Final Evaluation Report

Your Details	
Full Name	Monica Tembah Shilereyo
Project Title	The abundance and distribution of Geata Mouse Shrews (*Myosorex geata*) and their environmental and anthropogenic drivers in the Uluguru Mountains, Tanzania
Application ID	38747-1
Date of this Report	23/12/2025

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
Updates on the population abundance and distribution of the *M. geata* in the Uluguru mountains	X			Only one individual of *Mysorex* sp. was captured during the study period, with species confirmation pending molecular analysis. The extremely low detection may reflect rarity or population decline, raising conservation concern and highlighting the need for targeted surveys and long-term monitoring to assess its status and inform management. To maximize capture success, trapping was conducted during both the wet season (April–May 2025) and the dry season (October 2025) using permanent sampling plots. Trapping transects were established along an altitudinal gradient, where three sites were selected based on elevation: Site 1 (lower elevation, 1200 m a.s.l.), Site 2 (middle elevation, 1900 m a.s.l.), and Site 3 (upper elevation, 2450 m a.s.l.). At each elevation, two permanent plots were established (a primary plot and a replicate), making a total of six plots across the three sites. At each site, 200 Sherman traps and 22 bucket pitfall traps were

				installed and operated for four consecutive nights per season. This resulted in a total of 16 trapping nights per site per season and 32 trapping nights across both seasons. The entire study had 5,328 trap night effort.
Fill the conservation gap on the distribution of the species and their environmental correlates (seasonal, elevation gradient and the vegetation variables).			X	Small mammal (rodent and shrew) abundance, distribution, and diversity were assessed, revealing a clear separation of species along the elevation gradient. Variables such as tree height, tree density, shrub height, and litter depth that were generally higher at middle and upper elevations were found to significantly influence small mammal community composition and distribution. These findings underscore the need to restore lower-elevation habitats in order to maintain ecosystem integrity. During the entire study, a total of 221 individuals were captured, belonging to two orders (Rodentia and Eulipotyphla), four families (Dendromurinae, Muridae, Myoxidae, and Soricidae), and 13 genera. Of these, seven taxa were identified to species level, while six were identified only to the genus level. The recorded taxa included *Crocidura monax*, *Crocidura* sp., *Myosorex* sp., *Sylvisorex* sp., *Dendromus melanotis*, *Graphiurus murinus*, *Grammomys ibeanus*, *Hylomyscus denniae*,

				Lophuromys flavopunctatus, *Mastomys natalensis*, *Mus* sp., *Praomys delectorum*, and *Praomys* sp. Most species in the family Soricidae, to which the focal species belonged, could not be identified to species level. Among the captured taxa, *Praomys* spp. was the most abundant. Some species within this genus are considered vulnerable, and species such as *Praomys delectorum*, which was identified in this study, are reported to have restricted habitat requirements, with some island populations being isolated from others (Happold, 2013). According to the IUCN Red List, *Graphiurus murinus* is classified as Least Concern. However, Kingdon (2015) noted that there is insufficient ecological information, and the species may face threats, highlighting the need for monitoring to establish its conservation status in the Eastern Arc Mountains. For the genus *Mus*, some African species are reported to be endangered, while others remain data deficient (Happold, 2013). The DNA sample collected will help confirm the species of these individuals in this forest. Individuals belonging to the family Soricidae (*Crocidura* sp., *Myosorex* sp., and *Sylvisorex* sp.) were not identified to species

				level. For *Sylvisorex* sp. very little ecological information is available, and further research is needed to determine its conservation status. Tissue samples were collected for molecular analysis. Within the genus *Crocidura*, some species are endangered and poorly known. Since several individuals could not be identified morphologically, the collected samples will be subjected to DNA analysis for accurate species determination. The focal species in this study, *Myosorex* sp., is categorised as Endangered (IUCN, 2016). Only one individual was captured. A DNA sample was collected to confirm its species identity. Following molecular analysis, individuals that could not be assigned to species level will be identified, enabling clearer determination of their conservation status, including whether they are endangered or vulnerable.
Understanding community awareness of the importance of Uluguru mountains forest conservation for livelihoods.			X	More than 80% of respondents were aware of the importance of the forest to their livelihoods, with most individuals identifying only tangible benefits, such as water availability for domestic and agricultural use. Their inability to articulate intangible ecosystem services, coupled with reluctance to adopt new

				sustainable farming practices, highlights the need for more targeted conservation education. Social data were collected from two regions; Movemero and Morogoro urban and were selected due to their closeness to the Uluguru forest Reserve. A total of four wards were purposively selected across these two districts namely; Bunduki, Nyandira, (in Mvomero district), Bigwa and Kilakala (in Morogoro Urban). Two villages from each ward were selected making a total of **eight villages. A total of 268** respondents were interviewed representing 10% of the total households from each villages surveyed as recommended by Kothari (2004). Over 99% of the respondents had no idea about the ecological roles of small mammals, commonly referring to them simply as rodents. • **Outreach topic:** Therefore, I designed a topic on the role of small mammals in the ecosystem, including their functions in the food web as well as their role as seed dispersers. During the interviews, respondents showed greater awareness of mainly tangible forest benefits, particularly water availability (60%), while giving less attention to

