

Northern Rangelands Trust STATUS OF WILDLIFE REPORT 2005 - 2019



**IMPACT OF NRT-MEMBER COMMUNITY CONSERVANCIES
ON WILDLIFE IN NORTHERN KENYA**

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NRT Ecological Monitoring Program

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Acknowledgements

The data used in this report comes from Northern Rangelands Trust (NRT) member community conservancies whose rangers gather data during their daily patrols, using NRT’s ranger-based monitoring program Wildlife-CoMMS, which was first established in Sera Wildlife Conservancy in 2005.

Wildlife-CoMMS is entirely managed by the community conservancies and NRT’s role is to provide technical support and training to develop sustainable, devolved wildlife monitoring systems in our member conservancies.

In this report we are presenting data from all NRT member conservancies to build a landscape-wide assessment of their impact on wildlife. We are grateful to all the NRT-member conservancies for sharing their data with NRT and to the rangers for their commitment and dedication to the conservation and protection of wildlife in northern Kenya.

Fran Michelmoro-Root is a long-term partner in the development of the Wildlife-CoMMS database which has evolved and improved in response to the needs of conservancies. She continues to provide technical support to CoMMS databases in NRT.

We are grateful to the following organisations who directly support NRT’s wildlife monitoring program and collaborate on wildlife monitoring across the landscape, and also to the many donors who have supported NRT and our member community conservancies over the years, who are too many to mention here.



Forward

Today NRT has a membership of 39 community conservancies covering 4.4 million hectares, across 10 counties in northern Kenya. The community conservancy movement keeps growing with NRT receiving requests every year from communities who wish to establish new conservancies. The inclusion of conservancies under the Kenya Wildlife Conservation and Management Act 2013 facilitates this growth and provides recognition of the role communities and private landowners are playing in protecting and conserving Kenya's wildlife.

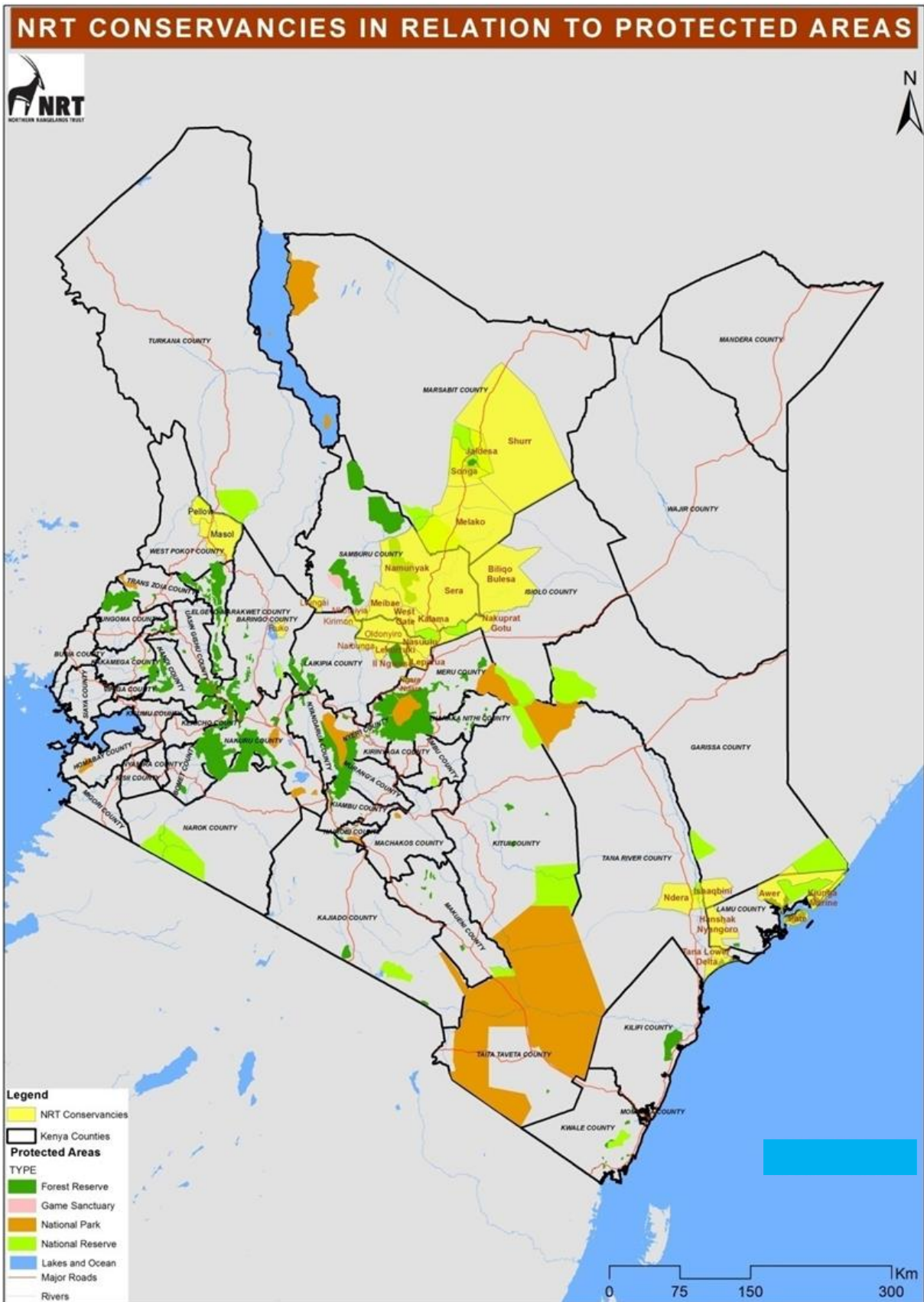
Community conservancies have the dual goals of conserving wildlife and natural resources alongside improving the lives of their indigenous community owners; the NRT model promotes coexistence of wildlife with people. This management approach differs to National Parks and some other conservancy models; however, **15 years of data shows that NRT-member conservancies are effective in protecting and conserving wildlife**. Sustaining this success will require **committed conservancy leadership, strong management** teams, sufficient **resources**, good **partnerships** with government and other stakeholders, **innovation and flexibility** to address emerging threats, and ensuring the commitment of indigenous communities to conserving wildlife on their land continues.

Community conservancies are well placed to tackle the many challenges facing wildlife and are a vital part of Kenya's strategy to conserve our wildlife heritage. We are proud to provide a comprehensive report on the status of wildlife in the NRT-landscape and the impact our member community conservancies have had in wildlife conservation since NRT began. This success would not be possible without the support and commitment of the indigenous communities who own and manage these conservancies, the Kenya Wildlife Service and county governments who play a significant part through their recognition, enabling legislation and support to community conservancies.



Tom Lalampaa

CEO, Northern Rangelands Trust



Contents

Executive Summary.....	6
Introduction	9
1. Status & Trends Of Key Wildlife Species	11
1.1 African Elephant (<i>Loxodonta africana</i> : Vulnerable).....	12
1.2 Reticulated Giraffe (<i>Giraffa camelopardalis</i> ssp. <i>reticulata</i> : Endangered).....	19
1.3 Grevy’s Zebra (<i>Equus grevyi</i> : Endangered).....	23
1.4 Beisa Oryx (<i>Oryx beisa</i> ssp. <i>beisa</i> : Endangered)	27
1.5 African Buffalo (<i>Syncerus caffer</i> : Near Threatened)	29
1.6 Eland (<i>Tragelaphus oryx</i> : Least Concern)	32
1.7 Gerenuk (<i>Litocranius walleri</i> : Near Threatened)	34
1.8 Common Zebra (<i>Equus quagga</i> : Near Threatened)	36
1.9 Lion (<i>Panthera leo</i> : Vulnerable).....	38
1.10 Cheetah (<i>Acinonyx jubatus</i> : Vulnerable)	41
1.11 Wild Dog (<i>Lycaon pictus</i> : Endangered)	43
1.12 Tana River Red Colobus & Tana Crested Mangabey (<i>Piliocolobus rufomitratu</i> s & <i>Cercocebus galeritus</i> : Critically Endangered).....	45
1.13 Sea Turtles.....	48
2. Wildlife Sanctuaries.....	50
2.1 Hirola (<i>Beatragus hunteri</i> : Critically Endangered) – Ishaqbini Conservancy	50
2.2 Black Rhino (<i>Diceros bicornis michaeli</i> : Critically Endangered) – Sera Conservancy	53
2.3 Elephant Orphans – Reteti Elephant Sanctuary, Namunyak-Ngilai Conservancy	57
2.4 Rothschild Giraffe (<i>Giraffa camelopardalis</i> ssp. <i>rothschildi</i> : Near Threatened) - Ruko Conservancy	59
3. Human-Wildlife Conflict	60
4. Wildlife Protection And Security.....	69
4.1 Monitoring Illegal Activities - Efforts On Combating Wildlife Crime	69
4.2 Conservancy Ranger Patrol Effort.....	70
References.....	72

Executive Summary

This is the first comprehensive report on the impact of NRT member community conservancies on wildlife since NRT was established in 2004. **It brings together all the data available on the status and distribution of key wildlife gathered by community conservancy rangers during their daily patrols, as well as additional research and monitoring from partner organisations working in the landscape.** The report also presents the status of endangered species being managed in several community-run sanctuaries established in our member conservancies in collaboration with NRT.

NRT-member conservancies provide **vital range and landscape connectivity for critically endangered and endangered wildlife**, and in some cases host a large proportion of their national or global populations. Monitoring has been established on eight endangered large mammals these include hirola, black rhino, Tana River red colobus, Tana crested mangabey, African wild dog, Grevy's zebra, reticulated giraffe and Beisa oryx and two endangered sea turtles; green and hawksbill turtles. Conservancy-based monitoring of additional endangered species including pangolin and pancake tortoise are being developed.

The impact of NRT-member community conservancies on improving the status of wildlife is evident. Data gathered by conservancies as well as research partners highlights how conservancies have played a significant role in stabilising and increasing populations of elephant, reticulated giraffe, Beisa oryx, and Grevy's zebra. **Improved security for wildlife in conservancies has significantly reduced ivory poaching of elephants from a peak of over 100 in 2012 to four elephants in 2019.** While decreasing sightings of elephants have been recorded in some conservancies, these are balanced by increasing trends in others where elephants have sufficient space and good habitat.

Improved security is allowing elephants to expand their range into areas that were previously insecure and have the potential to accommodate increasing elephant numbers in future. Actions of conservancy rangers in improving security and creating conservation awareness have also resulted in a significant reduction in poaching of endangered sea turtles in NRT member conservancies at the coast.

Buffalo appear to be declining in much of the NRT landscape. Buffalo are highly vulnerable to drought and northern Kenya has experienced two severe droughts in 2009 and again in 2016/17 which led to high numbers of buffalo deaths, and the loss of this species entirely from some conservancies.

Meibae and Lekurruki community conservancies have shown declines in sightings in 50% of the key species being monitored in their areas. Severely degraded rangelands in Meibae and the expansion of unplanned settlements is likely to be the cause of these declines. In Lekurruki, insecurity and

incursions of large numbers of livestock into the conservation area have been major challenges in recent years and this is likely the cause of wildlife declines in this conservancy.

Large-scale surveys of large carnivores have not been completed across much of the NRT landscape, so information on status and trends is patchy. Conservancies provide important range and connectivity for large carnivores (including lion, cheetah, leopard, wild dog, spotted and striped hyena), although in most conservancies these species are at low densities. Both cheetahs and wild dogs appear to be stable or otherwise decreasing in most conservancies. The Namunyak conservancies (Ngilai, Kalepo and Nalovuon) continue to host an important source population of wild dog which were unaffected by recent disease outbreaks which decimated wild dog in Laikipia. Well-managed core conservation areas are providing refuge for lion which is particularly important in areas where human and livestock population densities are high. In areas with lower human densities, traditional nomadic pastoralism is a land-use that remains compatible with large carnivore conservation providing sufficient space and enabling predators, especially lion, to avoid people. Similarly, in the Boni forest and adjacent areas within the NRT-Coast region, there are few people and abundant wild prey, here the populations of lion and other large carnivores are unlikely to be under serious threat.

Addressing human-elephant conflict is an increasingly urgent issue with reports of at least 27 people killed and 28 people injured by elephant in NRT-member conservancies since 2012. Conflict with people is also an increasing threat to elephants and now one of the highest causes of elephant mortality in the NRT landscape. In the next five years, NRT will be placing greater emphasis on establishing fences around settlements and agriculture in elephant conflict hotspots to mitigate these threats. Whilst NRT has not invested significantly in predator conflict mitigation, this is widespread, impacts human livelihoods and poses a threat to the conservation of large carnivores in some conservancies.

Over the past eight years, NRT has assisted member conservancies to establish several fenced sanctuaries for endangered species which are community-owned and managed. These sanctuaries are providing secure breeding areas for critically endangered hirola and black rhino, as well as other more common species. Ishaqbini Hirola Sanctuary now hosts 20-25% of the global population of hirola and there are plans to expand the sanctuary, and the population of black rhino in Sera Rhino Sanctuary is increasing at an average of 14% per year. The Rothschild giraffe sanctuary established in Ruko conservancy on the shores of Lake Baringo has been less successful due to rising lake levels which isolated the giraffe on a small island; a sanctuary on the mainland for these giraffe is currently being constructed.

The Reteti Elephant Sanctuary was established in Ngilai Community Conservancy (Namunyak) in 2016, specifically to rescue and rehabilitate orphaned elephant calves. By the end of 2019 Reteti had handled 50 elephant calves and successfully released six calves into Sera Rhino Sanctuary to begin their re-wilding phase, a further four calves were released in May 2020.

Successful conservation of wildlife in NRT member conservancies requires a multi-faceted approach to address the complex and interconnected threats to wildlife, many of which are exacerbated by climate change. Increasing human populations are leading to the expansion of unplanned settlements which are encroaching on traditional grazing lands, degrading rangelands, reducing space available for wildlife and cutting off vital wildlife corridors. Settlement and land-use planning needs to be prioritised by conservancies, and supported by county governments, to maintain a connected and open landscape for wildlife as well as livestock. Rangeland degradation remains one of the most pressing challenges to pastoralist livelihoods and wildlife which is exacerbated by climate change; while NRT and conservancies have invested considerable effort in addressing this, improving rangeland management needs to greater emphasis in many conservancies.

Maintaining security for wildlife to address threats of trophy and bushmeat poaching remains a major focus of NRT and the conservancies' work and is a proven success which is evident from increasing populations of favoured bushmeat species, including giraffe and Beisa oryx, as well as the extremely low level of ivory poaching in the conservancies. However, commercial bushmeat poaching in NRT-Coast remains a significant challenge which is widespread and requires substantial resources and commitment from the conservancies to tackle effectively.

Introduction

The Northern Rangelands Trust (NRT) is a not for profit organisation established in 2004 by community conservancies with a mission to ***develop resilient Community Conservancies that transform lives, secure peace, and conserve natural resources.***

A community conservancy is a community-based organisation created by indigenous communities to support the management of community-owned land for the benefit of improving livelihoods and conservation of natural resources. NRT member conservancies are legally registered entities, governed by a locally elected board of directors and run by local management team, which includes various sub-committees such as grazing, peace, finance and tourism. All affairs of the NRT member community conservancies are run by the local communities themselves. NRT has various programs such as security, peace, wildlife, rangelands, water, education, enterprise development, and provides member community conservancies with technical and oversight support.



Wildlife conservation and management within community conservancies is primarily achieved through daily patrols, wildlife monitoring and conservation awareness by conservancy rangers, as well as targeted wildlife management projects (e.g. sanctuaries and translocations) for key species. Wildlife monitoring is carried out by conservancy rangers using the Wildlife Conservancy Management Monitoring System (Wildlife CoMMS, or WCoMMS). WCoMMS is a standardised and devolved monitoring system designed by NRT for monitoring wildlife at a conservancy level.

All aspects of the monitoring system are carried out by the conservancy including data collection, analysis, and reporting, thereby providing vital information for adaptive management of the conservancy by management teams (King 2013, WCoMMS Guide). Data collection is done during

routine ranger patrols within the conservancy. Each patrol team records information in the following five areas:

1. **Wildlife Observation** – Numbers and location of all identifiable wildlife species (especially large mammals) observed during routine patrols. Each conservancy has identified its key wildlife species for monitoring.
2. **Wildlife Mortality** – All wildlife mortality observed especially of large mammals, including cause and means of death. Small mammals, reptiles and birds are only recorded when there are reported mass deaths. This includes monitoring illegal killing of elephants (which contributes to the KWS/CITES MIKE program).
3. **Human Wildlife Conflict** – All conflict reported between wildlife and people especially those that cause human death, injury or loss of property, including predation of livestock.
4. **Illegal activities** – detecting any activity that is not permitted by law within Kenya (e.g. poaching, illegal logging, and illegal charcoal production) or conservancy by-laws as unanimously agreed by the community e.g. grazing plans, forest management plans, fishing plans.
5. **Patrol effort** – recording all patrol locations visited each day and determining patrol effort by frequency per location.

Currently 37 of NRT's 39 member community conservancies are implementing WCoMMS to a certain level (WCoMMS has not yet been established in Kirimon and Kaptuya conservancies). Pate and Kiunga conservancies in NRT-Coast region are implementing Marine-CoMMS which includes additional information on the marine ecosystem i.e. fisheries, mangroves and turtle nesting. Additional monitoring data on key species is also gathered in specific conservancies. These are:

- **Hiroa** in Ishaqbini.
- **Beisa oryx** in Nakuprat Gotu.
- **Black rhino** in Sera.
- **Rothschild's giraffe** in Ruko.
- **Tana mangabey** and **Tana red colobus** in Ndera.
- **Marine turtles** in Pate and Kiunga.

To complement WCoMMS, NRT also undertakes periodic aerial surveys in key areas to determine population numbers of wildlife. NRT collaborates with the Kenya Wildlife Service (KWS) to carry out ecosystem-level total aerial counts in the Ewaso ecosystem every four to five years and works with Grevy's Zebra Trust (GZT) and other partners in the biennial Great Grevy's Rally. NRT also works with other partners to carry out more detailed research on wildlife and habitats, including habitat assessments in fenced sanctuaries, predator counts, population surveys using individual ID photo recognition, elephant movements and behaviour (with Save the Elephants, STE).

This report aims to document the current status of key wildlife species in NRT member conservancies and trends in these species over time, since NRT's inception and the start of WCoMMS in 2005. The report also provides a summary of the status of wildlife and habitats in fenced sanctuaries within NRT member conservancies.

1. Status & Trends of Key Wildlife Species

This chapter summarises the status of 11 key species of wildlife which are common or present across the majority of NRT member community conservancies, based on available data from NRT and partner organisations including WCoMMS, aerial and ground surveys, and in some cases data from GPS collars fitted to individual animals. Data from Wildlife/Marine-CoMMS on two endangered primates and marine turtles found in specific conservancies in NRT-Coast are also presented.

Wildlife encountered by conservancy rangers during routine patrols are recorded in a standardised manner on datasheets using the Wildlife-CoMMS system, indicating the species seen, number and location. These frequent observations provide cumulative sightings of each species over time and an index of abundance per species which factors in patrol effort. The method is not designed to determine population numbers, but instead provide information on trends in sightings of key species and their location over time. Each conservancy has its own list of key species (approximately 15-20 medium-large mammals) which are known to occur in the area and are easily recognisable. Trends in sightings are presented for conservancies that have at least three years of WCoMMS data. Long-term trends (>3yrs) of species based on index of abundance are described as:

- **INCREASE** positive trend line with R^2 value greater than 0.1
- **DECREASE** negative trend line with R^2 value greater than 0.1
- **STABLE** trend line with R^2 value between 0 and 0.1

Distributions of key species in contiguous conservancies in the NRT-centre region are discussed, noting that for the most part this is an open ecosystem and wildlife are able to freely migrate across the landscape. Maps show the density of sightings of these species across the landscape for the period 2014-2019. Maps for NRT-Coast are not shown as WCoMMS has only been more recently established in several of these conservancies.

1.1 African Elephant (*Loxodonta africana*: Vulnerable)

Elephant move across the NRT-centre landscape from southern Laikipia and the foothills of the Aberdares and Mt. Kenya through to Samburu, Isiolo and Marsabit in the north. There is a general seasonal movement of elephant during the October rains to the north-eastern parts of this landscape (eastern Samburu and Isiolo north) as conditions dry out, elephant move south-west from about June to catch the July/August rains in Laikipia.

Rangers WCoMMS data between 2008 and 2019 show the highest density of observations of elephants in Naibunga, Il Ngwesi, parts of Meibae, Westgate, Kalama, Namunyak and Sera conservancies (figure 1). Trends in sightings of elephant, using index of abundance data, show that **sightings have increased in 16 out of 23 conservancies (69%)** for which there is >3 years of W-CoMMS data, **two conservancies (9%) show a decrease in sightings of elephant and five conservancies (22%) show that elephant sightings are stable** (table 1). The decrease in sightings of elephant in Meibae, despite the relatively high presence in this area which is an important elephant corridor, is likely due to increasing human settlements and high densities of people and wildlife. However, this is compensated by increases seen in other conservancies which have expanded elephant range and good habitat as a result of improved security.

Table 1: Elephant trends from WCoMMS data as observed by conservancy rangers by conservancy.

Laikipia/Meru	Isiolo	Samburu	Marsabit	NRT-Coast	Baringo
Ngare Ndare (2012-19)	Biliqo Bulesa (2010-19)	Sera pre-sanctuary (2005-14)	Melako (2009-19)	Ishaqbini pre-sanctuary (2008-10)	Ruko (2010 -19) Nil
Il Ngwesi (2008-19)	Nakuprat Gotu (2014-19)	Sera post sanctuary (2015-19)	Songa (2017-19)	Ishaqbini post sanctuary (2011-19)	
Lekurruki (2009-19)	Nasulu (2014-19)	Namunyak (2007-19)	Shurr (2017 – 19)	Nil	Ndera (2012-19)
Naibunga (2010-19)	Leparua (2012-19)	Kalama (2008-19)	Jaldesa (2017-19)		Lower Tana (2017-19)
	Naapu (Mpus Kutuk) (2008-19)	Westgate (2007-19)			Hanshak Nyongoro (2017 -19) Nil
		Meibae (2007-19)			Kiunga (2017-19)
		Nkoteiya (2017-19)			
		Ltungai (2008-19)			

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

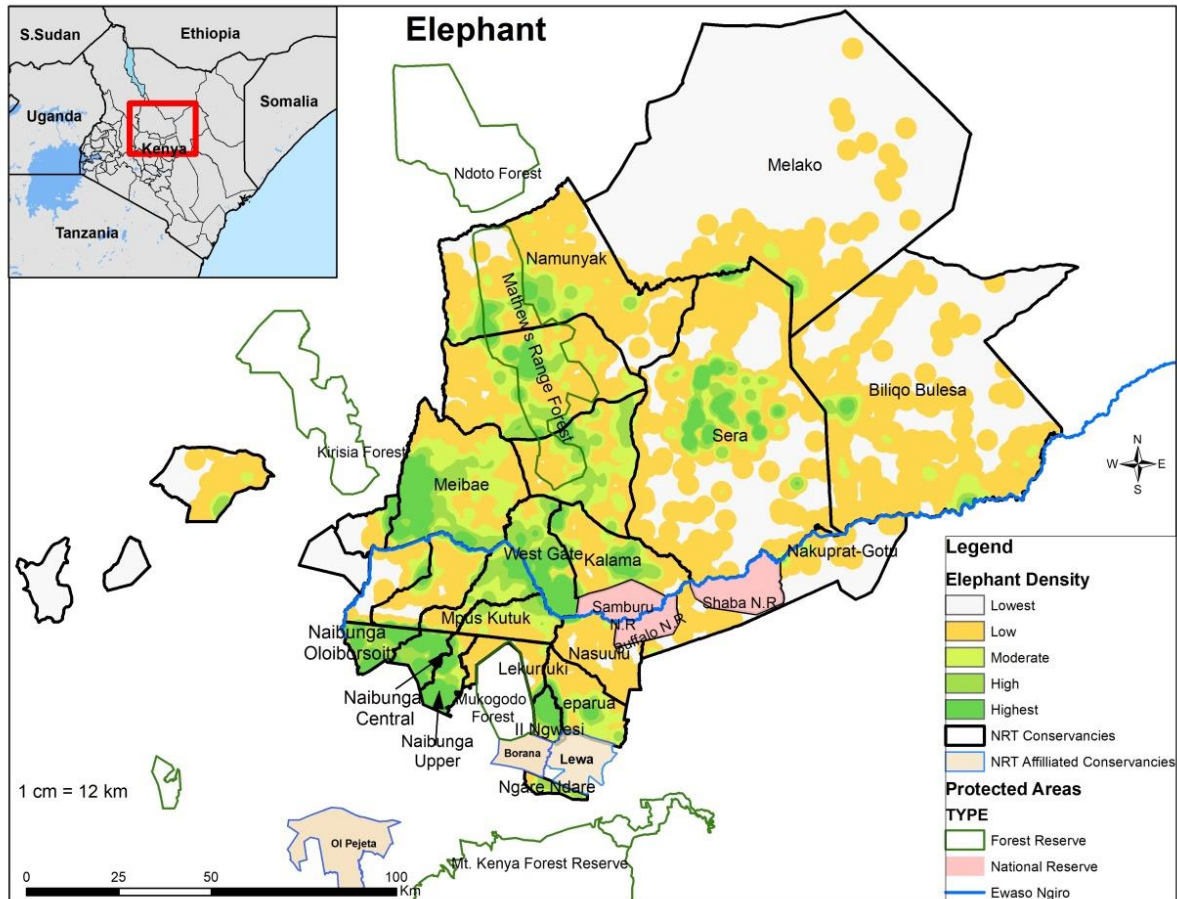


Figure 1: Map showing densities of elephant sightings from WCoMMS data 2014 to 2019.

