



Conservation and Wildlife Department

Research, Conservation and Wildlife Report.

Quarter 1, 2023

Authors;

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1.0 Introduction

This report summarizes the main activities undertaken by the Conservation and Wildlife Department on the Lewa – Borana Landscape (LBL) in the first quarter of 2023. In the period the long-awaited rainfall began, where a total of 121mm were received. This led to the readjustment of a number of intervention activities from the previous quarter among them the withdrawal of supplemental feeding of a few lactating and old black rhinos in the landscape. We undertook research and monitoring activities on various wildlife and conservation thematic areas to ensure we keep track of the state of wildlife and their habitats. In collaboration with the Kenya Wildlife Service (KWS) mobile veterinary unit in Lewa, we offered veterinary interventions to a number of species of concern that needed such interventions. We also build on the milestones of conservation knowledge among the neighbouring schools and beyond, through our Conservation Education Programme (CEP).

2.0 Research and Monitoring

This includes the research and monitoring work we undertake on the key species of concern including the Rhino, Predator, Ungulates, Elephant, Avifauna, and Herpetofauna, as well as the Rangeland and Hydrological research and monitoring.

2.1 Rhino Monitoring

Rhino population

There was a slight reduction in the black rhino population from 133 to 131 individuals occasioned by one birth and three deaths. *Waiwai* (27.5 years) gave birth to her ninth calf. *Annitah* (6.4 years) was euthanized after sustaining severe back injuries, *Kipchoge* (5.8 years) died due to predation by lions, and *Senewa Calf 2* (1-month-old) was assumed dead, possibly eaten by hyenas, after missing from late last year to date.

The white rhino population increased to 123 individuals after *Safari* (8 years) gave birth to her first calf.

Rhino interventions

Two post-mortems were done on two black rhino carcasses. *Annitah* was euthanised and postmortem revealed that she had suffered severe back and leg injuries, preventing her from standing. A postmortem on *Kipchoge's* carcass which had been partially eaten by lions showed that the liver was harder in consistency due to chronic pathological conditions and the worm load was higher than normal. Liver samples were taken to Lancent laboratory for a definitive determination.

Supplementary feeding

Three black rhinos; *Zaria*, *Kitui*, and *Sonia* were returned to the supplementary feeding program in February 2023 after their body conditions slightly dropped. The feeding was later suspended towards the end of March 2023 after a significant amount of rainfall was received which led to an improvement in forage quality and quantity.

2023 Evidence files

We have so far achieved 30% photographic records of black rhinos and 45% of white rhinos in the landscape in preparation for auditable rhino evidence files. Camera traps were deployed in the forest to capture elusive rhinos that range in the thick section of Ngare Ndare forest.

LBL Rhino Ear Notching and Transmitter Fitting Exercise

The LBL's rhino ear notching and transmitter fitting exercise was completed in the quarter as planned for 2023. This was conducted in collaboration with the Kenya Wildlife Service (KWS), Wildlife Research and Training Institute (WRTI) and Association of Private and Community Land Rhino Sanctuaries (APLRS). A total of 42 rhinos were ear notched (20 black and 22 white) as shown in Table 1. Six of the 42 ear-notched candidates were also fitted with Long Range Wide Area Network (LoRaWAN) enabled transmitters. One adult male black rhino (*Antonio*) outside those that were ear notched was fitted with a transmitter. All seven transmitters are functioning and can be viewed on the EarthRanger (ER) platform. The table below shows the numbers operated on Lewa and Borana:

Table 1: Break down of rhinos successfully ear-notched

Species	Lewa		Borana		Total
	Male	Female	Male	Female	
Black rhino	6	5	5	4	20
White rhino	11	10	1	0	22
Total					42

2.2 Predator Monitoring

Lion Population Performance

The lion population in the landscape stood at 46 individuals, consisting of 29 adults, 8 sub-adults, and 9 cubs. Sarah (14 years old) female has been on and off its pride. This could be due to her advanced age making her unable to cope with the speed of the other members. Intensive monitoring will be undertaken in the second quarter to account for all the prides and coalitions in the landscape.

Hyena Population Performance

The hyena population is estimated at 168 individuals, consisting of 138 adults, 9 sub-adults, and 21 cubs. The prolonged drought experienced last year may have weakened the prey base, particularly buffalos, making them more vulnerable to predation and ultimately leading to an increase in the predator population.

Human-Carnivore Conflicts

Four incidences of livestock depredation led to the loss of one cow and two sheep. These cases were in the communities in the southern and south-eastern parts of the landscape.