				important intangible aspects such as climate regulation and soil improvement (about 20%). • **Outreach topic**: Tangible and intangible benefits of the Uluguru Forest for improved livelihood and sustainable conservation. More than 50% of respondents reported that forest conditions had deteriorated; however, they were reluctant to identify the specific activities responsible for the loss. Evidence from satellite map analysis showed expansion of settlements and agricultural land at the expense of forest cover. Field observations and key informant interviews including village chairpersons, village environmental committee chairpersons, and the Uluguru Chief Conservator identified the main drivers of forest degradation as fire, agricultural expansion, settlement encroachment in upland areas up to 1,800 m a.s.l., and illegal mining. • **Outreach topic:** Anthropogenic activities and their impacts on the Uluguru forest and its associated ecosystem services. It was also observed that the community was reluctant to adopt environmentally friendly practices, such as terracing in hilly farming areas and the use of fuel-saving stoves. This reluctance was partly attributed to resistance to change,

				limited awareness, and misconceptions about these techniques. • **Outreach topic:** Promotion of environmentally friendly practices for sustainable livelihoods. However, this programme was not widely implemented because it required collaboration with multiple stakeholders, including agricultural extension officers, energy-saving technology specialists, forest personnel, and other relevant actors.

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

a) Generation of baseline small mammal diversity data. This is the first study in the Uluguru forest by assessing small mammal abundance and composition in relation to season, elevation and vegetation structure. In addition, the component of community's awareness and engagement in forest conservation further made this study unique. These data fill an important knowledge gap for this Eastern Arc ecosystem and provide a reference for long-term monitoring and future conservation research.

b) Evidence of links between habitat change and biodiversity. The study demonstrated clear relationships between small mammal assemblages, habitat structure, elevation, and human disturbance. The results provide empirical evidence of how forest degradation and land-use change are affecting biodiversity, supporting the need for improved forest protection and sustainable land-use practices.

c) Gap between awareness and adoption of sustainable practices. The project revealed that local communities are generally aware of the importance of forest resources for their livelihoods; however, this awareness has largely been limited to tangible benefits such as firewood, and agricultural land. Intangible benefits such as biodiversity conservation and climate regulation are less recognized, and this limited perception has not translated into widespread adoption of sustainable practices. This gap appears to be driven by reliance on business-as-usual livelihood strategies and limited access to practical, skills-based support from extension

services, highlighting the need for strengthened capacity-building and community-focused conservation interventions.

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

1. The distance from one elevation (site) to the next elevation. Ideally, I calculated three hours walk up the mountain. But moving to the higher elevation, took up to six hour especially when the crew had big luggage with them. This increased cost of pottering services.
Solution: Working with local, experienced youth in both seasons greatly helped with negotiations and ensured that activities remained within budget. When negotiations were difficult, the budget was adjusted to keep the work progressing.

2. Delayed rains in the mountain. This year there was little bit of delayed long rains in March-April.
Solution: I had to postpone wet-season data collection to late April to meet the experimental requirements, which consequently delayed data collection and the overall project.

3. Difficult terrain and dense vegetation. Steep slopes and thick vegetation made movement and transport (pottering) of equipment challenging.
Solution: These constraints were mitigated by working with local guides familiar with the terrain and by modifying transect layouts to maintain safety and data consistency.

4. Human disturbance at lower elevation. Ongoing agricultural and forest-use activities around the lower elevation site occasionally interfered with sampling (disturbance to small mammals).
Solution: Sampling locations were adjusted to minimize disturbance while still representing habitat conditions.

5. Increase in working cost than expected. Original budget showed only one assistant from the University. But due to nature of the work I had to employ one more. I had to pay the operation costs to the university that was not budgeted at the beginning. During the initial stage of the project, I proposed using public transport for the team, but due to nature of the study and the materials/resources needed I opted for car hire for timely landing and make sure that all the working materials will arrive safely (Sherman traps are particularly prone to damage when they are not handled properly). Although these items were not included in the original budget, they were

covered through negotiations and adjustments resulting from changes in the exchange rate.

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

Local communities were actively involved throughout the project, including;

1. Assisting with field surveys: During household interviews, I engaged two local community members from each surveyed villages to assist with navigating the area and introducing me to households for interviews. They were compensated for their work and, in addition, gained practical experience in social data collection.
2. Providing local knowledge on forest areas, guiding researchers along transects, and assisting with small mammal signs identification. During trapping, over ten local individuals supported various activities, including navigating the forest, identifying trails, and acting as security guides. All were paid as agreed. Some forest guardians used project resources to patrol areas beyond their normal stations. Selected individuals were trained to set Sherman and bucket pitfall traps and safely handle small mammals, developing practical field skills and experience in wildlife monitoring.
3. They participated in discussions on sustainable land-use practices and were exposed to some sustainable practices through photos on phones such as what is terracing and its importance in controlling soil erosions. During our movements from one site to another we used to encounter fires signs and illegal activities in the forest, and through discussions, they got some insights and knowledge on conservation practices, increased awareness of the ecological importance of forests beyond immediate livelihood benefits.
4. Dissemination of findings through village leaders and Village Environmental Committees. Out of the eight villages surveyed during data collection, I visited four villages (two villages from each district) to share the initial project findings. Discussions focused on the benefits of the Uluguru Mountains forest to local livelihoods, raising awareness of unsustainable practices threatening the forest, and the community's role in forest conservation for sustainable development. Disseminating project findings to the study villages strengthens community ownership of conservation outcomes and ensures that information reaches local decision-making structures.

