

It was critical to control the lion population in the landscape through hormonal contraception. The MVU selected three prime breeding female lions between three to eight years old as targets for this intervention. From a vehicle, the lionesses were darted with tranquilizer to allow the Vet to subcutaneously administer a Gonadotropin Releasing Hormone implant. This hormone is designed with a slow-release formulation that releases deslorelin, causing temporary sterility lasting at least 24 months. This implant can also be reversed at any time.

Plate 7: (L) Veterinary Apprentice Programme participants Waqqas is seen on the left with an immobilized Grevy's zebra; (R) Sylvia attends to a lion receiving a hormonal implant



Plate 8: Progressive healing of a female Grevy's zebra treated by the MVU after a lion attack



### **B. Improved wildlife preservation through the Reteti Wildlife Rescue Facility**

The primary goal of conservation efforts is to make sure wildlife remain in their natural habitat. Certain cases, however, are brought to the MVU's attention where an animal's continued stay in the wild could compromise its life. For example, an animal in question is brought to an Orphanage after all attempts to rejoin it with other herds have failed. The MVU picks up animals via a helicopter, a caravan aircraft, or by vehicle and takes them to the wildlife Orphanage. Here, rescued animals are hand-raised and serve as ambassadors for this conservation practice. In 2017, with the MVU's help, Reteti Elephant Sanctuary

received 13 elephant calves below one-year old. 60% of these calves survived at the facility. These elephants will be released to Sera’s wilderness once it is determined that they are ready to rejoin the wild.

Table 6: Information on the 13 rescued elephant calves

| <b>Date</b> | <b>Name</b> | <b>Reason</b> | <b>Location</b> | <b>Sex</b> |
|-------------|-------------|---------------|-----------------|------------|
| 07-01-2017  | Baawa       | Drought       |                 | Male       |
| 11-01-2017  | Kirimon     | HWC           | OI Malo Ranch   | Male       |
| 27-01-2017  | Ilingwesi   | HWC           | Il Ngwesi       | Male       |
| 21- 02-2017 | Sosian      | HWC           | Sosian Ranch    | Male       |
| 18-03-2017  | Nadosoit    | Well          | Lodosoit        | Female     |
| 05-04-2017  | Natimana    | Well          | Nchoro Ngiro    | Female     |
| 11-06- 2017 | Warges      | Separated     | Sarara          | Male       |
| 21-06-2017  | Impala      | Separated     | Mpala Ranch     | Female     |
| 29-06-2017  | Kinya       | Well          | Kinya           | Female     |
| 03-07-2017  | Lchurai     | Separated     | Tale            | Female     |
| 12-10-2017  | Loisaba     | Drought       | Loisaba         | Male       |
| 14- 11-2017 | Lemorinjo   | Abandoned     | Kipsing         | Male       |
| 18-01-2018  | Kapai       | HWC           | Lenkolii        | Female     |

Plate 9: (L) A rescued baby elephant is on its way to shelter via a helicopter; (R) A baby elephant arrives at the Reteti Wildlife Rescue Facility



**C. Prevented the spread of diseases**

Disease outbreaks remain a significant threat to endangered species. In 2017, a massive outbreak of Canine Distemper decimated a significant population of wild dogs in Laikipia County. Canine Distemper is a severe and often lethal infectious disease that affects dogs and a broad range of terrestrial and aquatic animals. It is caused by the Canine Distemper Virus (CDV), a Morbillivirus of the Paramyxoviridae family, which is an enveloped and pleomorphic virion with a helical capsid that is associated with a single, non-segmented RNA genome of negative polarity (Merck 2016). The virus can be transferred through direct contact with nasal discharges, oral secretions, and urine of infected animals.

With assistance from the MVU, the Canine Distemper and Rabies vaccination campaign in the immediate surroundings of Lewa and Borana Conservancy vaccinated 1,429 domestic dogs. This activity prevented the spread of the pathogen to other carnivore species while protecting the vulnerable apex predators in the region. Our hypothesis is that wildlife has no immunity to this pathogen, therefore, the CDV spreads much faster among their species compared to domestic animals. Domestic dogs may have an innate immunity due to previous outbreaks or from vaccination.