Monitoring Illegal Killing of Elephants (MIKE)

NRT conservancies have been participating in Monitoring Illegal Killing of Elephants (MIKE) program with consistent data collection since 2008. The MIKE program was established in 2002 under CITES and the Laikipia-Samburu MIKE site is one of four sites that have contributed information on Kenya’s status on elephant deaths. MIKE evaluates relative poaching levels based on the Proportion of Illegally Killed Elephants (PIKE), which is calculated as the number of illegally killed elephants (poaching + conflict) found divided by the total number of elephant carcasses encountered by patrols or other means.

Data from NRT member conservancies are collected and shared with Kenya Wildlife Service (KWS) and field data is harmonised for Laikipia Samburu MIKE site every three months. The trend of PIKE has changed over time, with reduction of illegally killed elephants especially trophy poaching since 2012 (figure 2 and 3). In Samburu, a PIKE of over 54% is likely to mean that the population is not sustaining itself (STE 2019), i.e. above this figure the population will cause the population to decline.

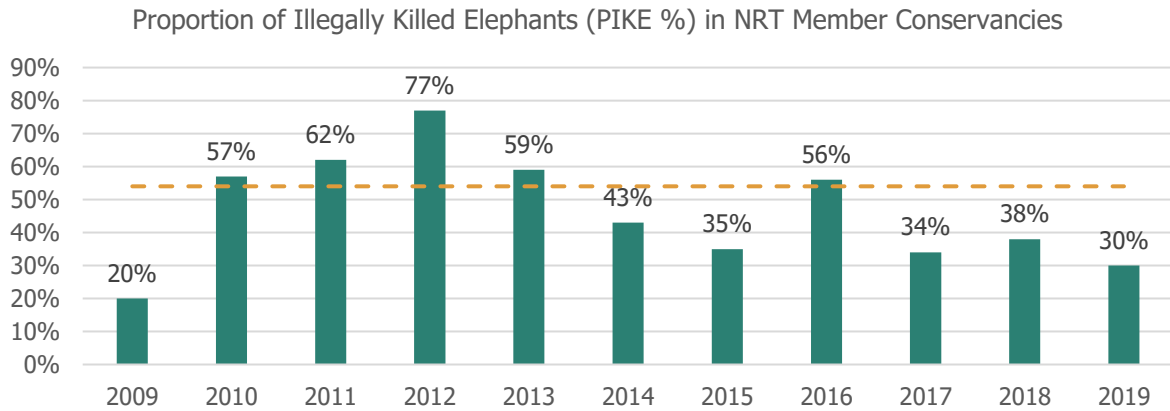


Figure 2: Graph shows the proportion of illegally killed elephants (PIKE) by year. PIKE above 54% is likely to mean that the population is not sustaining itself.

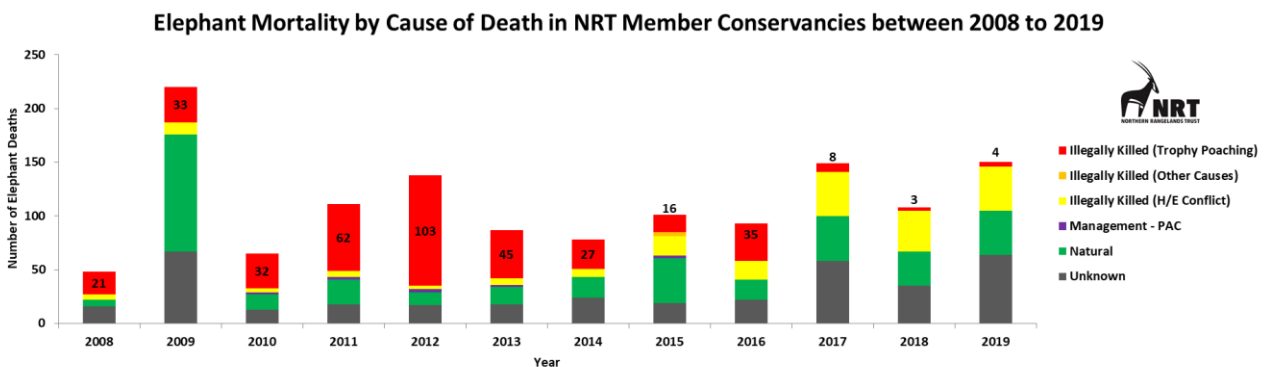


Figure 3: Graph shows number of elephant deaths by year and cause of death.

Trophy poaching in the NRT landscape peaked in 2012 with more than 100 elephant being killed for ivory across Laikipia, Isiolo and Samburu in one year. However, with the establishment of the NRT mobile security to support highly motivated conservancy rangers, poaching was brought down to manageable levels (figure 4 and 5). **2018 and 2019 had the lowest number of poached elephant in the landscape since monitoring began.** However, killing of elephant in conflict has increased in the past three years, and **conflict killing is now one of the highest causes of death of elephant in the NRT landscape.**

Figure 4 and 5 show the distribution of illegal killing of elephant between 2008–2013 and 2014–2019. Pre-2013, poaching was widespread across the landscape however since 2014 poaching incidents have been largely restricted to the Namunyak conservancies. Up to 2013, conflict killing of elephant was more widespread, however since 2014 conflict killing hotspots are in the Namunyak conservancies (Ngilai, Nalowuon and Kalepo) and Naibunga conservancies (Naibunga Upper, Centre and Lower).

Aerial Surveys

The population of elephant in the NRT landscape are estimated using aerial surveys carried out by KWS and other stakeholders (Ngene *et al.* 2017). This involves a total count of elephants across designated counting blocks (figure 7) using multiple light aircraft flying transects at 1km strip width. A similar count is done by Department of Resource Surveys and Remote Sensing who conduct sample counts (5-10km strip width) for some parts of the landscape. KWS total aerial counts have been carried out in 2002, 2008, 2012 and 2017 with **results showing a steady increase in the Laikipia-Samburu-Marsabit elephant population** over this period. In 2017, the population estimate was 7,347 individuals (figure 6). This count is scheduled every five years with the next count is expected to be in 2022.

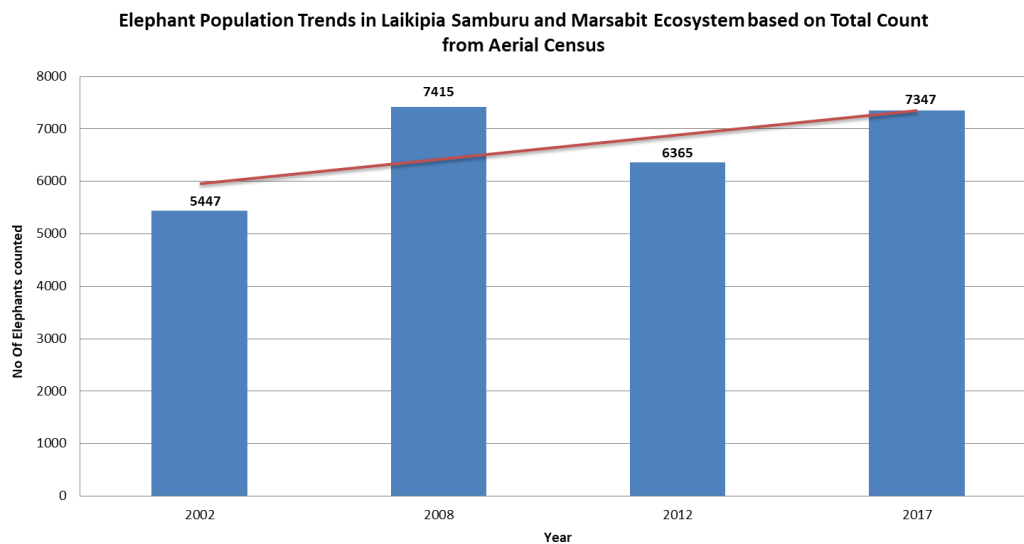


Figure 6: Elephant population estimates in Laikipia, Samburu, Isiolo and Marsabit landscape based on KWS total aerial count between 2002 and 2017 (Ngene et al 2017)

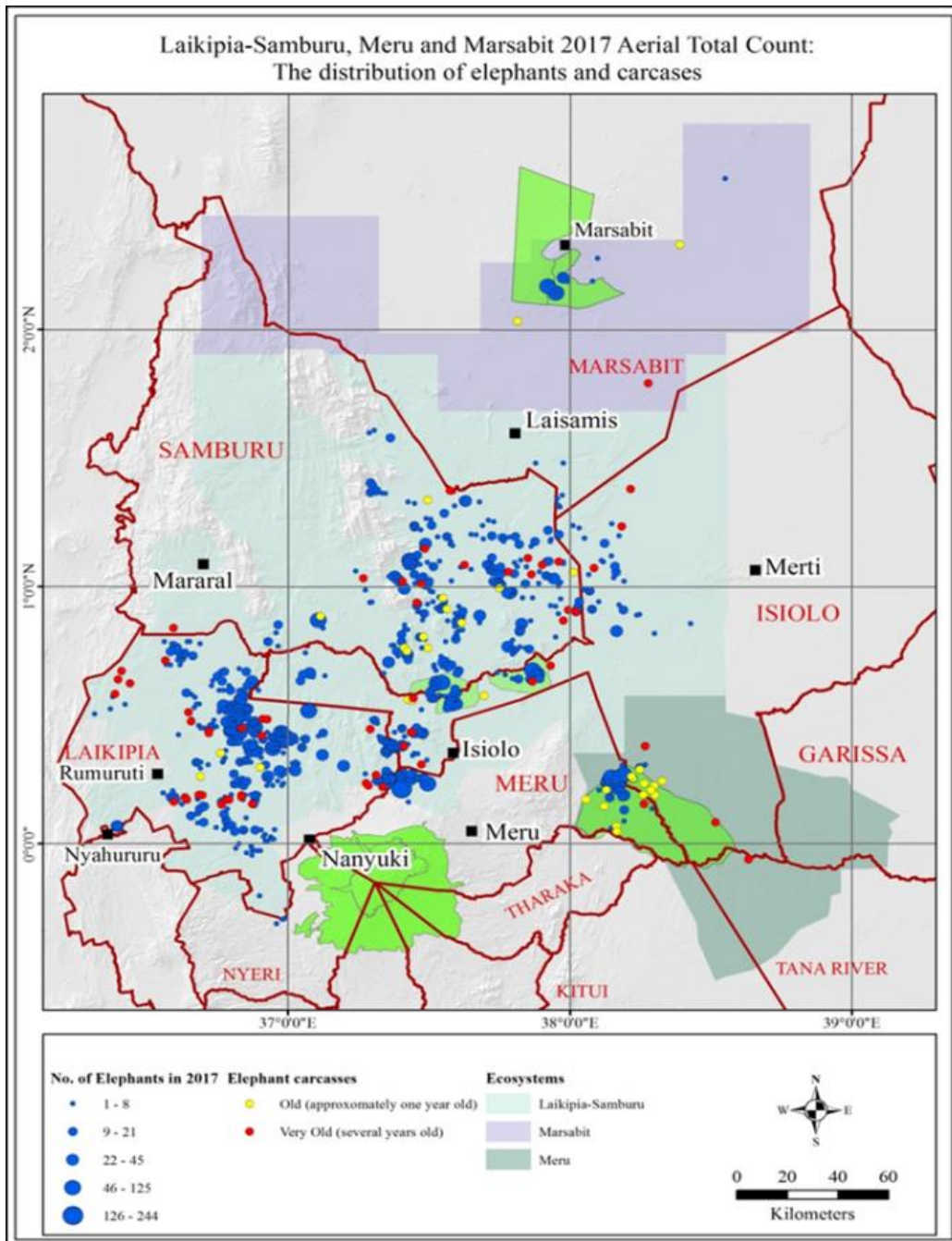
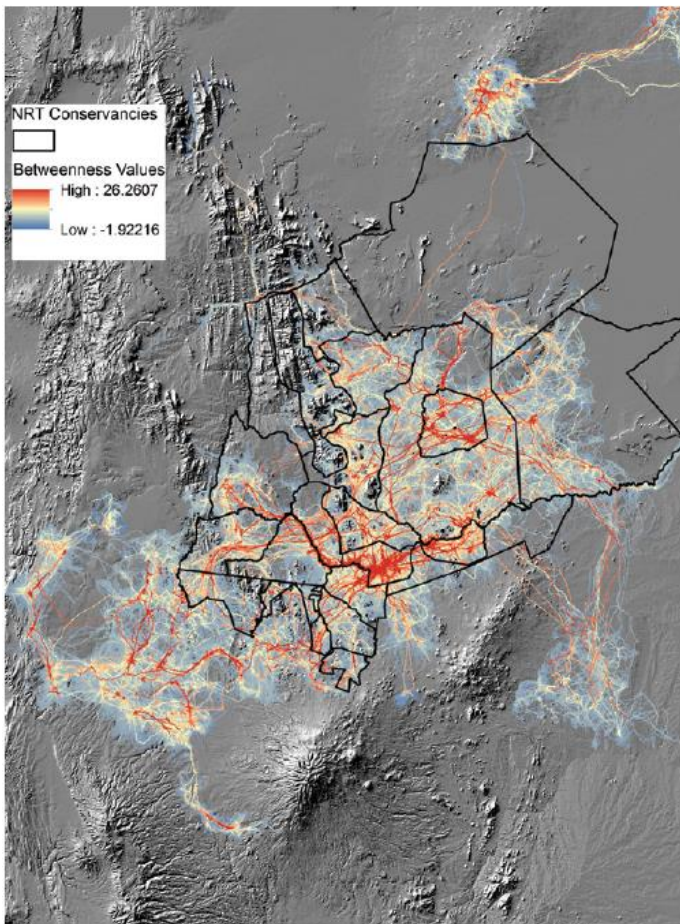


Figure 7: Elephant distribution from 2017 aerial count conducted by KWS and partners showing concentration in Laikipia East and Samburu East, this correlates with data on concentrations of elephant sightings reported by conservancy rangers in WCoMMS (Ngene et al. 2017)

Elephant Movements

Save the Elephants (STE) have been conducting in-depth research on elephants in Samburu for the past 20 years. Part of their research has included collaring of almost 60 elephant with GPS collars in order to study their movements. In partnership with NRT, 40 elephant were collared between 2014 and 2019 with a specific view to study the impact of conservancies in expanding safe range for elephants and identifying critical corridors in the landscape that must be conserved. Elephant corridors linking Samburu and Marsabit and Isiolo and Meru have been identified from the tracking data, providing important evidence on the need to protect these corridors in future. The information from the collaring has been used in the gazettelement of Wildlife corridors and dispersal areas including the LAPSSET corridor route.



Research by STE, based on the Laikipia-Samburu MIKE data and KWS aerial survey data, shows that within communal lands, **NRT community conservancies demonstrated significantly higher numbers of elephant and lower illegal killing levels compared to non-designated community lands** (i.e. community land not under conservancies). The data provided conclusive evidence of the importance of community conservancies for elephant. Aerial surveys showed that community conservancies held increasing numbers of elephants, and mortality data from the MIKE programme showed that they suffered from lower levels of illegal killing relative to non-designated community lands (STE 2019).

Figure 8: Elephant movement from collared elephants by STE from over 15 years of tracking showing the elephants utilizing mostly private ranches in Laikipia and Community Conservancies in Laikipia, Isiolo and Samburu.

1.2 Reticulated Giraffe (*Giraffa camelopardalis ssp. reticulata*: Endangered)

Reticulated giraffe are distributed across many conservancies within the NRT landscape predominantly in Laikipia, Samburu East, Isiolo North and Marsabit. They are also common in parts of NRT Coast (not shown on map) in Garissa and Lamu counties. Highest densities of sightings of giraffe reported in WCoMMS are in Il Ngwesi, Leparua, Westgate, Kalama, Namunyak (Nalowuon and Kalepo), Sera, Melako and Biliqo Bulesa conservancies. 21 conservancies have sufficient WCoMMS data on giraffe to allow trend analyses, of these **increased sightings are reported in 15 conservancies (71%), decreased sightings in two conservancies (9%) and stable in three conservancies (14%)** (Table 2 and figure 9).

Table 2: Reticulated giraffe trends from WCoMMS data as observed by conservancy rangers by conservancy.

Laikipia/Meru	Isiolo	Samburu	Marsabit	NRT-Coast	Baringo
Ngare Ndare (2012-19)	Biliqo Bulesa (2010-19)	Sera pre-sanctuary (2005-14)	Melako (2009-19)	Ishaqbini pre-sanctuary (2008-10)	Ruko (2010-19) Nil
Il Ngwesi (2008-19)	Nakuprat Gotu (2014-19)	Sera post sanctuary (2015-19)	Songa (2017-19)	Ishaqbini post sanctuary (2011-19)	
Lekurruki (2009-19)	Nasulu (2014-19)	Namunyak (2007-19)	Shurr (2017 – 19)	Ndera (2012-19)	
Naibunga (2010-19)	Leparua (2012-19)	Kalama (2008-19)	Jaldesa (2017-19)	Lower Tana (2017-19)	Nil
	Naapu (Mpus Kutuk) (2008-19)	Westgate (2007-19)		Hanshak Nyongoro (2017-19)	
		Meibae (2007-19)		Kiunga (2017-19)	Nil
		Nkoteiya (2017-19)	Nil		
		Ltungai (2008-19)	Nil		

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

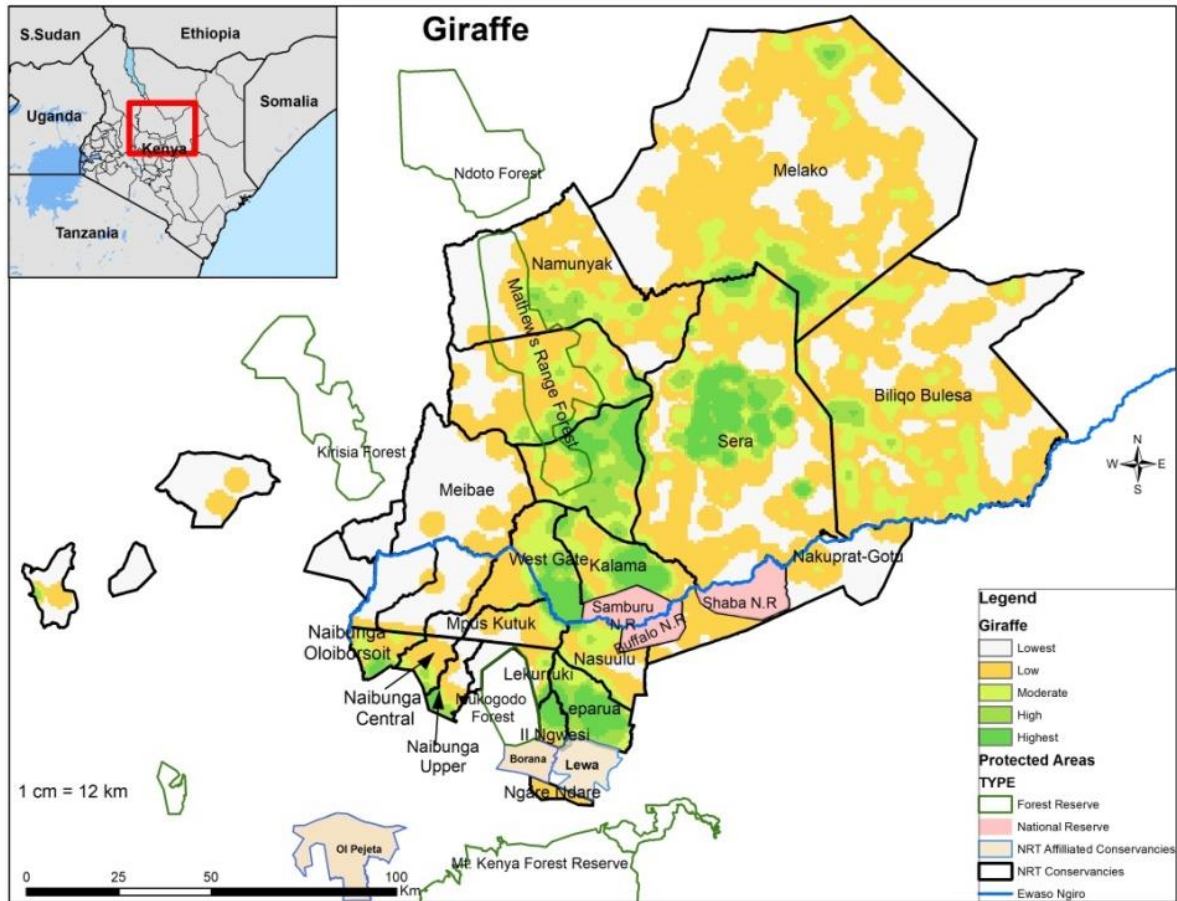


Figure 9: Map showing densities of Reticulated Giraffe sightings from WCoMMS data 2014 to 2019

Aerial surveys

Aerial surveys conducted by KWS (Ngene *et al.* 2017) show that reticulated giraffe are distributed across the landscape in Laikipia, Isiolo, Samburu, Meru and Marsabit counties, except for west of the Mathews range in Samburu. This distribution is similar to that reported by conservancy rangers in WCoMMS. **The giraffe population in the Laikipia-Samburu ecosystem showed a significant increase between 2008 to 2017**, the estimated population of giraffe was 4,019 individuals in the Laikipia-Samburu ecosystem compared to 1,509 in 2012. This is due to increased security and reduced poaching because of the efforts of community and private conservancies (Ngene *et al.* 2017) over this period. Average density of giraffe in the Laikipia-Samburu ecosystem in 2017 was 0.45 giraffe/km².

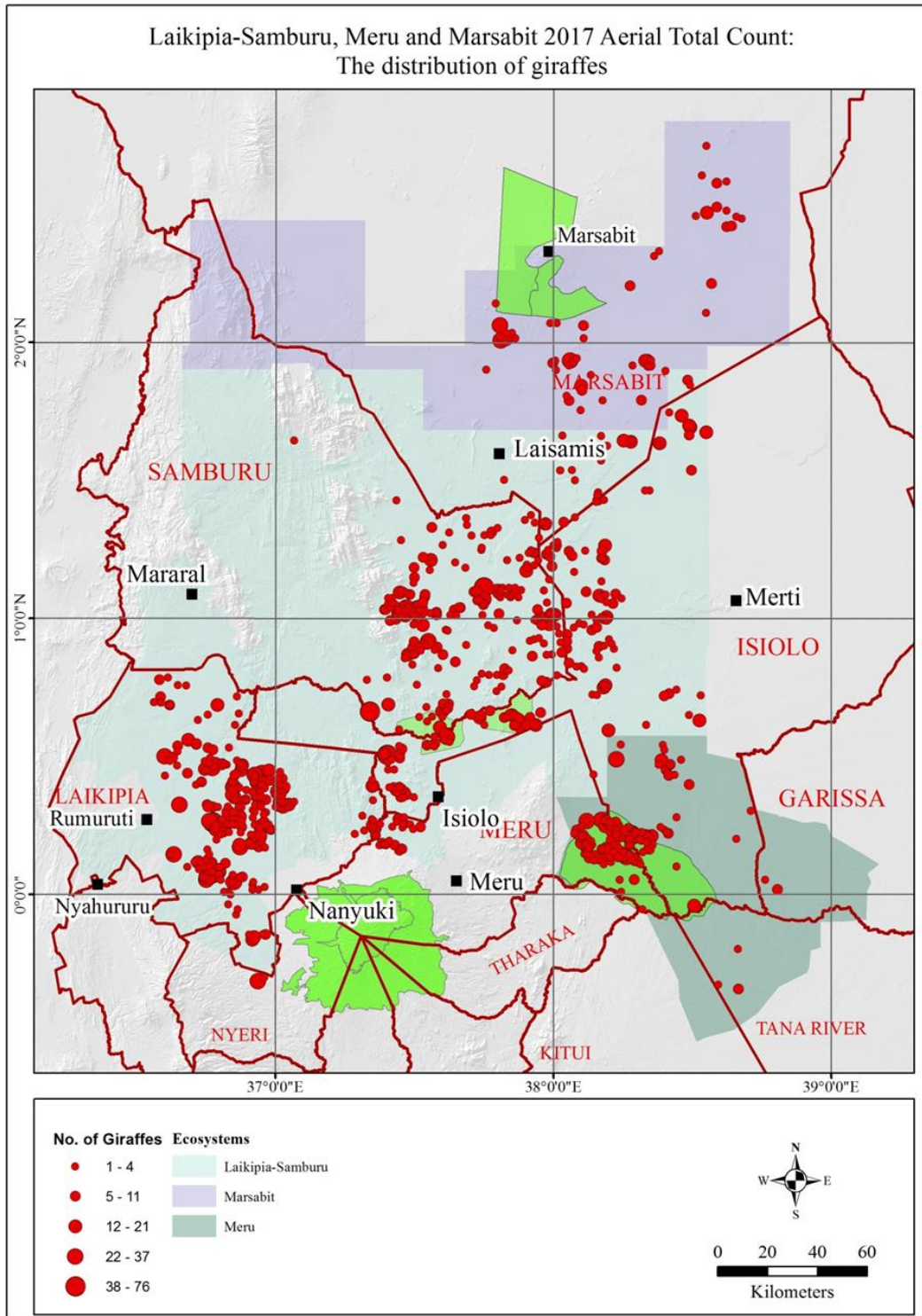


Figure 10: Map showing giraffe distribution across the Laikipia -Samburu, Meru and Marsabit during KWS aerial survey 2017.