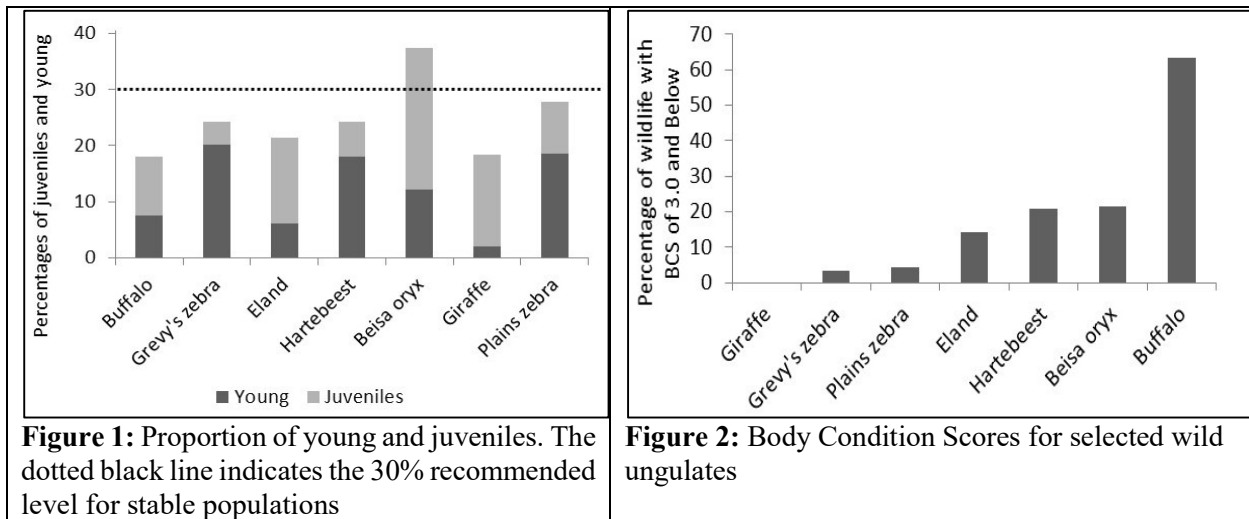
Wildlife Mortality

A total of 18 wildlife mortality cases were documented. The majority of these cases (9) were predation by lions (9) while the rest were predation by cheetahs, leopards, and other natural causes. Buffaloes formed a majority of these cases.

2.3 Ungulates monitoring

Ungulates survey

We undertook the monthly ungulates survey for the indicator wildlife species in the quarter. The percentage representation of young and juveniles in the respective sample populations of selected species, the proportion of adult females per one adult male, and body condition scores are as shown in Figures 1, 2, and 3. We noted that buffalos were the most affected by the just-ended long drought period which led to a reduced number of sub-adults and young compared to previous years where their percentages surpassed the recommended 30% for a stable population. Buffalo had markedly the highest number of individuals with body condition scores (BCS) of below 3.0. The ratio of adult females per adult male for Grevy’s zebra is 1:1, which might indicate that more males are being born or are surviving to adulthood skewing the ratio towards males. However, this is just three months of data. Monitoring will continue for more insights.



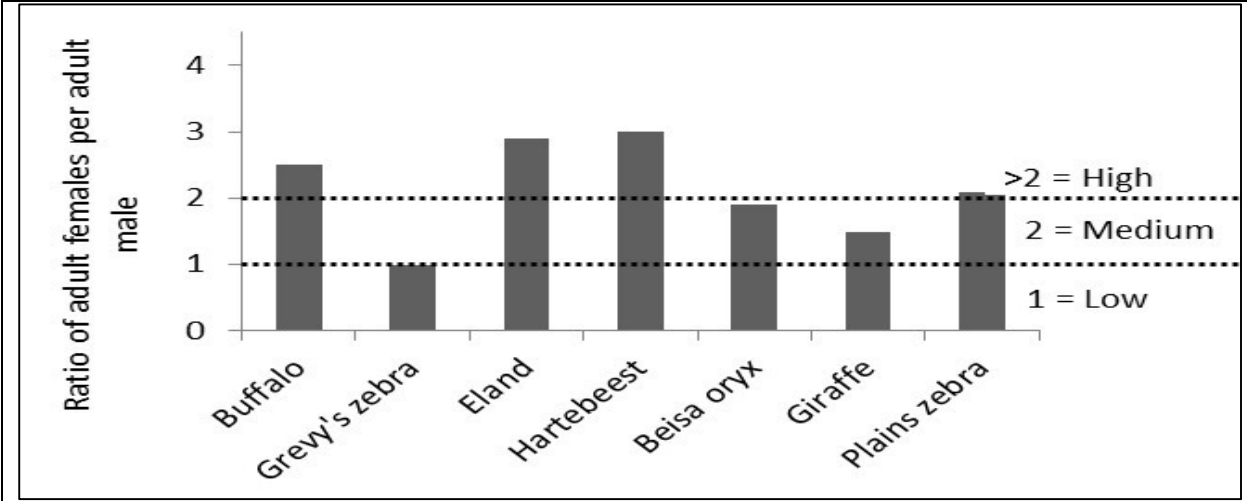


Figure 3: Proportion of adult females per one adult male. The black dotted lines indicate levels of various growth potential, that is, Low, Medium, and High

We continue to record high numbers of Grevy’s zebra in the western part of the landscape (Borana) as shown in Figure 4. Formally, almost the entire population in the landscape used to be in the eastern part (Lewa). Rainfall showers that were experienced in the western part of the landscape during the dry period might have triggered these movements. We continue to monitor their movement patterns to see whether they will migrate to the eastern part of the landscape when the rainfall will be evenly distributed in the landscape. The figure below shows the trends of Grevy’s zebra across LBL:

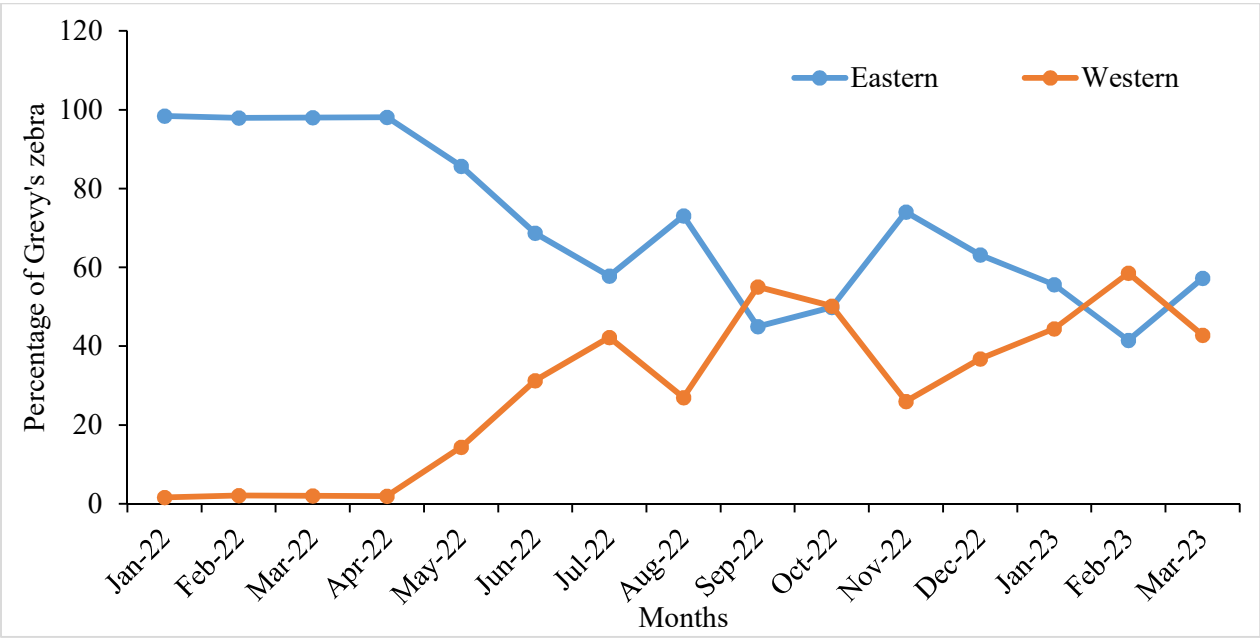


Figure 4: Grevy’s zebra population trend on LBL (January 2022 – March 2023)

The National Grevy's zebra stripe Identity Software

We continued to analyze the 2023 Grevy's zebra stripes identification data and results will be provided in the mid-year report.

2.4 Elephant monitoring

Elephant population and conflict monitoring

We documented 4 resident matriarchal family groups; *Sanaipei* (15), *Saba* (14), *Cointreau* (27), and *Naisula* (27). We also documented 10 lone bulls during the period. We also documented a total of 234 fence breakages and 5 crawling incidences. 30% of the breakage incidences ($n=71$) occurred on the main boundary fence line while 70% ($n=163$) occurred on the exclusion zone fence lines. All 5 crawling incidences occurred on the exclusion zones. Figure 5 below indicates the distribution of elephants' fence-breaking incidences in the landscape.

