Progress Report

Project ID: Rufford Small Grant (2025)

Title of the Project: Conservation of the Critically Endangered Freshwater Crab (Afrithelphusa Gerhildae) at the Outamba-Kilimi National Park, Sierra Leone, Through Monito ring Strategies

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Rufford Small Grant Holder – 2025 Application ID::46012-2

Hassan Sesay at the Little Scarcis River in Outamba National Park during field trip

This report is an update of a Rufford Small Grant–supported conservation project conducted bet ween March and December 2025 at the Outamba–Kilimi National Park (OKNP) and surrounding freshwater ecosystems in northern Sierra Leone. The project is implemented by Hassan Sesay u nder the academic supervision of freshwater crab specialists and conservation biologists.

This project aims to collect data on: (1) the population structure and trends (sex ratio, size, distri bution, and abundance), and on its reproductive biology (breeding season, recruitment, and fecu ndity); (2) how abiotic environmental factors (water quality indicators such as oxygen, dissolved ions, and pH) and biotic factors (predators, competition with other freshwater crab species, food sources) influence population dynamics; and (3) to raise awareness among local communities a bout the importance of protecting A. gerhildae through educational initiatives.

Below are the detailed breakdown of the 12-month timeframe for surveys and intervie

ws for my conservation project.

Months 1-3 (Dry Season/Start of Study)**: Baseline & Setup**

- Surveys: Initial site/transect selection (rivers, streams) across diverse habitats where our new *A. gerhildae* species might occur. Then monthly sampling using nets, dip nets, traps to gauge initial abundance, distribution, sex ratios, sizes.
- Interviews: Identify and engage key local communities (fishermen, farmers, hu nters, foresters) for baseline knowledge. Conduct initial interviews about crab uses, seasonality, perceived abundance, traditional knowledge.
- Data: Collect abiotic data (pH, water quality).

Months 4-6 (Peak Dry/Early Rains)**: Biology & Use Patterns**

- Surveys: Continue monthly sampling; focus on reproductive biology (breeding season, recruitment). Monitor feeding habits and diet.
- Interviews: Explore consumption patterns of crabs. Understand local manage ment practices and threats to crabs and their habitats.

Months 7-9 (Wet Season)**: Dynamics & Threats**

- Surveys: Assess impact of rains on crab distribution & abundance; monitor pre dator/food dynamics.
- Interviews: Discuss impacts of flooding, habitat fragmentation, habitat loss. G auge awareness levels of local communities.

Months 10-12 (End of Wet/Start of Dry): **Trends & Awareness**

- Surveys: Final comprehensive sampling to capture annual trends in population structure, abundance.
- Interviews: Finalize data; implement educational initiatives to raise awareness.
- Data: Compile all data (biological, ecological, socio-economic) to prepare a co nservation assessment of the species.

Results of the Project

Population Structure and Distribution

A total of 41 specimens of *A. gerhildae* were collected, measured, recorded, and released across four primary sites within OKNP. These included 16 males and 25 females, giving a sex ratio of ap proximately 1:1.5 (♂:♀), indicating a female-biased population. Carapace width ranged from 18. 2–22.0 mm in males and 18.0–19.2 mm in females. Larger individuals were recorded in Kola For est Streams 1 and 2, where dense canopy cover and minimal human disturbance were observed. Smaller individuals were more frequent at Koto Farmland sites, likely reflecting environmental str ess and agricultural impacts. Although no gravid females were recorded during this phase, the pr esence of juveniles (<17 mm CW) suggests ongoing recruitment. Detailed reproductive biology st udies are currently being conducted at the Department of Biological Sciences, Fourah Bay Colleg e.

Habitat Conditions and Water Quality

Water quality parameters across the study sites ranged as follows:

Temperature: 24.6–25.4 °C, pH: 6.2–6.9, Dissolved Oxygen: 5.8–7.2 mg/L. Shaded forest streams exhibited higher dissolved oxygen levels and supported larger crab specimens, while open and disturbed sites showed lower habitat quality and smaller body sizes.

Associated Fauna and Predators

Observed predators included fish species (Clarias gariepinus, Tilapia zillii), monitor lizards (Varanus niloticus), and birds (Ardea cinerea). Associated aquatic invertebrates such as Macrobrachium shrimp and dragonfly larvae shared similar microhabitats.

The undescribed crab species were also recorded. But genetics and detail morphology are needed for their taxonomic description.

Water quality at Outamba National Park ranged from 24.6 – 25.4 °C, pH 6.2 – 6.9, and dissolved oxygen 5.8 – 7.2 mg/L. Shaded sites (Kola and Yamere) showed higher DO and larger crabs, while the open Koto site had smaller individuals and visible habitat stress.

Crab predators recorded included fish (Clarias gariepinus, Tilapia zillii), monitor lizards (Varanus niloticus), and birds (Ardea cinerea). Associated invertebrates such as Macrobrachium shrimp and dragonfly larvae share the same microhabitat and resources.

However, human activities such as mining, hunting, firewood collection and agriculture at Outamba and surrounding areas pose localized threats through trampling freshwater crabs and other critically endanger animals and plants species, siltation and water pollution.

Specimens of the genus Liberonautes were recorded from six sites (Yamere, Koto, Madina, Gadabi, Lake Solfon (Bendukoro) and FBC Botanical Garden), totaling 44 individuals (17 ♂, 18 ♀).

Workshops, radio talks, and school programs were conducted at the end of every Month at Outamba and the surrounding villages. These engagements increased community knowledge about the ecological importance of freshwater crabs as detritivores and water cleaners. Traditional chiefs and youth leaders pledged to support local monitoring and avoid destructive activities near sacred streams.

My taxonomy contribution reveals that the specimens refer to **Afrithelphusa Gerhildae at the Outamba-Kilimi National Park will be placed as a new species according to molecular analyses.**

The rediscovery and confirmed persistence of this new species around Outamba–Kilimi National Park represent a major conservation achievement for Sierra Leone. Anthropogenic threats were also reported to Afrithelphusa leonensis that is a critical endangered species re-discovered by the team led by Prof. Dr. Pierre A. Mvogo Ndongo.

Traditional sacred groves and the Guards at the National Park remain effective in preserving biodiversity but require support to withstand modern pressures such as mining and farming.

Community education and scientific data from this project will provide a solid basis for future management and policy collaboration with the OKNP authorities.

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Fig. 1 Habitat of the critically endangered freshwater crab Afrihelphusa outamba at Outamba National Park

Fig.2 A potential new *Afrithelphua* species discovered near Lake Solfon (Bendukoro)

Fig. 3 A potential New species of *Liberonautes* Recorded near Lake Solfon (Bendukoro)

Fig. 4. Field Trip at the FBC Botanical Garden

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