HORN OF AFRICA ANTELOPE SURVEY (2025–2026)

NORTHWESTERN KENYA

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Horn of Africa Antelope Survey (2025–2026): Northwestern Kenya

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Report to the Zoological Society for the Conservation of Species and Populations.

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Cover photograph: Kirk's Dik-Dik *Madoqua (kirkii) kirkii* adult male and juvenile, west of Merti Plateau, central Kenya.

All photographs and maps by Yvonne de Jong and Tom Butynski.

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SUMMARY

Northern Kenya is the most poorly known region in Eastern Africa as concerns the taxonomy, distribution, abundance, threats, and conservation status of its larger mammals. Nonetheless, this region is known to hold a high number of threatened species and subspecies. Among the larger mammals, 19 species of antelope are known to occur. During November 2025 to July 2026, we completed 'Phase Three' of the 'Horn of Africa Antelope Survey'. Phase Three consisted of two field trips in northwestern Kenya covering as much of the land area as possible in the region west of Lake Turkana and Suguta Valley (*i.e.*, west of the Eastern (Gregory) Rift Valley), north of Kainuk, east of the Uganda border, and south of the Elemi Triangle. In addition, we conducted two shorter surveys, one in far western Laikipia County (4 days) and one in the vicinity of the Merti Plateau (7 days), central Kenya. Diurnal surveys, nocturnal surveys, and camera trap surveys were conducted by two researchers (total of 47 field days; total distance driven 5,883 km).

The objectives of Phase Three were to: (1) considerably improve our understanding of the taxonomic status, distribution, relative abundance, and threats to the region's species of antelope; (2) contribute to the reassessments of their *IUCN Red List* degree of threat status; (3) provide practical, prioritized, recommendations for ameliorating the threats; and (4) bring local, national, and international attention to the unique biodiversity of northern Kenya, using antelopes as a flagship group.

Twelve of the 19 antelope species of northern Kenya were encountered during Phase Three. The species most frequently encountered was Kirk's Dik-Dik *Madoqua* (*kirkii*) *kirkii*, followed by Common Impala *Aepyceros melampus melampus*. The least common were Klipspringer *Oreotragus oreotragus,* and Greater Kudu *Tragelaphus strepsiceros*.

During Phase Three, antelope species were extremely scarce in northwestern Kenya. Most of northwestern Kenya has been historically marginally suitable for water-dependent antelopes. Five of the 16 antelope species known for northwestern Kenya were recorded. All are water-independent species with Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii* and Common Duiker *Sylvicapra grimmia nyansae* most common.

All antelope species in northern Kenya are threatened to some extent by competition with livestock for food and water, habitat degradation, loss, and fragmentation, and poaching. In northwestern Kenya, most, if not all, are to some extent negatively affected by the invasion of woody plants, particularly Mesquite *Neltuma juliflora* and False Umbrella Thorn *Acacia reficiens.* There are now large areas of monotypic 'Mesquite woodlands'. While these two invasives provide some browse and shade for several species of antelope (*e.g.*, Impala *Aepyceros melampus*, Smith's Dik-Dik, Bright's Gazelle *Nanger notata*, Lesser Kudu *Tragelaphus imberbis*, Greater Kudu *Tragelaphus strepsiceros*, Gerenuk *Litocranius walleri*), particularly during droughts, it seems unlikely that they, in balance, they benefit from these species. Invaded habitats are unlikely to support the same antelope diversity and abundance as intact native habitats.

Most of northwestern Kenya is too arid for large-scale agriculture or even large-scale ranching. It appears that the most threatened antelope species in northwestern Kenya at this time are Tiang *Damaliscus lunatus tiang*, Defassa Waterbuck *Kobus defassa*, Mountain Reedbuck

Redunca fulvorufula, Impala, Oribi *Ourebia ourebi*, followed by Beisa Oryx *Oryx beisa*, Common Eland *Taurotragus oryx*, and Kirk's Dik-Dik *Madoqua kirkii*. Kirk's Dik-Dik is presumed to be present in the southern part of northwestern Kenya. Both species of Dik-Dik are relatively adaptable to human-caused habitat changes. To some extent, livestock grazing and browsing might favor them.

Man-made perennial water sources (dams and boreholes) provide water to antelopes and other wildlife in some parts of northwestern Kenya. These are, however, typically unavailable to wildlife as they are fenced and/or occupied by people, livestock, and dogs. Although the vegetation in and around settlements is typically severely degraded by livestock and people, the human population in the region is relatively small and there are few roads. The natural habitats of large parts of northwestern Kenya are, therefore, little affected by livestock or people due to the scarcity of perennial sources of water.

Forty-nine mammals species, other than antelopes, were encountered during Phase Three, seven of which are 'threatened with extinction' according to the IUCN Red List of Threatened Species. During Phase Three we found one new primate species for Kenya, Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti,* and collected additional records for a phenotypic cline for Baboons *Papio* in central Kenya. We also obtained elevational range extensions, geographic range extensions, and natural history data for Somali Lesser Galago *Galago gallarum*, Senegal Lesser Galago *Galago senegalensis senegalensis*, and for several bird species. Most notably, we encountered the River Prinia *Prinia fluviatilis* at two sites on the Lotikipi Plains of extreme northwestern Kenya and once in the Elemi Triangle. These encounters extended the known geographic range of this species to 140 km to the northeast.

Eventually, all 12 of the antelope species range maps presented in this report, and some non-antelope species maps, will be further updated based on: (1) geographic range extensions found during this survey, (2) application of soil and vegetation shapefiles that identify areas of unsuitable habitat, and (3) locality data from the databases that we have compiled over the past 25 years.

Figure 1. Adult female Southern Gerenuk *Litocranius walleri walleri.* Merti, central Kenya.

INTRODUCTION

Northern Kenya lies within the Horn of Africa Biodiversity Hotspot due to its high number of endemic and threatened genera and species (Conservation International 2022). This is the least studied region in eastern Africa as concerns the taxonomy, distribution, abundance, threats, and conservation status of its larger mammals. This hotspot includes at least five endemic species of antelope. Additional information on the larger mammals of northern Kenya is not only of considerable scientific interest, itis also a prerequisite for setting priorities for their conservation.

There has been little research on the mammals of northern Kenya. Sixty years ago, Stewart and Stewart (1963) provided rough range maps for the larger mammals of Kenya based on answers to questions presented to 'reliable observers' (*e.g.*, game wardens, veterinary officers, professional hunters), but few of these people would have knowledge of northern Kenya. Beyond that, there were a few aerial surveys undertaken by the Kenya Wildlife Service (*e.g.,* KWS 2021), but these dealt with only the largest mammals and, at least in some cases, the results greatly underestimated abundance (sometimes by at least 6-fold, *e.g.*, hartebeest). In addition, species were sometimes misidentified (*e.g.*, Impala *Aepyceros melampus* for Hirola *Beatragus hunteri*, and Common Warthog *Phacochoerus africanus* for Desert Warthog *Phacochoerus aethiopicus*). Over the past 24 years, we have conducted research on antelopes, primates, warthogs, and other larger mammals over much of Kenya, including large parts of northern Kenya on both sides of Lake Turkana (Sibiloi National Park and the Chalbi Desert in 2012, and Huri Hills and Mount Forole in 2013.

Figure 2. Adult male Bright's Gazelle *Nanger notata* at Meru National Park, central Kenya.

During February 2023 – January 2024, we completed the Northeast Kenya Antelope Survey, 'Phase One' of the 'Horn of Africa Antelope Survey' (Butynski and De Jong 2024), an understudied part of the Horn of Africa Biodiversity Hotspot. As far as we are aware, no other ground surveys to assess the taxonomic status, distribution, abundance, and threats of the larger mammals for any part of northeastern Kenya have been conducted. This appears to be primarily due to the remoteness of the region, the aridity and scarcity of perennial water, and insecurity in the vicinity of the border with Somalia. Sufficient security allowed us, with great care, to conduct ground surveys by vehicle up to Wajir City and 90 km to the north of Wajir City at Saraman. Security issues beyond Saraman into extreme northeastern Kenya (Mandera and Malka Mari National Park) meant that these area were not surveyed. Although the region has a high number of endemic and threatened species and subspecies (Conservation International 2022) it is also the most poorly known region in eastern Africa as concerns the taxonomy, distribution, abundance, threats, and conservation status of its larger mammal fauna.

During Phase One, antelope species were nowhere common outside of protected areas. We collected data on 10 of the 15 species of antelope known to occur in northeastern Kenya, but also on many other threatened and/or poorly known species (*e.g.*, Grévy's Zebra *Equus grevyi*, Somali Warthog *Phacochoerus aethiopicus delamerei,* Somali Lesser Galago, Pancake Tortoise *Malacochersus tornieri*, Short-toed Snake Eagle *Circaetus gallicus*, and White-headed Vulture *Trigonoceps occipitalis* (Butynski and De Jong 2024). During Phase One we found range extensions for Kirk's Dik-Dik *Madoqua kirkii* (130 km to the northeast) and Greater Kudu *Tragelaphus strepsiceros* (20 km to the east). The extension for Kirk's Dik-Dik is particularly important as this expands the area of sympatry with Günther's Dik-Dik *Madoqua* (*guentheri*) *guentheri* by 18,000 km² to the north and, most importantly, means that this species probably occurs in southern Ethiopia, making it a new large mammal for Ethiopia. Phenotypic descriptions and photographs obtained during this survey are not only important in fine-tuning the eastern limit of Smith's Dik-Dik and the western limit of Günther's Dik-Dik, but they are also important for detecting phenotypic clines and hybrid zones.

From June 2024 to March 2025, we completed 'Phase Two' of the 'Horn of Africa Antelope Survey' (Butynski and De Jong 2025b). Phase Two consisted of four field trips in northern Kenya, covering as much of the land area as possible north of the Ewas N'jiro River, east of Lake Turkana, west of the Somali border, and south of the Ethiopia border (Figure 4). During this phase, antelope species were nowhere common outside of protected areas. Ten of the 18 antelope species of northern Kenya were encountered. The species most frequently encountered was Günther's Dik-Dik, followed by Bright's Gazelle *Nanger notata*. Similar to the finding during Phase One, the least common were Common Waterbuck *Kobus ellipsiprymnus ellipsiprymnus* and Greater Kudu. The eight species not encountered (Common Eland *Tragelaphus oryx*, Salt's Dik-Dik *Madoqua saltiana*, Common Duiker *Sylvicapra grimmia*, Peter's Gazelle *Nanger petersii*, Coke's Hartebeest *Alcelaphus buselaphus cokii,* Chandler's Mountain Reedbuck *Redunca fulvorufula chanleri*, Klipspringer *Oreotragus oreotragus aureus*, Tiang) have geographic ranges that are on the margins of this region. Similar to Phase One, we obtained range extensions for Kirk's Dik-Dik. This species

was encountered between Bute and Malka Mari National Park, thereby extending its range ~100 km to the northeast. Together, the findings of Phase One and Phase Two extend the known range of Kirk's Dik-Dik ~300 km to the northeast.