Giraffe Movements

San Diego Zoo Global (SDZG) in collaboration with NRT fitted 28 reticulated giraffe with GPS collars within NRT member conservancies in 2018 and 2019. These giraffes are being tracked to look at their spatial temporal utilisation and interaction with other species and livestock on the landscape. Preliminary results have shown that giraffe use the interconnected space between the conservancies with avoidance to high livestock density areas, (O'Connor *et al.* 2020). The home range for female reticulated giraffe in the wild was estimated to be approximately 250 km², while the home range for males is up to 1,250 km², five times the size of a female's home range.

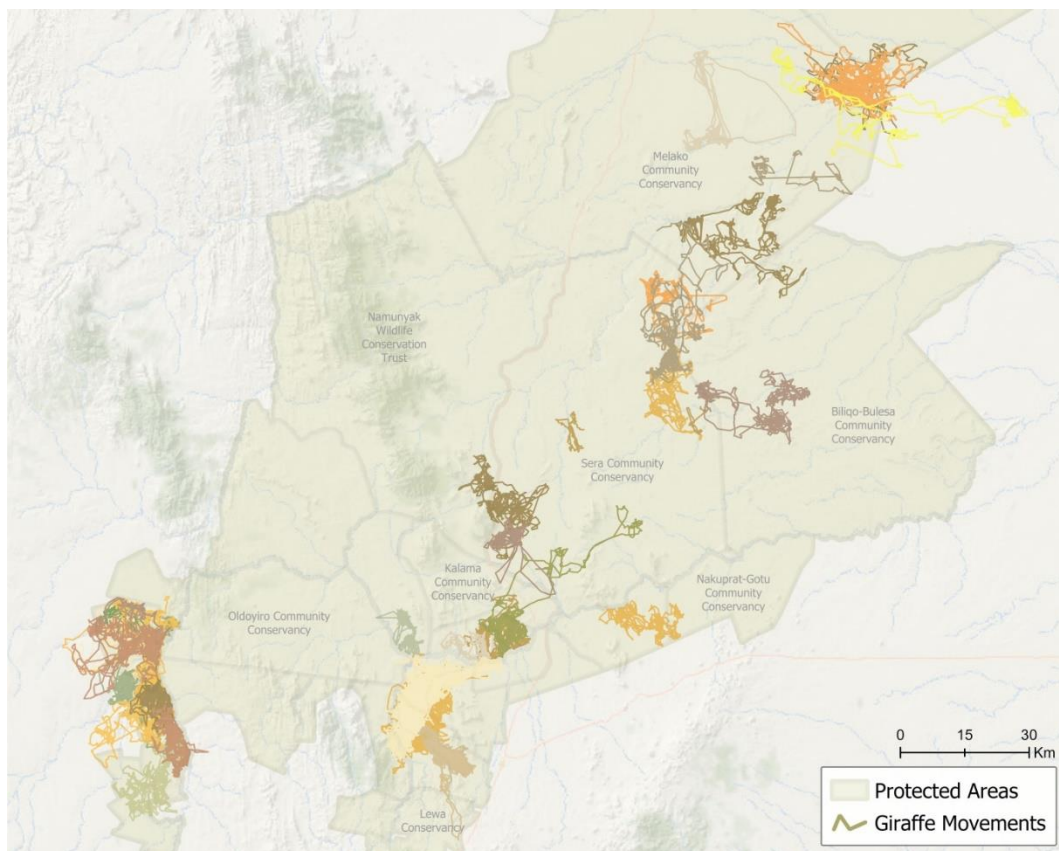


Figure 11: Map from SDZG showing the movements of 39 collared giraffe (2017-2019)

1.3 Grevy's Zebra (*Equus grevyi*: Endangered)

Grevy's zebra are iconic species that are endemic to northern Kenya and southern Ethiopia, they are categorised as endangered by the IUCN Red list with an estimated population size of 2,400 individuals remaining in northern Kenya (2018 Great Grevy's Rally). In the NRT member conservancies Grevy's zebra are only found in conservancies in Laikipia, Isiolo, Samburu and parts of Marsabit. Grevy's are found in the highest concentrations in Meibae, Westgate, Naaspu (Ol Donyiro), Leparua, Il Ngwesi and the Naibunga conservancies (Upper, Lower, Centre). 17 conservancies have sufficient WCoMMS data on Grevy's zebra to allow long-term trend analyses, of these **increased sightings are reported in seven conservancies (41%), decreased sightings were in three conservancies (18%), and stable sightings in seven conservancies (41%)** (Table 4 and figure 12). Of concern is the decrease in sightings in Meibae which has the highest concentration of Grevy's zebra in the NRT landscape.

Table 3: Grevy's zebra trends shown from daily sightings by conservancy rangers by conservancy in limited conservancy within Laikipia, Samburu East, Isiolo and Marsabit.

Laikipia/Meru		Isiolo		Samburu		Marsabit		NRT-Coast		Baringo	
Ngare Ndare (2012-19)	Nil	Biliqo Bulesa (2010-19)	Green	Sera pre-sanctuary (2005-14)	Green	Melako (2009-19)	Yellow	Ishaqbini pre-sanctuary (2008-10)	Nil	Ruko (2010-19)	Nil
Il Ngwesi (2008-19)	Yellow	Nakuprat Gotu (2014-19)	Green	Sera post sanctuary (2015-19)	Yellow	Songa (2017-19)	Red	Ishaqbini post sanctuary (2011-19)	Nil		
Lekurruki (2009-19)	Red	Nasulu (2014-19)	Green	Namunyak (2007-19)	Yellow	Shurr (2017 – 19)	Nil	Ndera (2012-19)	Nil		
Naibunga (2010-19)	Green	Leparua (2012-19)	Yellow	Kalama (2008-19)	Yellow	Jaldesa (2017-19)	Nil	Lower Tana (2017-19)	Nil		
		Naapu (Mpus Kutuk) (2008-19)	Yellow	Westgate (2007-19)	Green			Hanshak Nyongoro (2017-19)	Nil		
				Meibae (2007-19)	Red			Kiunga (2017-19)	Nil		
				Nkoteiya (2017-19)	Yellow						
				Ltungai (2008-19)	Green						

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

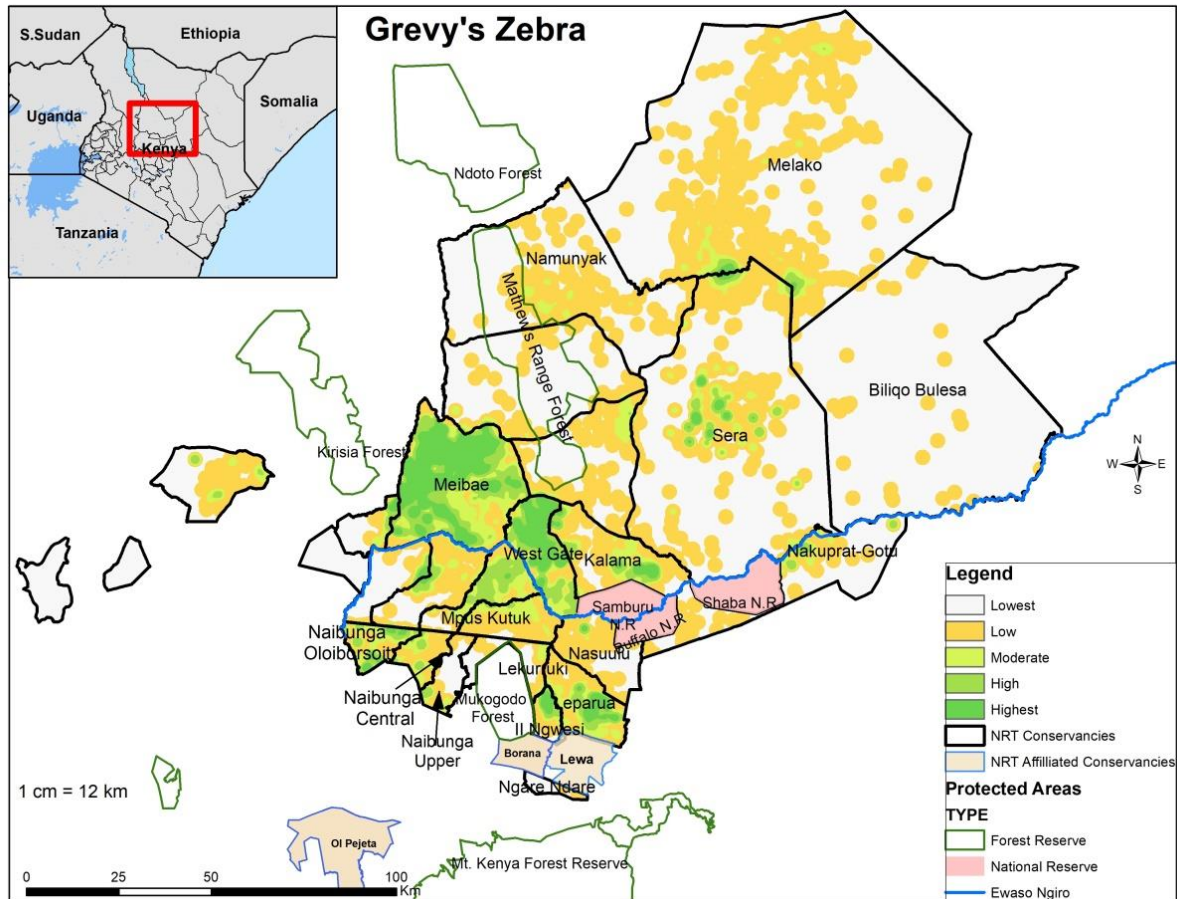


Figure 12: Map showing densities of Grevy's Zebra sightings from WCoMMS data 2014 to 2019.

Grevy's Zebra Trust Scout Monitoring

Grevy's Zebra Trust (GZT) scouts gather data in several community conservancies in the NRT-Centre landscape, including Sera, Kalama, Westgate, Meibae, Melako, and the Namunyak, and Oldonyiro conservancies. Distribution of GZT scout patrols differs to those of conservancy rangers in most conservancies, as GZT scouts are based out of their settlement areas, whereas conservancy rangers patrol from headquarters and outposts mostly away from settlement areas. This may account for some of the difference in sightings trends between conservancy and GZT data in Namunyak and Kalama (GZT data show a decrease in sightings, whereas conservancies data show sightings are stable). Long-term trends in sightings from GZT data support those from conservancy rangers in Meibae (decreasing) and Westgate (stable).

GZT observations show that during the recent droughts Grevy's zebra moved south and west, which may account for an increase in Grevy's zebra numbers in Isiolo, Laikipia and south-west Samburu. **Land degradation is the major driver of Grevy's zebra population decline in Meibae.** In Kalama, land degradation has also increased, with Grevy's zebra shifting into the reserves in the dry season.

Great Grevy's Rally

The Great Grevy's Rally is carried out every two years and coordinated by Grevy's Zebra Trust as a collective effort of data sourcing through citizen science where participants spend two days in the field taking photos of Grevy's zebra stripe patterns. Sorting and analysis is done by running the stripe pattern IDs through a computer software and population estimates developed through mark-recapture calculations. The GGR has been conducted in 2016, 2018 and 2020. 2020 estimates are not available, so this report presents results for the 2018 census. Figure 13 and 14 shows the results from 2016 and 2018. The highest numbers of Grevy's zebra were found in private ranches in Laikipia, however the population showed an increase between 2016 and 2018 in all counties (Figure 13).

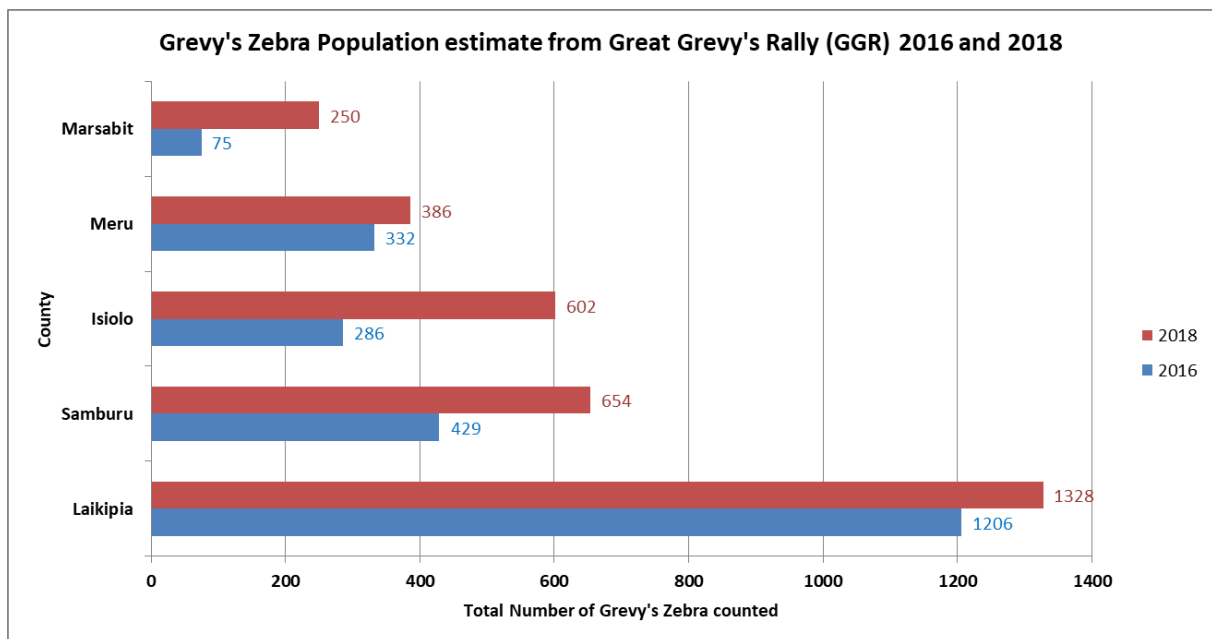


Figure 13: Grevy's Zebra population estimates from GGR 2016 and 2018 by County.

When comparing Grevy's zebra population trends in individual conservancies from the GGR analysis (2016-2018), there is an increase in Kalama and Westgate's Grevy's zebra population, Ngilai West's (northern part of Meibae conservancy) Grevy's zebra population is stable, whilst populations in all other conservancies declined.

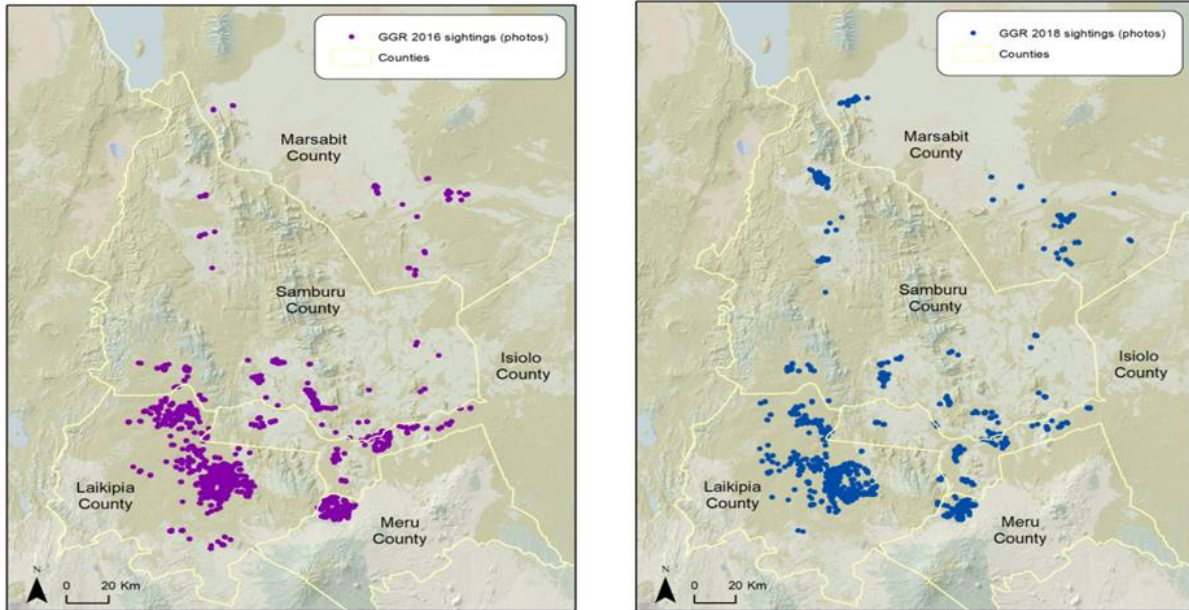


Figure 14: Grevy's Zebra distribution from GGR 2016 and 2018 showing highest densities of Grevy's zebra within private ranches/conservancies in Laikipia County

1.4 Beisa Oryx (*Oryx beisa ssp. beisa*: Endangered)

Beisa oryx (sub-species beisa) natural range is north of the Tana River in Kenya into Somalia, Ethiopia, Djibouti and Sudan. The global population is decreasing, and the species is classified as Endangered (IUCN red list). Beisa oryx are highly arid-adapted and endemic to northern Kenya however very little research or monitoring has been conducted on this species. Results from WCoMMS show that 15 conservancies have sufficient WCoMMS data on Beisa oryx to allow trend analyses. Beisa oryx are sighted most frequently in Nakuprat Gotu, Biliqo Bulesa, Sera, Melako, and Kalama. **Nine conservancies (60%) reported increased sightings, decreased sightings were reported in one conservancy, Westgate, and stable sightings in five conservancies (33%)** (Figure 15 and table 5). Interestingly, oryx are not sighted frequently to allow trend analysis in Il Ngwesi or Lekurruki although they are present in small numbers.

Table 4: Beisa Oryx trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru		Isiolo		Samburu		Marsabit		NRT-Coast		Baringo	
Ngare Ndare (2012-19)	Nil	Biliqo Bulesa (2010-19)	Green	Sera pre-sanctuary (2005-14)	Yellow	Melako (2009-19)	Green	Ishaqbini pre-sanctuary (2008-10)	Yellow	Ruko (2010-19)	Nil
Il Ngwesi (2008-19)	Nil	Nakuprat Gotu (2014-19)	Green	Sera post sanctuary (2015-19)	Green	Songa (2017-19)	Green	Ishaqbini post sanctuary (2011-19)	Yellow		
Lekurruki (2009-19)	Nil	Nasulu (2014-19)	Green	Namunyak (2007-19)	Yellow	Shurr (2017 – 19)	Green	Ndera (2012-19)	Nil		
Naibunga (2010-19)	Green	Leparua (2012-19)	Yellow	Kalama (2008-19)	Yellow	Jaldesa (2017-19)	Nil	Lower Tana (2017-19)	Nil		
		Naapu (Mpus Kutuk) (2008-19)	Nil	Westgate (2007-19)	Red			Hanshak Nyongoro (2017-19)	Nil		
				Meibae (2007-19)	Yellow			Kiunga (2017-19)	Nil		
				Nkoteiya (2017-19)	Nil						
				Ltungai (2008-19)	Nil						

Key; **Red** = Decrease, **Yellow** = Stable, **Green** = Increase

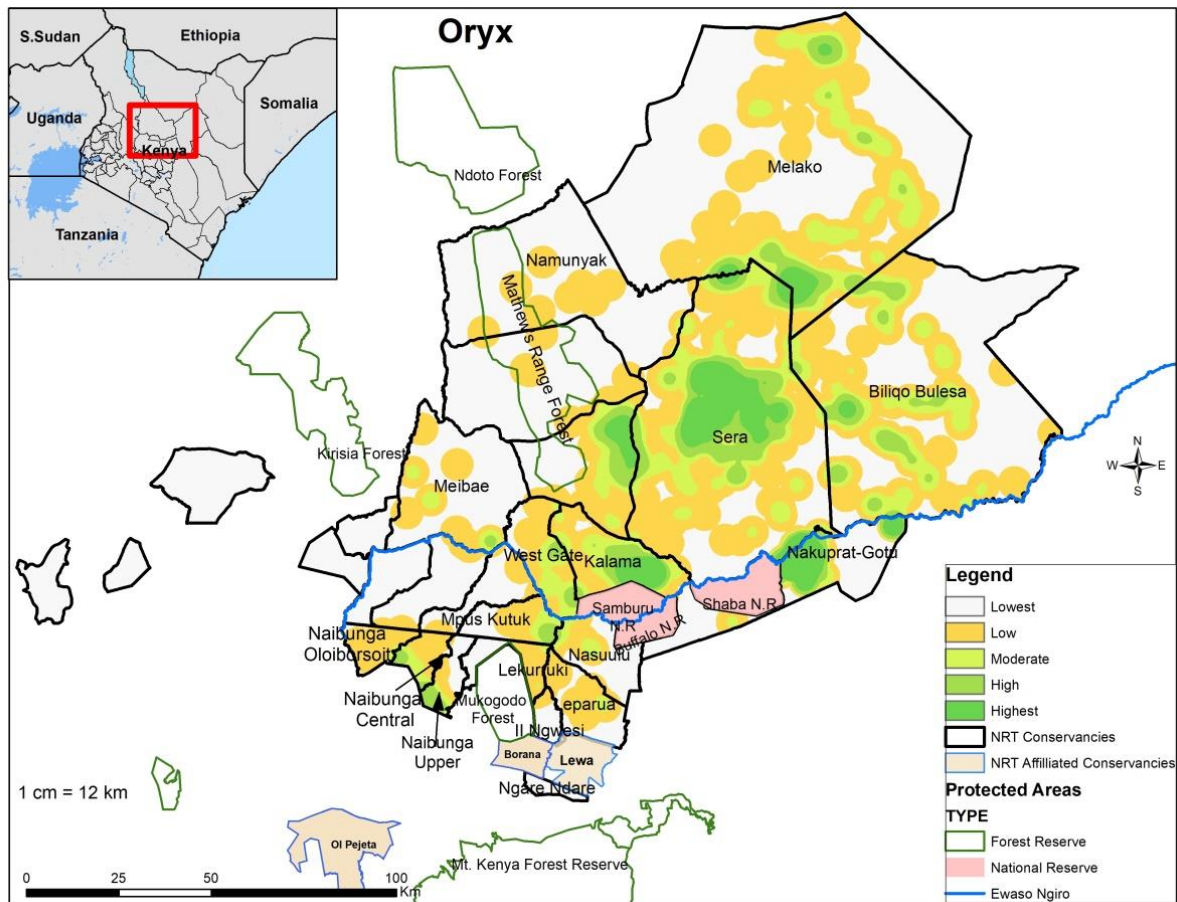


Figure 15: Map showing densities of Beisa Oryx sightings from WCoMMS data 2014 to 2019.

Aerial Surveys

Systematic aerial surveys have been conducted by NRT in the Sera Rhino Sanctuary and parts of Nakuprat Gotu Community Conservancy since 2016, to supplement information on the oryx population gathered from WCoMMS. The Sera Rhino Sanctuary has a small, but growing population of oryx that was introduced to the fence sanctuary at the start. The eastern part of Nakuprat Gotu Conservancy and neighbouring Shaba National Reserve is thought to have the largest sub-population of Beisa oryx in northern Kenya, with an estimated 700 individuals in 2018 which could represent up to 10% of the national population of this sub-species. **With increased investment in monitoring and anti-poaching patrols by NRT and Nakuprat Gotu, this population increased from approximately 600 individuals in 2016 to over 700 in 2018.**

1.5 African Buffalo (*Syncerus caffer*: Near Threatened)

Buffalo are not common in the NRT landscape apart from in a few conservancies including Nakuprat Gotu in Isiolo and conservancies in NRT-Coast. Other conservancies with resident buffalo include Biliqo Bulesa, Sera, Namunyak, Naibunga, Il Ngwesi and Ngare Ndare. Buffalo are highly water dependent and very susceptible to drought and were severely affected in the 2009 and 2016/17 droughts. Since 2009 numbers have slowly recovered in some conservancies, including Melako where the entire herd died in 2009 however there have been recent sightings in 2018 and 2019. 19 conservancies have sufficient WCoMMS data on buffalo to allow trend analyses, of these **increased sightings are reported in eight conservancies (42%), decreased sightings were in five conservancies (26%), and stable sightings in six conservancies (32%)** (Table 4 and figure 16).

