

## **Project Update: February 2021**

### **Project abstract**

The project aims to understand why common species are more abundant and widespread whereas rare species are less abundant and restricted in distribution. The study tests the idea that the degree of diet generalism, variety of foods eaten by an individual, is the main determinant in whether a population goes extinct, persists, or expands its range in the face of environmental changes. Understanding how species utilise resources available to them and correlating it to their abundance and distribution, gives us the ability to predict what species are at a greater risk of extinction. Additionally, the study will build the capacity of young scientists to studying small mammals, and local community to appreciating value of small and large mammals.

### **Progress**

Since the start of the project in March 2020, I have trapped 18 different species of small mammals both shrews and rodents that differ significantly in abundance and occupancy across my study sites.

1. Fringe tailed gerbil (*Gerbiliscus robustus*).
2. East African pouched mouse (*Saccostomus meansi*).
3. Harringtoni gerbil (*Taterrilus harringtoni*).
4. Nile grass rat (*Arvicanthis niloticus*).
5. Hinde's rock rat (*Aethomys hindei*).
6. Kellen's African dormouse (*Graphiurus kelleni*).
7. Grey African climbing mouse (*Dendromus melanotis*).
8. Woodland thicket rat (*Grammomys dolichorus*).
9. Rufous elephant shrew (*Elephantulus rufescens*).
10. Natal multimammate mouse (*Mastomys natalensis*).
11. Percivalis spiny mouse (*Acomys percivali*).
12. Kemp's spiny mouse (*Acomys kemp's*).
13. White toothed shrews (*Crocidura* spp 1).
14. White toothed shrews (*Crocidura* spp 2).
15. White toothed shrews (*Crocidura* spp 3).
16. *Mus* spp 1.
17. *Mus* spp 2.
18. *Mus* spp 3.



Figure 1: Grey African climbing mouse. Figure 2: Natal multimammate mouse



Figure 3: A juvenile of Nile grass rat of about 2 days old. Figure 4: A lactating Hinde's rock rat with two juveniles tightly holding on their mother

I have collected fecal samples from five species which will be used to identify the different plant items eaten by the 5 species and their quantities through DNA metabarcoding. This will be the first ever high resolution dietary identification for these species.

I have intensively trained two local graduates of wildlife management (Cate Lonyangaita, a Wildlife Management Diploma graduate, and George Lagrange, a Wildlife Management Degree graduate) on small mammal sampling, identification, handling, blood and fecal sample collection, lab processing of samples, and data cleaning. The two graduates are now employed at Mpala Conservancy adding to the small list of scientists working on small mammals in Kenya.



Figure 5: Leo Malingati processing small mammals' fecal samples. Each fecal sample is transferred in a small uniquely labeled vial tube that has lysine solution that helps avoid fecal DNA degradation. The veils are then stored in a freeze before the DNA metabarcoding analysis.



Figure 6: Cate Lonyangaita setting up a Sherman trap for small mammals trapping

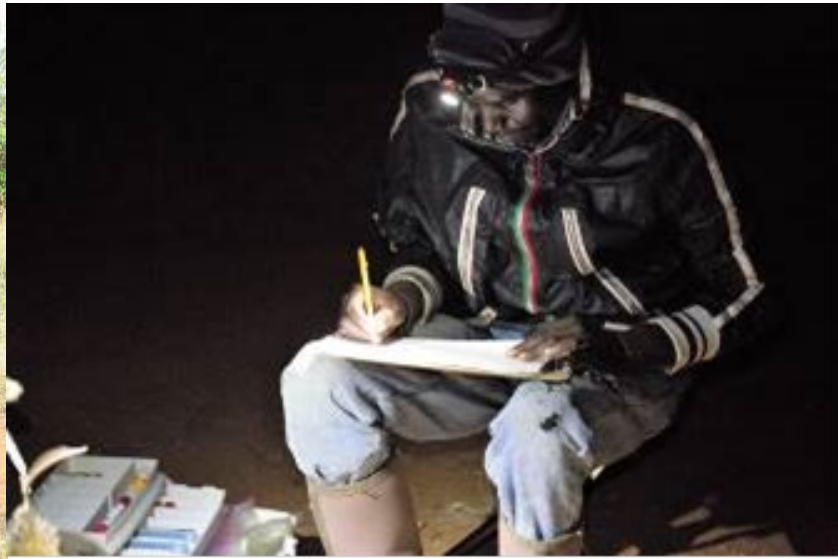


Figure 7: George Lagrange handling and processing a fringe tailed gerbil. Figure 8: Gilbert Busienei recording data on a chilly early morning. Our Traps are checked as early as 5 am.