Twenty-eight mammals species other than antelopes were encountered during this survey, four of which are 'threatened' (Savanna Elephant *Loxodonta africana*, Reticulated Giraffe *Giraffa reticulata*, Grévy's Zebra *Equus grevyi*, Leopard *Panthera pardus*). During this survey we found three new primate taxa for Kenya and East Africa: Hamadryas Baboon *Papio hamadryas*, Omo Vervet *Chlorocebus pygerythrus zavattarii*, and Ethiopian Lesser Galago *Galago senegalensis dunni*. We also obtained elevation range extensions, geographic range extensions, and natural history data for Somali Lesser Galago and Olive Baboon *Papio anubis*, and for several bird species. Galagos that looked Intermediate between Somali Lesser Galago and Senegal Lesser Galago *Galago senegalensis* were observed in acacia-commiphora bushland at Gurar. Phenotypic and bioacoustics comparisons are planned to use the field data and museum data now in our databases.

From November 2025 to July 2026, we completed 'Phase Three' of the 'Horn of Africa Antelope Survey'. Phase Three consisted of three field trips in northwestern Kenya covering as much of the land area as possible west of Lake Turkana and Suguta Valley (*i.e.*, west of the Eastern Rift Valley), north of Kainuk, east of the Uganda border, and south of the Elemi Triangle. During a fourth field trip we revisited Biliqo Bulesa Conservancy and Merti Plains of central Kenya (Figure 8).

Northern Kenya is generally flat, with most of the ground 100–800 metres above sea level (m asl). The Karasuk Hills (highest summit ~2,787 m) are among the highland ranges of northwestern Kenya. Northwestern Kenya lies within in the 'Northern *Acacia-Commiphora* Bushland and Thickets Ecoregion' and 'Masai Xeric Grasslands and Shrublands Ecoregion' (White 1983; Olson *et al.* 2001). This is a semi-arid region with generally hot temperatures. Rainfall occurs mainly during March–May and November–December. Mean annual rainfall ranges from 200 mm to 400 mm, while mean annual temperatures range from 25°C to 30°C. July and August are the hottest months with temperatures as high as 38°C.

Figure 3. Helmeted Turtle *Pelomedus a subrufa*. West-Pokot, central western Kenya.

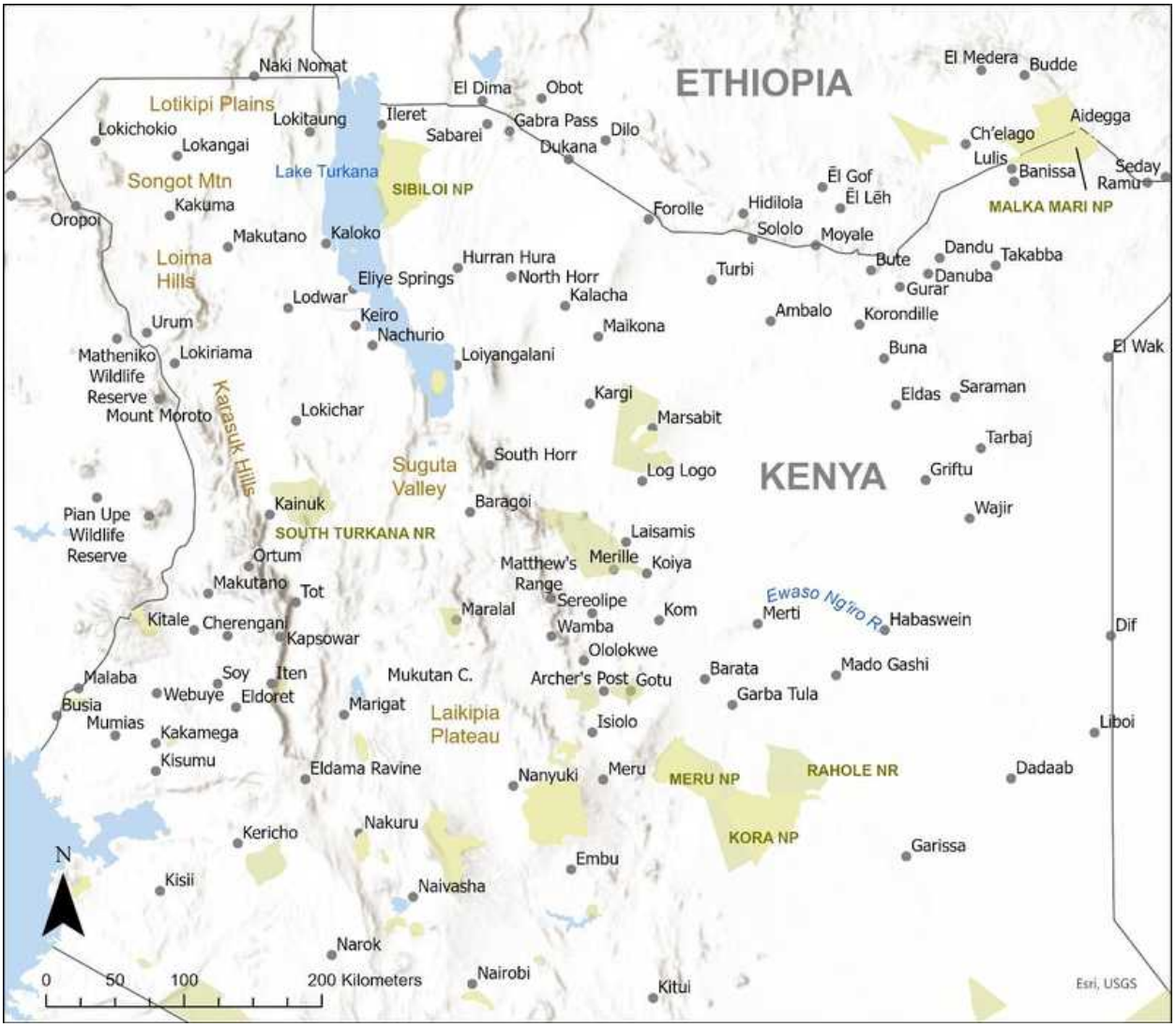

Figure 4. Study area for Phase Three of the Horn of Africa Antelope Survey with major roads depicted in red. Note the absence of roads and villages/towns over large areas. Map by Yvonne de Jong and Tom Butynski.

At least 19 species of antelope have been recorded for northern Kenya, two of which are 'Near Threatened' (Lesser Kudu *Tragelaphus imberbis*, Gerenuk) and two are 'Endangered' (Beisa Oryx, Mountain Reedbuck) (Table 1; Stewart and Stewart 1963; Kingdon 1982a,b; Groves and Grubb 2011; Kingdon and Hoffmann 2013; IUCN 2026). One 'Vulnerable' species (Soemmerring's Gazelle *Nanger soemmerringi*) occurs in southeastern Ethiopia and 'might' occur in northeastern Kenya. Some 'Least Concern' species are nationally threatened such as Tiang. This subspecies was once abundant east of Lake Turkana [2,000 individuals (Stewart and Steward 1963); 1,500 individuals (East 1988); 2,600 individuals (East 1999)], the only site in East Africa where this subspecies occurs. During a survey in 2012 we encountered only one Tiang in Sibiloi National Park. Considering the conservation threats throughout this vast region, and the fact that Sibiloi National Park is the only protected area in Kenya where Tiang occurs, it might soon be extirpated from East Africa (De Jong and Butynski 2014; Butynski and De Jong 2025b). In addition to the

antelopes, there are four 'Endangered' and four 'Vulnerable' species and subspecies of larger mammals in northern Kenya (Table 2). Our research in northern Kenya indicates that the main threats are habitat degradation, loss and fragmentation, poaching, drought, scarcity of perennial sources of water, charcoal production, and invasive species (Butynski and De Jong 2024, 2025b).

During Phase One and Phase Two we found that the main threats are habitat degradation and loss, poaching, drought, scarcity of perennial sources of water, charcoal production, and invasive species.

Table 1. Antelopes of northern Kenya (Stewart and Stewart 1963, Kingdon 1982a,b, Kingdon and Hoffmann 2013; Groves and Grubb 2011, IUCN 2026). The 16 species depicted in green font are historically recorded for northwestern Kenya.

Antelope Species	IUCN Red List Status 2026	Subspecies and Notes
Bushbuck *Tragelaphus scriptus*	LC	*Tragelaphus scriptus delamerei* (NA). Given species status by Groves and Grubb (2011).
Lesser Kudu *Tragelaphus imberbis*	NT	*Tragelaphus imberbis australis* (NA). Given species status by Groves and Grubb (2011).
Greater Kudu *Tragelaphus strepsiceros*	LC	*Tragelaphus strepsiceros chora* (NA).Given species status by Groves and Grubb (2011).
Common Eland *Tragelaphus oryx*	LC	
Kirk's Dik-Dik *Madoqua kirkii*	LC	*Madoqua kirkii kirkii* (NA) and *Madoqua kirkii cavendishi* (NA). Given species status by Groves and Grubb (2011).
Salt's Dik-Dik *Madoqua saltiana*	LC	*Madoqua saltiana swaynei* (NA). Given species status by Groves and Grubb (2011).
Günther's Dik-Dik *Madoqua guentheri*	LC	*Madoqua guentheri guentheri* (NA) and *Madoqua guentheri smithii* (NA). Given species status by Groves and Grubb (2011).
Mountain Reedbuck *Redunca fulvorufula*	EN	*Redunca fulvorufula chanleri* (VU).
Common Duiker *Sylvicapra grimmia*	LC	*Sylvicapra grimmia hindei* (NA) east of Rift Valley and *Sylvicapra grimmia nyansae* (NA) west of Rift Valley.
Waterbuck *Kobus ellipsiprymnus*	LC	*Kobus ellipsiprymnus ellipsiprymnus* (LC) and *Kobus ellipsiprymnus defassa* (NT). Groves and Grubb (2011) treat these as species.
Klipspringer *Oreotragus oreotragus*	LC	*Oreotragus oreotragus aureus* (NA). In central Kenya. Given species status by Groves and Grubb (2011).
Impala *Aepyceros melampus*	LC	*Aepyceros melampus melampus* (LC)
Bright's Gazelle *Nanger notata*	LC	
Peters's Gazelle *Nanger petersii*	LC	
Topi *Damaliscus lunatus*	LC	*Damaliscus lunatus tiang* (LC). Nationally threatened.
Gerenuk *Litocranius walleri*	NT	*Litocranius walleri walleri* (NA). Given species status by Groves and Grubb (2011).
Oribi *Ourebia ourebi*	LC	*Ourebia ourebi aequatoria* (NA). Referred to as "*Ourebia montana*" by Groves and Grubb (2011). In northern Uganda.
Beisa Oryx *Oryx beisa*	EN	*Oryx beisa beisa* (EN). Given species status by Groves and Grubb (2011).