Table 5: Buffalo trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru	Isiolo		Samburu		Marsabit		NRT-Coast		Baringo
Ngare Ndare (2012-19)		Biliqo Bulesa (2010-19)		Sera pre-sanctuary (2005-14)		Melako (2009-19)		Ishaqbini pre-sanctuary (2008-10)	Ruko (2010-19)
Il Ngwesi (2008-19)		Nakuprat Gotu (2014-19)		Sera post sanctuary (2015-19)		Songa (2017-19)		Ishaqbini post sanctuary (2011-19)	
Lekurruki (2009-19)		Nasulu (2014-19)	Nil	Namunyak (2007-19)		Shurr (2017 – 19)	Nil	Ndera (2012-19)	
Naibunga (2010-19)		Leparua (2012-19)	Nil	Kalama (2008-19)		Jaldesa (2017-19)	Nil	Lower Tana (2017-19)	
		Naapu (Mpus Kutuk) (2008-19)	Nil	Westgate (2007-19)				Hanshak Nyongoro (2017-19)	
				Meibae (2007-19)	Nil			Kiunga (2017-19)	
				Nkoteiya (2017-19)	Nil				
				Ltungai (2008-19)					

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

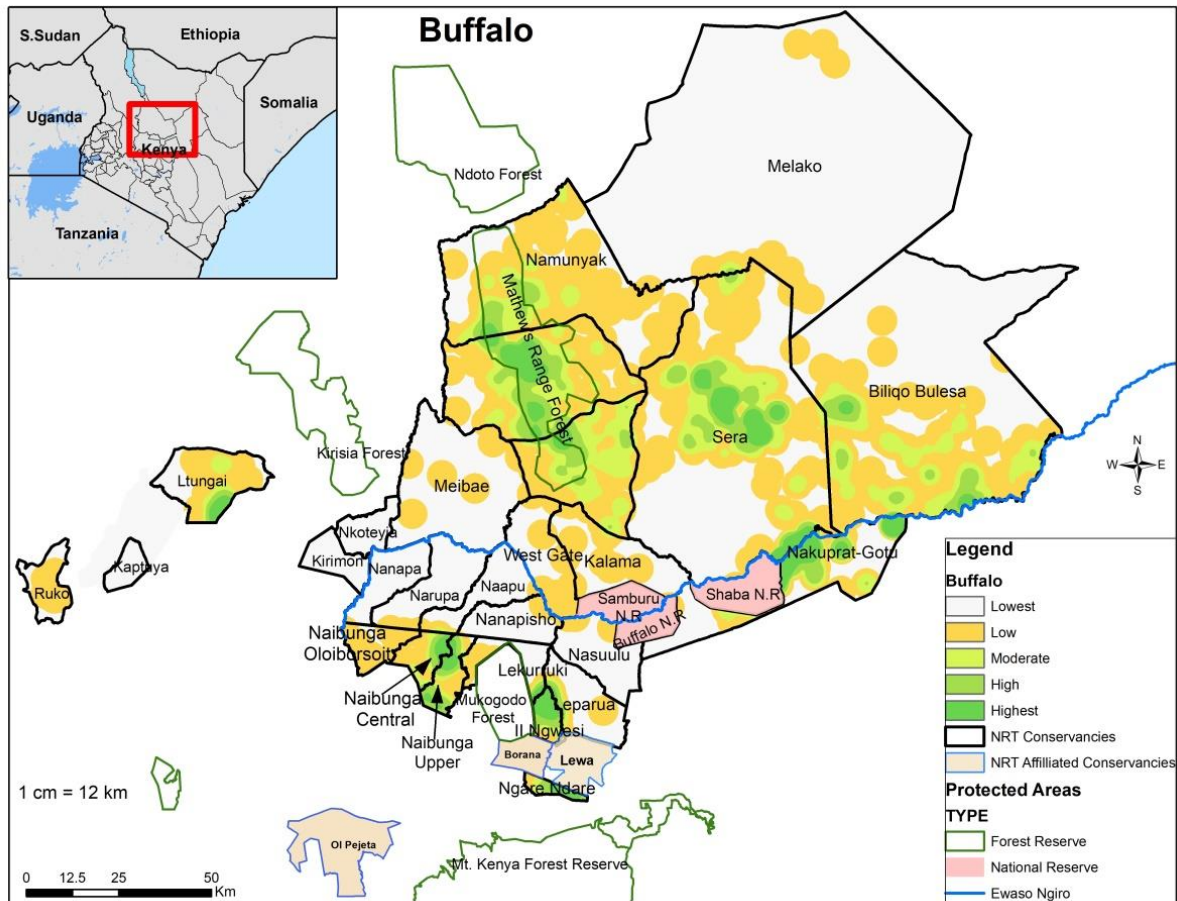
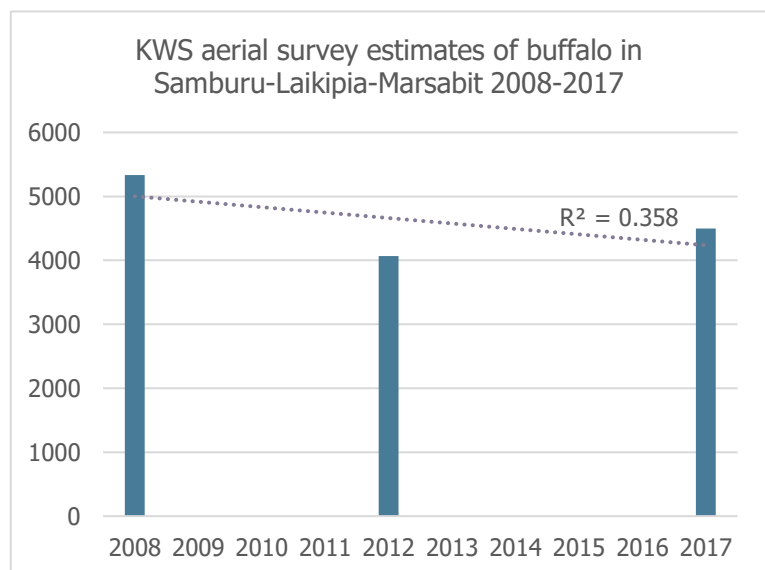


Figure 16: Map showing densities of Buffalo sightings from WCoMMS data 2014 to 2019.

Aerial Surveys

Buffalo have always been included in the large mammal aerial census of the Samburu-Laikipia and Marsabit ecosystem conducted by KWS and partners. Buffalo numbers declined between 2008 to 2012 largely due to the 2009 drought, however, numbers have recovered slightly between 2012 and 2017, with an estimated 4,499 buffalo in the ecosystem (Meru NP is not included). The majority of these are found within the private ranches and conservancies in Laikipia with very few observed in Isiolo, Samburu and Marsabit.



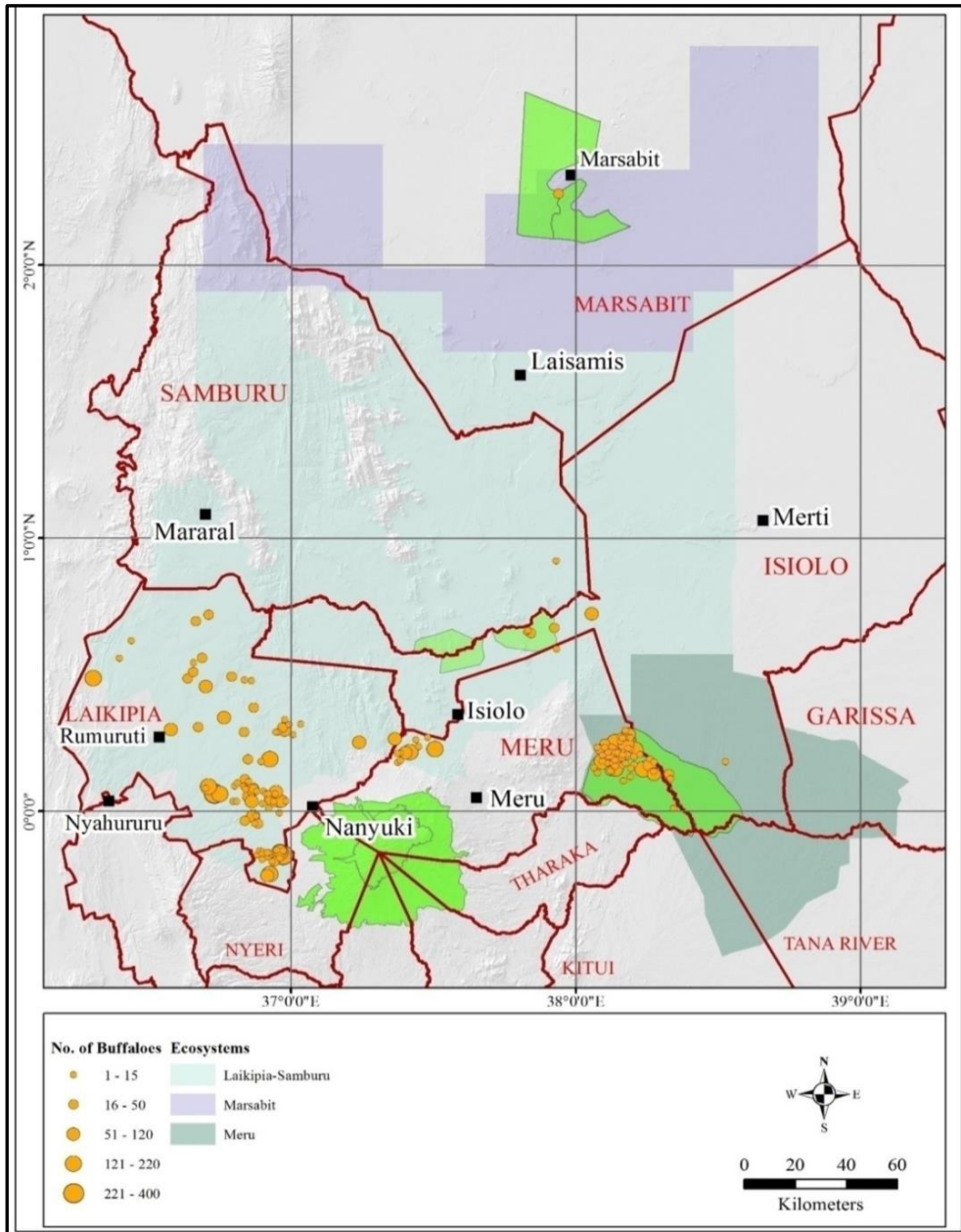


Figure 17: Distribution of buffalo in the KWS aerial count 2017

1.6 Eland (*Tragelaphus oryx*: Least Concern)

Eland were identified as a key species for requiring targeted conservation in the NRT landscape due to the high poaching threat on this species. Historical range of this species is reported only as far as southern Samburu in northern Kenya; they are widespread in Laikipia and occur in parts of south and west Isiolo and Meru counties. Eland have also been observed in areas adjacent to Boni forest in Lamu and Garissa counties. They are only present and observed frequently enough to determine trends in sightings in 10 NRT member conservancies, which form the northern most extent of their known natural range. The most frequent sightings of eland are in Naibunga and Il Ngwesi conservancies in Laikipia, and in Leparua Conservancy in Isiolo (these conservancies are adjacent to private ranches/conservancies). **Sightings of eland increased in five conservancies (50%); decreased in one conservancy, Lekurruki (10%) and were stable in four conservancies (40%).** (Table 9 and figure 18).

Table 6: Eland trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru		Isiolo		Samburu		Marsabit		NRT-Coast		Baringo	
Ngare Ndare (2012-19)	Green	Biliqo Bulesa (2010-19)	Nil	Sera pre-sanctuary (2005-14)	Green	Melako (2009-19)	Nil	Ishaqbini pre-sanctuary (2008-10)	Nil	Ruko (2010-19)	Nil
Il Ngwesi (2008-19)	Green	Nakuprat Gotu (2014-19)	Nil	Sera post sanctuary (2015-19)	Green	Songa (2017-19)	Nil	Ishaqbini post sanctuary (2011-19)	Nil		
Lekurruki (2009-19)	Red	Nasulu (2014-19)	Green	Namunyak (2007-19)	Yellow	Shurr (2017 – 19)	Nil	Ndera (2012-19)	Nil		
Naibunga (2010-19)	Green	Leparua (2012-19)	Yellow	Kalama (2008-19)	Nil	Jaldesa (2017-19)	Nil	Lower Tana (2017-19)	Nil		
		Naapu (Mpus Kutuk) (2008-19)	Nil	Westgate (2007-19)	Yellow			Hanshak Nyongoro (2017-19)	Nil		
				Meibae (2007-19)	Yellow			Kiunga (2017-19)	Nil		
				Nkoteiya (2017-19)	Nil						
				Ltungai (2008-19)	Nil						

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

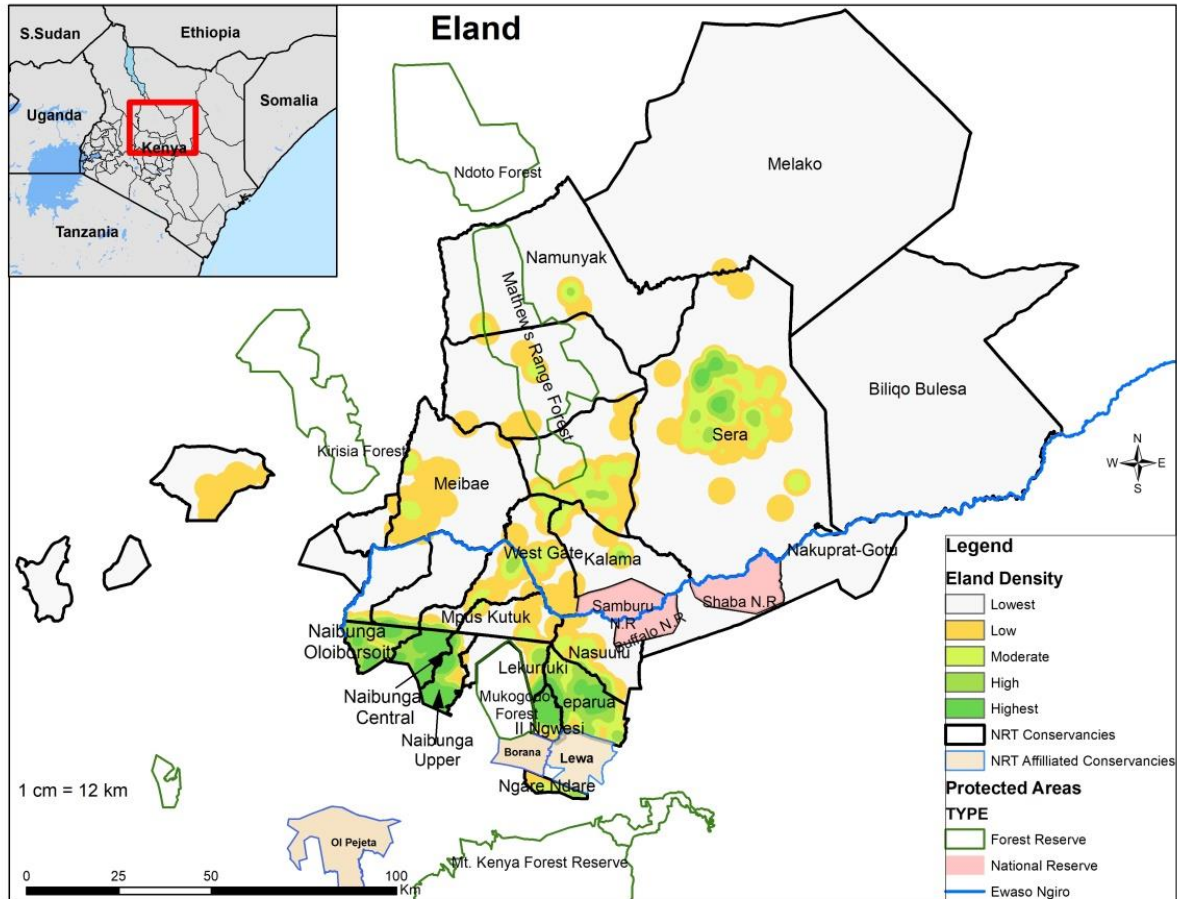


Figure 18: Map showing densities of Eland sightings from WCoMMS data 2014 to 2019.

1.7 Gerenuk (*Litocranius walleri*: Near Threatened)

Gerenuk are an arid-adapted species endemic to northern Kenya. They are common in most conservancies in NRT, apart from some conservancies in NRT-Coast (Lamu and Tana River counties) and only occasional sightings in Ruko and Ltungai. In 19 conservancies in which gerenuk are sighted frequently enough to allow trends to be determined, **eight conservancies showed an increase in sightings (42%), five a decrease (26%) and six stable (32%)**. (Table 10 and figure 19). Of particular concern is the decrease in sightings of gerenuk in Sera since the establishment of the rhino sanctuary, this requires further investigation to understand the reason for this decline.

Table 7: Gerenuk trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru		Isiolo		Samburu		Marsabit		NRT-Coast		Baringo	
Ngare Ndare (2012-19)	Nil	Biliqo Bulesa (2010-19)	Green	Sera pre-sanctuary (2005-14)	Green	Melako (2009-19)	Yellow	Ishaqbini pre-sanctuary (2008-10)	Green	Ruko (2010-19)	Green
Il Ngwesi (2008-19)	Green	Nakuprat Gotu (2014-19)	Yellow	Sera post sanctuary (2015-19)	Red	Songa (2017-19)	Green	Ishaqbini post sanctuary (2011-19)	Green		
Lekurruki (2009-19)	Red	Nasulu (2014-19)	Green	Namunyak (2007-19)	Yellow	Shurr (2017 – 19)	Nil	Ndera (2012-19)	Nil		
Naibunga (2010-19)	Yellow	Leparua (2012-19)	Yellow	Kalama (2008-19)	Yellow	Jaldesa (2017-19)	Green	Lower Tana (2017-19)	Nil		
		Naapu (Mpus Kutuk) (2008-19)	Red	Westgate (2007-19)	Green			Hanshak Nyongoro (2017-19)	Nil		
				Meibae (2007-19)	Red			Kiunga (2017-19)	Nil		
				Nkoteiya (2017-19)	Nil						
				Ltungai (2008-19)	Red						

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

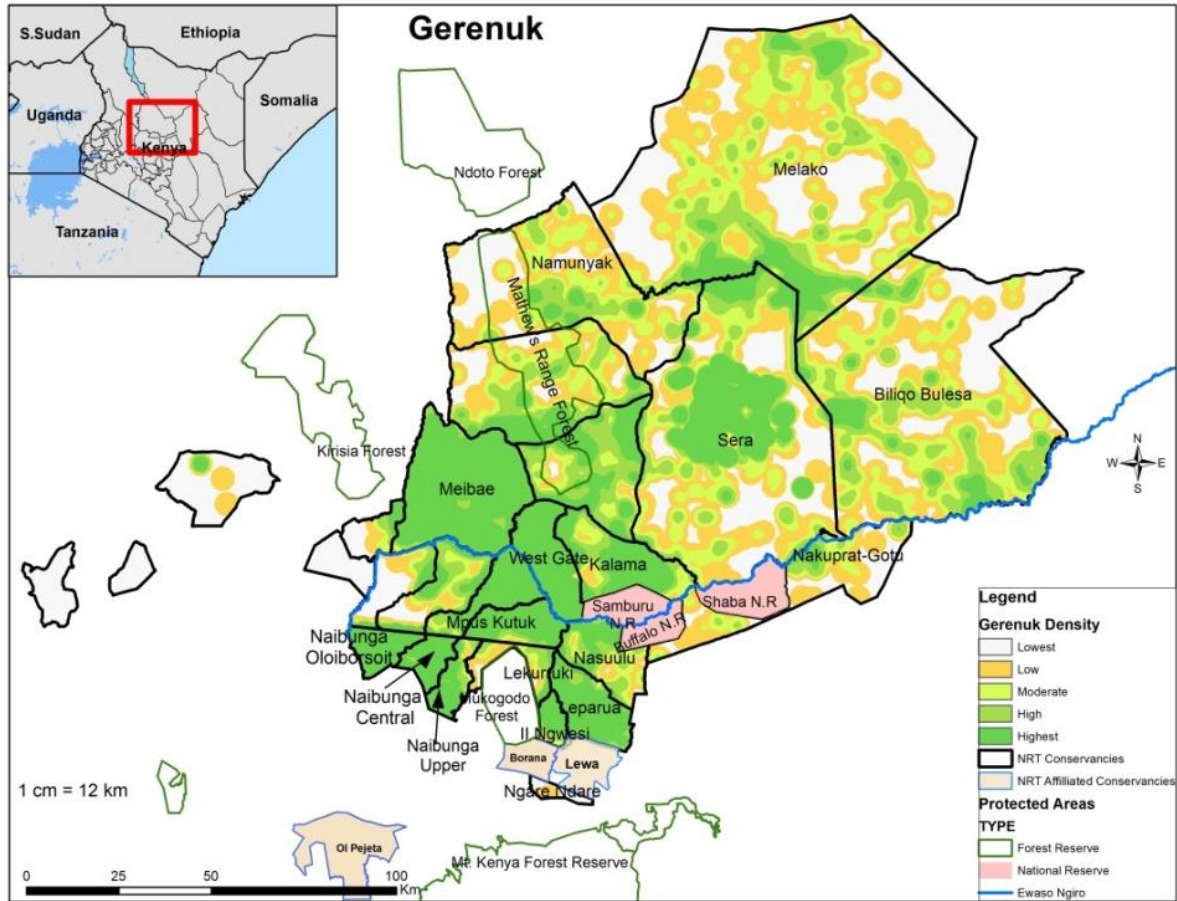


Figure 19: Map showing densities of gerenuk sightings from WCoMMS data 2014 to 2019.

1.8 Common Zebra (*Equus quagga*: Near Threatened)

The common zebra also referred to as plains zebra or Burchell’s zebra is common and widespread across Kenya. However, within the NRT landscape common zebra are found only in conservancies in the southern part of the NRT range where rainfall is higher (Laikipia, parts of Isiolo and southern Samburu) and in Ishaqbini in Garissa County where a small, isolated population exists. Common zebra are less arid adapted than Grevy’s zebra. In 13 conservancies in which common zebra are sighted frequently enough to allow trends to be determined, **five conservancies showed an increase in sightings (39%), two a decrease (15%) and six stable (46%)**. (Table 11 and figure 20).

Table 8: Common zebra trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru		Isiolo		Samburu		Marsabit		NRT-Coast		Baringo	
Ngare Ndare (2012-19)	Nil	Biliqo Bulesa (2010-19)	Nil	Sera pre-sanctuary (2005-14)	Nil	Melako (2009-19)	Nil	Ishaqbini pre-sanctuary (2008-10)		Ruko (2010-19)	Nil
Il Ngwesi (2008-19)	Nil	Nakuprat Gotu (2014-19)		Sera post sanctuary (2015-19)	Nil	Songa (2017-19)	Nil	Ishaqbini post sanctuary (2011-19)			
Lekurruki (2009-19)		Nasulu (2014-19)		Namunyak (2007-19)	Nil	Shurr (2017 – 19)	Nil	Ndera (2012-19)			
Naibunga (2010-19)		Leparua (2012-19)		Kalama (2008-19)		Jaldesa (2017-19)	Nil	Lower Tana (2017-19)	Nil		
		Naapu (Mpus Kutuk) (2008-19)		Westgate (2007-19)				Hanshak Nyongoro (2017-19)	Nil		
				Meibae (2007-19)				Kiunga (2017-19)	Nil		
				Nkoteiya (2017-19)							
				Ltungai (2008-19)							

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

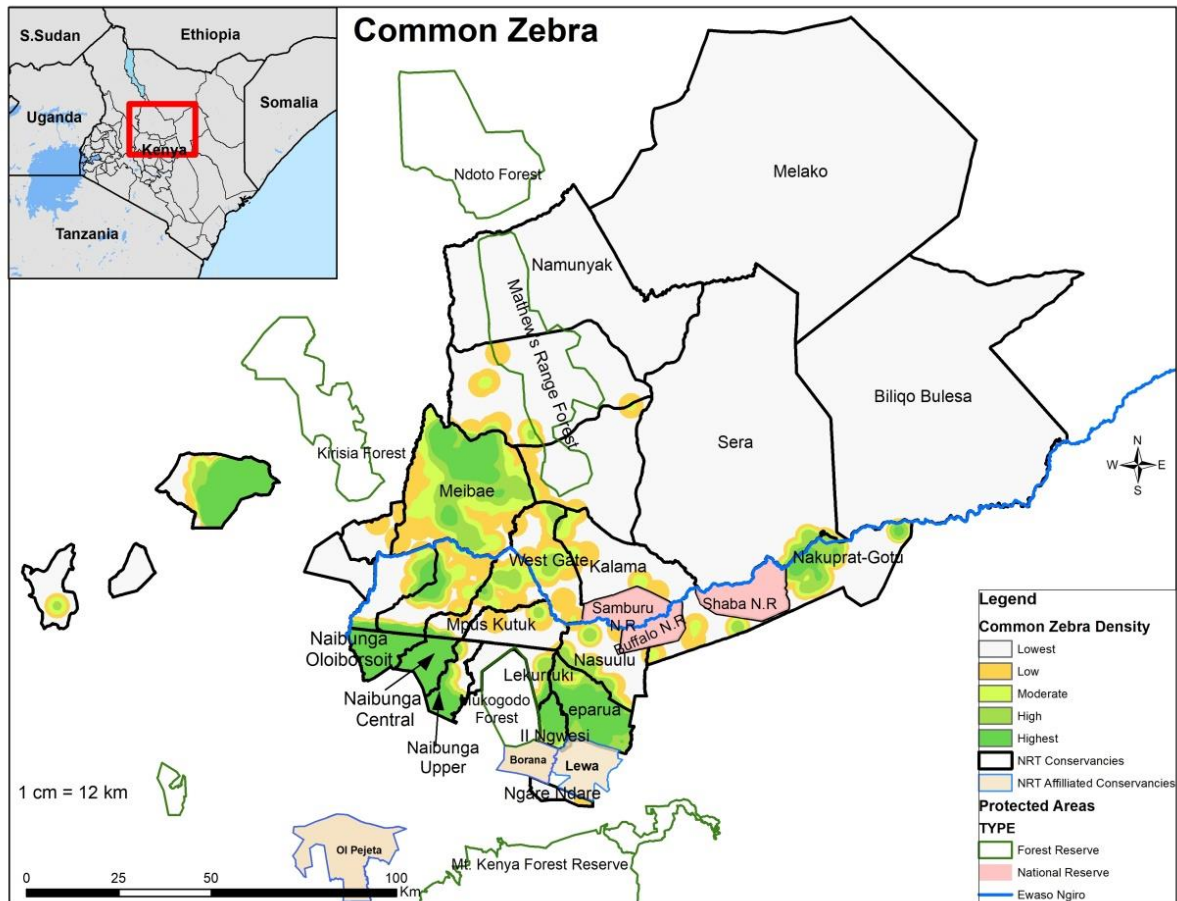


Figure 20: Map showing densities of Common Zebra sightings from WCoMMS data 2014 to 2019.