5. Are there any plans to continue this work?

Yes, I plan to continue this work because *Myosorex geata* was the focal species of this study. However, I collected only one individual of *Myosorex*, which has yet to be confirmed to species level, possibly through molecular techniques. This low capture

may indicate the species' rarity and highlights the need for long-term monitoring within and beyond the elevations of its historical records. Additionally, surveying adjacent forests, such as Rubeho and Ukaguru, where the species has been reported, will provide further insight into its distribution and inform conservation strategies.

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

I have participated in dissemination meetings in the four study villages. In these meetings, I engaged Village Environmental Committee members and local leaders to discuss the main findings of the project, including the importance of the Uluguru Forest to local livelihoods, threats to the forest, and potential livelihood alternatives to reduce pressure on the mountain.

The study findings and key recommendations have partly been shared with the Tanzania Forest Service. A meeting with the Chief Conservator highlighted the introduction of zero-fire incentive schemes for villages that prevent farm-to-forest fire outbreaks for one or two consecutive years. Collaboration with extension services to promote sustainable farming practices, including terracing, was also recommended to support both livelihoods and forest conservation.

As per guidelines, a full report will be submitted to the Tanzania Forest Service, Tanzania Wildlife Research Institute (TAWIRI), Tanzania Forestry Research Institute (TAFORI), and the Mvomero District, with a summary currently being prepared. Manuscripts based on the study ate also in development for publication to reach a wider audience.

The findings of this project will be presented at the University of Dar Es Salaam Research week to be held on March-April 2026.

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

i. Long-term monitoring of *Myosorex geata* to better understand its population status and distribution, both within the Uluguru Mountains and in adjacent forests such as Rubeho and Ukaguru.

ii. Expanding community engagement through Village Environmental Committees will help promote sustainable practices and reduce pressure on the forest (Example, investing in practical oriented education of sustainable agricultural practices to farmers).

Iii. The data collected will support the development of targeted conservation strategies and management plans for the Uluguru ecosystem, including zero-fire incentives for villages that maintain a zero-fire record, integration of small mammal monitoring into the forest conservation framework as bioindicators, and recognition

of less visible forest benefits to enhance community awareness and promote full engagement in forest conservation.

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 used the Rufford Foundation's logo on the diary and the T-shirts. Since T-shirts are more visible to the public than diaries, participants wore the T-shirts during all dissemination meetings conducted in the study villages. To confirm this, photos were shared with the foundation in the progress report.

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

1. **Prof. Flora Magige**. Read and commented during the initial stage of the application. She advised on the methodology and visited in the field for procedure. Now working on the data for publications
2. **Prof. Eivin Røskaft**. Read and commented during the initial stage of the application. Advised on the proper methodology for small mammals capture.
3. **Dr. Joseph Ogutu**. Read and commented during the initial stage of the application. Advised on the research design and possible papers to be published.
4. **Christina Malekani.** Field assistant during both house hold interviews and in the small mammal trapping.
5. **Dario Lucas**. He assisted in the field during small mammal trapping, specifically supporting the implementation of animal handling protocols
6. **James Mapua** is the TFS contact person in the forest and a member of the Village Environmental Committee. He served as a critical bridge between researchers and local leaders during both social surveys and small mammal trapping. He worked with us throughout the project as a forest guide and security escort, ensuring the safety of researchers and their equipment.
7. Dickson Mabula and Joseph Kichupa. Drivers
8. **General community**. They participated in the household and key informant interviews (citizen science) and collectively they made the project easier to execute.

10. Any other comments?

The successful implementation of this project highlights the critical role of The Rufford Foundation in supporting conservationists and advancing biodiversity conservation. The funding enabled the integration of scientific knowledge with community-led conservation, fostering ecological insights and stronger local stewardship. The project has also increased awareness of the Uluguru Forest's benefits and the threats from human activities, strengthening stakeholder commitment to its conservation. I view this project as a valuable Rufford investment in grassroots conservation and am inspired to continue this work to achieve greater conservation impact.

ANNEX – Financial Report

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Using the budget provided with your original application, please give a breakdown of budgeted versus actual expenditure. If there is a difference between the budgeted and actual amounts, please explain why.

If there are funds remaining, these should be returned to the foundation. We will provide details of how this can be done.

It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

All figures should be given in pound sterling, indicating the local exchange rate used.