

Final Evaluation Report

Your Details	
Full Name	Harith Farooq
Project Title	Extinct or just shy? A quest to find two of the least known skinks in East Africa.
Application ID	29825-1
Grant Amount	6,000
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Date of this Report	February 10 th 2022

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
Conduct an unprecedented 365-day herpetological survey in Northern Mozambique				We started our sampling in April, so we expect to finish the sampling in 63 days (we have a live countdown of the survey on our website: https://extinctorsy.org/)
Find the species <i>Proscelotes aenea</i> for the first time in over 100 years				We found the species for the first time in 100 years!
Find the species <i>Scolecocoeps boulengeri</i> for the first time in over 100 years				We didn't find the species and we suspect that it may be locally extinct in Lumbo.
Produce a species list of amphibians and reptiles of Lumbo				We have so far made a list of 17 species of amphibians and 40 species of reptiles. All photographed and well documented.
Document <i>Proscelotes aenea</i> and <i>Scolecocoeps boulengeri</i> : habitat, photographs and DNA sequences				We took for the first-time pictures of a live <i>P. aenea</i> as well as DNA samples. I am currently sequencing them in Sweden.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

We have a system of five traps spread out in our sampling area in Lumbo, northern Mozambique. They consist of pitfalls (buckets), snake traps and plates to guide the animals to our traps. Unfortunately, despite presenting our project to all the communities in the area, as well as the police, we still got some of our equipment stolen throughout the project. We replaced the equipment immediately and contacted the police.

3. Briefly describe the three most important outcomes of your project.

The most important outcome of this project are:

1. Finding the montane skink (*Proscelotes aenea*) for the first time since 1918.

2. Collection of important information on phylogenetics (DNA tissue), the habitat abundance in the area and the life history of the species.
3. The fact that we didn't record the Boulenger's limbless skink (*Scolecocaps boulengeri*) after almost 1 year of daily searches and trapping. It is therefore plausible to assume the local extinction of the species caused by the recent urbanisation of the area.

4. What do you consider to be the most significant achievement of this work?

5. Briefly describe the involvement of local communities and how they have benefited from the project.

The project didn't have a social component, but we presented the study to the local communities and welcomed any advice on finding the target species. During the project, we realised that we want to extend this project to involve local communities, to understand exactly how people and reptiles interact. My research in the north has shown that local communities kill any snake they encounter, regardless of where they find it. Therefore, it is important to understand whether local communities consider our target species, a limbless skink, to be a snake. In that case, it may be one of the causes of its local extinction. Another area we want to expand is land use. We wonder how can land use, a consequence of rapid recent population growth in the area has affected the soil where these skinks dwell.

6. Are there any plans to continue this work?

Yes, it is urgent to search for the species in between Lumbo and Pemba. These two species were observed in Pemba in 1948 and in Lumbo in 1918. My work in Pemba prior to this project showed that the species do not occur there anymore. Therefore, Lumbo was the last opportunity to find them where they were recorded previously. After this survey, we confirm the existence of the montane skink, in small numbers, and we can with some degree of confidence, propose that the Boulenger's limbless skink is locally extinct in Lumbo.

Since both Lumbo and Pemba are two coastal cities in Mozambique, 200 km apart, there is the possibility that both species occupy suitable habitat in between these towns. The habitat there is much more pristine and much less urbanised. That area remains now the last possible suitable habitat for the Boulenger's limbless skink before it is considered extinct and may house healthier populations of the montane skink which is found in Lumbo but in very low numbers.

I also plan to extend this work to local communities and understand: (1) Whether the limbless skinks are considered to be snakes due to their absence of limbs; and (2) how these species relate to anthropogenic effects on soil (e.g., Agriculture and pollution)

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

So far, the project has yielded two popsci articles in the conversation (one with over 200,000 views), 1 interview on the Swedish radio, and made it to the Mozambican press. In addition to these initial outputs, there are a number of articles that will be produced from this initial survey:

- Rediscovery of the Montane skink (*Proscelotes aenea*) in Lumbo, Northern Mozambique:
Here we will publish the rediscovery of this species, share photographs, videos, life cycle information, abundance and produce habitat suitability maps for the species. This will be submitted to African Zoology
- A checklist of amphibians and reptiles in Lumbo.
Here we will share the results of our survey and help illuminate the lack of information on amphibians and reptiles in the poorly documented northern Mozambique. This will be submitted to Amphibian and Reptile conservation.
- Survey method versus yield in herptiles: What is the most effective way of sampling reptiles and amphibians?
After 365 sampling days, we used different methods to sample the town of Lumbo. We will do an analysis of the most efficient methods and how they relate to the species found. This study has never been conducted before and will bring to light which methodology is more efficient for each type of amphibian or reptile. This will be submitted to Methods in Ecology.
- A framework for documenting biodiversity in developing countries.
Here I will discuss the potential of combining local universities with specialists to conduct surveys in priority areas to document species in urgent need of data. This will be submitted to a high-profile journal such as Nature Communications.

Conservation outcomes:

IUCN assessments:

Scolecocaps boulengeri will be proposed as Critically Endangered, possibly extinct CR (PE) based on EOO and the number of locations (1).

Proscelotes aenea will be proposed as Critically Endangered (CR) based on EOO and the number of locations (1).

This step will be crucial to propose Lumbo as a Key Biodiversity Area.