In a separate case, the MVU mitigated the spread of cattle transmitted diseases which caused widespread fatality among buffalos and impalas in the Mugie Conservancy in Laikipia. We suspect that the disease is attributed to the overlapping use of pasture and water by wildlife and cattle.

Plate 10: (L) Healthy wild dogs about to be tested for CDV; (M) An antigen detection kit for CDV; (R) A wild dog puppy with clinical case of CDV



Table 7: Results of wild dogs tested for Canine Distemper by the MVU in 2017

| ID           | Date       | Sex    | Location | Sample | Distemper Ab | Distemper Ag | Distemper Ag2 |
|--------------|------------|--------|----------|--------|--------------|--------------|---------------|
| Alpha male   | 19/07/2017 | male   | Ol Jogi  | Serum  | positive     | Negative     | positive      |
| Wild dog 135 |            | male   | Ol Jogi  | Serum  | inconclusive | Negative     | Negative      |
| Domestic dog |            |        | Loisaba  | Serum  | inconclusive | Negative     | Negative      |
| wild dog 142 | 20/07/2017 | Female | Ol Jogi  | Serum  | positive     | Positive     | positive      |
| Wilddog 141  | 20/07/2017 | Female | Ol Jogi  | Serum  | positive     | Positive     | positive      |
| Wild dog 141 | 21/7/2017  | Female | Ol Jogi  | Serum  | positive     | Positive     | positive      |
| Wild dog 115 | 9/6/2016   | male   | Ol Jogi  | Serum  | inconclusive | Negative     | positive      |
| wild dog 137 | 14/06/2016 | Female | Ol Jogi  | Serum  | inconclusive | Negative     | Negative      |
| Wild dog 141 | 21/07/2017 | Female | Ol Jogi  | Blood  | inconclusive | ND           | ND            |
| Wild dog 142 | 20/07/2017 | Female | Ol Jogi  | Blood  | positive     | ND           | ND            |
| Alpha male   | 19/07/2017 | male   | Ol Jogi  | Blood  | positive     | ND           | ND            |
| Wild dog 141 | 20/07/2017 | Female | Ol Jogi  | Blood  | positive     | ND           | ND            |
| Zurie        |            | male   | Mugie    | Serum  | ND           | Negative     | Negative      |
| Wild dog 1yr | 21/07/2017 | Female | Ol Jogi  | Urine  | ND           | Positive     | ND            |



#### **D. Investigated diseases that affected livestock at the Mugie Ranch**

The Mugie Conservancy, and in general in Northern Laikipia, experienced poor rainfall for the entire 2016 and early 2017. The area was dry and the quality of available grazing land was low in nutrition. As a result, the Mugie Conservancy only hosted 4,200 livestock– a drop from the 12,000 cattle recorded during the peak of herd movement during the land invasions in 2016 and 2017.

By the end of 2017, the tally of livestock mortality cases in the Conservancy was: buffaloes – 200; impalas – 150; hartebeests – 3; and oryxes – 3. It was challenging to collect the death toll for cattle and sheep due to their high mortality within and around the Mugie area. The wildlife and domestic cattle affected by a tick-transmitted, blood-borne pathogen further compounded the problem on livestock mortality in the region. Lewa investigated these cases to gain a better understanding of needed prevention measures for both wildlife and cattle in future.

### **VI. INNOVATION AND BEST PRACTICE IN WILDLIFE CONSERVATION**

#### **A. Launch of Wildlife Apprentice Programme**

In 2015, Lewa established a Veterinary Apprentice Programme where newly qualified veterinarians and students spend time with the MVU's resident Vet. The programme aims to offer field experience that reinforces standard veterinarian medical training, allowing aspiring veterinarians to apply knowledge and exercise effective decision-making in remote areas. The two beneficiaries in 2017 were Sylvia Kinya, a graduating student from Chuka University, and Waqqas Khalid, a senior student at Bristol University. The students spent two months learning with Dr. Matthew Mutinda and were exposed to the field in Lewa and surrounding national parks and private conservancies. The programme aims to eventually pay its dividends through better wildlife veterinary care and improved animal welfare on a larger scale.