1.9 Lion (*Panthera leo*: Vulnerable)

Lion occur in most NRT member conservancies however in relatively low numbers and are infrequently seen by rangers on patrol, more often rangers see tracks which indicate lion presence in the area. Highest recorded sightings were in Il Ngwesi, Lekurruki, Westgate, Kalama, Sera, Melako and within the Mathew's range in Namunyak. Lion are not reported frequently enough in Ruko, Nkoteiya, Songa and Jaldesa conservancies to enable trend analysis, although there have been occasional sightings. **Increased sightings were reported in only 11 out of 22 conservancies (50%), decreases in four conservancies (18%) and stable sightings in seven conservancies (32%).** (Table 12 and figure 21). The decline in sightings of lion in Sera since the establishment of the fenced rhino sanctuary is likely due to exclusion of lion from within the sanctuary where there is highest monitoring effort by rangers. However, in early 2020 a single lion entered the rhino sanctuary and has remained inside.

Table 9: Lion trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru		Isiolo		Samburu		Marsabit		NRT-Coast		Baringo	
Ngare Ndare (2012-19)	Red	Biliqo Bulesa (2010-19)	Green	Sera pre-sanctuary (2005-14)	Yellow	Melako (2009-19)	Yellow	Ishaqbini pre-sanctuary (2008-10)	Green	Ruko (2010-19)	Nil
Il Ngwesi (2008-19)	Yellow	Nakuprat Gotu (2014-19)	Green	Sera post sanctuary (2015-19)	Red	Songa (2017-19)	Nil	Ishaqbini post sanctuary (2011-19)	Yellow		
Lekurruki (2009-19)	Yellow	Nasulu (2014-19)	Green	Namunyak (2007-19)	Green	Shurr (2017 – 19)	Red	Ndera (2012-19)	Yellow		
Naibunga (2010-19)	Green	Leparua (2012-19)	Red	Kalama (2008-19)	Green	Jaldesa (2017-19)	Nil	Lower Tana (2017-19)	Yellow		
		Naapu (Mpus Kutuk) (2008-19)	Yellow	Westgate (2007-19)	Green			Hanshak Nyongoro (2017-19)	Green		
				Meibae (2007-19)	Yellow			Kiunga (2017-19)	Green		
				Nkoteiya (2017-19)	Nil						
				Ltungai (2008-19)	Green						

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

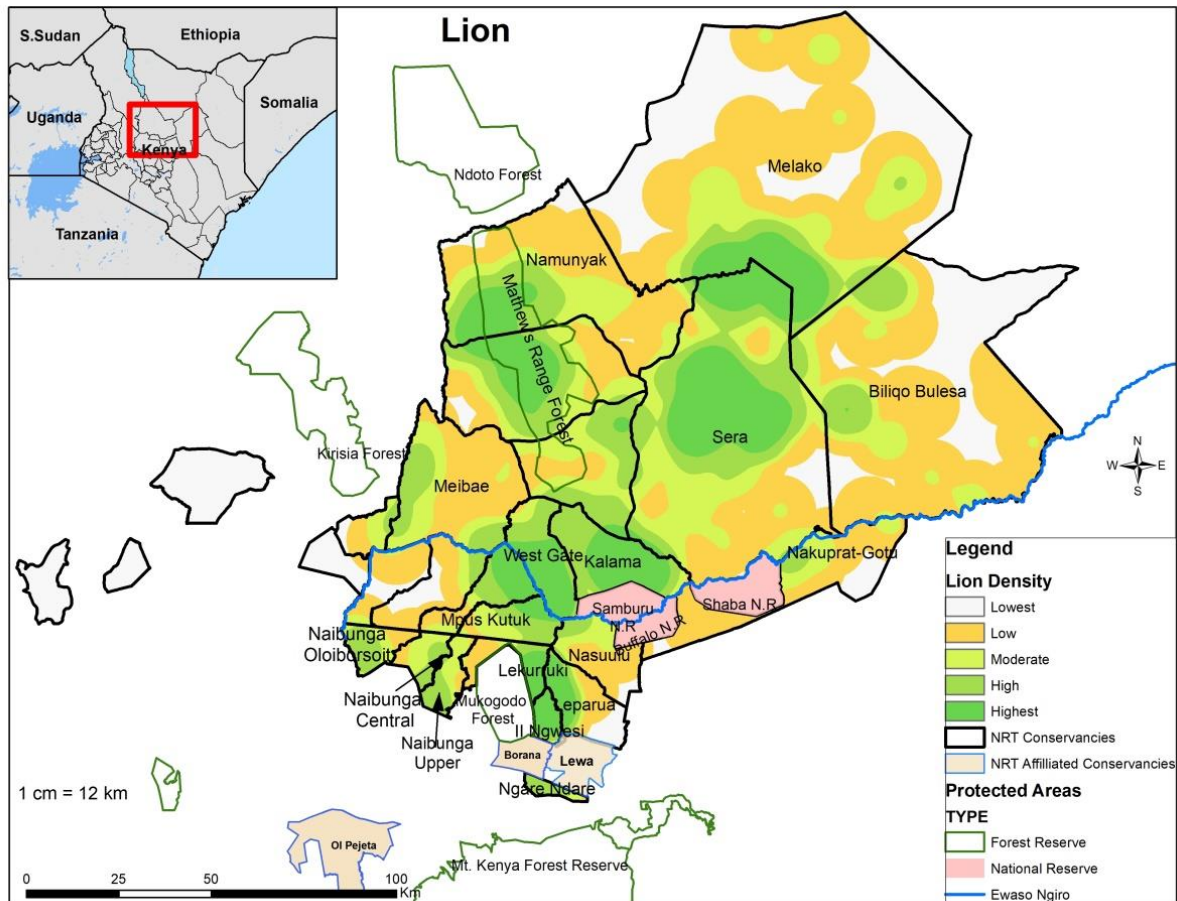


Figure 21: Map showing densities of Lion sightings from WCoMMS data 2014 to 2019.

In 2019, a national census of lion began with detailed surveys completed in Laikipia and parts of southern Samburu and Isiolo west counties; data on population estimates is not yet available. No surveys or research have been conducted on lions in NRT-Coast including the Boni forest, Marsabit conservancies or parts of Isiolo north including Biliqo Bulesa, so densities of lion and their movements and connectivity is not known. However, lion sightings by conservancy rangers and NRT staff as well as anecdotal evidence from communities suggest that these areas are likely to have significant populations of lions that are larger than elsewhere in the NRT landscape. These areas have low human population densities, and while conflict with lions does occur, it is unlikely that these populations are under serious threat.

Lion Research

Data from four lions collared by Ewaso Lions shows the connectivity between Samburu and Buffalo Springs reserves to the neighbouring conservancies of Kalama and West Gate and south into Laikipia County and Lekurruki and Il Ngwesi conservancies (Figure 22). This highlights the importance of conservancies as refuges for lions as well as maintaining connectivity in the landscape.

Research by Ewaso Lions, focused in southern parts of Samburu East, Isiolo West and Mukogodo in Laikipia, has confirmed a permanent presence of resident lion in Kalama and Il Ngwesi conservancies. These lion often move through Leparua, Westgate and Nasuulu. In Westgate, lion presence has changed over the years from having the permanent presence of resident lions, to lion moving in and out. Research has highlighted the importance of the Westgate conservation area for lions and the reduction in suitable lion habitat across the conservancy over time due to increased settlements. **The success of the Kalama conservation area has meant that lion have now become resident** and breeding here, having previously only moved through the area.

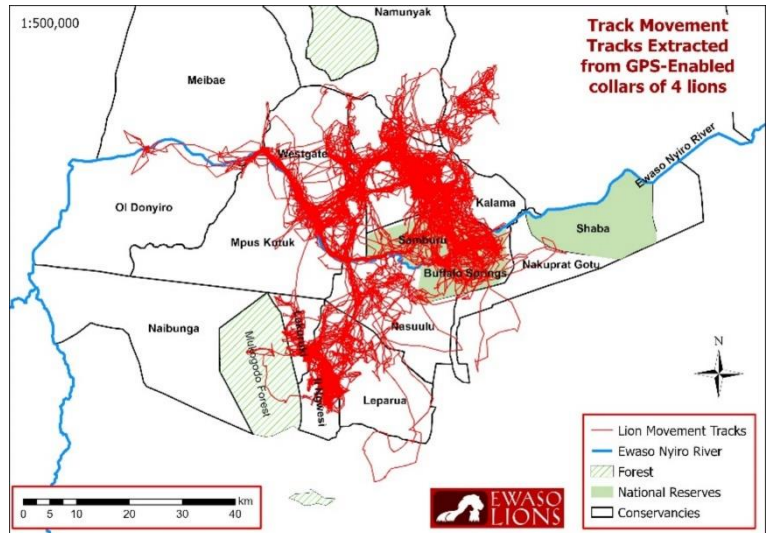


Figure 22: Lion movements from 4 lions collared by Ewaso Lions

In general, lion are not able to persist in areas with high human and livestock densities and increasing unplanned settlements will drive lion out of community areas. Lion require refuge areas to hide out during the day and as breeding sites where they can safely raise cubs; these tend to be areas of dense bush or areas not disturbed by people and livestock. **Creating these safe refuges within conservancies, as well as building up wild prey numbers, will be critical to ensuring lion remain in community areas** in the long-term and there is connectivity across the landscape. However, conflict with people is an inevitable consequence of lion presence and investing in mitigation measures is needed if lion conservation is a priority for conservancies.

1.10 Cheetah (*Acinonyx jubatus*: Vulnerable)

Cheetah are diurnal large carnivores that prefer open savannah/bushland and generally avoid forests and areas of dense vegetation. Cheetah are found in most NRT conservancies, however, in low densities. Conservancies with highest sightings of cheetah are Meibae, Westgate, Naapu (Mpus Kutuk), Il Ngwesi, Sera and Melako. 19 conservancies report sufficient cheetah sightings to allow trend analysis. **Increased sightings are reported in only four conservancies (21%), decreased sightings in five conservancies (26%) and stable in 10 conservancies (53%).** (Table 13 and figure 22). The **status of cheetah in conservancies is of concern**, with so few conservancies reporting increased sightings, and almost 80% of conservancies reporting at best stable or otherwise declining trends.

Table 10: Cheetah trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru		Isiolo		Samburu		Marsabit		NRT-Coast		Baringo	
Ngare Ndare (2012-19)	Nil	Biliqo Bulesa (2010-19)		Sera pre-sanctuary (2005-14)		Melako (2009-19)		Ishaqbini pre-sanctuary (2008-10)		Ruko (2010-19)	
Il Ngwesi (2008-19)		Nakuprat Gotu (2014-19)		Sera post sanctuary (2015-19)		Songa (2017-19)	Nil	Ishaqbini post sanctuary (2011-19)			
Lekurruki (2009-19)		Nasulu (2014-19)		Namunyak (2007-19)		Shurr (2017 – 19)	Nil	Ndera (2012-19)	Nil		
Naibunga (2010-19)		Leparua (2012-19)		Kalama (2008-19)		Jaldesa (2017-19)	Nil	Lower Tana (2017-19)	Nil		
		Naapu (Mpus Kutuk) (2008-19)		Westgate (2007-19)				Hanshak Nyongoro (2017-19)	Nil		
				Meibae (2007-19)				Kiunga (2017-19)			
				Nkoteiya (2017-19)							
				Ltungai (2008-19)							

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

Research by Action for Cheetahs Kenya (ACK) in Meibae Conservancy estimated that there were between 20-35 adult cheetah in Meibae in 2008-2015, however, from 2017 – 2019 this number has declined to less than 20 adult cheetah (ACK, *pers comm.*). There has been no national or ecosystem level census of cheetah since 2007, an updated census is currently ongoing.

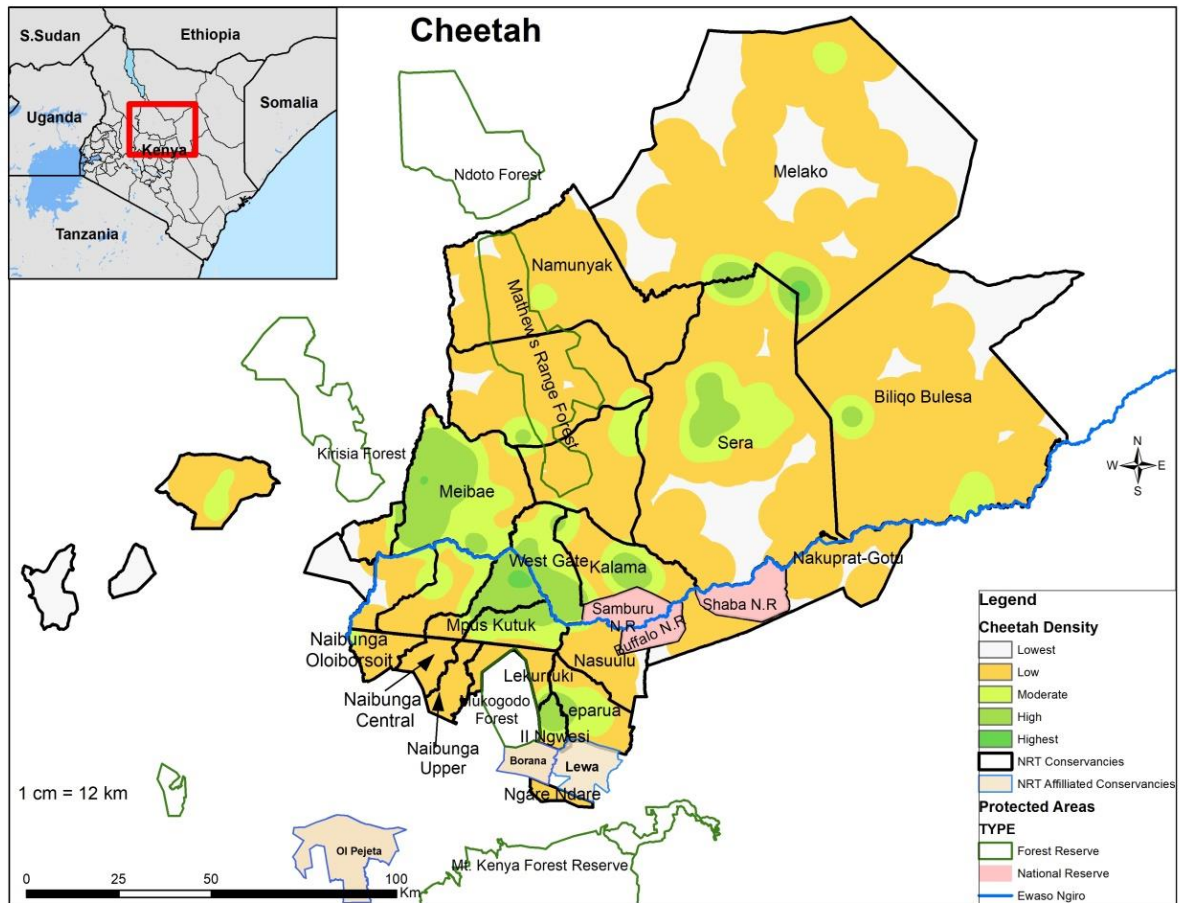


Figure 23: Map showing densities of Cheetah sightings from WCoMMS data 2014 to 2019.

1.11 Wild Dog (*Lycaon pictus*: Endangered)

Wild dog occur across parts of northern Kenya, with Laikipia-Samburu ecosystem historically considered to have one of the largest remaining populations. Wild dog are vulnerable to habitat fragmentation, human disturbance, and conflict with people however infectious diseases such as rabies and canine distemper have been shown to be the biggest killer of wild dog in the landscape. **In 2017, an outbreak of canine distemper almost wiped out the entire wild dog population in Laikipia**, and in 2019 deaths of five wild dogs in Kalama and West Gate conservancies were attributed to the same disease. Domestic dogs were similarly affected in these areas. Mass vaccination of domestic dogs to manage transmission of infectious diseases is being undertaken through a collaboration between the Directorate of Veterinary Services (DVS), KWS, Mpala Research Centre, Ewaso Lions, Actions for Cheetahs, Samburu County Government, NRT and others.

19 conservancies have reported wild dog presence, although sightings are very infrequent in some conservancies. Conservancies with the highest sightings include Namunyak along the Mathews range, Meibae, Westgate, Kalama, Naibunga, Il Ngwesi and along the Ewaso Nyiro river in Biliqo Bulesa. **Increased sightings from long term monitoring were reported in five conservancies (26%), decreased sightings in five conservancies (26%) and stable in nine conservancies (47%).**

Table 11: Wild Dog trends shown from WCoMMS sightings by conservancy rangers.

Laikipia/Meru	Isiolo	Samburu	Marsabit	NRT-Coast	Baringo
Ngarendare (2012-19)	Biliqo Bulesa (2010-19)	Sera pre-sanctuary (2005-14)	Melako (2009-19)	Nil	Ruko (2010-19)
Ilngwesi (2008-19)	Nakuprat Gotu (2014-19)	Sera post sanctuary (2015-19)	Songa (2017-19)	Nil	Ishaqbini post sanctuary (2011-19)
Lekurruki (2009-19)	Nasulu (2014-19)	Namunyak (2007-19)	Shurr (2017 – 19)	Nil	Ndera (2012-19)
Naibunga (2010-19)	Leparua (2012-19)	Kalama (2008-19)	Jaldesa (2017-19)	Nil	Lower Tana (2017-19)
	Naapu (Mpus Kutuk) (2008-19)	Westgate (2007-19)			Hanshak Nyongoro (2017-19)
		Meibae (2007-19)			Kiunga (2017-19)
		Nkoteiya (2017-19)			
		Ltungai (2008-19)	Nil		

Key; **Red** = Decrease **Yellow** = Stable **Green** = Increase

Of concern is the decrease reported in Westgate and Meibae which are critical range for the species where they are known to den. The Mathews range has historically been an important area for wild dog and continues to host resident packs; in late 2019 five resident packs were confirmed within Namunyak conservancy. Historical data from collared wild dog confirmed their wide ranging behaviour with packs moving between the Mathews range in Samburu, south into Laikipia.

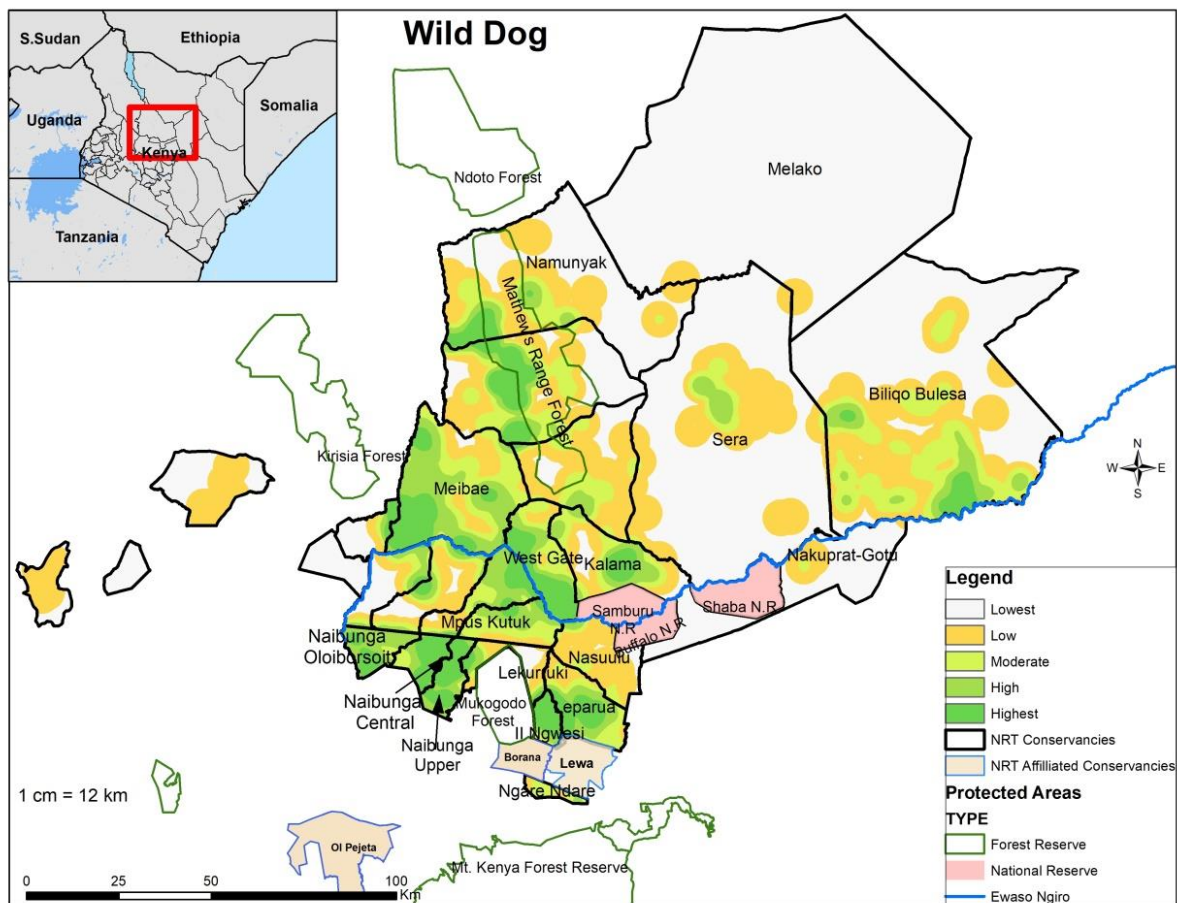


Figure 24: Map showing densities of Wild Dog sightings from WCoMMS data 2014 to 2019.



1.12 Tana River Red Colobus & Tana Crested Mangabey (*Ptilocolobus rufomitratu*s & *Cercocebus galeritu*s: Critically Endangered)

Ndera Conservancy, adjacent to the Tana River Primate Reserve, hosts two of the most threatened primates in Kenya, the Tana River red colobus and the Tana crested mangabey which occur only in small, isolated patches of riverine forests along a 60km stretch of the southern Tana River. **These two primate species are found nowhere else in the world.** Accurate information on their population size is not well known, however the population estimates for both species are approximately 1,000 individuals each and they are classified as critically endangered (Butynski *et al* 2020; Butynski *et al* in press). Both species are vulnerable to habitat loss as a result of destruction of forests due to logging, clearing for agriculture, and drying up of the riverine forests due to changing flood dynamics of the Tana River and climate change with less rainfall and more frequent droughts in recent years.

Monitoring of these primates in the forests in Ndera is carried out by conservancy rangers through periodic surveys of forest patches, using line transects, as well as records gathered in WCoMMS during routine patrols. All primate groups encountered during surveys are recorded and average group size is estimated based on WCoMMS data.

In 2019, six out of 13 forest patches in Ndera were surveyed by conservancy rangers. **Estimated population of red colobus in these six forest patches is just under 500 individuals, and approximately 300 Tana mangabeys** in these forests (Table 13). These results highlight the critical importance of conserving forest patches in Ndera Conservancy which host a high proportion of the remaining population of both species and the need to ensure communities are actively engaged in managing and protecting the forests on their land. NRT and Ndera conservancy aim to conduct annual surveys in all forest patches to monitor primate population trends.

Table 12: Survey results of Tana Red Colobus and Tana Mangabey in Ndera 2019

Month	Forest Name	Red Colobus Groups	Tana Mangabey Groups
March	Kinyadu	5	1
March	Buboya	1	1
April	Nkanu	13	4
May	Yutenye	2	0
May	Nkambini	14	2
July	Mkomani	3	2
Total number groups		38	10
Average Group Size (WCoMMS)		13	31
Estimated population		494	310

Forest cover change in Ndera Conservancy

In 2018 NRT assessed forest and land cover change between 2010 and 2018 within Ndera Conservancy, adjacent to and overlapping with the southern part of the Tana Primate Reserve. This was done by remote sensing through supervised classification following field ground truthing of two Digital Globe World View 2 images from 2010 and 2018.

Table 13: Results of land cover change analysis in Ndera conservancy between 2010 and 2018

Type	Area (ha) 2010	% of Habitat	Area (ha) 2018	% of Habitat	Change (ha)	% change
Farmlands	1,247	5.1	1,823	7.5	576	46%
Mathenge (<i>Prosopis juliflora</i>)	39	0.2	504	2.1	465	1192%
Riverine Forest	3,690	15.1	2,383	9.7	-1,307	-35%

Results showed there has been a **loss of 1,307 ha of riverine forest representing a 35% decline in forest cover**, this was predominantly in the south-eastern part of the conservancy in areas close to settlements (Table 13 and figure 25). These settlements and forests are aligned along a secondary tributary of the Tana River which is no longer permanent and only flows occasionally. Observation of forest condition in these areas showed that loss of these forests is predominantly due to drying up as a result of both changing river course and drought rather than logging or clearing for farms; mango plantations in these areas are also drying up and have been abandoned in many cases. Forest loss was less within the Tana Primate Reserve than outside, however, expansion of farms was also recorded within the Reserve; farmland has increased by 576 ha. Of importance is the significant **increase in the alien invasive tree *Prosopis juliflora*** (Mathenge) which covers almost 500 ha, an increase of over 1,000% compared to 2010. This is a serious concern and highlights the threat of this invasive species, particularly in areas that are cleared for farming and have since been abandoned or are used on a rotational basis only (shifting cultivation).

