonautes* species collected during this work at the Eboforest near Yabassi. This project will also help to intensify monitoring strategies that are crucial for long-term conservation species and the ecosystem they depend on.

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, I have used the Rufford Foundation logo in my documents, in the materials produced for this project, posters and I have acknowledged the support of the RF in my publications. The Rufford Foundation will also be thanked in all other upcoming manuscripts.

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

My two main supervisors for this project were Dr. Mvogo Ndongo (University of Douala, Cameroon) and Professor Neil Cumberlidge (Northern Michigan University, USA) who are both freshwater crab specialists with a lot of experience working in Central and West Africa. Dr. Mvogo Ndongo was directly involved in every stage of this project, while Dr Cumberlidge was not be involved in the field work but was supervised all stages of the project as they occur. In the field, we were working closely with two local field assistants that have been working and trained by Dr. Mvogo Ndongo in the methodologies needed to collect routine monitoring data on the health of the ecosystem and its organisms, and the steps needed to protect and conserve threatened species of freshwater crabs. My Field assistants and guides were guided me and helped to collect data in the field and to talk with local people on behalf of educational activities.

10. Any other comments?

This project was my first one as principal investigator. It help to growth up with my skills on behalf of conservation action plan. Thanks to Rufford Small grant Foundation, I got to know other research partner on behalf of conservation action plan.

ANNEX – Financial Report

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