Hartebeest *Alcelaphus buselaphus*	LC	*Alcelaphus buselaphus cokii* (LC) and *Alcelaphus buselaphus lelwel* (EN). Given species status by Groves and Grubb (2011).
Presence in northern Kenya requires confirmation		
Soemmerring's Gazelle *Nanger soemmerringi*	VU	*Nanger soemmerringi butteri* (NA). In southeastern Ethiopia. Kingdon (1982b) suspects present in northeastern Kenya.
Roan Antelope *Hippotragus equinus*	LC	*Hippotragus equinus langheldi* (NA)
Bohor Reedbuck *Redunca redunca*	LC	*Redunca redunca wardi* (NA). Given species status by Groves and Grubb (2011).
Kob *Kobus kob*	LC	*Kobus kob leucotis* (LC)

LC, Least Concern; NT, Near Threatened; VU, Vulnerable; EN, Endangered; CR, Critically Endangered; DD, Data Deficient; NA, Not Assessed

Table 2. Non-antelope species surveyed in northern Kenya that are Red Listed as 'threatened' or 'near-threatened.

Species	Current IUCN Red List Status 2022	Subspecies and Notes
Savanna elephant *Loxodonta africana*	EN	
Reticulated giraffe *Giraffa reticulata*	EN	
Grevy's zebra *Equus grevyi*	EN	
Lion *Panthera leo*	VU	
Leopard *Panthera pardus*	VU	*Panthera pardus pardus* (NA)
Cheetah *Acinonyx jubatus*	VU	*Acinonyx jubatus raineyi* (NA)
Wild dog *Lycaon pictus*	EN	
Patas monkey *Erythrocebus patas*	NT	*Erythrocebus patas pyrrhonotus* (VU)

LC, Least Concern; NT, Near Threatened; VU, Vulnerable; EN, Endangered; CR, Critically Endangered; DD, Data Deficient; NA, Not Assessed

Table 3. Other species of mammal surveyed in northern Kenya.

Species	Current IUCN Red List Status 2024	Subspecies and Notes
Desert Warthog *Phacochoerus aethiopicus*	LC	*Phacochoerus aethiopicus delamerei* (LC)
Common Warthog *Phacochoerus africanus*	LC	*Phacochoerus africanus massaicus* (NA) and *Phacochoerus africanus africanus* (NA).
Olive Baboon *Papio anubis*	LC	
Savanna Monkey *Chlorocebus pygerythrus*	LC	*Chlorocebus pygerythrus arenaria* (NA), *Chlorocebus pygerythrus centralis* (NA), and *Chlorocebus pygerythrus zavattarii* (NA).

Northern Lesser Galago *Galago senegalensis*	LC	*Galago senegalensis dunni* (LC) and *Galago senegalensis braccatus* (LC)
Somali Lesser Galago *Galago gallarum*	LC	
Bush Hyrax *Heterohyrax brucei*	LC	*Heterohyrax brucei hindei* (NA)
Rock Hyrax *Procavia capensis*	LC	*Procavia capensis jacksoni* (NA)
Unstriped Ground Squirrel *Xerus rutilus*	LC	*Xerus rutilus dabagala* (NA) and *Xerus rutilus rufifrons* (NA)
Striped Ground Squirrel *Xerus erythropus*	LC	*Xerus erythropus leucoumbrinus* (NA)

LC, Least Concern; NT, Near Threatened; VU, Vulnerable; EN, Endangered; CR, Critically Endangered; DD, Data Deficient; NA, Not Assessed

The following are among the many questions that Phase Three attempted to answer as concerns the larger mammals of northern Kenya:

- Which species of antelope and other larger mammal are present in the proposed Lotikipi National Reserve and on the Lotikipi Plains, northwestern Kenya?
- Does Roan Antelope *Hippotragus equinus* occur in northwestern Kenya?
- What are the limits of the geographic distributions of the two subspecies of waterbuck? Is there a phenotypic cline?
- What are the limits of the geographic distributions of Bright's Gazelle and Peters's Gazelle? Is there a phenotypic cline?
- Are Boutourline's Blue Monkey *Cercopithecus mitis boutourlinii*, Greyish-White-Tailed Guereza *Colobus guereza poliurus,* Grivet Monkey *Chlorocebus aethiops*, and Omo Vervet Monkey *Chlorocebus pygerythrus zavattarii* present?
- What is the geographic distribution of the Eastern Patas Monkey *Erythrocebus patas pyrrhonotus* in northwestern Kenya? How do adult males in this region differ phenotypically from adult males in central Kenya and northeastern Uganda?
- What are the limits of the geographic distributions of the two subspecies of Northern Lesser Galago? Is there a phenotypic cline?
- Which species of warthog occurs on Biliqo Bulesa Conservancy and on the Merti Plains?
- What is the geographic distribution of the Northern Warthog *Phacochoerus africanus africanus* and where does it meet the Eastern Warthog *P. a. massaicus*?
- Compare the phenotypes of Bush Hyrax *Heterohyrax brucei* and Rock Hyrax *Procavia capensis* with those from other parts of their geographic distributions. Which subspecies are present?
- What is the geographic distributions of the Striped Ground Squirrel *Xerus erythropus* and Unstriped Ground Squirrel *Xerus rutilus*, and where are they sympatric?

Figure 5. Brown Snake-Eagle *Circaetus cinereus*, Oropoi, northwestern Kenya.

Goal and Objectives

The goal of The Horn of Africa Antelope Survey is to prevent the extirpation of additional species of antelope and other larger mammals from the Horn of Africa, and to significantly contribute towards the long-term survival of northern Kenya's large mammal fauna. Black Rhinoceros *Diceros bicornis* have already been extirpated, and African Buffalo *Syncerus caffer* probably now occur only at a few sites, such as Loima Hills (I. Craig pers. comm. 2026) and in Marsabit National Park.

The objectives of Phase Three are to survey the 19 species of antelope known to occur in northern Kenya, as well as of the other larger mammals, in order to: (1) considerably improve our understanding of their taxonomic status, distribution, relative abundance, and threats; (2) contribute to the reassessments of their *IUCN Red List* degree of threat status; (3) provide practical, prioritized, recommendations for ameliorating the threats; and (4) bring local, national, and international attention to the unique biodiversity of northern Kenya, using the antelopes as a flagship group.

METHODS

Distances travelled

To assess presence and relative abundance of antelopes and other larger mammals (hereafter, focal species'; Tables 1, 2 and 3), and to cover large areas in a limited time, rapid assessment survey methods were used (Butynski and Koster 1994; White and Edwards 2000; De Jong and Butynski 2009; Butynski and De Jong 2012, 2017, 2024, 2025b). Differences in research conditions, constraints, and opportunities in northern Kenya, as well as the natural histories of the focal species, required that a variety of methods and approaches be employed.

Four field trips were conducted during Phase Three for a total of 47 days. We drove from central Kenya (Laikipia County) to northwestern Kenya. The total distance driven during Phase Three was 5,883 km (Table 4). Figure 8 shows the survey area and the routes used during the four surveys of Phase Three.

Table 4. Survey distances travelled by vehicle and by foot during the Horn of Africa Antelope Survey (November 2025 – July 2026).

Period	Number of days	Distance vehicle diurnal (km)	Distance vehicle nocturnal (km)	Distance on foot diurnal (km)	Distance on foot nocturnal (km)
26 November – 13 December 2025	18	2,404		19	9
12 – 15 February 2026	4	381		8	6
18 April – 5 May 2026	18	2,101	2	69	23
26 June – 2 July 2026	7	997		9	11
Total	**47**	**5,883**	**2**	**105**	**49**

Figure 6. Gambian Sun Squirrel *Heliosciurus gambianus*, Oropoi, northwestern Kenya.

Diurnal surveys

Vehicle surveys were conducted on the most remote roads available with the aim of covering all major habitat types. Vehicle surveys typically began soon after dawn and lasted until near dusk, with a break during the heat-of-the-day. Vehicle speed was usually 10–20 km/h. Zeiss Victory 10x42 and Zeiss Dialyt 7x42B binoculars were used.

Information collected during surveys included date, weather, start time, end time, survey route with place names (Garmin GPSMAP 65), travel speed (GPS), and travel distance (GPS). When a focal species was encountered, the following data was obtained: time, coordinates (GPS), elevation, species, number of individuals seen, group composition, vegetation type, and visual assessment of tree density. The aim during every encounter was to obtain detailed descriptions of as many individuals as time and visibility allow. Photographs were taken with a Canon R6 Mark III digital camera fitted with a Canon 100-500 mm lens, and with a Nikon D7100 digital camera fitted with a Nikon 80–400 mm lens. All photographs were taken in 'RAW' format.

Figure 7. Adult female Bright's Gazelle *Nanger notata*, central western Kenya.