Links for outputs of the project:

<https://theconversation.com/search-for-elusive-skinks-is-filling-gaps-in-mozambiques-biodiversity-data-165635>

<https://theconversation.com/one-sentence-in-a-book-leads-researchers-to-a-species-not-seen-in-over-100-years-170560>

<https://sverigesradio.se/avsnitt/forlorade-arter-behover-inte-vara-utdoda>

<https://cartamz.com/~cartamzc/index.php/sociedade/item/9236-proyecto-da-universidade-lurio-em-nampula-encontra-especie-de-lagarto-que-nao-era-vista-ha-mais-de-100-anos>

8. Timescale: Over what period was the grant used? How does this compare to the anticipated or actual length of the project?

The grant was received in February 2022, and after purchasing the required equipment and logistics we started the sampling on April 22nd, 2022. The survey is for 365 days and is still underway. We have already conducted 83% of the survey and we will continue with the sampling until April 23rd, 2022.

9. Budget: Provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. 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.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Field assistant salary x2 x 12	800		-800	We decided to have only a team of students at the end.
Food, communication (12 months)	440	1700	+1,260	
Field equipment	800	800		
Ziplock's, vials, ethanol	800	300	-500	
Travel Pemba-Gothenburg x 2				
DNA sequencing	1200		-1200	Covered by the Antonelli Lab, at Gothenburg University
DNA amplification	100		-100	Covered by the Antonelli Lab, at Gothenburg University
DNA extraction	100		-100	Covered by the Antonelli Lab, at Gothenburg University
Phone with camera for field assistant	150	400	+250	Olympus tough TG6 + ring flash and extra batteries.
Travel Pemba-Lumbo	410	600	+190	
Pitfall-systems	1200	200	-1000	Partly donated by Luke Verburgt

Sub-total	6000	4000		
Housing for students in Lumbo		2000	+2000	Instead of hiring local people we decided to use students full time, therefore it was cheaper to rent a house in Lumbo for 12 months.
Total	6000	6000		

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

My previous work in Pemba, where I compiled records of reptiles in the last 20 years showed that both species are absent in the area. This means that Lumbo was the last known place where the species could be found. One of the species was found *Proscelotes aenea*, but in very small numbers. After almost a year with traps and daily active search we still didn't find the same number of individuals that were caught in 1918 (in 2 months), suggesting that the species is in decline in Lumbo. This information together with the fact that *Scolecocaps boulengeri* has yet not been found and is probably extinct in Lumbo, makes it urgent to survey other suitable areas in the surroundings of Lumbo and Pemba. Pemba and Lumbo are two coastal cities in Northern Mozambique, 200 km apart, most of it is very little urbanised and may house populations of both *Scolecocaps boulengeri* and *Proscelotes aenea*. The absence in Pemba and Lumbo of *S. boulengeri* and low numbers of *P. aenea* suggests that these two species are probably greatly affected by land use and therefore may be on the verge of extinction. Targeted protection of suitable habitat will most likely be the only way to preserve the species, therefore it is urgent to map these two species as soon as possible.

Now we have information to assess the species conservation status, while we search for additional populations. *Scolecocaps boulengeri* will be proposed as Critically Endangered, possibly extinct CR (PE), while *Proscelotes aenea* will be proposed as Critically Endangered (CR).

This will be instrumental to propose Lumbo as a Key Biodiversity Area.

11. 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 added the logo and referenced Ruffords on the project's website www.extinctorshy.org and Instagram account @eos_lumbo. I also published two popular science articles in the Conversation where I reference back and link to Ruffords:

- Farooq H, & Perrigo A (2021). Search for elusive skinks is filling gaps in Mozambique's biodiversity data. (Science + Technology). Retrieved from <https://theconversation.com/search-for-elusive-skinks-is-filling-gaps-in-mozambiques-biodiversity-data-165635>

- Farooq H, & Perrigo A (2021). One sentence in a book leads researchers to a species not seen in over 100 years (Science + Technology). Retrieved from <https://theconversation.com/one-sentence-in-a-book-leads-researchers-to-a-species-not-seen-in-over-100-years-170560> (over 200,000 reads)

12. Please provide a full list of all the members of your team and briefly what was their role in the project.

Lecturers at Lúrio university

Harith Farooq: I coordinated the whole project and supervised the students.

Cristóvão Nanvonamuquitxo: Coordinated the rotation between the various teams of students on the sites.

Students at Lúrio university

Ali Puruleia: His thesis was on the data of amphibians and reptiles collected in Lumbo, so he was in the field site for most of the survey.

Ernesto Milagre: His thesis was on the data of birds observed in Lumbo, but he helped with the collection of amphibians and reptiles.

Abdulrabe Jamal: He helped with the collection of amphibians and reptiles in the first months of the project.

Wilson Monia: His thesis was on the data of mammals in Lumbo, but he helped with the collection of amphibians and reptiles.

Iassine Amade: His thesis was on the habitat description of Lumbo, but he helped with the collection of amphibians and reptiles.

Collaborators

Allison Perrigo: Secured additional funding to teach data analysis to the students participating in the project.

Luke Verburgt: Donated 3 trapping system from his previous work in Mozambique.

Yasalde Massingue: Transported the donated traps to Lumbo and helped setting up the survey.

13. Any other comments?

I am interested in applying for a 2nd Rufford Small Grant. My previous work in Pemba and now the extensive sampling of Lumbo through this grant showed that the two species in this project, the montane skink and the Boulenger's limbless skink are extinct in Pemba, and only one of the two still occurs in Lumbo but in very small numbers.

Pemba and Lumbo are two coastal towns 200 km apart, where there are many habitats that remain pristine. It is crucial to search for these two species there to:

1. Confirm that the Boulenger's limbless skink is not extinct and
2. Assess if the population of the montane skink is not the last remaining population of the species.