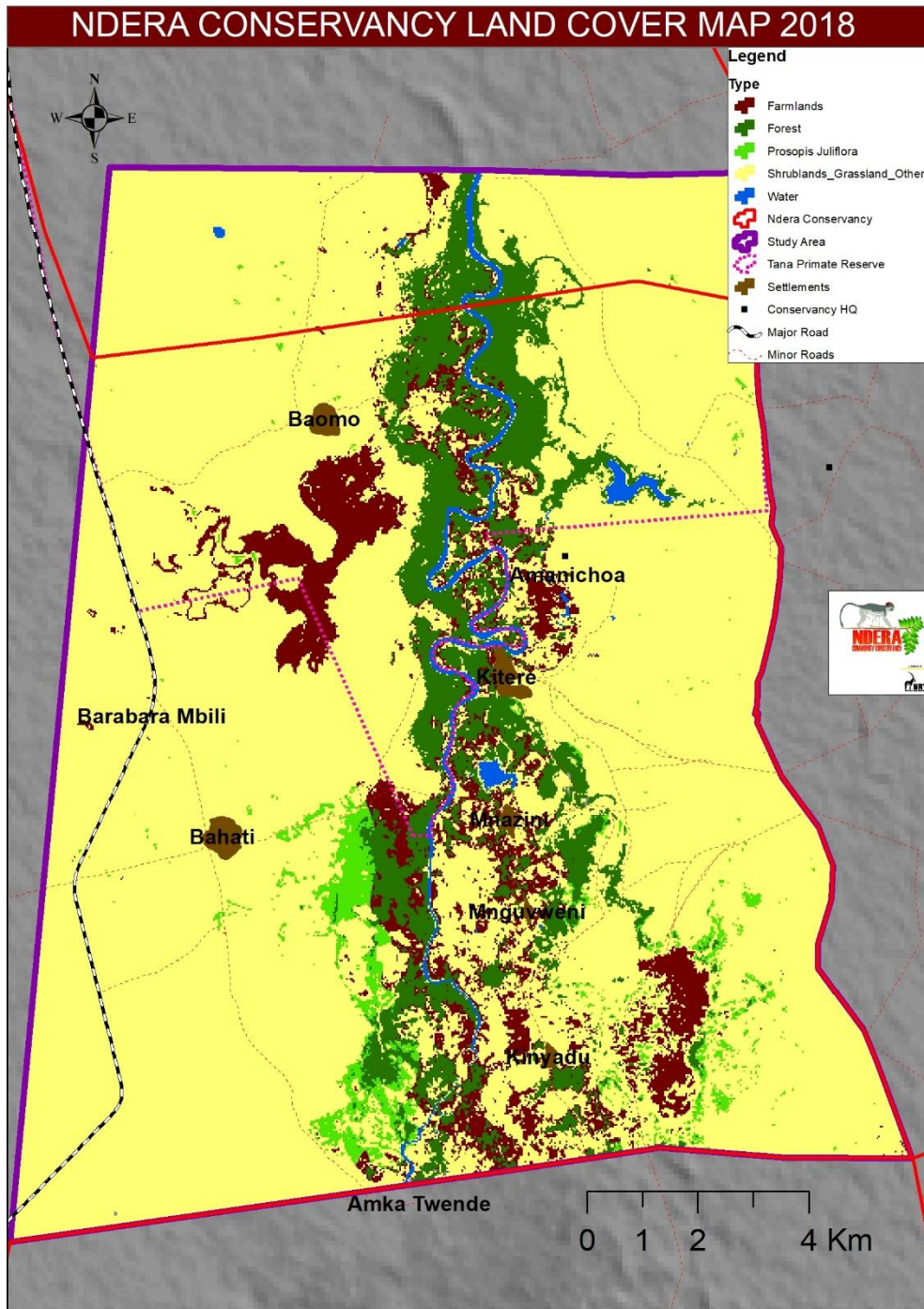


Figure 185: Land cover map of Ndera conservancy and southern Tana Primate Reserve, 2018



1.13 Sea Turtles

Five species of sea turtles occur in the waters off Kenya’s north coast where NRT supports two marine conservancies, Pate and Kiunga in Lamu County. These are hawksbill turtle (*Eretmochelys imbricata*; critically endangered), green turtle (*Chelonia mydas*; Endangered), olive ridley turtle (*Lepidochelys olivacea*; Vulnerable), loggerhead turtle (*Caretta caretta*; Vulnerable) and leatherback turtle (*Dermochelys coriacea*; Vulnerable). However, only three of these species, green, hawksbill and olive ridley are known to nest in the Lamu archipelago. Green turtles are the most common species in the area, with only occasional nesting by hawksbill and olive ridley turtles. Monitoring of turtles by conservancy rangers has been ongoing since 2016 with rangers recording locations of all sightings of turtles, information on turtle carcasses and turtle nests. Data gathered by rangers is part of Marine-CoMMS, a similar ranger-based monitoring system to Wildlife-CoMMS.

Sea turtle populations in Kenya are generally considered to be declining because of poaching, loss of nesting habitats, and by-catch in fishing nets. Track and nest surveys along nesting beaches are the most feasible and low-cost approach for long-term monitoring of sea turtle populations.

Turtle Mortality

The Kiunga Marine National Reserve which encompasses Kiunga conservancy has many turtle nesting beaches and this area is widely recognised as a critical area for turtles in Kenya. Turtles use the seas around Pate island which are important feeding ground for turtles, however there are few nesting beaches. Conservancy rangers report all incidents of turtle carcasses and cause of death for each carcass is determined. Rangers also play an important role in sensitising fishers regarding by-catch of turtles in fishing nets and assist with releasing turtles tangled in nets, rangers have also arrested several individuals involved in turtle poaching.

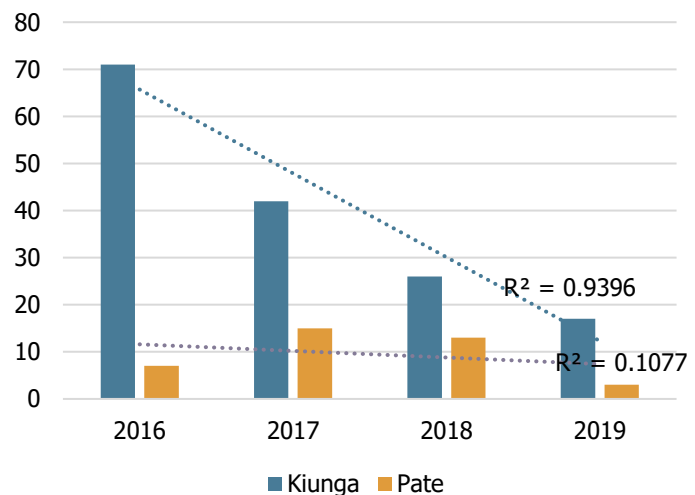


Figure 26: Number of turtle carcasses reported per year in Kiunga and Pate conservancies

Numbers of turtle carcasses reported decreased significantly in Kiunga conservancy between 2016 – 2019, there was a slight decline in Pate in 2019.

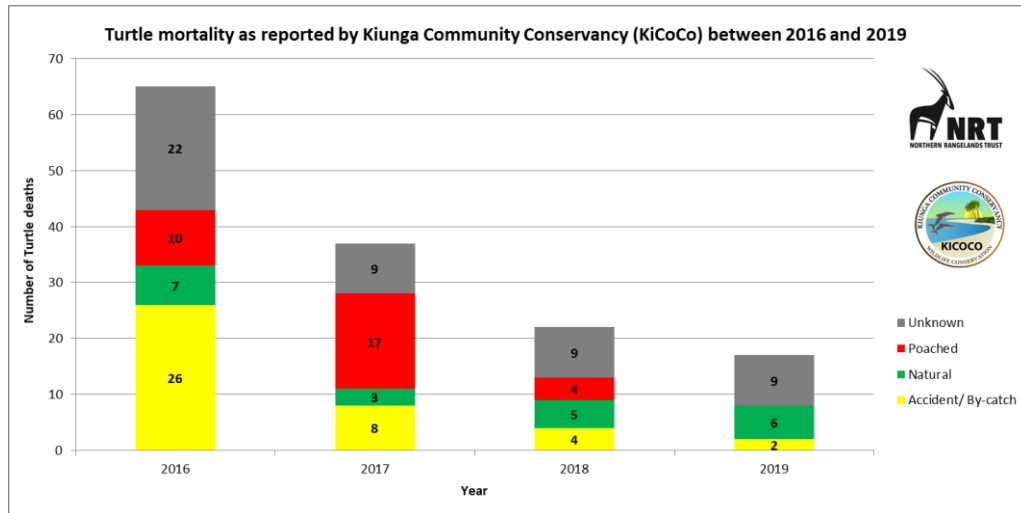


Figure 27: Turtle mortality in Kiunga conservancy showing cause of death from 2016-2019

There were **no turtle carcasses found due to poaching in Kiunga in 2019**, whereas poaching in 2017 was the highest cause of death. By-catch has also decreased significantly over the past four years, from 26 cases in 2016 to only two records in 2019. This reduction in poaching and by-catch is likely due to increased enforcement and successful prosecution of turtle poachers, and increased awareness among communities on turtle conservation by Kiunga conservancy in partnership with KWS and WWF.

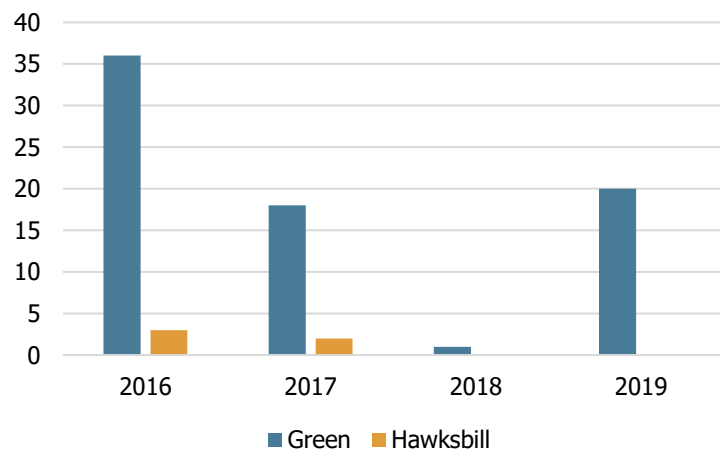
Turtle nest monitoring

Beach patrols to monitor turtle tracks and nests are done by rangers while on patrol. All data is shared with KWS and the WWF turtle monitoring project. Due to increased insecurity in 2018, rangers were not able to access many of the turtle nesting beaches in Kiunga and patrol effort was significantly reduced.

This is likely to be the reason for extremely low numbers of nests recorded in 2018. There were 19 green

turtle nests recorded in 2019, while this is higher than 2017 and 2018, it is significantly lower than the number recorded in 2016. In 2020 there will be an increased emphasis on turtle nest monitoring by rangers who are now able to access more of the remote beaches due to provision of an additional boat and extra firearms. Very few hawksbill nests are recorded.

Figure 28: Turtle nests recorded by Kiunga Conservancy Rangers



2. Wildlife Sanctuaries



2.1 Hirola (*Beatragus hunteri*: Critically Endangered) – Ishaqbini Conservancy

Hirola are critically endangered and considered to be the world’s rarest antelope. This unique and charismatic species occupies a restricted range along the border of Kenya and Somalia. Kenya’s hirola population witnessed an 85-90% decline in the mid-1980s from an estimated 14,000 to 1,600 animals. Since then, the population has continued to decline and is currently estimated to be only 445 - 475 individuals (KWS National Recovery and Action Plan for Hirola Antelope 2018-2027).

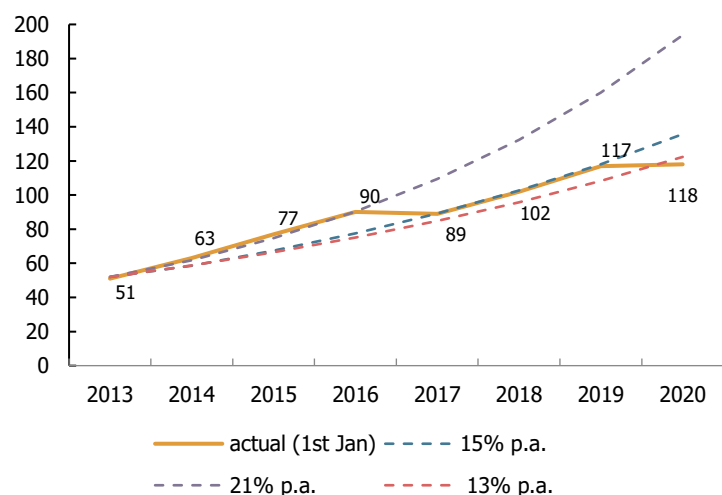
The Ishaqbini hirola sanctuary in Ijara (Garissa County) was established in August 2012 with a founder population of approximately 48 hirola. The fenced, predator-proof sanctuary is 27km² and was established on land set aside by the Ishaqbini community following research that identified predation as a constraint to population growth in the conservancy area. The sanctuary population is the only sub-population of hirola that is increasing, all free-ranging populations, including those introduced into Tsavo East National Park are either stagnant or declining.

Population Monitoring

At the end of 2019, the **estimated population inside the sanctuary was 118-130 individuals; this represents approximately 25% of the remaining population of hirola in Kenya.**

Average annual population growth in the sanctuary was 21% in the first 3 years (2013-2015). Following the 2016 drought, the population recovered and showed a 17% and 15% annual growth in 2017 and 2018 respectively, however it decreased to only 2% growth in 2019 as a result of births and deaths being almost equal. Overall, the average annual growth rate of the population since the sanctuary was established (2013-2019) is 13%. The low population growth in 2019 is likely due to social and ecological constraints to the population with the sanctuary having reached carrying capacity.

Figure 29: Actual and projected growth of Hirola sanctuary population at 13%, 15% and 21% per year.



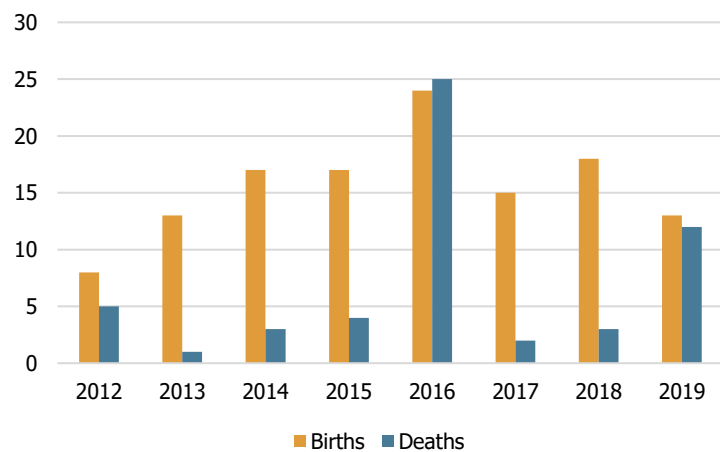
The size of the free-ranging population in Ishaqbini has not recently been established as aerial and ground surveys across much of the conservancy have not been possible due to insecurity. However, rangers estimate only 20 hirola remain to the west of the sanctuary in the area overlapping with the eastern bank of the Tana National Primate Reserve. Previous aerial survey estimates of this area from 2014 to 2017 ranged between 16 to 33 individuals.

Table 14: Population demography of hirola in the sanctuary and outside since 2013.

	Sanctuary 1 st 4 years	Sanctuary 7 th year (2019)	Outside 2013-2019
Adult sightings	72%	72%	90%
Sub-adult sightings	8%	18%	7%
Calf sightings	20%	10%	3%
Ratio of sightings Adult F : Adult M	2.6 : 1	2.2 : 1	2.4 : 1
Average herd size	7.5	8	6
Maximum herd size	23	23	27
Average annual population growth	20%	2%	Unknown
Estimated population size	97	118-130	16-33

Population size based on records of births and deaths inside the sanctuary is estimated at 118 individuals at the end of 2019. However, this is likely to be an underestimate as aerial surveys have consistently given slightly higher numbers (an average of +12). The population within the sanctuary at the end of December 2019 was therefore likely to be within the range of 118 – 130 individuals. There were 13 births and 12 deaths in the sanctuary in 2019.

Figure 30: Number of hirola births and deaths reported inside the sanctuary



The demography of the sanctuary population has changed over time. The proportion of sightings of adult females to adult males has changed from 3.3 : 1 in 2013 to 2.2 : 1 in the 2019 (F:M sex ratio decreased to less than 2 : 1 in 2016, 2017 and 2018). A high proportion of males in the population is also likely to contribute to suppressing population growth rate with intra-specific competition and deaths from fighting becoming more frequent.

The priority for Ishaqbini is to expand the area of the sanctuary in order to accommodate the growing population and maintain a higher population growth rate. Expansion of the sanctuary has been approved by the Ishaqbini Conservancy Board and initial funding for fencing and other

infrastructure has been secured, with the aim to start construction of sanctuary expansion fence in the second half of 2020. Removal of bachelor male herds from the sanctuary will also be explored as an option to increase the female to male sex ratio of the sanctuary population, reduce intra-specific competition between males and potentially increase breeding rates.

Habitat & Disease Management

Habitat improvement within the Ishaqbini sanctuary has been ongoing. This involves management and clearing of *Acacia reficiens*, an invasive tree that creates thick stands of dense bush under which grass growth is suppressed. A total of 300 ha of bush has been cleared in the sanctuary since 2017 in order to improve habitat and grass cover specifically for hirola. Removal of alien invasive plants including *Opuntia* and *Prosopis juliflora* from the sanctuary is also ongoing.

Reducing densities of other wildlife in the sanctuary is necessary in order to reduce competition with hirola for forage and water, maintain optimal densities for habitat management, reduce parasite loads (which increase in areas with high densities of animals) and avoid high mortality during droughts. Using a two-way gate system in the fence, a total of 44 animals have been removed from the sanctuary since 2018 including 33 Giraffe, 9 common zebra, 1 buffalo and 1 lesser kudu.

NRT and San Diego Zoo Global have established a disease surveillance and management program for the hirola sanctuary. Since 2016 this has included an annual vaccination campaign of livestock in Ishaqbini carried out in partnership with the Ministry of Livestock. The aim is to reduce disease outbreaks in livestock and reduce the risk of disease transmission from livestock to hirola and other wildlife thereby creating a 'disease-free' buffer around the sanctuary. In 2019, 63,000 head of livestock (19,400 cattle and 43,700 sheep and goats) were vaccinated against viral Peste des petits ruminants (PPR) and bacterial (anthrax, black-quarter, contagious caprine pleuropneumonia, contagious bovine pleuropneumonia) diseases that have the potential to spill over to hirola. Livestock also received acaricide spray as a measure towards controlling tick loads. 232 households benefitted from the 2019 vaccination campaign.



2.2 Black Rhino (*Diceros bicornis michaeli*: Critically endangered) – Sera Conservancy

Sera Rhino Sanctuary in Samburu East was established in 2015 with a founder population of 10 introduced black rhinos as well as other resident wildlife. The fenced sanctuary covers approximately 107km² within the conservancy with a surrounding buffer zone of approximately 188km² where there are no settlements and livestock grazing is restricted to dry season grazing only. Sera conservancy rangers monitor the rhinos daily, recording their location and association with other rhinos. Detailed reports on home ranges and body condition of individual rhinos are compiled every month using records and photos from rangers as well as camera trap images from over 30 camera traps deployed across the sanctuary. All adult rhinos are ear-notched to enable individual recognition, ear notching of calves is planned in the next 2-3 years.

Six calves have been born since the rhinos were introduced, the rhino population is currently 16 individuals, with an **average population growth of approximately 14% per year**. The target is to achieve at least a 5% population growth per year. Carrying capacity of the sanctuary for rhinos, based on vegetation biomass assessments was established as 45 individuals (Cedric *et al* 2019).

Population demography of the Sera rhino population (table 16) includes 7 males (5 adults, 2 calves) and 9 females (5 adults, 1 sub-adult, 3 calves)

Table 15: population demography of black rhinos in Sera, December 2019

Age Class	Male	Female	Not sexed	Sub Total	Proportion in population
Calves (0<3.5yrs)	2	3	0	5	31%
Sub Adults (3.5<6 yrs) unless calved	0	1	0	1	6%
Adults (>6 yrs)	5	5	0	10	63%
Grand Total	7	9	0	16	
Proportion in population	44%	56%	0%	100%	

Two adult females have given birth twice inside the sanctuary, with an average inter-calving (IC) period for Sera being 2.8 years. The mean age at first calving for the 4 adult females that have reproduced is 7.9 years. Detailed records of breeding performance and calving prediction are kept for all female rhinos in order to track age at first calving and inter-calving intervals in the population. These are critical indicators of population performance and will be used to manage the population to maximize growth rate over time (Table 16)

Table 18: Wildlife moved into and out of Sera rhino sanctuary

Date	Species	Capture site	Release type	# Released
Wildlife translocated into the sanctuary				
October 2015	Impala	Lewa	Enclosed	33
March 2016	Buffalo	Lewa	Orphan, free release	1
May 2016	Oryx	Sera Conservancy	Driven in	15
January 2017	Eland	Oi Donyo	Enclosed	9
May 2018	Eland	Westgate	Orphan, free release	1
January 2019	Grevy's Zebra	Naibor	Free release	3
May 2019	Elephant orphans	Reteti	Enclosed	3
October 2019	Impala	Lewa	Enclosed	40
November 2019	Elephant orphans	Reteti	Enclosed	3
January 2020	Common Zebra	Reteti	Orphan, free release	1
May 2020	Grevy's Zebra	Lewa	Enclosed	25
Wildlife removed from the sanctuary				
July 2018	Elephant	Sera	Driven out	12
July 2019	Elephant	Sera	Driven out	9

In addition, 21 elephant have been removed from the sanctuary to reduce the number of elephant inside the fenced area. A small population of wild elephant will be maintained within the sanctuary as part of the re-wilding process for orphaned elephants coming from Reteti elephant orphanage (section 2.3). Elephant and giraffe populations will continue to be managed by moving excess animals outside the fence, in order to reduce impact on vegetation and reduce competition with rhinos for browse.

Vegetation Monitoring

Regular vegetation monitoring has been undertaken in Sera to provide information on habitat suitability for black rhino as well as vegetation biomass assessments to develop indicators of carrying capacity for wildlife in the sanctuary (King 2008, Wandera *et al.* 2010 & Cedric *et al.* 2019). The biomass assessment in 2019 confirmed there has been an increase in forage availability since the previous assessment in 2010 following the fencing of the sanctuary and exclusion of livestock. This study estimated an ecological carrying capacity of 45 black rhinos in Sera. In February 2020, a biomass assessment was conducted and established that the sanctuary has 4,098 kg/ha of grass/forb and 581 kg/ha of woody species (Cedric *et al.* 2020) (table 19). The estimated daily consumption of vegetation biomass by the current numbers of 9 major herbivore species was found to be only 5.5% of the available biomass, or 11% of the utilizable biomass (half of the available biomass) indicating that there is more than sufficient vegetation to sustain existing wildlife populations. In semi-arid areas such as Sera, the vegetation biomass will fluctuate significantly depending on rainfall. Annual vegetation monitoring by NRT and the Sera rangelands coordinator will continue as well as detailed habitat and biomass assessments every few years. Results from

these surveys will be used to monitor habitat condition and recommend management interventions through removal of excess wildlife if necessary, in order to maintain optimal habitat for black rhinos.

Table 19: Available forage in Sera rhino sanctuary February 2020 (Cedric et al 2020)

#	Species	% VI	N	M (Kg)	Individual per day (Kg)	Pop. per day (kg)	% Utilizable Biomass	% Available Biomass
1	Elephant	1.5	39	7,000	105	14,948	6.82	3.41
2	Eland	1.5	5	600	9	164	0.07	0.04
3	Grevy's Zebra	1.5	19	400	6	416	0.19	0.19
4	Impala	1.2	16	50	0.6	234	0.11	0.05
7	Grants Gazelle	1.2	4	50	0.6	58	0.03	0.01
5	Buffalo	3.5	18	900	31.5	2,070	0.93	0.47
6	Beisa Oryx	2.3	58	100	2.3	487	0.22	0.11
8	Reticulated Giraffe	1.6	124	700	11.2	5,069	2.28	1.14
9	Black Rhino	1.5	16	1,100	16.5	964	0.43	0.22
Total						24,279	11.07	5.54

% VI= Voluntary intake, N= Est. number of individuals, M = Mean mass per species, Utilizable biomass = 50% of available biomass



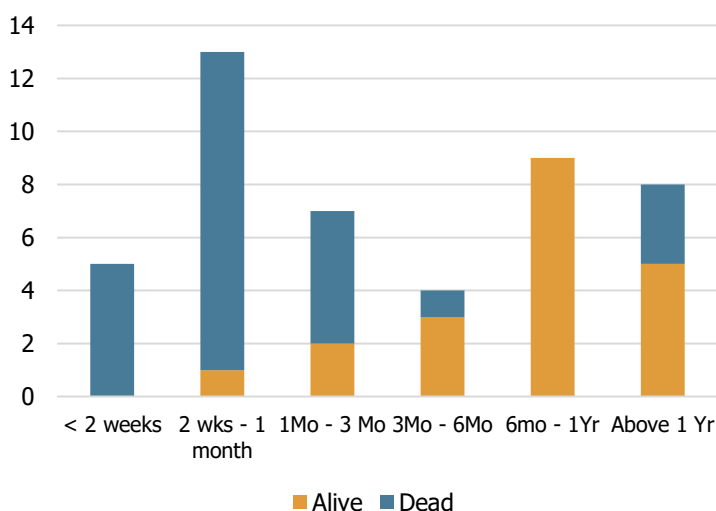
2.3 Elephant orphans – Reteti Elephant Sanctuary, Namunyak-Ngilai Conservancy

Reteti Elephant Sanctuary in Ngilai unit of Namunyak Conservancy was opened in August 2016 with the aim of rescuing elephant calves in crisis, rehabilitating them and eventually releasing them to the wild. The facility is run and managed by the community through Namunyak Conservancy working in collaboration with NRT, KWS, San Diego Zoo Global and Save the Elephants. Since it started, **over 50 elephant calves have been handled by the sanctuary**, the location of all rescues is shown in figure 31 with most rescues from Samburu and Laikipia counties. The major reasons leading to rescue were elephant calves stuck in wells and separation from their families for unknown reasons; human-wildlife conflict and death of the mother were the reason for 11 rescues. 11 elephant calves were reunited with their families by the Reteti team at the rescue site, this is always the priority of rescues if possible.