#### **B. Contribution to Scientific Knowledge and Research**

The observations gathered by the MVU from various clinical cases enhanced the conservation community's wildlife knowledge. In 2017 to the early months of 2018, Dr. Mutinda contributed to the following peer-reviewed published journals:

1. Guevara, L., Abdelgawad, A., Onzere, C., Greenwood, A., Davidson, Z., Bishop, R., Mutinda, M. (2018). Seroprevalence of Equine Herpes Viruses-1 and -9 (EHV-1 and EHV-9) in Wild Grévy's Zebra in Kenya. *Journal of Wildlife Disease*. Retrieved from: <https://doi.org/10.7589/2018-01-003>
2. Mutinda, M., Tunseth, D.A., Zimmerman, D., Crofoot, M.C., Hayek, S., Engel, J., Murray, Suzan. (2018). Biochemical Reference Intervals for Free-ranging Olive Baboons (*Papio anubis*) in Kenya. *International journal of primatology*.

These studies improve our understanding of the wildlife and the dangers that can potentially harm them.



## **VII. CONCLUSION AND NEXT STEPS**

In 2017, the MVU was successful in protecting and treating wildlife. As a response to the rapid increase in land use, animal habitat conversion, and HWC in recent years, Lewa and KWS have significantly ramped up efforts to improve our approach to protecting both endangered species and human communities.

The MVU's next steps will focus on the two initiatives:

1. Build the capacity of the wildlife veterinarian services to respond more effectively and efficiently in an expansive landscape. Moving forward, we are looking into increasing the MVU team's capacity to readily respond to more wildlife veterinary emergencies in the region. This plan is part and parcel of acquiring new skills and continued self-evaluation on team competencies to help the MVU effectively fulfill its role. These vast landscapes should be easily accessed by flight for prompt and appropriate wildlife care.
2. Invest in facilities and equipment. The existing diagnostic equipment in the mobile clinic need to be upgraded in order to effectively practice evidence-based medicine. Moving forward, Lewa and KWS aspire to raise funds to establish a diagnostic laboratory based out of Lewa.

We greatly appreciate the continued support from individuals and foundations toward preserving our planet's endangered species despite numerous, complex challenges each year. The main funding to support the personnel, vehicle operations, and procurement of drugs and equipment was provided by The Pettus Crowe Foundation. San Diego Zoo Global improved our capability for wildlife diagnostics through provision of laboratory equipment and training. We also recognize the following supporters who provided various equipment for the MVU's operations - "Own Time-Own Dime" Training Team, Anne Pattee, Sean Hawkins, John Fitts, Maureen O'Keefe, Bridget Caldwell, and Norah Farnham. Lewa and KWS would also like to thank our fellow conservation partners, the Northern Rangelands Trust and Save the Elephants, for their continued collaboration and partnership. Once again, on behalf of the entire Lewa and KWS teams, we thank everyone for your support and look forward to our continued partnership!

VIII. ADDITIONAL PHOTOS



Atypical inguinal growth in a Grevy's zebra



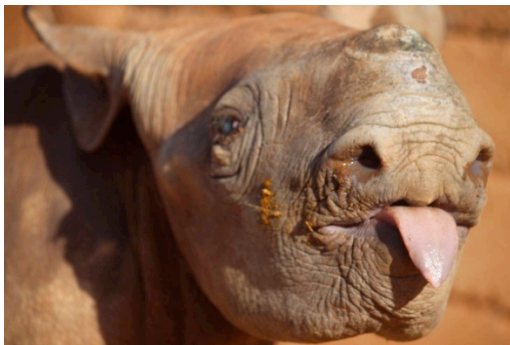
A healthy Grevy's zebra and foal



Surgical management of a wound in a Grevy's zebra



Snare removal in a Grevy's zebra



A happy black rhino calf post treatment



Massive horn in a black rhino



A snare on an elephant trunk



Snare removal on a white rhino