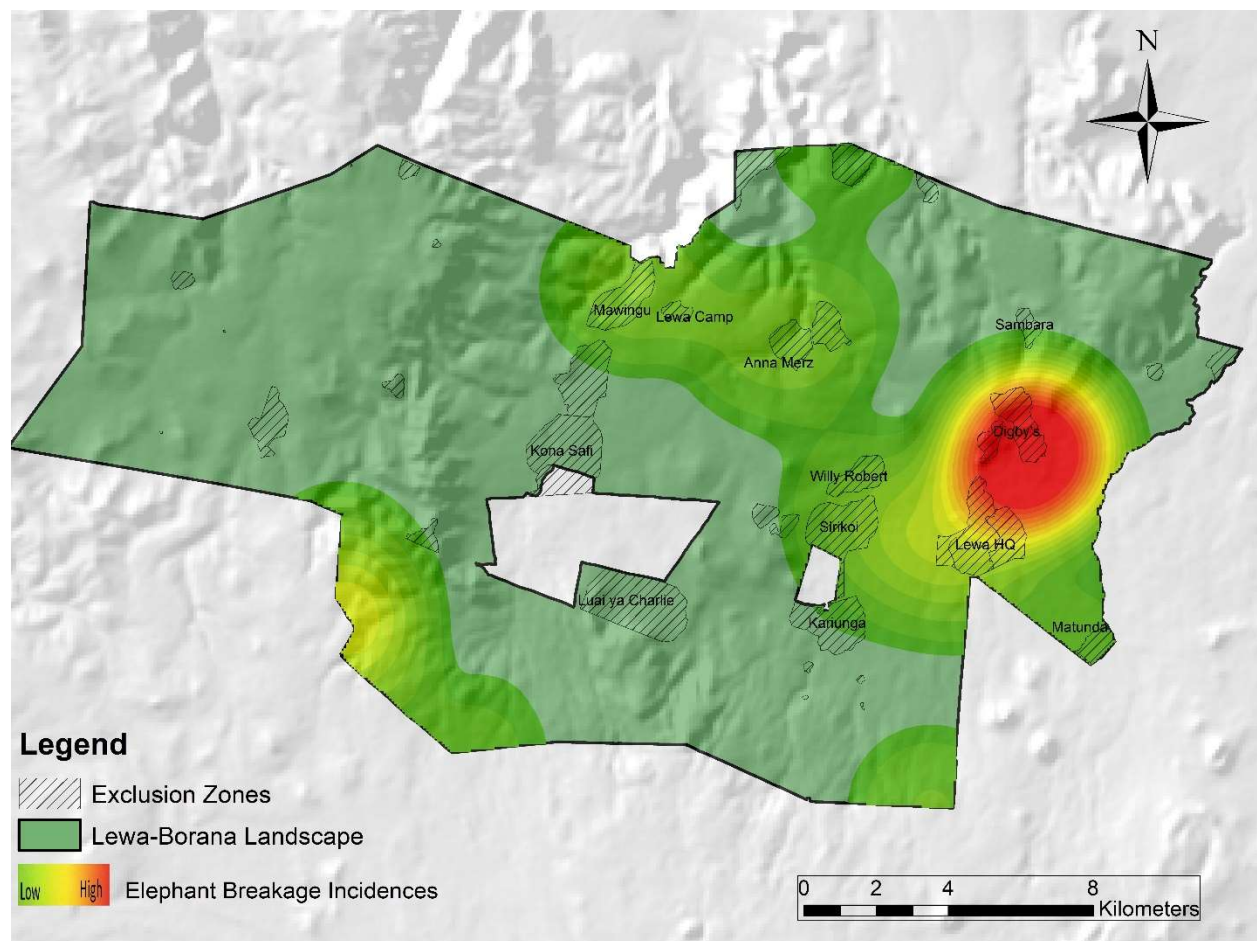


Figure 5: Heatmap showing fence-breaking incidence hotspots

On the main boundary fence lines, *Upper Ethi*, *Moloi gate*, *Karimba*, and *Kisima firm* on the western and southern sides of the landscape were the most affected areas as shown in Figure 6 below:

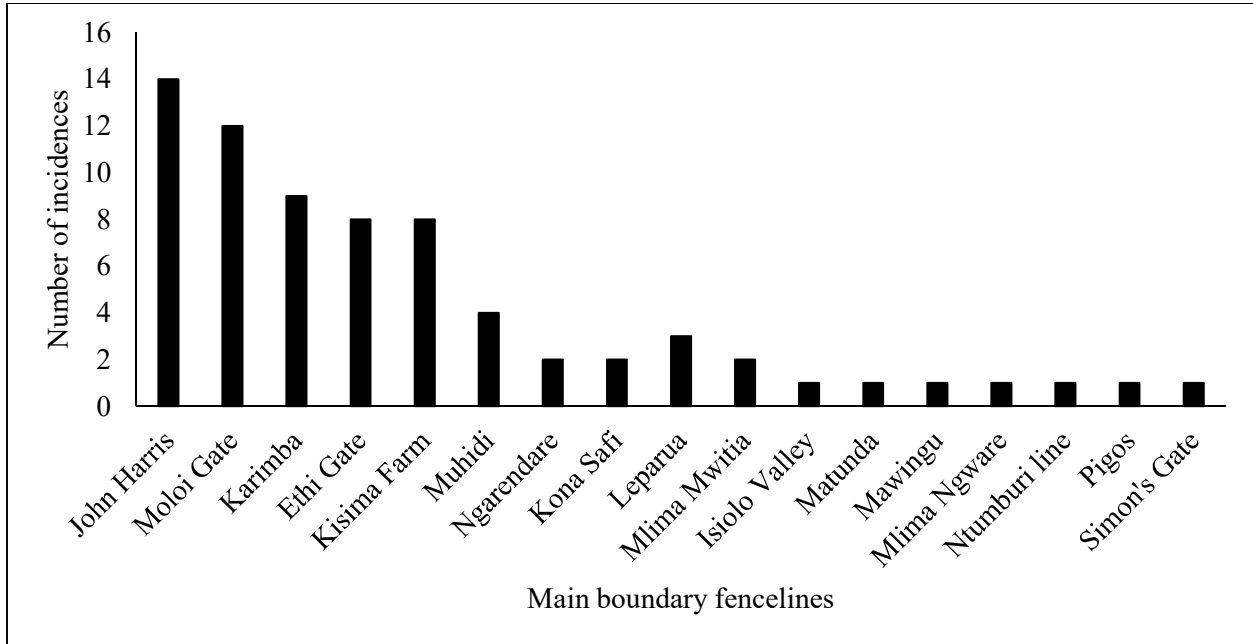


Figure 6: Incidences on the main boundary fence lines

Digby's, *Lewa Headquarters*, *Junction Tano*, *Sirikoi*, and *Anna Merz* exclusion zones recorded the highest breakages as shown in the figure below:

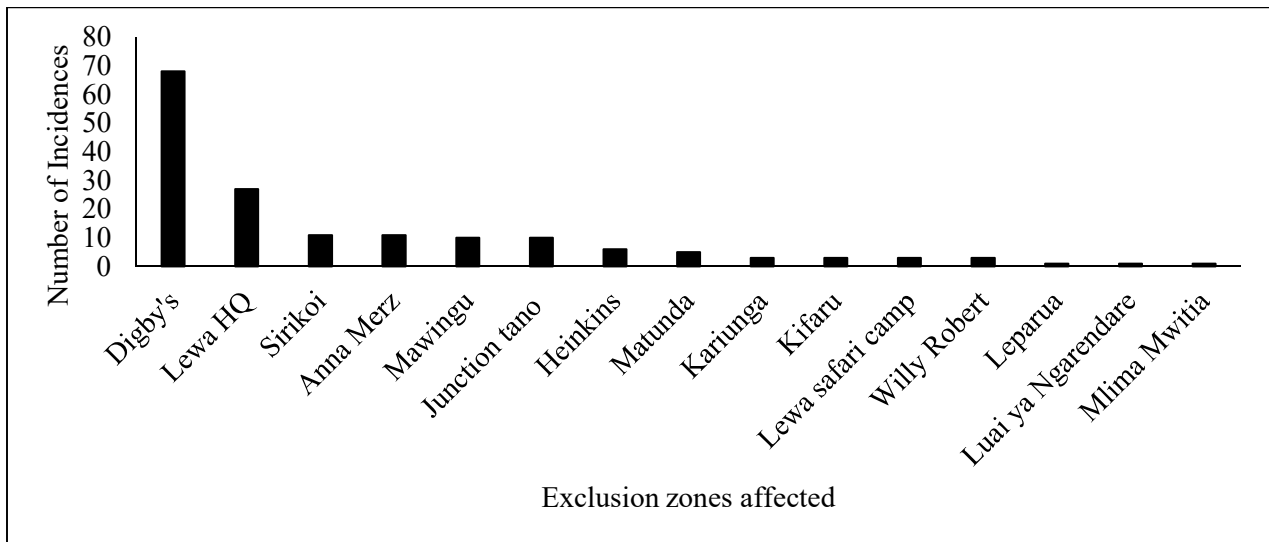


Figure 7: Incidences in the exclusion zone

Nine bulls, namely *Mjasiri*, *Odongo*, *Tyson*, *Monk*, *Mukume*, *Bundi*, and *Keke*, were identified as the persistent fence breakers on the main boundary and the exclusion zone fence lines respectively as shown in the figure below:

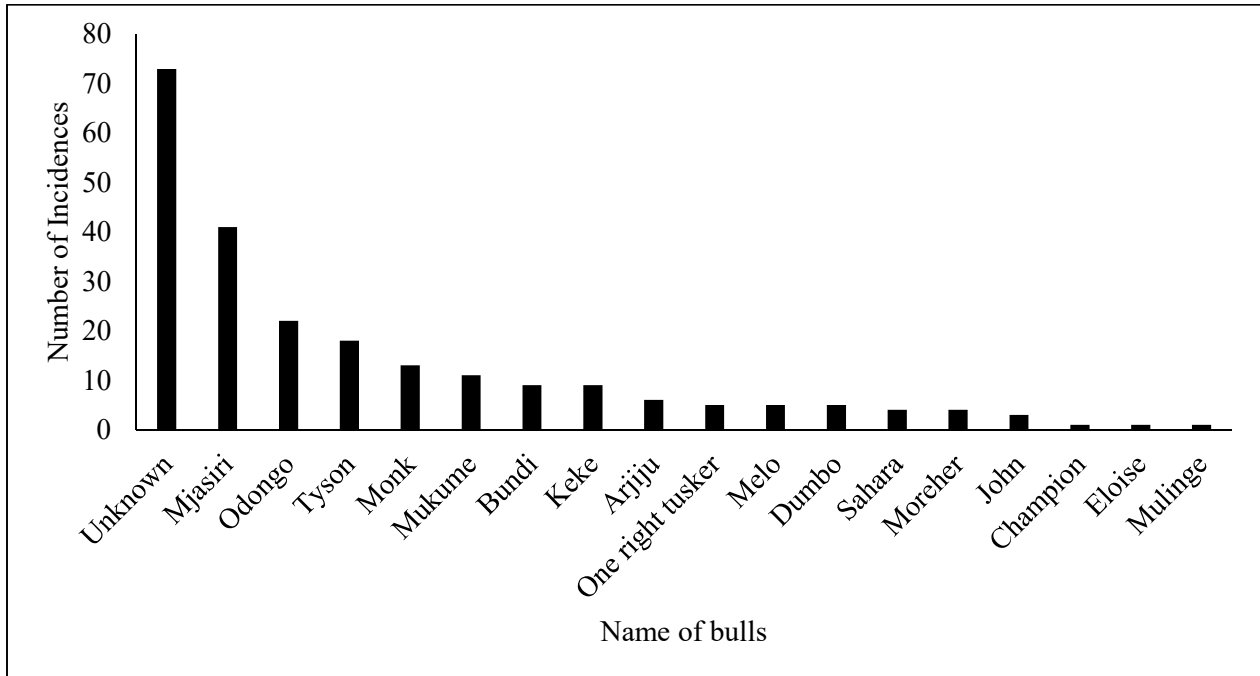


Figure 8: Bulls responsible for fence breakages

Sanaipei (15 individuals) was the only crawling family during the quarter.

