Final Evaluation Report

Your Details	
Full Name	DAVID ONYIMBI
Project Title	ROOST SITE SELECTION BY HILDEGARDE'S TOMB BAT (*Taphozous hildegardeae*) AT THE KENYAN COAST.
Application ID	42941-1
Date of this Report	10th July 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
i. To determine the microclimatic characteristics of caves occupied and those not occupied by the Hildegarde's Tomb bat.			■	Inclusive of the newly discovered caves during the study, we have a total of 10 surveyed caves: 5 with the target species and 5 controls for each of those. Data loggers (2 per cave) were placed in all the caves, and programmed to collect data every hour of a day for a whole week. The results reveal that the presence of Hildegarde's Tomb Bat (*Taphozous hildegardeae*) is closely linked to certain cave conditions. In particular, caves with moderately high and variable water vapour pressure and temperature were more likely to host the species.
ii. To determine physical characteristics of caves occupied and those not occupied by the Hildegarde's Tom bat.			■	While larger and more structurally complex caves tended to support more individuals, these physical features did not show statistically significant differences between occupied and unoccupied sites. This could have been as a result of insufficient data points as we only worked on 10 caves as broken down above, but is subject to confirmation as we intend to continue exploring more caves and building upon the current data for more statistical power.
iii. To describe the macro habitat surrounding of			■	At the broader landscape level, target caves occurred in areas with contrasting land uses—some

caves occupied and those not occupied by the Hildegarde's Tomb bat.				surrounded by dense forest, others within highly urbanised environments—highlighting the species' apparent tolerance for a range of macro-habitat conditions.

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

a) **Scientific Insight on Roost Site Selection:** The most significant outcome of the project was successfully identifying the key factors influencing roost site selection by Hildegarde's Tomb Bat (*Taphozous hildegardeae*). Our findings revealed a clear preference for caves with high microclimate variability, as well as those that are larger and structurally more complex. This provides critical baseline data to inform targeted conservation planning for this endangered species.

b) **Positive Shift in Community Perceptions:** Another major outcome was the noticeable shift in how local communities perceive bats. Community members became increasingly curious and engaged, asking why scientists were studying bats in their area. This growing interest represents a crucial step toward fostering local stewardship and paves the way for future education and capacity-building efforts in bat conservation across coastal Kenya.

c) **Forging Strategic Conservation Partnerships:** The project also led to the establishment of valuable collaborations with organisations such as CoalitionWILD, Global South Bats, the Woodtiger Fund, and Bat Conservation International. These networks, alongside the support of the Rufford Foundation, are vital to ensuring the long-term sustainability and regional expansion of conservation efforts for Hildegarde's Tomb Bat in Kenya and the broader East African region.

We documented a considerable number of other bat species, as the caves are multi-specie caves. With consultation, confirmation and appropriate guidance, I intend to develop information posters with this lists and have them put up outside each studied cave as part of our community outreach and education phase.

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

One unforeseen challenge was the difficulty accessing several key caves during the rainy season. We hadn't anticipated that some of these caves would flood to knee-high levels, making entry and data collection difficult. To address this promptly, we procured appropriate wading gear, which allowed us to safely access the flooded caves and continue our work without significant delays.

Another unexpected obstacle involved infestations of aggressive ants in several dry caves. These ants, which densely covered the cave floors, made it nearly impossible

to move through, conduct measurements, or install our microclimate data loggers without disruption. To overcome this, we adopted a field-tested solution: soaking our footwear in used engine oil before entering the caves. This acted as a deterrent and allowed us to complete our tasks with minimal interference.

These adaptive field strategies not only helped us stay on schedule but could also serve as useful lessons for other researchers working in similarly challenging cave environments.

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

In each locality where we surveyed caves, we worked closely with at least two community guides. We worked with a total of four community guides, two from the North and two from the South coast, as named in the team members list in **(Q9)** below. Their involvement was vital to the success of the project. These local guides played a key role in locating cave sites, facilitating access—especially when dealing with privately owned or culturally significant caves—and assisting with field activities. Their ability to communicate our mission in local dialects was particularly important in building trust with landowners and community members, enabling smoother collaboration and site access.

