

Project Update: October 2023

1.0 Introduction

There has been a steep decline in the population of African elephants due to illegal killing for ivory, land use change, and human-elephant conflict. Additionally, overlapping human and elephant populations has also resulted in increased rates of orphaning/calf abandonment in elephant e.g., through killing of adults or calves becoming stuck in human landscape features like dry season wells. This study therefore seeks to assess how physiological and nutritional stress response differ among African elephants of different age and social status and occupying different habitats in Laikipia-Samburu ecosystem. The study also seeks to assess how physiological and nutritional stress response of orphaned African elephants at Reteti Elephant Sanctuary and released orphaned elephants in Sera Wildlife Conservancy compares to age and sex-matched non-orphaned individuals at Sera Wildlife Conservancy and Samburu National Reserve. Lastly, the study seeks to assess how physiological and nutritional stress of male African elephants within Laikipia-Samburu ecosystem changes during crop raiding and non-crop raiding periods.

2.0 Discussion

2.1 Assessing how physiological and nutritional stress response differ among African elephants of different age and social status, occupying different habitats in Laikipia-Samburu ecosystem

Fourteen individuals from Samburu National Reserve and 12 individuals from Mpala Ranch of different age group at Mpala Ranch were selected to understand how the physiological and nutritional responses of African elephants vary with age, social status, and habitat type in the Laikipia-Samburu ecosystem. A total of 189 faecal samples have been collected from 26 individuals (within Samburu National Reserve and Mpala Ranch) selected for longitudinal sample collection.



Figure 1: A photo showing fecal samples being collected from one of the families identified for longitudinal fecal sample collection.

2.2 Assessing how physiological and nutritional stress response of orphaned African elephants at Reteti Elephant Sanctuary and released orphaned elephants in Sera Wildlife Conservancy compares to age and sex-matched non-orphaned individuals at Sera Wildlife Conservancy and Samburu National Reserve.

Seven rehabilitated orphans released into Sera Wildlife Conservancy, four non-orphaned elephants within Sera Wildlife Conservancy and another seven non-orphaned elephants within Samburu National Reserve were targeted for monthly faecal sample collection. Our goal is to compare the released orphans to age- and sex-matched non-orphaned individuals that occupy the exact same ecosystem (i.e., Sera Wildlife Conservancy), while also increasing sample size by comparing with additional non-orphans of a slightly different ecosystem (i.e., Samburu National Reserve).



Figure 2: A photo showing some of the orphaned elephants under rehabilitation at Reteti Elephant Sanctuary.