Use of migratory gaps by wildlife

Landscape connectivity is crucial in allowing wildlife movement, especially during adverse weather conditions. The crossing events at various wildlife migratory corridors by wildlife across various gaps on the landscape were; Mount Kenya endpass gap (2,410 crossing events), Marania underpass gap (133 crossing events), Mount Kenya underpass gap (1,178 crossing events), and Northern gap (7,705 crossing events).

The key users of each gap were;

- Mount Kenya end pass gap - Plains zebra (1,838), waterbuck (202), elephant (195), bush pig (13), warthog (10) and lion (4)
- Mount Kenya underpass gap - Buffalo (376), elephant (270), baboon (216), vervet monkey (139), warthog (45), waterbuck (45), spotted hyena (35) and bushbuck (16)
- Marania underpass gap - Elephant (92), waterbuck (35) and lion (1)

- Northern gap - Elephant (3,790), plain zebra (3,599), spotted hyena (135), Grevy's zebra (75), giraffe (57), lion (14), black-backed jackal (10) and leopard (7)

These movements underscore how migration is essential for sustaining the resilience of large populations of wildlife in the face of variable rainfall regimes. The migratory movements are also a key survival strategy of wildlife to track resources over vast areas.

2.5 Avifauna Monitoring

Bird checklist

The LBL and NNF bird checklist currently stands at 491 bird species. The photographic evidence files of all the species are 78% complete.

Waterbirds survey

An average of 1404±44 individuals of 39 different species were surveyed in the quarter. Species with the highest count included, Egyptian goose (488), Cattle egret (292), White stork (186), Abdim's stork (71), Blacksmith plover (70) and Grey crowned crane (66). We participated in the National Waterfowl Census held by the National Museums of Kenya and recorded a total population of 2,476 individuals of 30 species on LBL. We also participated in the National Grey Crowned Crane census coordinated by the National Museums of Kenya and recorded 55 individuals comprising 51 adults and 4 chicks.

Raptors survey

An average of 59±8 individuals of 23 species of raptors were surveyed. Species with the highest count included Lesser kestrel (18), Rüppell's vulture (9), Tawny eagle (7), White-backed vulture (3), Secretary bird (3), and Bateleur (3). One ad hoc sighting recorded 20 Rüppell's vultures, 8 White-backed vultures, and 2 Lappet-faced vultures. 6 active nests were also surveyed including two for Tawny eagle, two for Martial eagle, one for Bateleur and Secretary bird respectively. One nest for Tawny eagle and Bateleur have recorded one chick each.

2.6 Herpetofauna Monitoring

We carried out a one-week survey of pancake tortoises and water terrapins on LBL and surrounding Community Conservancies. A total of 48 new individuals of pancake tortoises which included sightings of 13 in Kalama, 8 in Nasuulu and 27 in LBL were recorded during the survey. In addition, we recaptured 16 pancake tortoises on the LBL. We also sighted 23 new terrapins on LBL. Since the beginning of the survey in 2019, we have so far documented 187 Pancake tortoises and 45 terrapins respectively. We recognise that pancake tortoises are critically endangered; therefore, documenting their existence on LBL and surrounding conservancies is the first step in establishing management interventions to guarantee their protection. During the surveys, we taught the rangers of the community conservancies how to identify the species and their importance in the landscape.

Also, in collaboration with the National Museums of Kenya (NMK), Kenya Wildlife Service (KWS), Northern Rangelands Trust (NRT), York University (YU), and Turtle Survival Alliance (TSA) convened an awareness forum for the species which brought together members of LBL, NRT, Kalama, Nasuulu, Lekurruki, Il Ngwesi and Leparua Community Conservancies. This awareness meeting was meant to educate the communities on the existence of the species within their conservancies, their role in the ecosystem, and the benefits of protecting and conserving them. It also included awareness of the role of the communities in protecting the habitat to guarantee the survival of this species. This was the first step in the plan to develop a Species Recovery and Action Plan for Pancake tortoise in collaboration with the KWS, NMK, and Wildlife Research and Training Institute (WRTI).

2.7 Rangeland and Ecological Monitoring

Invasive species monitoring

A total of 7 invasive species were recorded in the landscape. They included thorn apple (*Datura stramonium*), long-spined thorn apple (*Datura ferox*), long-spine cactus (*Opuntia exaltata*), prickly pear (*Opuntia ficus-indica*), Khaki weed (*Alternanthera pungens*), Mexican prickly poppy (*Argemone Mexicana*), and Mathenge (*Prosopis juliflora*) (Henderson, 2001, 2002). We eradicated *D. stramonium*, *A. Mexicana*, and *D. ferox* species. Even though the current occurrence

level is low as shown in Figure 9, we continue to put up mitigation measures before they get out of hand.