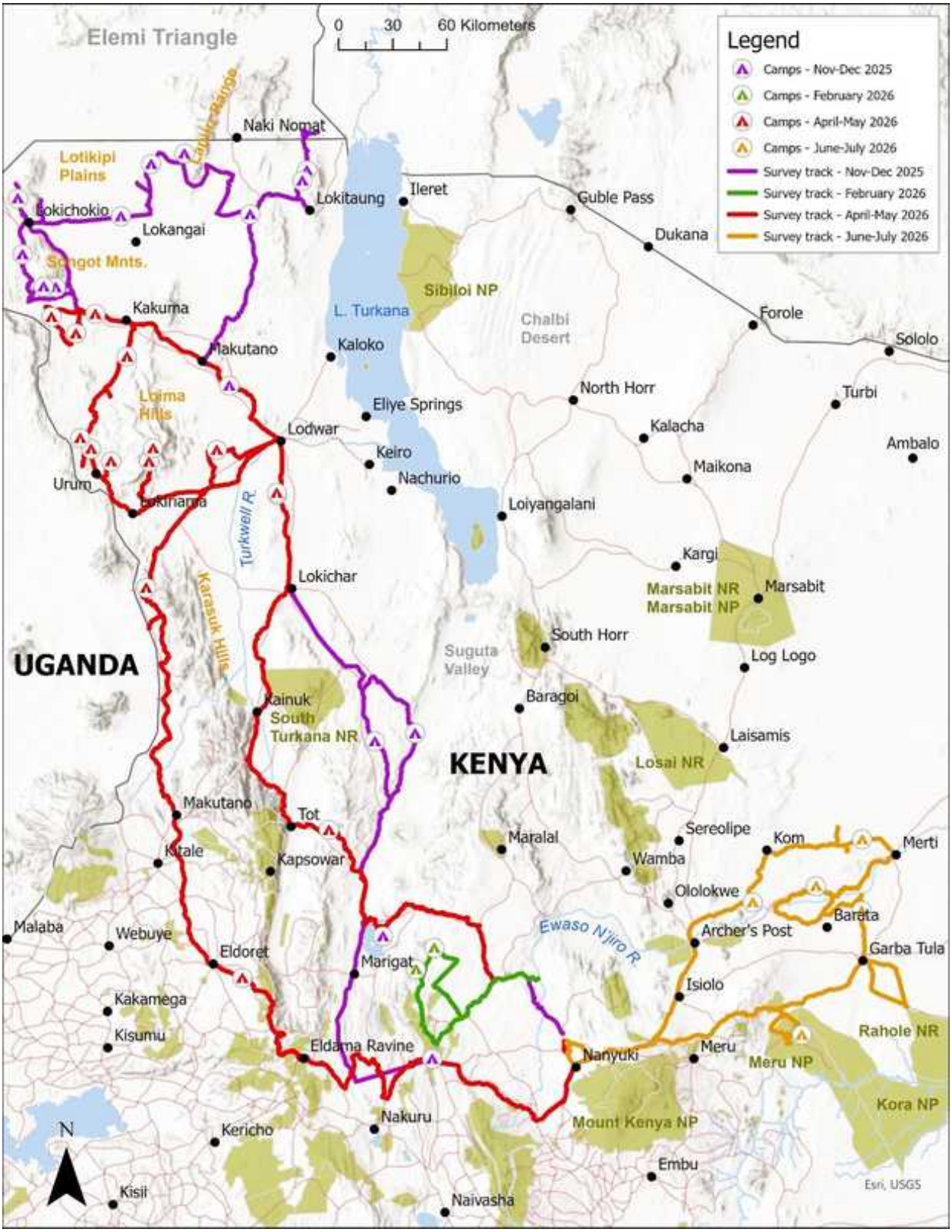

Figure 8. Study area for the Horn of Africa Antelope Survey and roads along which surveys were conducted during Phase Three (November 2025 – July 2026). Some roads were surveyed more than once, such as the tarmac highway from Lokichar to Kakuma.

The track of each survey route was saved in a GPS and downloaded into an ASUS notebook using Garmin MapSource software. By recording the start and end times for each survey, the rate of travel, the distance travelled (as determined by GPS), and the number of groups or individuals observed of each species (crude indices of abundance) were obtained (*i.e.*, groups encountered/kilometer and groups encountered/hour). By surveying large areas, a rough indication of the distribution of focal taxa was obtained. Throughout the survey, notes on threats and human pressures were taken.

Nocturnal surveys

Presence of galagos, hyraxes, nightjars, owls, and other species was recorded during nocturnal surveys conducted from a vehicle and/or by foot at all camps. These surveys were typically conducted during 19:00–22:00 h and 04:00–06:00 h. Reflection from the eyes of focal taxa (antelopes, carnivores, galagos) can be observed at >100 m in suitably open habitats. Torches (Semlos, Fenix TK20R, EagleTac M3C4) and Petzl Tikka RXP headlamps were used. Walks and drives were conducted slowly (0.5–1 km/h on foot and 5–10 km/h by vehicle) with pauses to scan the area, observe animals, and record vocalizations.

The following data were recorded: date, weather, moon phase, start time, finish time, localities surveyed (GPS), walking/driving speed (GPS), and distance covered (GPS). When focal taxa were encountered, binoculars were used. The following data were collected for each encounter: date, time, GPS coordinates, elevation, species, number of individuals, height above ground, vegetation type, and tree density. In addition, photographs were taken using a Canon Speedlite 430EX II flash.

Figure 9. Senegal Lesser Galago, *Galago senegalensis senegalensis*, Oropoi, Turkana, northwestern Kenya.

Listening post surveys were conducted in the vicinity of camps and from high points at dusk, dawn, and before and after nocturnal vehicle or walking surveys. The advertisement calls of galagos, carnivores, and other species provide information that can be used for species identification (Bearder *et al.* 1995; Zimmermann 1995). Audio recordings of galago vocalizations and other nocturnal mammals and birds, preferably the loud advertisement calls, were obtained using a Zoom F3 Field Recorder with Sennheiser MKE600 shot-gun microphone and up to two Open Acoustic AudioMoths. The time and date of each recording is automatically saved on the audio file.

Camera trap surveys

Up to 10 Browning camera traps were installed around camps. These were set to take infrared-triggered videos of 10 seconds with a time lapse of 2 seconds. Various baits (including sardines, salt, bread, dog food, cat food, predator scent fluid) were used to attract mammals.

Figure 10. Aardvark *Orycteropus afer*, Turkana, northwestern Kenya.

RESULTS

Twelve of the 19 antelope species of northern Kenya were encountered during Phase Three (Table 5). The most frequently encountered species was Kirk's Dik-Dik, followed by Common Impala. The least common were Klipspringer and Greater Kudu.

Table 5. Minimum numbers of antelopes encountered during Phase Three of the 'Horn of Africa Antelope Survey'.

Species	**November-December 2025**	**February 2026**	**April-May 2026**	**June-July 2026**	**Total**
Kirk's Dik-Dik *Madoqua kirkii kirkii*				186	186
Common Impala *Aepyceros melampus melampus*	61 + 1 herd	>3 herds		4 herds	61 + 8 herds
Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii*	2	>20	24		>46
Southern Gerenuk *Litocranius walleri walleri*				40	40
Bright's Gazelle *Nanger notata*	12			9 + 4 herds	21 + 4 herds
Dik-Dik sp.? *Madoqua*	4		5		9
Common Duiker *Sylvicapra grimmia*	2		7		9
Southern Lesser Kudu *Tragelaphus imberbis australis*			1	6	7
Common Waterbuck *Kobus ellipsiprymnus ellipsiprymnus*				4 herds	4 herds
Defassa Waterbuck *Kobus ellipsiprymnus defassa*	herd	herd			2 herds
Masaai Bushbuck *Tragelaphus scriptus delamerei*		2			2
Klipspringer *Oreotragus oreotragus aureus*			2		2
Greater Kudu *Tragelaphus strepsiceros*	1				1
Total	**82 + 2 herds**	**22 + 4 herds**	**39**	**241 + 12 herds**	**384 + 18 herds**

A general description of each of the four surveys is given below. This is followed by an account of each antelope species encountered in order of most common to least common. We then, briefly, mention the antelope species not encountered and antelope conservation in northern Kenya. Finally, we present our conclusions. We end this report with notes on the non-antelope species encountered and present our next steps.

November–December 2025 Survey

The November-December survey (18 days) was conducted in northwestern Kenya, south and west of Lake Turkana along the Uganda and South Sudan border, including the Songot Mountains, Lotikipi Plains, southern extent of the Lapur Range, and southeastern extreme of the Elemi Triangle (survey route/camps depicted with purple in Figure 8).

February 2026 Survey

This short survey (4 days) was conducted within Mukutan Conservancy, extreme northwestern Laikipia Plateau (survey route/camps depicted with green in Figure 8).

April–May 2026 Survey

This survey (18 days) was conducted in northwestern Kenya, south and west of Lake Turkana along the Uganda border, including Puch Pasir, Loima Hills and Karasuk Hills (survey route/camps depicted with red in Figure 8).

June–July 2026 Survey

This survey (7 days) was conducted along the Ewaso N'jiro River west of Shaba National Reserve, within Biliqo Bulesa Conservancy, on the foothills of Merti Plateau, and within Meru National Park (survey route/camps depicted with orange in Figure 8).

Figure 11. White-crested Helmetshrike *Prionops plumatus.* Loima Hills, northwestern Kenya.

Madoqua* (*kirkii*) *kirkii (Günther, 1880) Least Concern

Abundance

At least 186 Kirk's Dik-Dik were encountered. All encounters were in central Kenya during the fourth survey of Phase Three (Figure 13). In addition, Kirk's Dik-Dik were captured on camera traps. Figure 13 shows the localities where individuals were confirmed during Phases One, Two and Three. Nine Dik-Dik were not identified to species-level and, therefore, are not included on this map. Up to four individuals were seen together, although 1 or 2 individuals were most commonly encountered.

Taxonomic note

The taxonomic arrangement of *Madoqua* is mainly based on pelage colouration and skull size, and remains under debate. Cotterill (2003), Brotherton (2013), and Kingdon (2013, 2015) recognize four species in the *Madoqua* (*kirkii*) Species Group: Kirk's Dik-Dik *Madoqua* (*k.*) *kirkii* (Günther, 1880); Damara Dik-Dik *M.* (*k.*) *damarensis* (Günther, 1880); Cavendish's Dik-Dik *M.* (*k.*) *cavendishi* Thomas, 1898; Thomas's Dik-Dik *M.* (*k.*) *thomasi* (Neumann, 1905). Groves and Grubb (2011) follow this taxonomy but, in addition, accept Hinde's Dik-Dik *M.* (*k.*) *hindei* Thomas, 1902. They do not recognize any subspecies. Here we follow the taxonomy of Groves (2011) and Groves and Grubb (2011), which was also applied by De Jong and Butynski (2017a). The taxonomic arrangement of *Madoqua* requires a thorough review. The observations and photographic material collected during this survey will be instrumental in that review.

Figure 12. Adult female Kirk's Dik-Dik *Madoqua* (*kirkii*) *kirkii,* Biliqo Bulesa Conservancy, central Kenya.