I have had the opportunity to work with two locals (Gilbert Busienei and Peter Lokeny) who helped with fieldwork; data recording, setting and checking of traps, handling mammals and collecting samples, and processing of samples in the lab.



Figure 9: Peter Lokeny (Left) loads ear tags and prepares the small mammals processing stations. We mark captured small mammals with unique numbered ear tags for monitoring purposes. Figure 10: From the left, Gilbert Busienei and the Wildlife Warriors crew watch on as I talk about small mammals and finally release a fringe-tailed gerbil. Wildlife Warriors is a wildlife organization in Kenya that creates awareness about wildlife conservation.

I have shared my research and inspired nature enthusiasts and children who joined me in the field to learn about small mammals. Additionally, I do frequent posts on my Facebook page educating the public on fun facts of wildlife. Some of the posts have



surpassed 4000 reaches [Environmental Justice Advocates]  
<https://www.facebook.com/environmentaljusticeadvocates/>

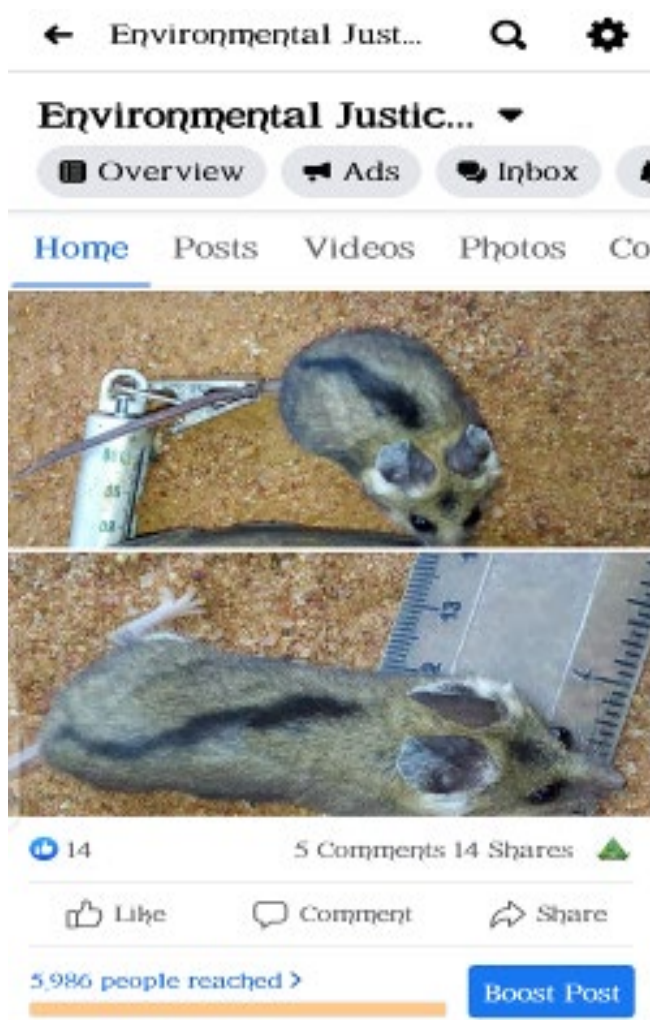


Figure 11: Screenshot of Environmental Justice Advocates Facebook page where I share posts on wildlife fun facts.

### Future plans

I am done with fieldwork and am now working on fecal sample analysis, and data analysis to answer my questions and test my hypotheses. I will be presenting my results to Mammal Committee of Nature Kenya in April 2021 and a master's defence to University of Nairobi in June 2021. I intend to do a manuscript to publish with Journal of Mammalogy from May 2021.