Beyond logistical support, the community guides gained practical skills through hands-on involvement in fieldwork. They were trained in basic techniques such as GPS coordinate recording, cave surveying, and wildlife photography, and also learned about bat ecology and conservation. This experiential learning enhanced their understanding of local biodiversity and equipped them with foundational skills that can support future conservation work.

Their participation has also laid a strong foundation for post-project awareness campaigns. As respected members of their communities, these guides are well-positioned to share knowledge about the importance of bats and promote conservation-friendly attitudes. Furthermore, their involvement opens up possibilities for future collaboration, particularly in identifying and mentoring youth and potential assistants for ongoing bat surveys and monitoring in coastal Kenya.

5. Are there any plans to continue this work?

Absolutely—there are clear and strategic plans to continue and expand this work. During our field activities, we unexpectedly discovered two previously undocumented caves, Mkate and Mwanangoto, inhabited by Hildegarde's Tomb Bat—one in Shimoni and another in Watamu. These discoveries significantly extend the known distribution of this endangered species and underscore the urgent need for further exploration.

Building on this momentum, I have already secured additional funding through the 2025 Bat Conservation International (BCI) Scholars Programme. This support will allow us to replicate our fieldwork, such as cave characterisation and microclimate monitoring, in the newly identified caves. The expanded dataset will enhance the scientific robustness of our results and contribute to impactful future publications.

Looking ahead, we have identified several priority areas for the continuation of this project:

Exploration and Mapping of Additional Roosts:
The species' potential range is broader than what has been surveyed so far. We aim to explore, map, and assess additional caves across coastal Kenya, contributing to more accurate species distribution modelling and conservation planning.

Community Education and Capacity Building:
We plan to develop targeted educational outreach and training programs for local communities, particularly youth and conservation volunteers. This will increase local stewardship and inspire the next generation of bat conservationists.

Policy Engagement:
We intend to share our findings with local and national wildlife authorities to advocate for the formal protection of key roost sites. Our data can inform cave management policies and support the integration of lesser-known bat species into regional conservation agendas.

Habitat Protection and Monitoring:
Long-term goals include establishing a local bat monitoring network, involving trained community members, to ensure regular surveillance of critical habitats. We also hope to collaborate with landowners and local governments to implement protective measures for roost caves, such as buffer zones or cave access guidelines.

We are actively seeking further support, through future grants from the Rufford Foundation and other partners, to scale up these efforts. Continued investment will be essential in securing the long-term survival of Hildegarde's Tomb Bat and preserving the integrity of its fragile cave ecosystems.

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

1. Scientific Conferences;

NMK–AKE 1st Joint International Scientific Conference, 2024:
I have already presented our preliminary findings and methodological approach at this Nairobi-based forum, which fostered valuable feedback from regional experts.

20th International Bat Research Conference, Cairns (August 2025):
I am scheduled to deliver a full talk on the microclimate preferences of Hildegarde's Tomb Bat, exposing our work to a global community of bat researchers and conservation practitioners.

2. Academic Thesis & Peer-Reviewed Publication;

I am finalizing my master's thesis for submission and examination at the University of Nairobi.

Following my thesis defense, I will prepare one or more manuscripts for submission to high-impact, peer-reviewed journals (e.g., African Journal of Ecology, PLOS ONE, or Acta Chiropterologica), ensuring our data and interpretations reach the broader scientific community. We are yet to select a particular journal at this stage.

3. Engagement with Wildlife Authorities;

We will compile concise policy briefs and presentations for Kenya Wildlife Service, Kenya Forest Service, and National Museums of Kenya.

These documents will translate our cave-monitoring data into clear recommendations—such as formally designating key roost sites, developing cave-management guidelines, and integrating lesser-known bat species into national conservation frameworks.

4. Stakeholder & Community Outreach;

In collaboration with local partners, we will organize workshops and village-level meetings to share results in accessible formats (e.g., illustrated fact sheets, slide presentations in Kiswahili and local dialects).

These sessions will reinforce community stewardship, illustrate the ecological value of bats, and solicit feedback on future research priorities.