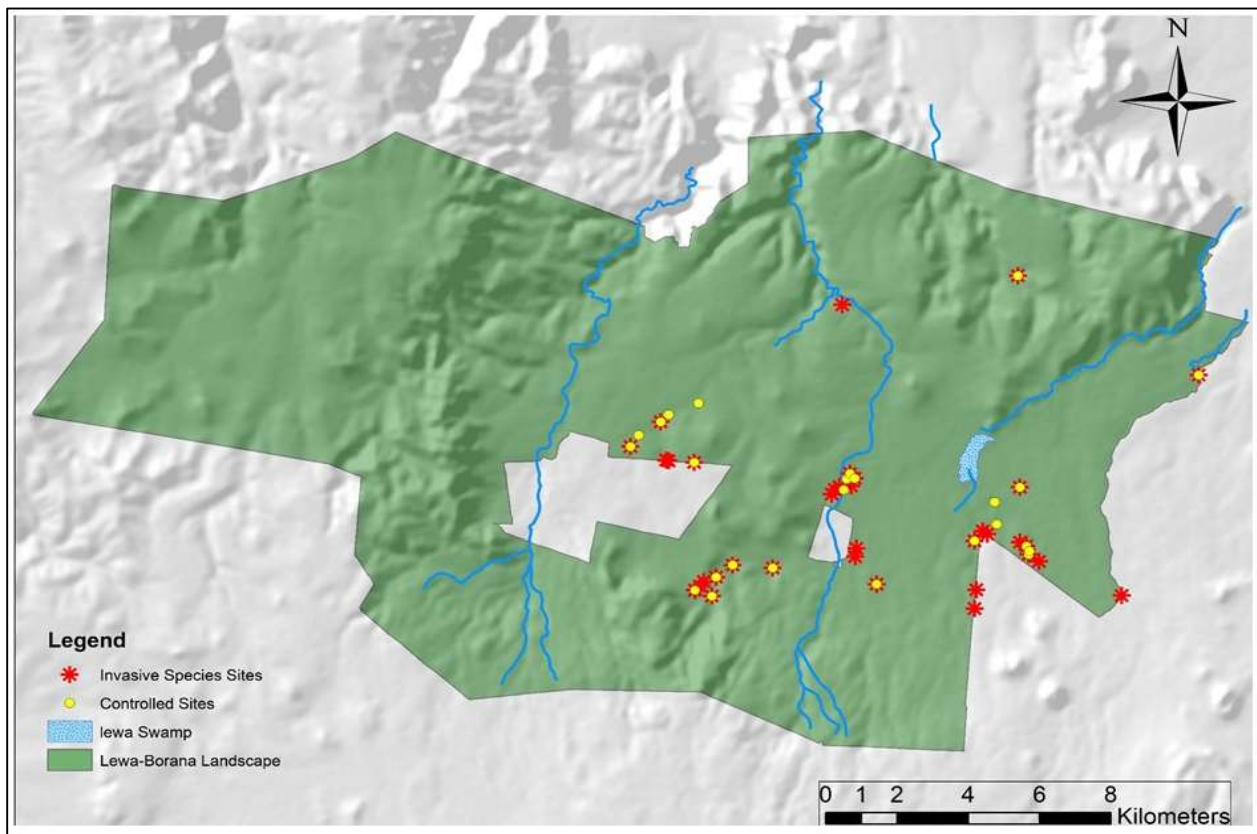


Figure 9: Invasive species distribution and areas controlled

2.8 Hydrology

Rainfall

The rainfall received between January and March was 121mm, more than double the amount received over the same period in 2022 (51mm). Additionally, this was also significantly higher than the mean long-term rainfall (1975-2022) received for this quarter of 98 ± 11 mm. We expect a boost in general greenness indices, which shall be better analysed in the next quarter's vegetation report.

Automated Weather Stations

We monitored the two weather stations installed at Lewa and Borana headquarters using the EarthRanger platform, and the reports are as shown in Figures 9 and 10 below:

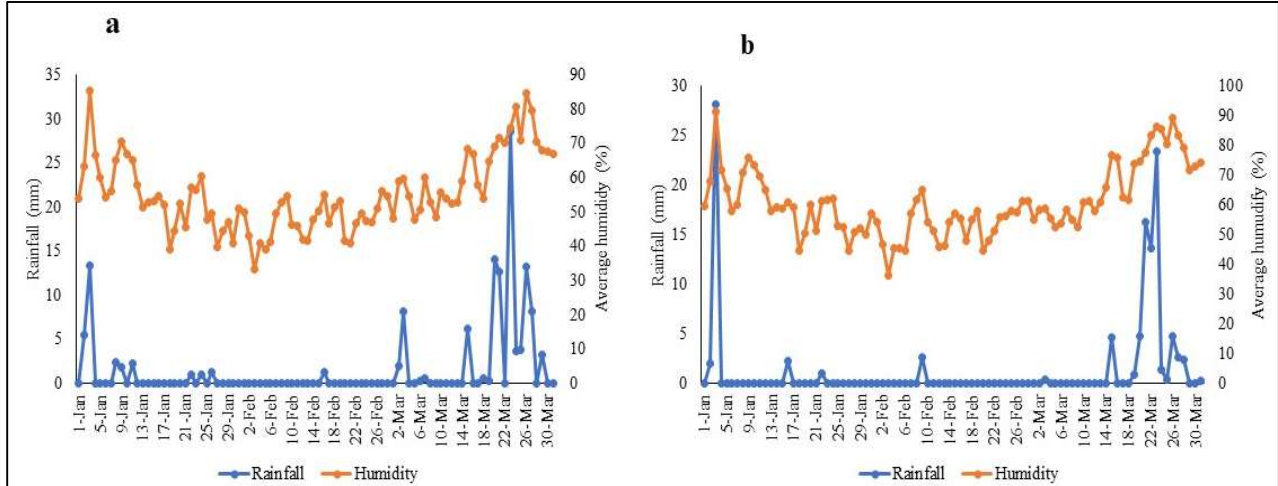


Figure 10: a) Lewa Wildlife Conservancy rainfall and average humidity for January-March 2023 and **b)** Borana Wildlife Conservancy rainfall and average humidity for January-March 2023

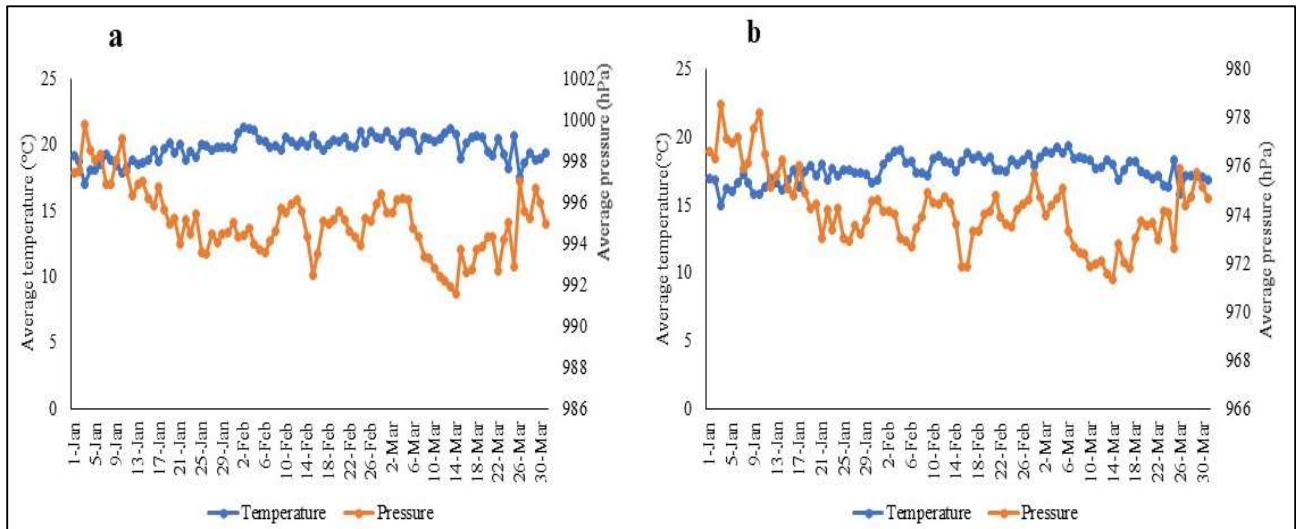


Figure 11: a) Lewa Wildlife Conservancy average temperature and pressure for January-March 2023 and **b)** Borana Wildlife Conservancy average temperature and pressure for January-March 2023

Hydrological survey on LBL

The comprehensive hydrological survey on LBL and neighbouring areas was initiated in late 2022. The survey which is a partnership between the Water Resource Users Associations (WRUAs) and Water Resource Authority (WRA) is in the last stages of phase 1. The first phase will come up

with a report on the rainfall and climate status and the temporal trends of the surface and groundwater resources in the region.

3.0 Conservation Education Programme

During the quarter, the CEP hosted 29 groups with a total of 882 beneficiaries. They were hosted either on a day trip, residential meeting or virtual engagement. The CEP together with the Lewa Education Programme (LEP) hosted the Principals from all 27 schools for a 2-day workshop to discuss school management issues, academic performance, discipline and environmental conservation. The workshop was also attended by representatives from the Ministry of Education, the Teachers Service Commission and other Lewa partners.

Each of the institutions also nominated one of their teachers to receive training on Environmental stewardship and building capacity in steering conservation clubs. A total of 1,500 tree seedlings were supplied and planted within the schools.

4.0 Conclusion and Recommendation

The department will continue to undertake all its activities in the next quarter as it collates data for a more elaborate mid-year report covering all the aforementioned thematic areas.

We note that the Predator Monitoring programme needs a vehicle to effectively carry out its operations. This will ensure all predator dynamics, especially for lions and hyenas are continuously monitored and documented.

5.0 Acknowledgement

We sincerely acknowledge all LBL supporters, donors and stakeholders who have enabled us to carry out the programmes and activities in this report. Much appreciation goes to all LBL management and staff for their support, dedication and insights while undertaking these programmes. We also acknowledge our neighbouring communities for their continued peaceful co-existence with each other, nature, the environment, and wildlife. Much appreciation also goes to government agencies whom we worked closely with, including the KWS.

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