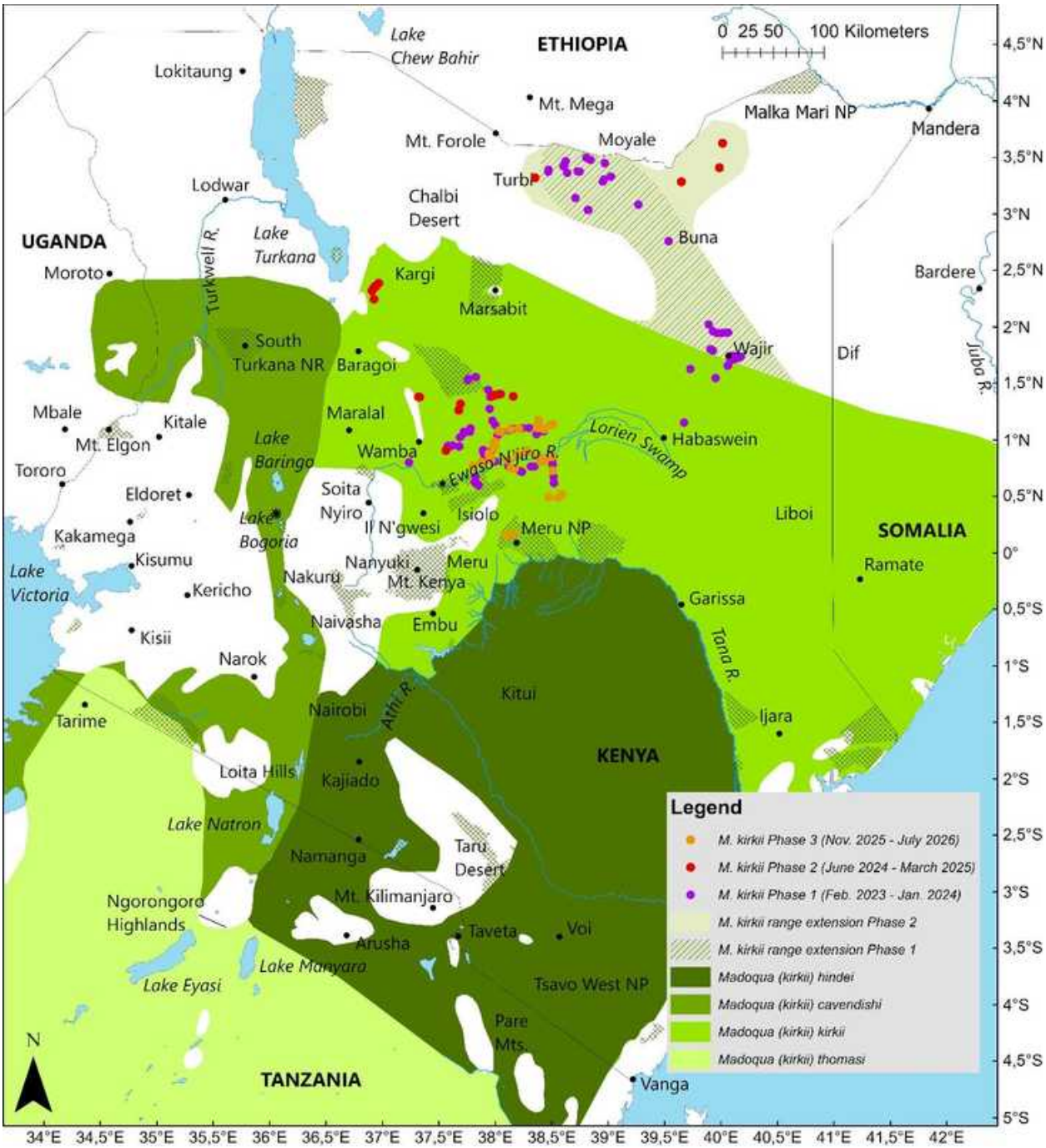

Figure 13. Encounters with Kirk's Dik-Dik *Madoqua kirkii* during Phase Three (orange), Phase One (purple) and Phase Two (red) of the 'Horn of Africa Antelope Survey'. Geographic range of *M. kirkii* from IUCN/SSC Antelope Specialist Group (2016d) and De Jong and Butynski (2017a).

Distribution

During Phase Three, Kirk's Dik-Dik were only encountered in central Kenya. Similar to Phase One, this species was encountered both north and south of the Ewaso N'jiro River. The elevation range of these encounters was 375–828 m asl. This is well within the known elevation range for

this species (0–2,000 m asl; IUCN/SSC Antelope Specialist Group 2016d).

Figure 14. Juvenile Kirk's Dik-Dik *Madoqua* (*kirkii*) *kirkii,* southwest of the Merti Plateau, north of the Ewaso N'jiro River, central Kenya.

Latrines

Territorial pairs of Kirk's Dik-Dik repeatedly defecate at the same locations, typically on bare ground along territory boundaries, at path intersections, in dry river beds, or near prominent vegetation. These latrines, typically situated on bare ground, play an important role in territorial communication. Latrine sites are used throughout the year and are revisited frequently, resulting in accumulations of many thousands of small, dark, oval pellet groups that may persist for months, if not years, in arid environments. Active latrines contain a mix of fresh, glossy pellets and older, dull, weathered pellets, indicating repeated use over extended periods. Latrines and preorbital gland marking behaviour provide information on territory occupancy, pair identity, and reproductive status, reducing the need for direct aggressive encounters between neighbouring pairs. During Phase Three, we encountered latrines as large as 7 m in diameter (Figure 15). From our experience, latrines maintained by Gunther's Dik-Dik are seldom greater than 2 m in diameter.

Because Kirk's Dik-Diks are highly territorial and maintain stable pair bonds, active latrines are reliable indicators of long-term territory occupancy.

Figure 15. Active Kirk's Dik-Dik *Madoqua* (*kirkii*) *kirkii* latrine, east of Barata, central Kenya.

Figure 16. Kirk's Dik-Dik *Madoqua* (*kirkii*) *kirkii*, Biliqo Bulesa Conservancy, central Kenya.

Common Impala *Aepyceros melampus melampus* (Lichtenstein, 1812) Least Concern

Abundance

At least 61 individuals and eight herds of Common Impala (Figure 18) were in 14 encounters during Phase Three.

Taxonomic note

Fitz and Bourgarel (2013) and IUCN/SSC Antelope Specialist Group (2016a) recognize two subspecies, Common Impala *A. m. melampus* and Black-Faced Impala *A. m. petersi* Bocage, 1879. Both taxa are given species status by Groves and Grubb (2011). Here we follow the taxonomic arrangement of Fitz and Bourgarel (2013) and IUCN/SSC Antelope Specialist Group (2016a).

Figure 17. Two adult male Common Impala *Aepyceros melampus melampus*, Meru National Park, central Kenya.

Distribution

During Phase Three, all encounters with Common Impala were in central Kenya. This is well within the known geographic range for this species (Figure 18; Fritz and Bourgarel 2013; IUCN/SSC Antelope Specialist Group 2017a).

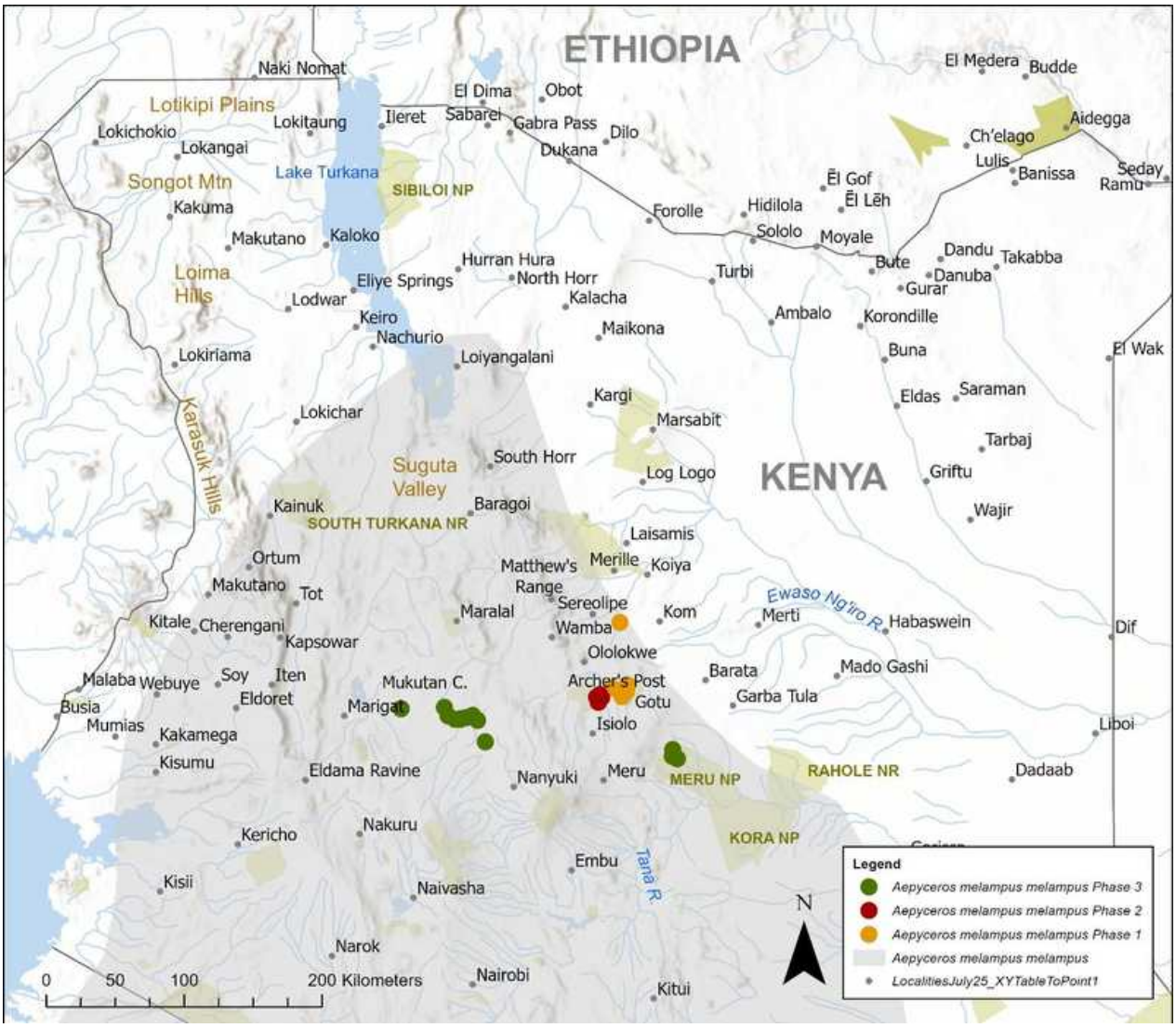

Figure 18. Encounters with Common Impala *Aepyceros melampus melampus* during Phase Three, Phase Two (red), and Phase One (orange) of the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2017a).