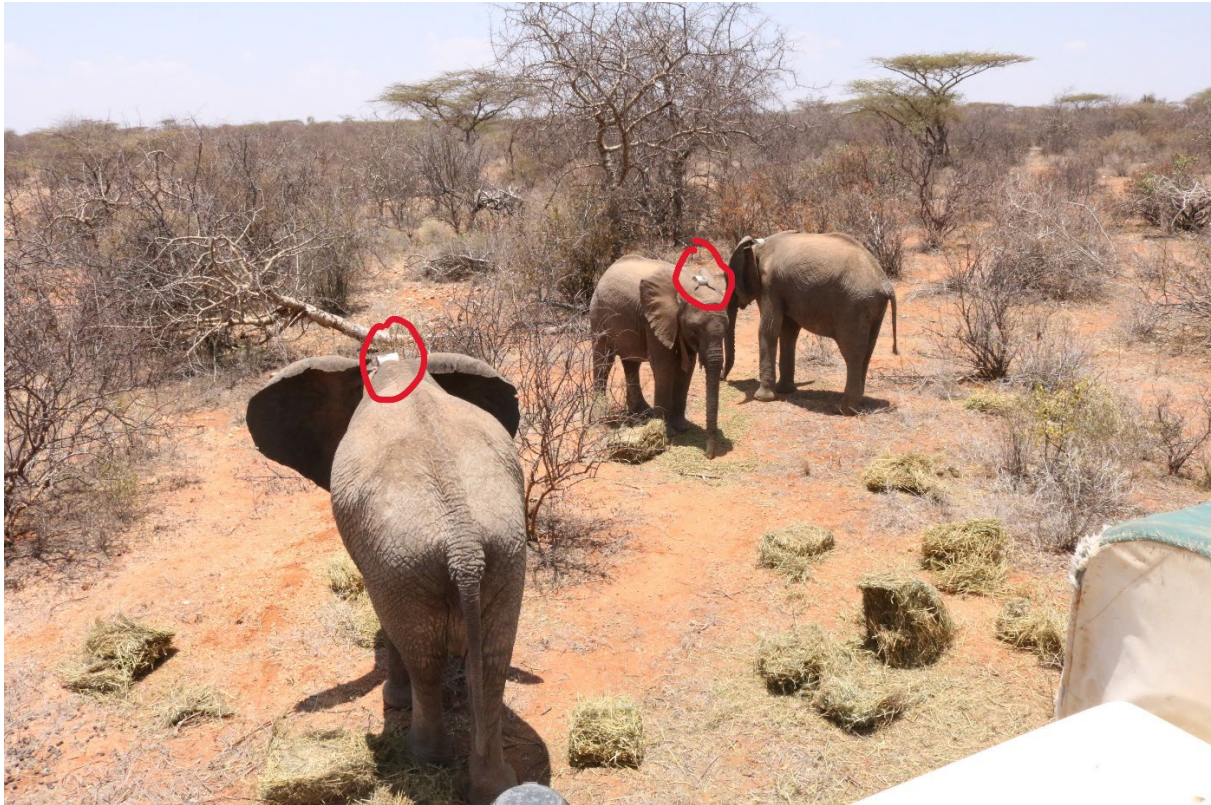


Figure 3: A photo showing the released orphaned elephants at Sera Wildlife Conservancy fitted with a GPS collar (circled in red) to help locate the individuals for sample collection.

A total of 173 samples have been collected from both orphans and non-orphans within Sera Wildlife Conservancy as well as from the non-orphaned individuals within Samburu National Reserve.

2.3 Assessing how physiological and nutritional stress of male African elephants within Laikipia-Samburu ecosystem changes during crop raiding and non-crop raiding periods.

A total of seven collared bulls with tracking data provided by Space for Giants, an organisation that deals with conservation of African elephants within Western Laikipia were targeted for monthly sample collection. Thirty-one samples have been collected during crop raiding season from known individuals with tracker while a further 11 samples collected from unknown individuals in company of known individuals during crop raiding periods. 40 samples have been collected during non-crop raiding season from known individuals with tracker while a further five samples collected from unknown individuals in company of known individuals during non-crop raiding periods.



Figure 4: Fecal sample from one of the crop raiders showing maize husk (circled in red) found in the dung bolus after crop raiding.

A summary of samples collected during crop-raiding season and non-crop-raiding season is shown in Table 1 below.

Table 1: A table showing samples collected from known individuals with tracker and unknown individuals during crop raiding season and non-crop raiding season.

Crop raider	Fecal samples collected during crop raiding and non-crop raiding periods.		Total
	Crop-raiding samples	Non-crop raiding samples	
Mutara	5	9	14
Jikaze	3	5	8
Naledi	4	2	6
Uzima	6	8	14
Popote	5	7	12
Tembea	7	5	12
Tumaini	1	4	5
Uknown	11	5	16
Total	42	45	87

Future plans

We will continue to collect monthly fecal samples from individuals selected in both Mpala and Samburu National Reserve, the orphans and non-orphans at Sera Wildlife Conservancy, and the crop raiders in Western Laikipia. Further, we plan to

simultaneously continue processing and analysing faecal samples at Mpala Research Centre's Endocrine Laboratory with the hope that a manuscript for publication can be prepared. Finally, we plan to hold a workshop at Laikipia and Samburu to present the findings of our study early next year.



Figure 5: Sample processing and analysis of both stress and nutritional hormones going on at the Endocrine Lab at Mpala Research Centre.