Taken to Nairobi (before establishment of Reteti)	2
Reunited with wild elephant family	11
Relocated to Sera (Rewilding Program)	6
At Reteti (as at 31 st Dec 2019)	14
Total mortality 2016-2019	26
Total calves handled	59

Table 20: Summary of elephant rescues by Reteti since 2016

Figure 31: Survival of Reteti calves rescued at different age group between 2016 to 2019



There were low survival rates of rescued calves in 2017 and 2018, however 2019 had a significant improvement in survival rates. Highest mortality occurred in calves below 1 month of age, with 100% of calves below two weeks of age dying within the first two weeks after rescue. Older calves (above 6 months of age) had the highest survival rates. Among the leading causes of mortality were infectious and nutritional causes. The Reteti team alongside KWS and SDZG experts continue to learn and adapt the rehabilitation protocols for the orphans.

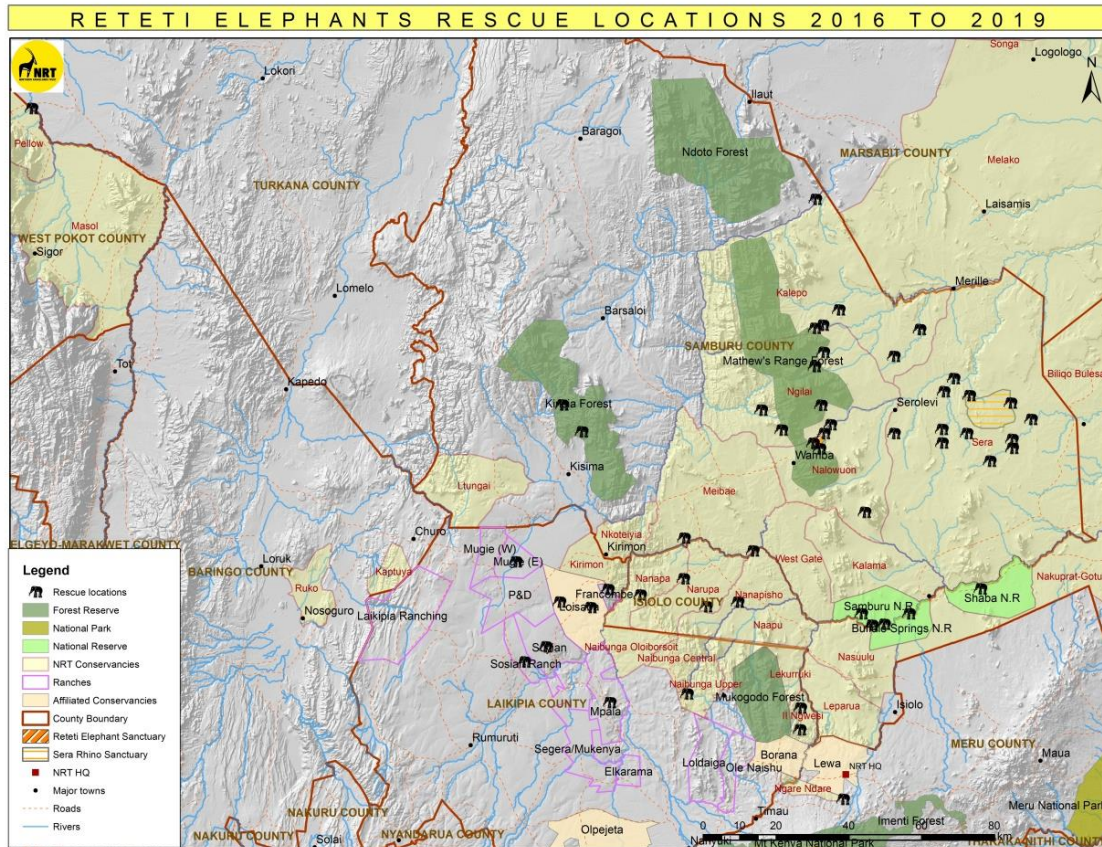


Figure 19: Map showing distribution of elephants rescued by Reteti since 2016.

In 2019, six orphaned elephants were moved from Reteti to Sera Rhino Sanctuary to start their re-wilding phase. The calves were moved in two groups, the first were three males and the second two females and one male. Calves were selected based on age, size, and social cohort, informed by elephant keepers and veterinary staff recommendations and detailed observations on social interactions from STE and SDZG. The calves were prepared for the move by separating them from the rest of the orphan herd, reducing human contact and frequency bottle feeds. Calves were also fitted with GPS collars to enable detailed monitoring of movements once they were released in Sera. A third group of four calves is being prepared for the rewilding phase in Sera in May 2020.

Calves were introduced into a holding boma in Sera for 12 to 24 hours after which they were released into the 107km² fenced sanctuary. In Sera the orphans have reduced contact with humans and monitoring is largely done remotely using 30 camera traps and GPS collars, as well as opportunistic data collection when encountered by STE observers and Sera rangers. Several wild elephants within the sanctuary are also collared which enables analysis of orphans' interaction with these wild herds from collar data. The body condition of the elephant orphans is good, and orphans have also been noted to interact with wild elephant herds. Sera is an ideal site for the rewilding phase as it is a fenced sanctuary large enough to allow elephants to roam freely while having the necessary capacity and infrastructure for post-release monitoring and protection.



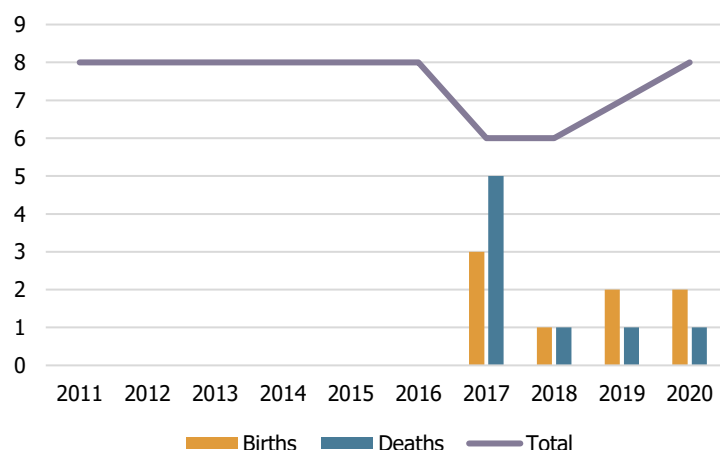
2.4 Rothschild Giraffe (*Giraffa camelopardalis ssp. rothschildi*: Near Threatened) - Ruko Conservancy

Rothschild's giraffe, previously known as Baringo giraffe, historically ranged over much of Western Kenya however they are now found in only a few National Parks, Reserves or conservancies where they were introduced. The national population is estimated at 609 individuals (National Recovery and Action Plan for Giraffe in Kenya 2018-2022) out of a global estimate of 1,400 individuals (IUCN Red list 2020).

In 2011, Ruko Conservancy established a sanctuary for Rothschild's giraffe on a small peninsula on the eastern shores of Lake Baringo. A founding population of eight sub-adult giraffe (two males and six females) were introduced from Soysambu Conservancy. Rising lake water levels cut off the peninsula which is now an island, and lake levels continue to rise and the island of only 4km² is also bisected by a steep cliff further reducing

the area available. The giraffe on the island have faced several challenges which have limited population growth largely due to nutritional stress and compromised health. In 2017 the first calves were born, however none survived beyond a few weeks. Two adult giraffe also died likely due to nutritional complications. To date, eight calves have been born, and only two calves have survived. The current population remains at eight individuals (one male, five adult females and two juvenile females).

Figure 33: Population number, births and deaths of Rothschild's giraffe in Ruko conservancy (2011-2020)



To mitigate these challenges, the community has agreed to set aside additional land of approximately 18km² on the eastern shore of the lake for a giraffe sanctuary. A management plan, habitat, security, and environmental impact assessments have been completed and the plan has the approval of the community, KWS and the County Government of Baringo. Fence construction is expected to start in the second half of 2020 with a view to moving the giraffes from their island as soon as possible. Additional animals will be translocated from other sites to reinforce this small population and boost breeding of this threatened species in future.

3. HUMAN-WILDLIFE CONFLICT

Human-wildlife conflict (HWC) refers to the interactions between wild animals and humans, and the resultant impact on people and their livelihoods. It is one of the most complex and urgent challenges for wildlife conservation around the world and poses a threat to survival of species as it often results in retaliatory killing of wildlife by people.

The NRT conservancy model promotes coexistence of wildlife and people who share the same landscape. Many local communities have lived alongside wildlife for millennia and HWC is part of daily life, however, as wildlife habitats are lost from encroachment of human settlements, agriculture and development infrastructure, conflict with wildlife increases. Additionally, the success of conservancies in stabilising and increasing wildlife populations may result in an increase in human wildlife conflict. Mitigating HWC is complex and requires a multi-faceted approach including indirect measures such as sustainable land management and settlement planning to maintain critical corridors and dispersal areas for wildlife, and promoting conservation to ensure the landscape supports sufficient densities of wild prey for carnivores. Conservancies aim to achieve this as well as to incentivise conservation through providing direct and indirect benefits from wildlife to communities, to outweigh the costs associated with living alongside wildlife.

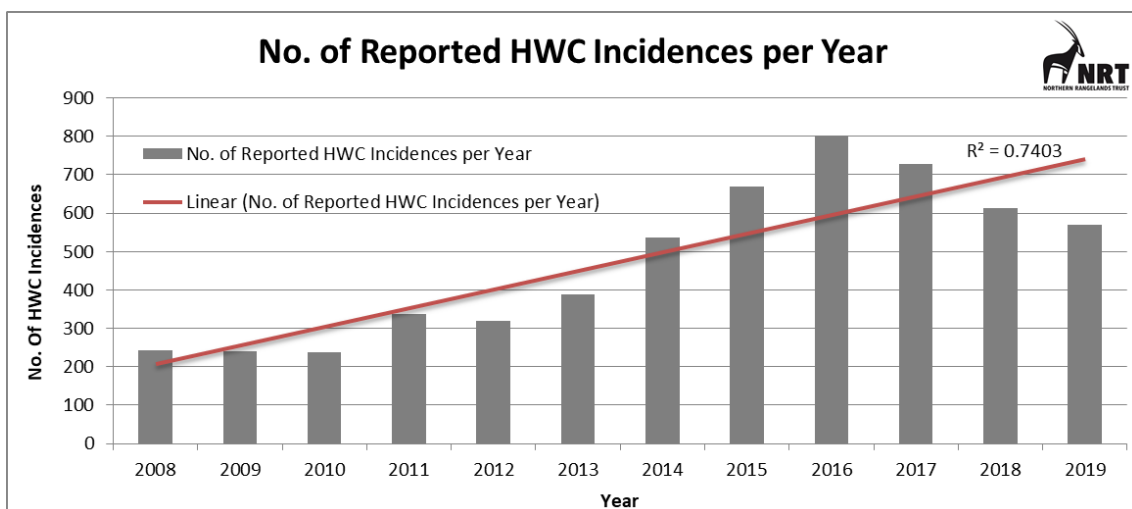


Figure 34: Number of incidences as reported by rangers through WCoMMs from 2008 to 2019

Monitoring of human-wildlife conflict is part of the NRT conservancy ranger-based monitoring system, Wildlife-CoMMS. Gathering information on HWC is important as it provides information for managers to understand the major causes of conflict and conflict hotspot areas, and to engage with communities and plan mitigation measures to reduce the impact of wildlife conflict on people’s lives and livelihoods. It is also important for conservancies to respond to conflict incidents where possible, to support and advise community members and reduce the potential for retaliatory killing of wildlife. HWC data gathered by NRT member conservancies however is not always consistent

and will not include all incidents of conflict that occur across the conservancy. This is for several reasons, e.g. lack of information from community members; reluctance of rangers to gather data as this creates expectations among the community for compensation from conservancies; lack of compensation from government to communities is a disincentive to report incidents; distance between ranger outposts and community settlements means incidents are often not reported.

The number of HWC incidents reported between 2008-2019 has increased over time as WCoMMS has expanded into new conservancies. The **highest number of incidents reported was in 2016 when there was a severe drought**, conflict reports from Kiunga and Ishaqbini were significantly higher in this year; conflict reports declined in 2017-2019. In the past five years (2015-2019), the highest number of conflict reports are from Melako, Kiunga and Ishaqbini conservancies. This may be attributed to both high conflict levels in these conservancies as well as consistent reporting and good data capture. Conservancies reporting on average more than 50 conflict incidents per year for the past five years are Melako, Kiunga, Ishaqbini, Ltungai and Westgate.

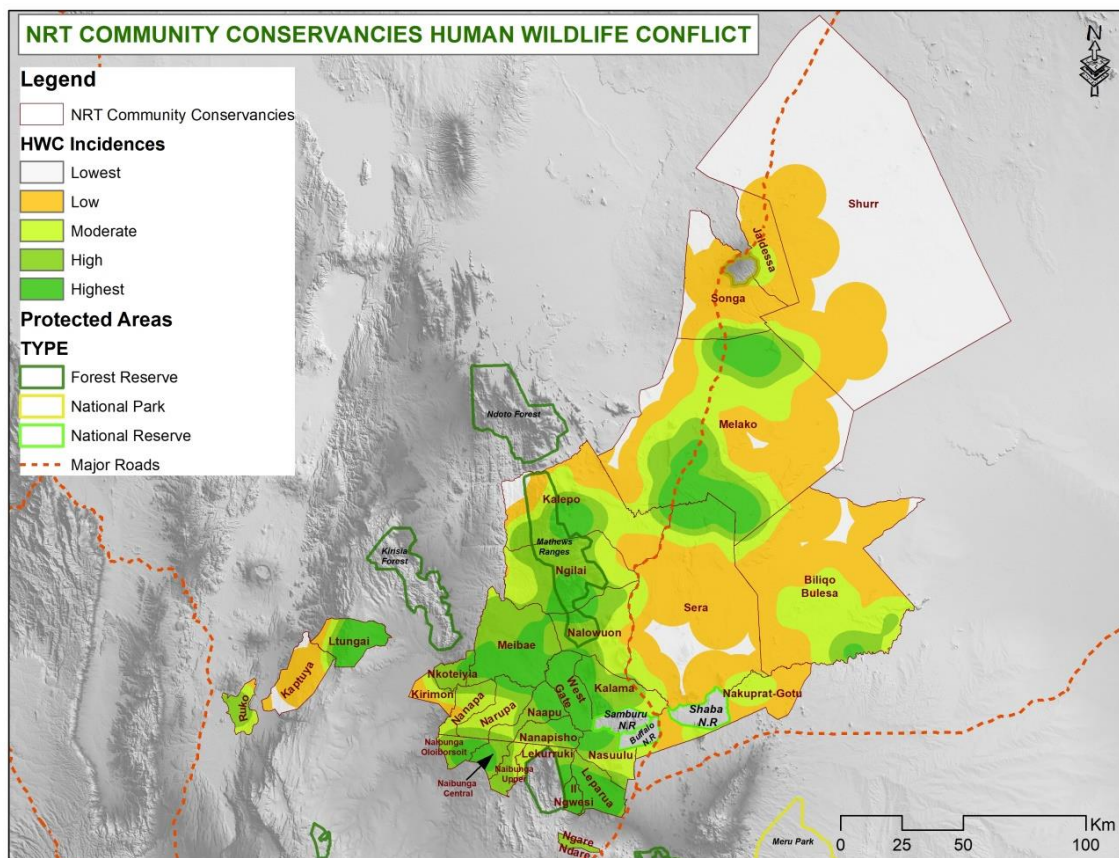


Figure 35: HWC hotspots from Ranger based monitoring WCoMMS

Most of the HWC reports are depredation of livestock by large carnivores with the highest number of reports due to spotted hyena, followed by leopard, lion, cheetah, and wild dog. Most conflict with hyena and lion occurs at night, whereas leopard, cheetah and wild dog attacks are predominantly during the day. For other types of conflict (e.g. crop-raiding, conflict over water, human injury or death) elephant are the most reported conflict species followed by buffalo. There

are less crop-raiding incidents reported as most NRT member conservancies are semi-arid and support pastoralism rather than agriculture. Agro-pastoralism occurs in the southern and western parts of the NRT landscape and around Mt. Marsabit, and parts of NRT-Coast support agriculture. Most crop-raiding occurs at night (apart from baboons).

Table 3: HWC conflicts reported showing occurrence at night or day for different species

#	Conflict Species	Day	Night	Total
1	Spotted Hyena	329	989	1,318
2	Leopard	749	511	1,260
3	Lion	338	479	817
4	Elephant	152	332	484
5	Cheetah	378	59	437
6	Buffalo	57	321	378
7	Wild Dog	254	20	274
8	Baboon	144	4	148
9	Plains Zebra	1	143	144
10	Crocodile	58	3	61
11	Jackal	55	4	59
12	Hippopotamus	3	44	47
13	Striped Hyena	6	31	37
14	Warthog	2	34	36
Total incidents reported		2,526	2,974	5,500

Human Deaths and Injuries from Wildlife

Through our member conservancies, NRT gathers reports on human deaths and injuries caused by wildlife. **Since 2012, NRT has received reports of 45 people killed by wildlife and more than 100 people injured in conservancies.** Elephant, buffalo and lion contributed to 75% of all reports of injuries and deaths (Figure 37). **Elephant caused the largest number of deaths (60% of all reports, 27 people),** followed by nine people killed by crocodiles and six by buffalo. The highest number of deaths were in Naibunga Conservancy with nine people killed by elephant. The most deaths were recorded in 2017 during the severe drought, particularly in the NRT-Coast region (Figure 36).

Figure 36: Number of human deaths from wildlife reported to NRT 2013-2019

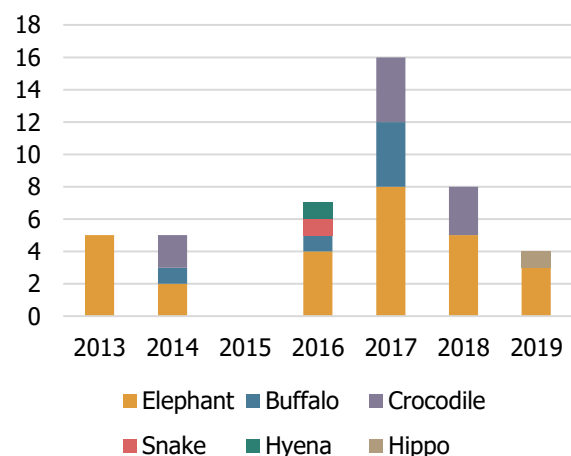
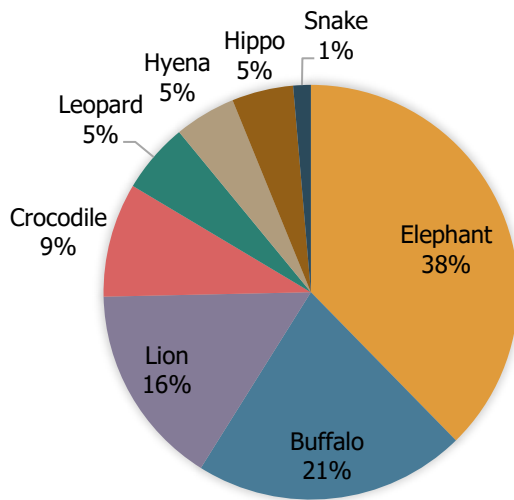


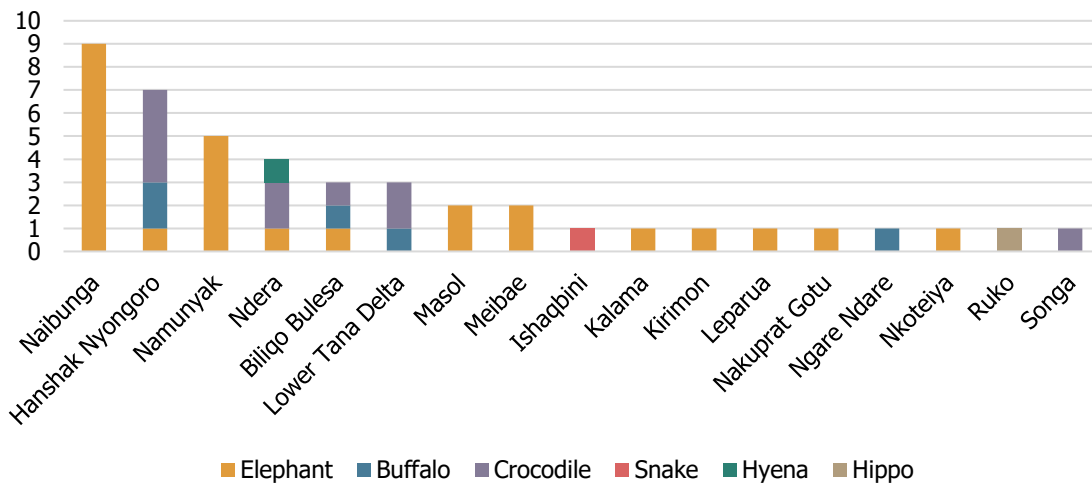
Figure 37: Proportion of human deaths and injuries casued by different wildlife

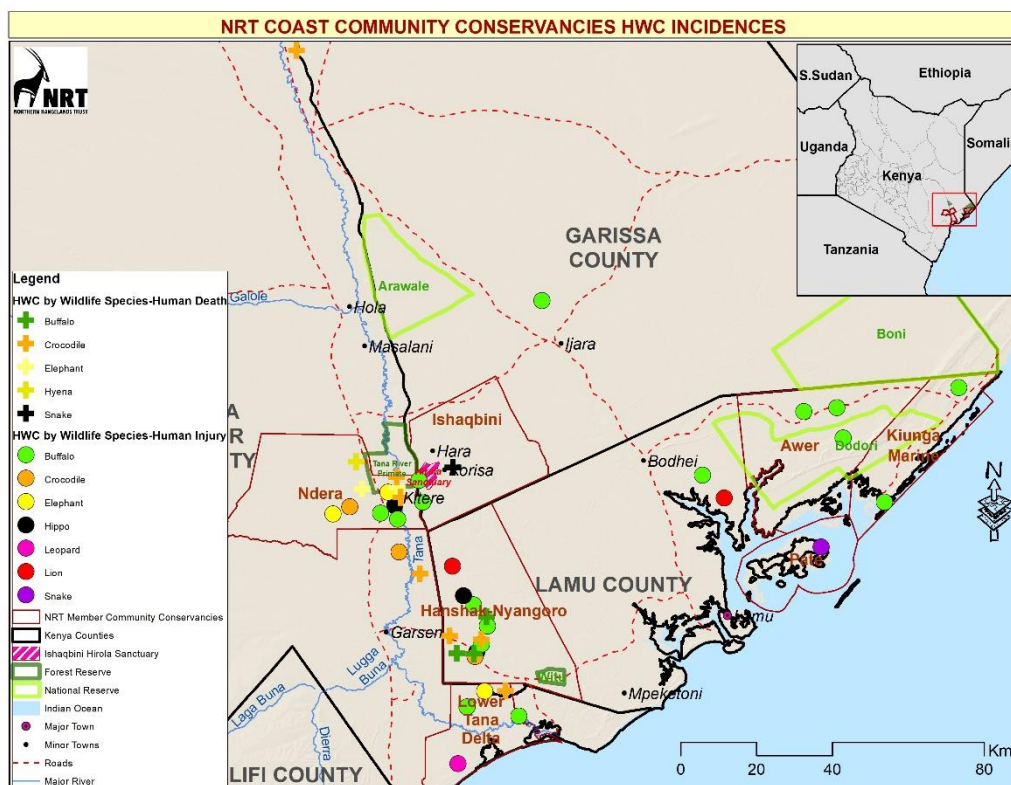
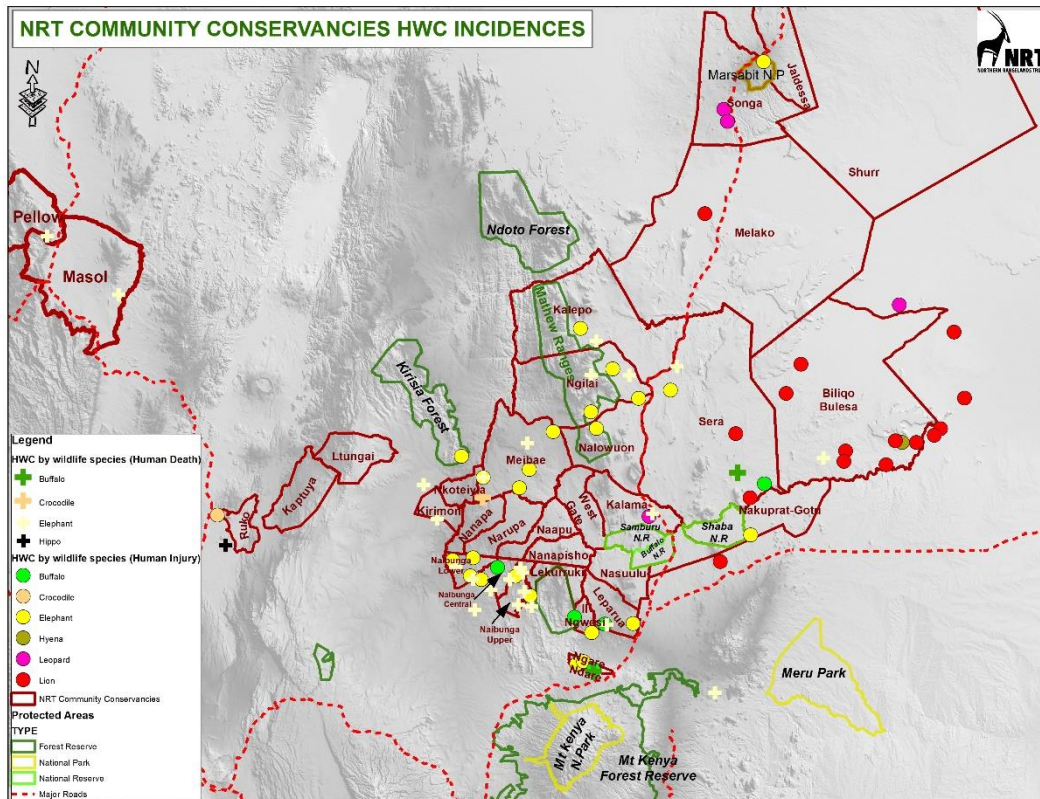


The high number of people injured by lion were predominantly due to one pride in Biliqo Bulesa in 2018 and 2019 which injured at least 16 people; this pride was later eliminated through PAC.