All encounters were between 680 m asl and 2,000 m asl (Mukutan Conservancy, central Kenya). Fritz and Bourgarel (2013) and IUCN/SSC Antelope Specialist Group (2017a) report the upper elevation limit of this species as 1,700 m asl. De Jong *et al.* (2015) found Common Impala at 2,200 m asl on Lolldaiga Hills Ranch, Laikipia, central Kenya.

Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii* (Thomas, 1901) Least Concern

Abundance

More than 43 Smith's Dik-Dik were seen or camera-trapped at eight localities during Phase Three. Figure 20 shows the localities where individuals were confirmed during Phases One, Two, and Three. Six Dik-Diks and three latrines were not identified to species level (Figure 20).

Taxonomic note

The taxonomic arrangement of the *Madoqua guentheri* Species Group is mainly based on pelage coloration and skull size, and remains under debate. Drake-Brockman (1930) provisionally recognized four subspecies: *guentheri* Thomas, 1894; *smithii* Thomas, 1901; *wroughtoni* (Drake-Brockman, 1909); *hodsoni* (Pocock, 1926). This taxonomy has been widely followed (Allen 1939; Ansell 1972; Yalden *et al*. 1984; Kingswood and Kumamoto 1996; Hoppe and Brotherton 2013; Kingdon 2015). Grubb (2005) and Groves (2011) recognize but two subspecies as they take *wroughtoni* and *hodsoni* to be synonyms of *guentheri.* Groves and Grubb (2011) and Groves (unpublished data, pers. comm.) found absolute differences among body and skull measurements of *guentheri* and *smithii.* On this basis, they treat them as species (with no subspecies). Here we follow the taxonomy of Groves and Grubb (2011). De Jong and Butynski (2017d) also applied this taxonomy but noted that the taxonomic arrangement of *Madoqua* requires a thorough review. The observations and photographs obtained during this survey will be useful for this review.

Figure 19. Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii* at Mukutan Conservancy, central Kenya.

Distribution

Smith's Dik-Dik were observed between 595 m asl and 2,000 m asl. This is within the known elevation range for this species group (0–2,100 m asl; IUCN/SSC Antelope Specialist Group 2016c; Figure 20). It is most likely that the unidentified Dik-Dik encountered west of Lake Turkana were Smith's Dik-Dik as they were far beyond the known range of Kirk's Dik-Dik.

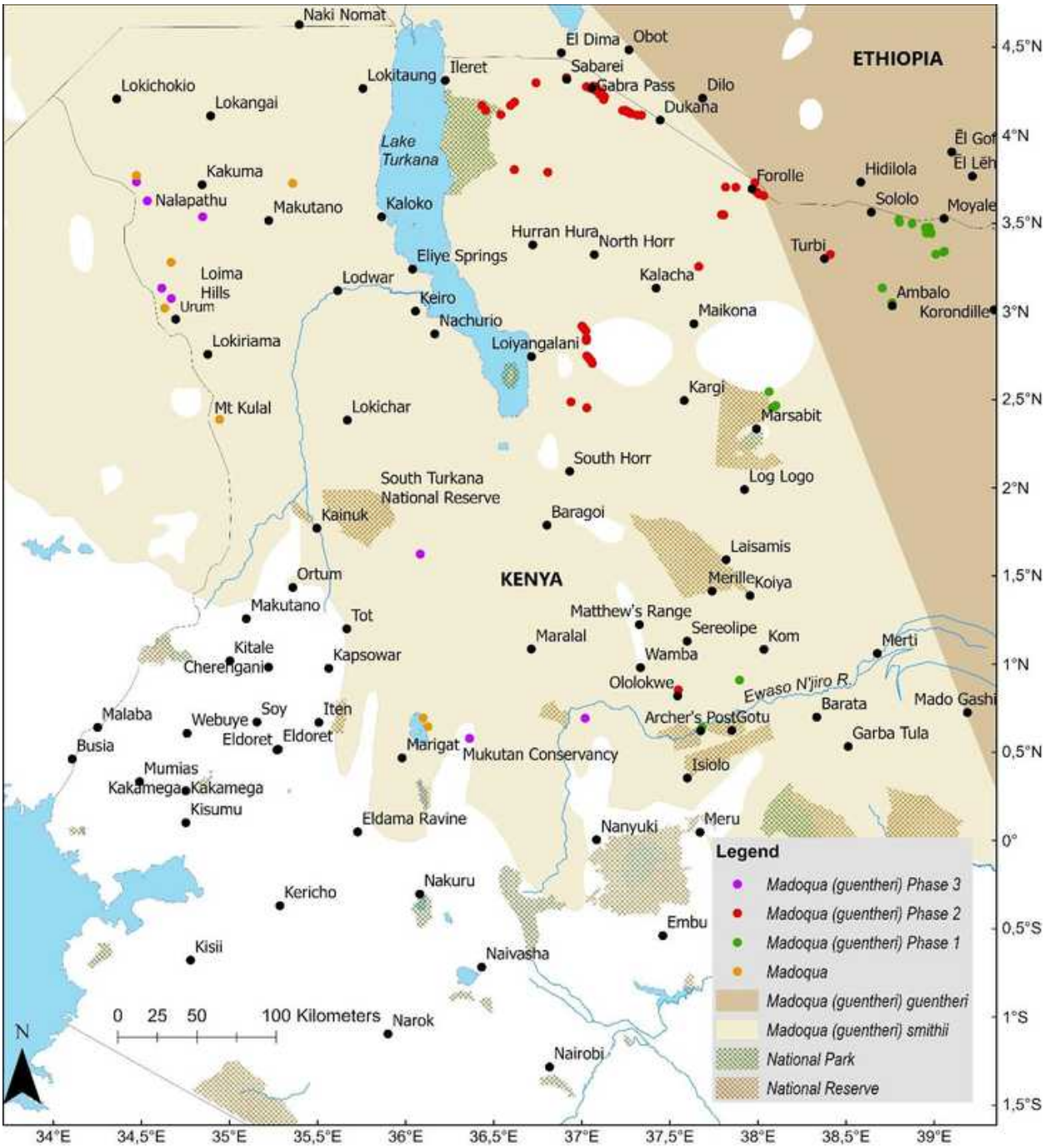

Figure 20. Encounters with Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii* during Phase Three (orange), Phase Two (red), and Phase One (green) of the 'Horn of Africa Antelope Survey'. Geographic ranges from IUCN/SSC Antelope Specialist Group (2016c), De Jong and Butynski (2017a), and Butynski and De Jong (2024, 2025b).

Flehmen behaviour by Smith's Dik-Dik

On the 30 April 2026, we observed, at about 100 m, a pair of Smith's Dik-Dik south of Nalapathu, Turkana County (Figures 21-27). The adult male slowly approached the adult female and inspected her at less than a meter. He slowly walked around the female while sniffing the air. His head and crest raised, nose elongated and raised, and the white caudal patch flared. The female remained nearly motionless with her elongated nose down during most of this encounter. After about 1 minute she fled. No genital licking was observed. The male appeared to exhibit flehmen during this encounter, a behaviour related to courtship. Flehmen occurs during the assessment phase of courtship before copulation. It is stereotyped chemosensory behaviour in which the male elevates his head, curls the upper lip, and partially opens his mouth following investigation of urine or genital secretions. This response facilitates the transfer of pheromonal and other chemical cues to the vomeronasal organ, enabling assessment of reproductive status and individual identity (Estes 2012). Flehmen has rarely been observed in Smith's Dik-Dik.

Figure 21. Probably flehmen by Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii*, Nalapathu, Turkana County. The adult male is the individual with the raised crest.

Figures 22 & 23. Probably flehmen by Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii*, Nalapathu, Turkana County. The adult male is the individual with the raised crest.

Figures 24 & 25. Probably flehmen by Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii*, Nalapathu, Turkana County. The adult male is the individual with the raised crest.

Figures 26 & 27. Probably flehmen by Smith's Dik-Dik *Madoqua* (*guentheri*) *smithii*, Nalapathu, Turkana County. The adult male is the individual with the raised crest.

Southern Gerenuk *Litocranius walleri walleri* (Brooke, 1879) Not Assessed

Abundance

At least 40 Southern Gerenuk (Figure 29) were seen during 24 encounters during Phase Three. Herds of up to four individuals were seen, but 1–2 individuals were most frequently encountered.

Figure 28. Adult female Southern Gerenuk *Litocranius walleri walleri* in acacia woodland, Biliqo Bulesa Conservancy, central Kenya.

Taxonomic note

We provisionally follow the taxonomic arrangement of Grubb (2002), Leuthold (2013a), and the IUCN/SSC Antelope Specialist Group (2016b) who accept two subspecies of *Litocranius walleri;* Southern Gerenuk *L. w. walleri* (Brooke, 1878) and Northern Gerenuk *L. w. sclateri* (Neumann, 1899). Both were given species status by Groves and Grubb (2011).

Figure 29 shows the localities where Southern Gerenuk were observed. This antelope was encountered between 372 m asl and 737 m asl. This is well within the known elevation range for this species (0–1,600 m asl; IUCN/SSC Antelope Specialist Group 2016b). All encounters were east of the Eastern Rift Valley and well within the known range for this species (IUCN/SSC Antelope Specialist Group 2016b).