The priority is to finalise thesis submission and defence of this project, then start working on the outreach plan by the final quarter of this year. This will include a proposal to RSG for a second grant as we progress with this work. Consequently, with secured funding, we intend to start executing this workshops by the end of the 1st Quarter of 2026.

5. Open-Access Data & Digital Dissemination;

Data (e.g., cave microclimate logs, GPS coordinates, photographic documentation) will be deposited in an open-access repository such as Dryad or the Kenya Biodiversity Data Portal.

We will also leverage institutional websites and social media channels to publish highlights, infographics, and video summaries, broadening our reach to educators, NGOs, and the general public.

By combining formal scientific outlets, policy engagement, community education, and open-data sharing, we aim to maximise the impact and uptake of our findings across multiple audiences.

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

The most important next steps involve deepening community engagement while expanding the scientific scope of our work. First, we plan to prioritize education,

awareness, and conservation capacity building in the communities where we have already completed cave surveys. These areas have shown growing interest and curiosity, and it is vital to harness that momentum by equipping local stakeholders—especially youth and landowners—with knowledge about bats, their ecological roles, and how to protect their habitats.

Through targeted workshops, training sessions, and school outreach, we aim to cultivate a network of local champions who can sustain awareness and support for bat conservation long after our project ends. Strengthening community-level understanding will also help reduce negative perceptions about bats and promote co-existence.

In parallel, we plan to scale up cave exploration and mapping across the wider coastal Kenya region—and eventually into neighbouring areas of coastal East Africa. The discovery of new Hildegarde's Tomb Bat roosts during this project suggests that many important habitats remain undocumented. Systematically identifying and assessing these sites will provide critical data for species conservation planning at the landscape level.

Ultimately, these steps—community-based education, regional cave exploration, and capacity building—will help secure both grassroots and institutional support for the long-term protection of Hildegarde's Tomb Bat and the unique cave ecosystems it depends 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! The Rufford Foundation logo was proudly included on all formal project materials, including presentations, posters, and official reports. It was prominently featured during my presentation at the NMK–AKE 1st Joint International Scientific Conference (2024), where the Foundation was acknowledged for its support.

The Foundation has received and continues to receive substantial visibility and recognition throughout this project, and will into the foreseeable future. As I prepare for the 20th International Bat Research Conference in Cairns, Australia (August 2025) and future publications, the Rufford Foundation will be acknowledged in all associated materials, ensuring its role in supporting grassroots conservation is widely recognised in both local and international arenas.

Additionally, the Foundation was mentioned in community outreach sessions and stakeholder meetings, reinforcing its role in empowering locally led conservation work. We are committed to continuing to highlight Rufford's support in our ongoing work, ensuring their impact is visible, appreciated, and linked to real-world conservation outcomes.

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

TEAM MEMBER:	ROLE:
Mr. David Onyimbi:	Researcher.
Dr. Evans Mwangi:	Primary Academic advisor.
Dr. Paul Webala:	External Academic advisor.
Dr. David Waldien:	External Academic advisor.
Mr. Simeon Kajengo:	Community guide/ field assistant.
Mr. Juma Mwadarusi:	Community guide/ field assistant.
Mr. Mwinyi Gobo:	Community guide/ field assistant.
Mrs. Mwanaulu Mkulu:	Community guide/ field assistant.

10. Any other comments?

I am deeply grateful to The Rufford Foundation for believing in and supporting this grassroots initiative. The Foundation's support not only enabled important scientific discoveries about the endangered Hildegarde's Tomb Bat but also helped catalyze community-level interest in bat conservation—something that is rare but critically needed in coastal Kenya and beyond.

This project has laid a strong foundation for future work in research, education, and habitat protection. I believe Rufford's model of empowering early-career conservationists at the local level is a powerful force for change. It offers young scientists like me the opportunity to take leadership in addressing urgent conservation issues from the ground up.

Moving forward, I hope to build on this momentum by forging stronger collaborations, influencing policy, and ensuring that local communities remain at the heart of conservation solutions. I would gladly recommend Rufford's support to other emerging conservation leaders who are ready to turn their ideas into a tangible impact.

Thank you once again for this opportunity—it has been a transformative chapter in both my career and personal journey as a conservationist.