Maps of distribution of human death and injury show the high concentration of elephant conflict in Naibunga and Namunyak, and lion conflict in Biliqo Bulesa. Distribution of human deaths and injuries reported from conservancies at NRT Coast shows highest concentration of incidents in Ndera and Hanshak Nyongoro conservancies (figures 39 & 40).

Figure 38: Number of human deaths from wildlife reported to NRT by conservancies 2012-2019





Figures 39 & 40: Distribution of human deaths and injuries reported to NRT by conservancies in NRT-Centre and Coast regions

Mitigating Human Elephant Conflict

Namunyak and Naibunga conservancies have the highest incidents of Human Elephant Conflict (HEC). The Mathews forest in Namunyak conservancy is a dry season refuge for livestock and wildlife, especially elephants. Seasonally elephant converge with livestock in the forest and conflict at water sources occurs, in some cases with elephant attacking and killing livestock. Retaliatory shooting and killing of elephant by armed herders occurs and conflict is now one of the highest causes of elephant mortality reported in Namunyak (figure 41); conflict killing has increased significantly since 2016. To mitigate this Namunyak Conservancy established a pilot Livestock Consolation Fund, with funds from tourism being used as consolation payments for community members whose livestock have been killed or injured by elephant. This pilot project is currently under review to determine whether it is having an impact on reducing retaliatory killing of elephant. Conflict killing of elephant was highest in 2017 following the severe drought, decreased in 2018 however increased again in 2019.

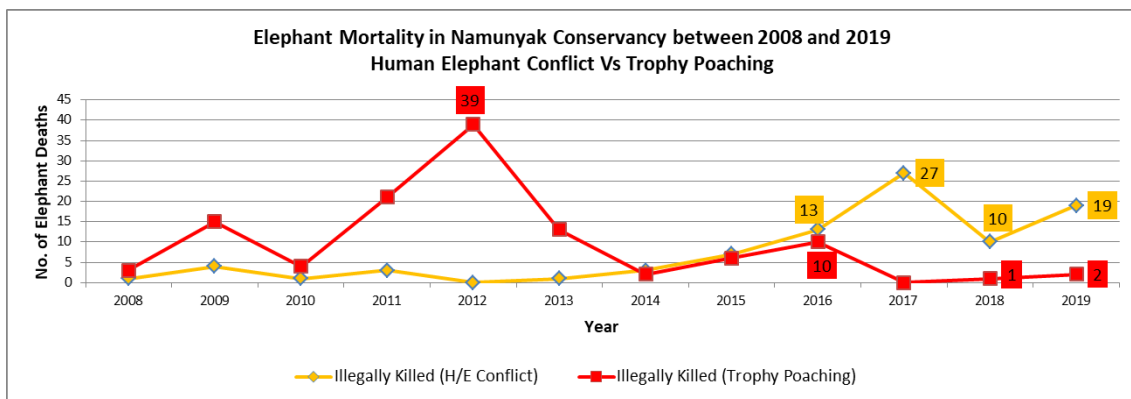


Figure 41: Elephant mortality due to poaching and conflict killing in Namunyak 2008 - 2019

Naibunga Conservancy is a dispersal area for livestock moving south from Samburu and Isiolo and into private ranches and conservancies in Laikipia. The area has one of the highest incidences of death and injury of people by elephants in the country. Naibunga has high numbers of settlements which are widely dispersed across much of the conservancy, in some cases these settlements have encroached into known elephant corridors. The alien invasive plant *Opuntia stricta* has encroached into much of the conservancy and is a plant which elephants like to feed on, in dry periods elephants come into settlement areas to feed on this plant and its fruit. Water sources are also a common conflict point with elephants. In collaboration with Naibunga Conservancy, the local community and KWS, NRT have undertaken a feasibility assessment for fencing off key settlements and water points to reduce conflict with elephants while retaining critical corridors for elephant between the Samburu/Laikipia of the north and the private land in Laikipia to the South. Fences will be designed in such a way as to minimally interfere with the free movement of people and livestock but minimize human/livestock interaction with elephants (figure 42). NRT and Naibunga will fundraise for this project to implement the fencing in a phased approach.

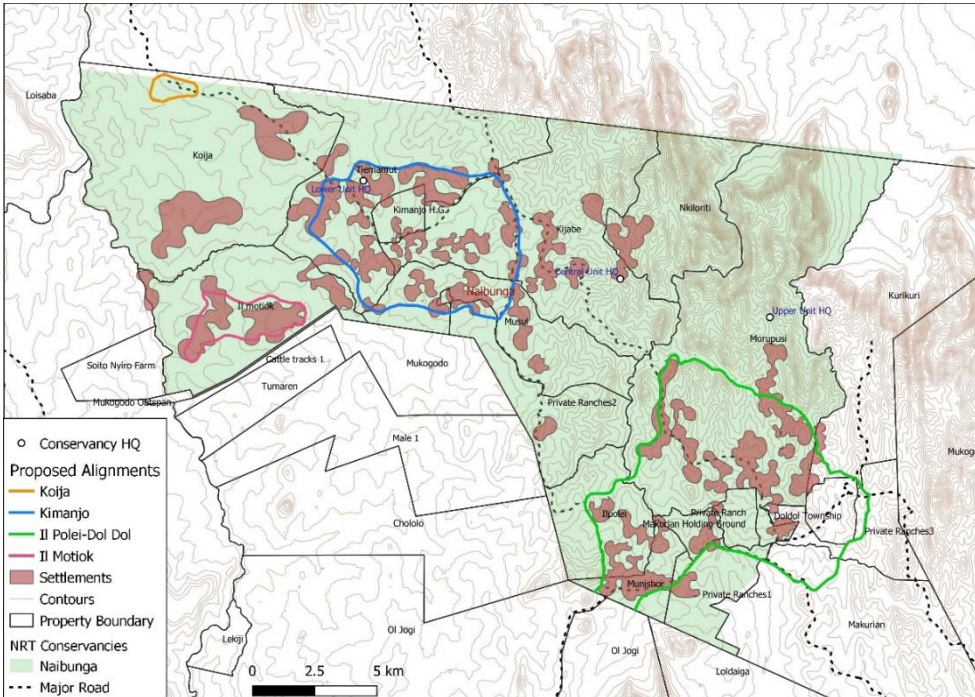


Figure 42: Proposed fence alignment for fencing off Naibunga settlements.

Crop-raiding by elephants in Songa and Jaldessa conservancies in the foothills of Mt. Marsabit has a significant impact on people's livelihoods and poses a threat to elephant through retaliatory killing. NRT, with support from the US Forest Service and Save the Elephants, undertook a feasibility study for mitigating human-elephant conflict around Mt Marsabit analysing elephant movement and conflict data. The areas most used by elephant, elephant movement corridors and agricultural land are shown in figure 43.

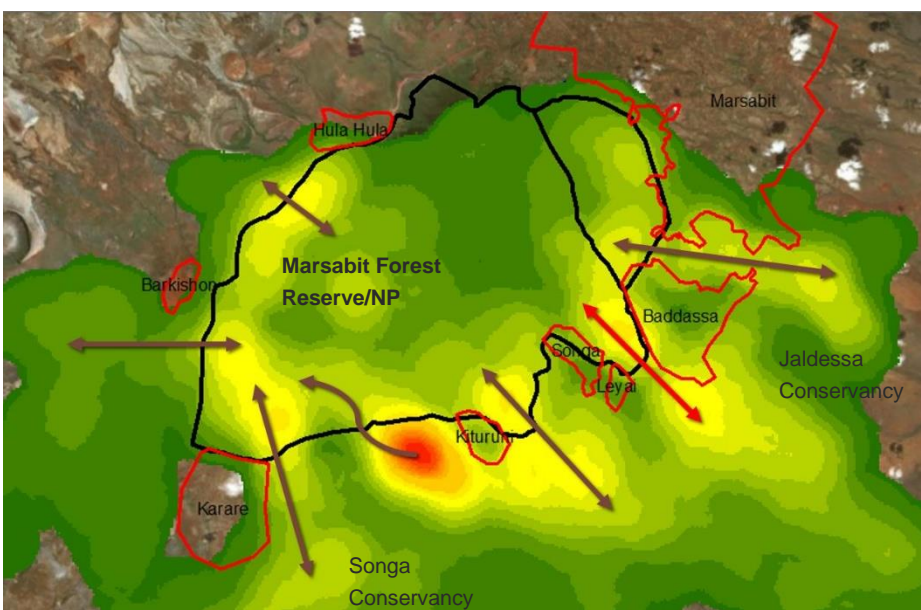


Figure 43: Primary movement corridors spanning the boundary of Marsabit National Park (outlined in black), as identified from current elephant telemetry data. Key settlements and farmland areas outlined in red

The proposal is to fully fence off the agricultural land surrounding the forest and maintain corridors and dispersal areas for elephants connecting the Marsabit forest with the rangelands to the south and east. Community sensitisation and readiness for the fencing project is ongoing and will be implemented in a phased approach as funding is secured, targeting the most affected settlement areas first.

A project to fence off farms in Ndera Conservancy to reduce crop raiding by various wildlife species (including hippo, bushbuck, elephant and buffalo) began in 2019 piloting mobile electric-tape fences which are low-cost as well as permanent, low electric fences with outriggers. The effectiveness of the different fencing configurations will be monitored with a view to expanding this fencing project in future.

Mitigating Livestock Depredation

Development and implementation of direct conflict mitigation strategies depends on the context of each conservancy including the conflict species, traditional livestock-keeping practices, cost of mitigation measures, attitudes of communities towards wildlife etc. While livestock depredation is widespread across the NRT landscape, NRT has not invested significantly in direct mitigation measures. However, some conservancies are working with other partners including Ewaso Lions, Lion Landscapes, and Action for Cheetahs Kenya to mitigate livestock depredation.

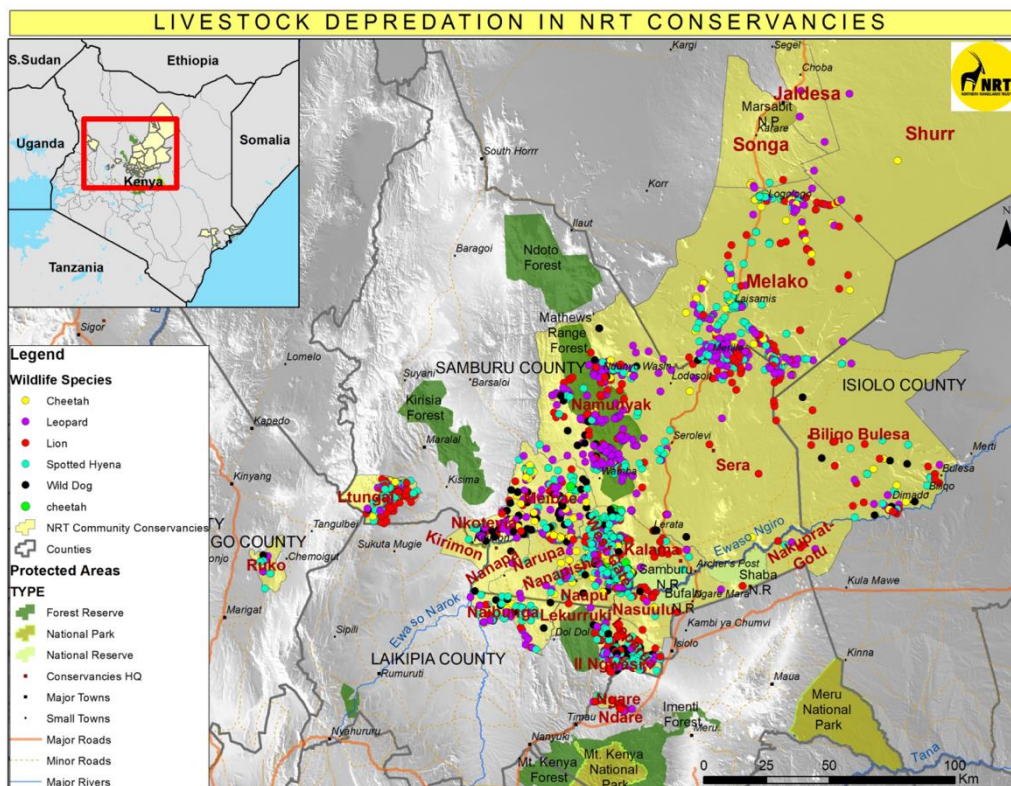


Figure 44: Map of livestock depredation incidents reported by member conservancies in NRT centre region

Predator-conflict mitigation actions include:

- Promoting good herding practises to ensure livestock is looked after by adults rather young children
- Reinforced predator proof bomas for holding livestock at night
- LED lighting to deter predators from attacking bomas at night
- Early warning system from collared lions or information from community Lion guardians/scouts
- Engagement with herders, moran (youth), women and elders on the importance of peaceful co-existence

A review of NRT's Wildlife Conservation and Management Program is planned for 2020 and investing in human-wildlife conflict mitigation is likely to become a higher priority in the next five years.

4. Wildlife Protection and Security

4.1 Monitoring Illegal activities - Efforts on Combating Wildlife Crime

Conservancy rangers are employed by community conservancies primarily to provide security and monitoring of wildlife in their conservancies, however they also provide security for people and their property. NRT’s conservancy model promotes the coexistence of people and wildlife, with wildlife conservation and management supported alongside traditional livelihoods. Conservancy rangers assist in law enforcement as per the laws of Kenya and the by-laws of their respective conservancies; approximately one third of rangers are also registered National Police Reservists. Conservancy and NRT ranger teams work closely with other law enforcement agencies including the National Police Service, Kenya Wildlife Service and Kenya Forest Service. Below is a summary graph of the common offences that conservancy rangers assist in combating. There were 60 arrests made as a result of illegal activities by conservancy and NRT rangers working with government agents in 2019, a significant increase from previous years. Many of these were in the NRT-Coast region. The capacity for Conservancies to report and for NRT to record illegal activities has improved over time, especially since the introduction of the JOCC (Joint Operations Command Centre) at Lewa, which has contributed to the increase in incidents reported between 2010 and 2019.

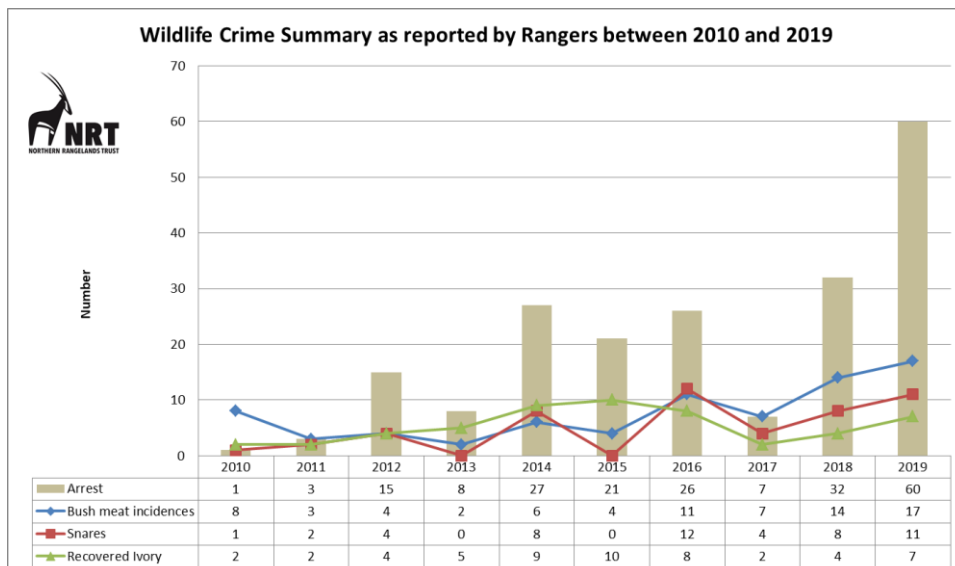


Figure 45: Reports of wildlife crime from Conservancy rangers

4.2 Conservancy Ranger Patrol Effort

Wildlife CoMMS is based upon daily patrols by conservancy rangers; ideally patrols should be consistent and regularly cover all areas of a conservancy in order to build up a picture of wildlife distribution, trends and threats across a conservancy. Conservancy wardens and their NCO's plan patrols for ranger teams which may have different objectives e.g. wildlife monitoring, anti-poaching, community awareness, responding to human-wildlife conflict reports etc. Each patrol team whether on foot, vehicle, or at fixed observation points (OPs) fills in data sheets on all wildlife observations, wildlife mortality, illegal incidents, human-wildlife conflict incidents and patrol effort (areas/locations of the conservancy visited by the patrol team) at the end of the day. Patrol effort data is used to calculate the number of patrol days for each location in a conservancy. Figures 46 and 47 show the spatial distribution of conservancy ranger patrols across the NRT landscape, for NRT-centre and NRT-Coast regions.

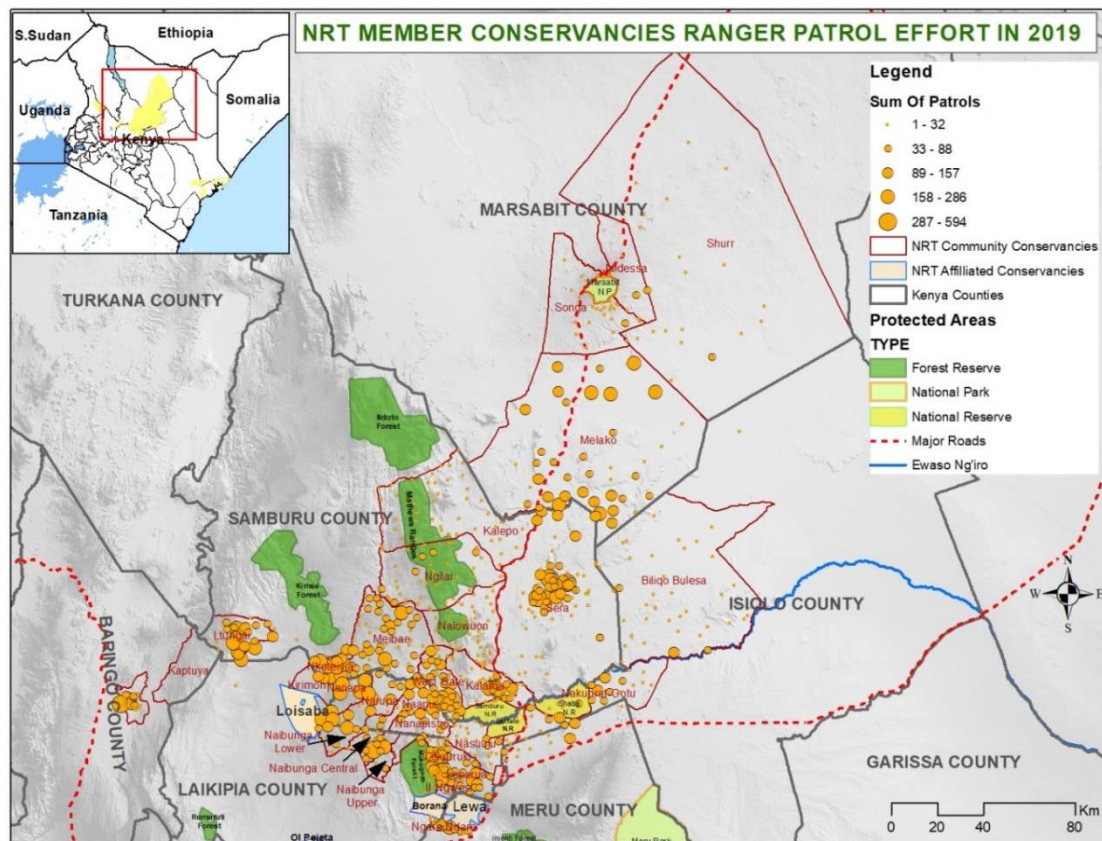


Figure 46: Total patrol days per location in conservancies in NRT Centre region

The patrol effort map clearly shows gaps in areas patrolled by conservancy rangers. Patrol effort is highest in areas closest to conservancy headquarters and outposts. In some of the largest NRT-member conservancies including Sera, Biliqo Bulesa, Namunyak, Melako and Shurr, large parts of the conservancy area are either not patrolled at all or very infrequently. In conservancies that have

few rangers, patrol effort is also low and concentrated around headquarters (e.g. Songa, Ruko, Jaldesa). There is also low patrol effort within the Mathews forest in Namunyak; in general patrol effort in Namunyak and Nasuulu conservancies was low in 2019 (this could also be due to inconsistent reporting of patrol effort). In Sera most patrols are concentrated within or immediately adjacent to the rhino sanctuary, and in Kalama patrol effort is concentrated in the core conservation area and buffer zone rather than the rest of the conservancy. Use of conservancy vehicles for patrolling should be improved and prioritized by conservancy managers in order to improve the coverage of patrols across the entire conservancy.

In the NRT-Coast region (figure 47), large parts of Ishaqbini, Hanshak Nyongoro, Kiunga and Awer are inaccessible due to insecurity posed by Al-Shabaab and were therefore not patrolled by rangers in 2019. In Ndera, ranger patrols are concentrated in the riverine forests and adjacent bushland along the Tana River; the conservancy also has low numbers of rangers. Wildlife-CoMMS is not yet fully established in Awer conservancy, hence the absence of patrol effort data from Awer.

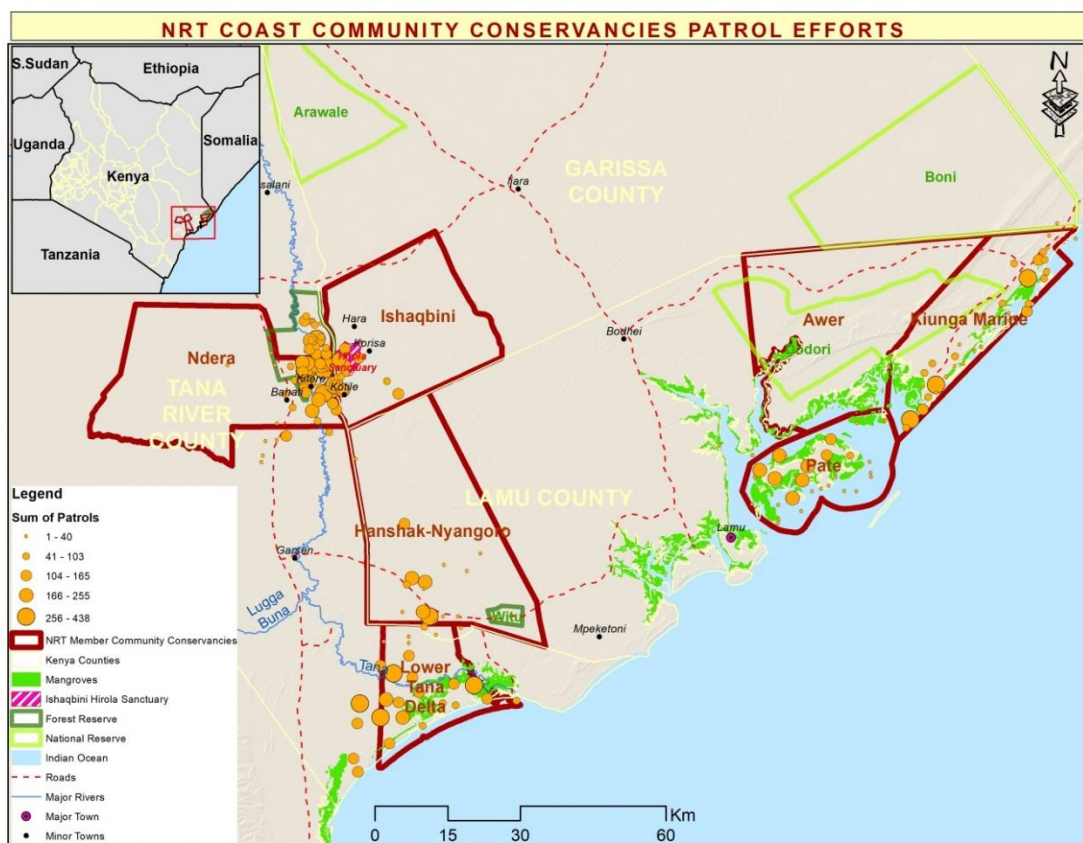


Figure 47: Total patrol days per location in conservancies in NRT Coast region

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