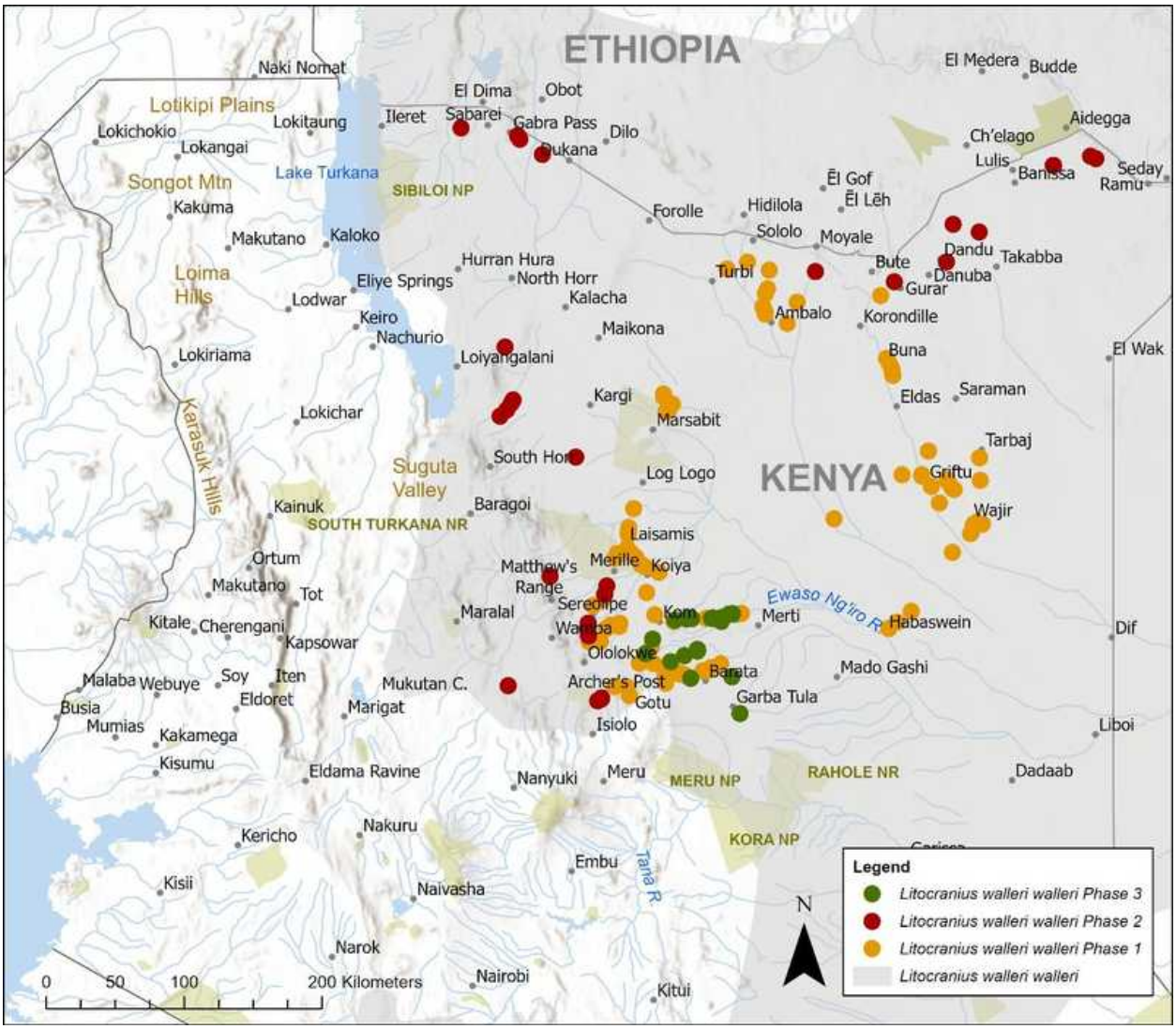

Figure 29. Encounters with Southern Gerenuk *Litocranius walleri walleri* during Phase Three (green), Phase Two (red), and Phase One (orange) of the 'Horn of Africa Antelope Survey'. Geographic range taken from IUCN/SSC Antelope Specialist Group (2016b).

Bright's Gazelle *Nanger notata* (Thomas, 1897) Least Concern

Abundance

At least 21 individuals and four herds of Bright's Gazelle (Figure 31) were seen in 12 encounters during Phase Three. Figure 31 depicts the localities where this species was confirmed. Herds consisted of up to four individuals, with the larger herds being in Meru National Park.

Taxonomic note

The taxonomic arrangement of the nanger gazelles is complex and under debate. Here we follow the taxonomic arrangement of Groves and Grubb (2011) and Siegismund *et al.* (2013) who treat *notata* as a species within the Grant's Gazelle Species Group *Nanger* (*granti*). The IUCN/SSC Antelope Specialist Group (2016f) treats *notata* as a subspecies of Grant's Gazelle *Nanger granti* (Brooke, 1872).

Figure 30. Three Bright's Gazelle *Nanger notata*, Lotikipi Plains, northwestern Kenya.

Distribution

Bright's Gazelle were uncommon but widespread. They were encountered on the Lotikipi Plains of extreme northwestern Kenya, east of Kainuk, in Lake Turkana National Reserve, and in central Kenya. All observations were well within the known range (Siegismund *et al.* 2013; IUCN/SSC Antelope Specialist Group 2016e) and within the elevation range of 392–1,917 m asl. This is within the reported elevation range for this species (0–2,000 m asl; IUCN/SSC Antelope Specialist Group 2016e).

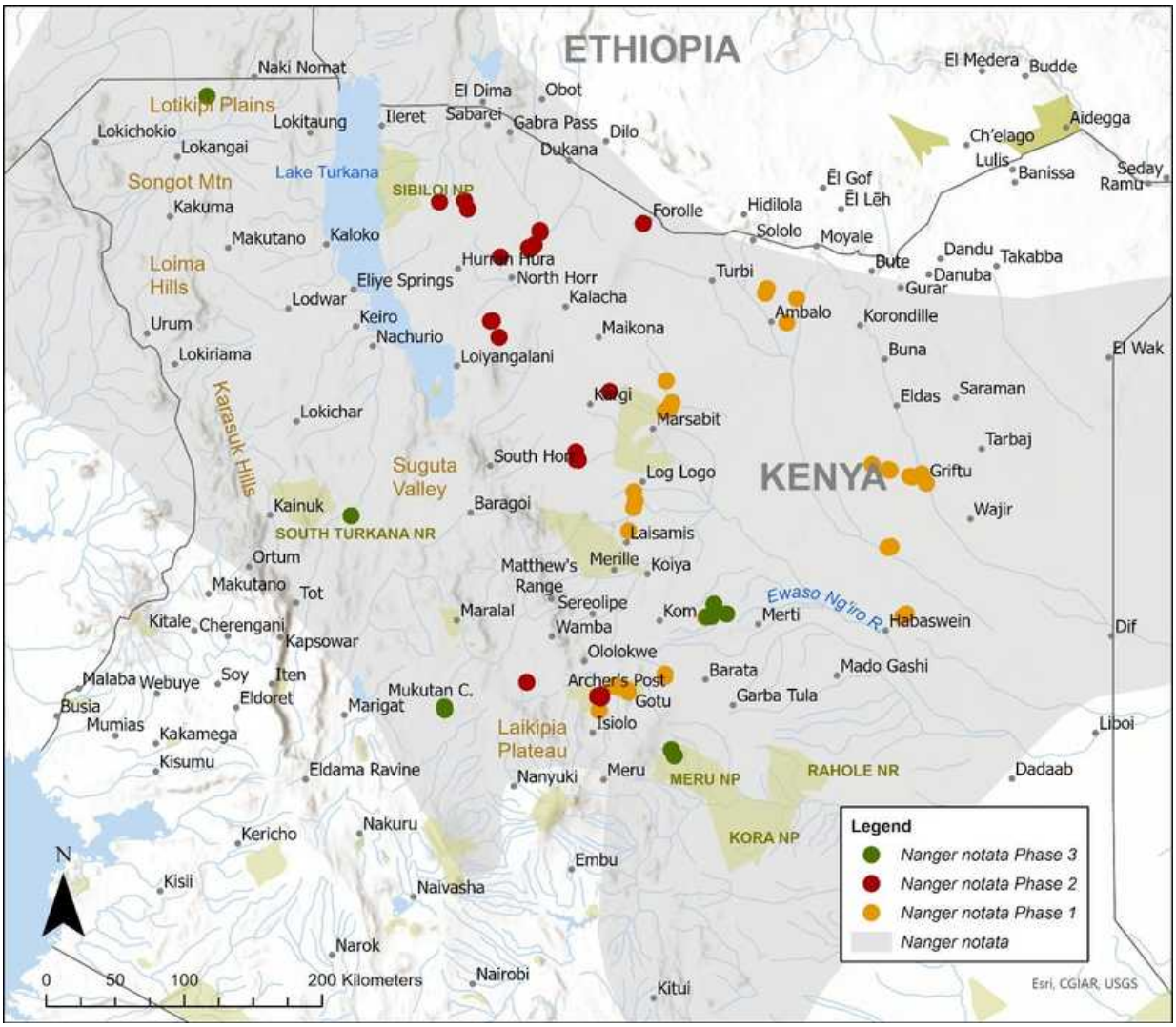

Figure 31. Encounters with Bright's Gazelle *Nanger notata* during Phase Three (green), Phase Two (red), and Phase One (orange) of the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2016e).

Figure 32. Adult male Bright's Gazelle *Nanger notata*, Merti, central Kenya

Uganda Crowned Duiker *Sylvicapra grimmia nyansae* (Neumann, 1905) Not Assessed

Abundance

At least nine Uganda Crowned Duiker (Figure 34) were observed during six encounters during Phase Three, including four individuals on camera traps. All encounters were in northwestern Kenya near the Uganda border. All were identified as Uganda Crowned Duiker *Sylvicapra grimmia nyansae* (Neumann, 1905). Up to two individuals were seen together.

Taxonomic note

Haltenorth (1963) recognized 19 subspecies of *S. grimmia*, some of which were accepted by Ansell (1972). Kingdon (1982a, 1997) placed no fewer than 30 described taxa in eight regional groups. Grubb and Groves (2001), Wilson (2001, 2013), and IUCN/SSC Antelope Specialist Group (2016g) recognized 14 subspecies. This taxonomic arrangement is followed here.

Distribution

During Phase Three, Uganda Crowned Duiker were encountered only in northwestern Kenya, near the border with Uganda. This antelope was encountered between 770 m asl and 1,587 m asl, which is well within the known range for this species (0–5,600 m asl; IUCN/SSC Antelope Specialist Group 2016j). No Duikers were encountered east of Lake Turkana during Phase One or Phase Two.

Figure 33. Adult female Uganda Crowned Duiker *Sylvicapra grimmia nyansae,* northwest of Urum, central western Turkana County.

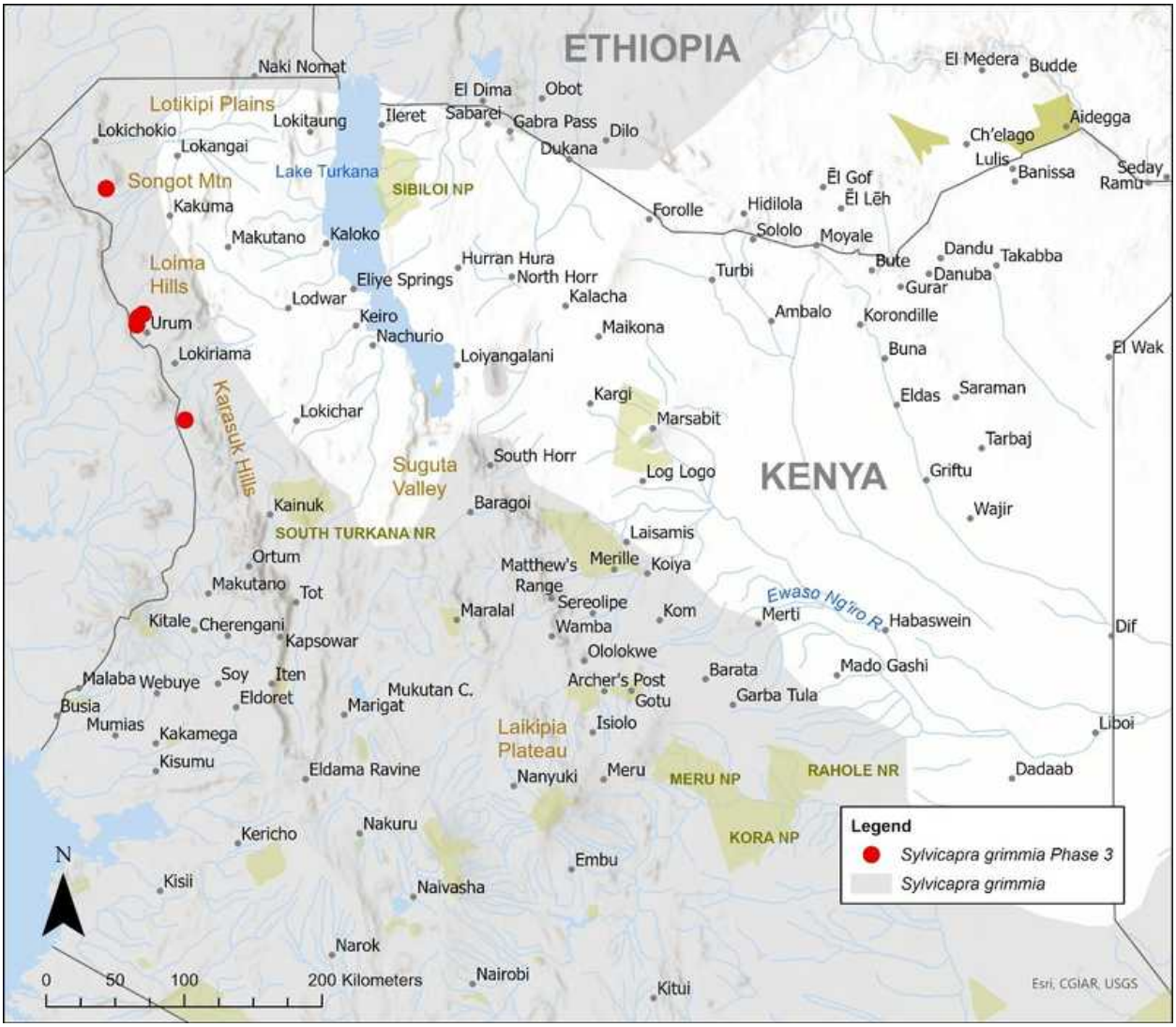

Figure 34. Encounters with Uganda Crowned Duiker *Sylvicapra grimmia nyansae* Phase Three (red) of the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2016i).

Figure 35. Adult female Uganda Crowned Duiker *Sylvicapra grimmia nyansae,* northwest of Urum, central western Turkana County.

Southern Lesser Kudu *Tragelaphus imberbis australis* (Heller, 1913) Not Assessed

Abundance

At least seven Southern Lesser Kudu (Figure 37) were seen during in three encounters during Phase Three. Up to three individuals were observed in herds near Merti and in Meru National Park. In Merti, the three individuals were captured on a camera trap.

Taxonomic note

Two subspecies of *Tragelaphus imberbis* are recognized by Leuthold (2013b) and none by the IUCN/SSC Antelope Specialist Group (2016h). *Tragelaphus i. australis* was given species status by Groves and Grubb (2011) as *Ammelaphus australis* Heller, 1913. Here we follow the taxonomy of Leuthold (2013b).

Figure 36. Subadult male Southern Lesser Kudu *Tragelaphus imberbis australis*, Meru National Park, central Kenya.

Distribution

Southern Lesser Kudu were encountered within the known geographic range (Figure 37; Leuthold 2013b; IUCN/SSC Antelope Specialist Group 2016i) between 387 m asl and 879 m asl. This is well within the known elevation range of this species (<1,740 m asl; IUCN/SSC Antelope Specialist Group 2016i).

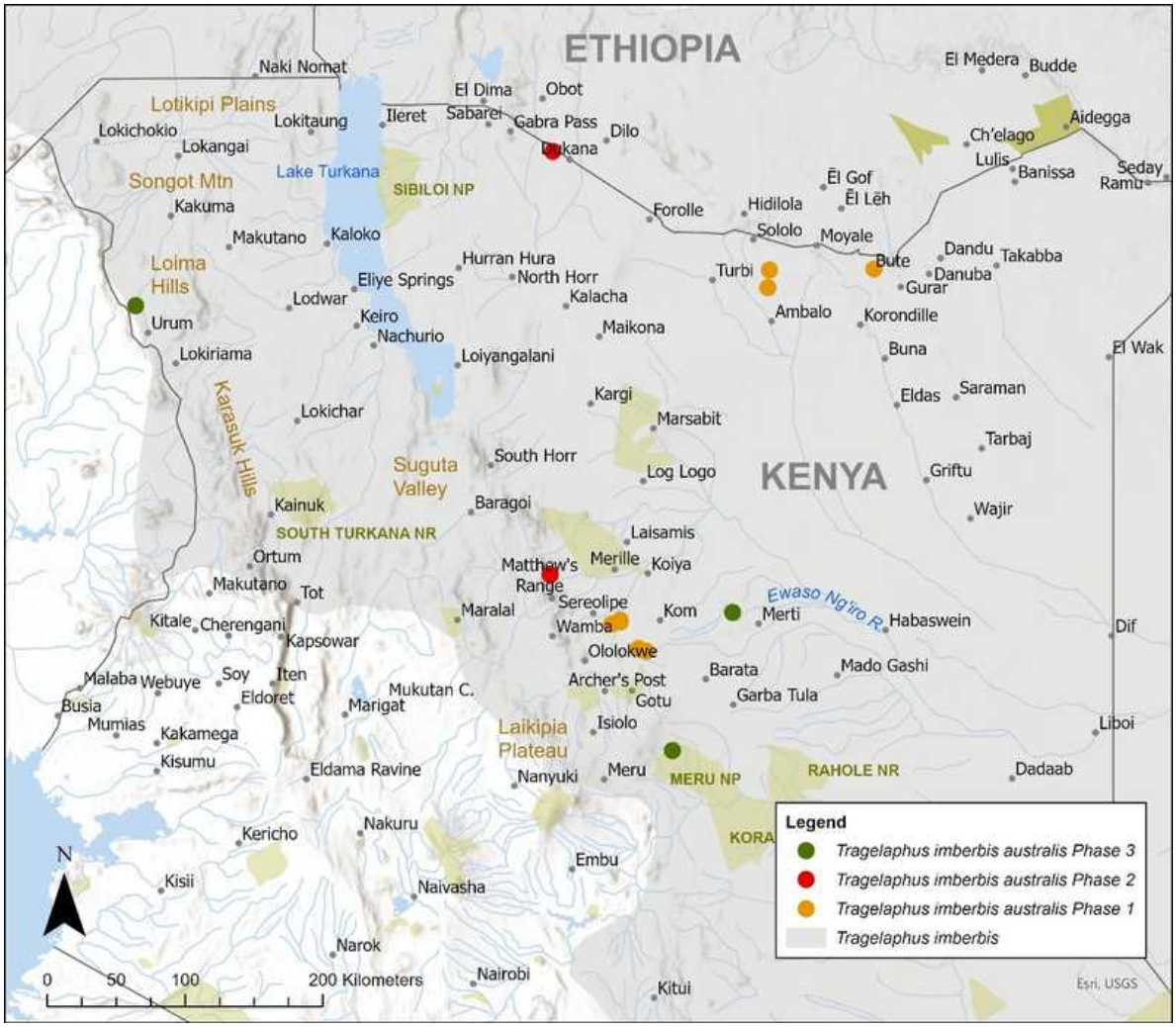

Figure 37. Encounters with Southern Lesser Kudu *Tragelaphus imberbis australis* during the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2016i).

Figure 38. Adult male Southern Lesser Kudu *Tragelaphus imberbis australis*, Merti, central Kenya. Screenshot from camera trap video.

Waterbuck *Kobus ellipsiprymnus* (Ogilby, 1833) Least Concern

Abundance

Four herds of Common Waterbuck (Figure 40) were encountered during Phase Three. All were in Meru National Park between 700 m asl and 750 m asl. Two herds of Defassa Waterbuck *Kobus ellipsiprymnus defassa* were encountered during Phase Three in Laikipia County (Figure 40) at 1699 m asl and 1986 m asl, which is typical for this subspecies (0–3,000 m asl; IUCN/SSC Antelope Specialist Group 2016a).

Figure 39. Adult female Common Waterbuck *Kobus ellipsiprymnus ellipsiprymnus*, Meru National Park, central Kenya.

Two subspecies of waterbuck occur in Kenya; Defassa Waterbuck *Kobus ellipsiprymnus defassa* (Rüppel, 1835) and Common Waterbuck *Kobus ellipsiprymnus ellipsiprymnus*. Their taxonomic arrangement is debated; some authors (*e.g.,* Lorenzen *et al*. 2006; Kingdon 1982a, 2015; Spinage 2013; IUCN/SSC Antelope Specialist Group 2016b) treat them as subspecies, while others (*e.g.,* Stewart and Stewart 1963, Groves and Grubb 2011) consider them species. Here we follow the taxonomic arrangement of Lorenzen *et al*. (2006), Kingdon (1982a, 2015), Spinage (2013), and IUCN/SSC Antelope Specialist Group (2016b).

Distribution

All records of Waterbuck obtained during Phase Three were well within the range of this species (IUCN/SSC Antelope Specialist Group 2016a). No individuals with intermediate phenotypic traits were encountered. Information about the clinal zone can be found at: https://www.wildsolutions.nl/waterbuck-kobus-ellipsiprymnus-laikipia-county).

The maps presented by Spinage (2013) and IUCN/SSC Antelope Specialist Group (2016a)(Figure 40) are incorrect in that they indicate that Common Waterbuck occur in the region between Archer's Post and Marsabit. Here, and over other large regions of the geographic distributions shown on their maps, the habitat is far from suitable for Common Waterbuck. The old map of Stewart and Stewart (1963) for the geographic distribution of Common Waterbuck appears to be much more accurate.

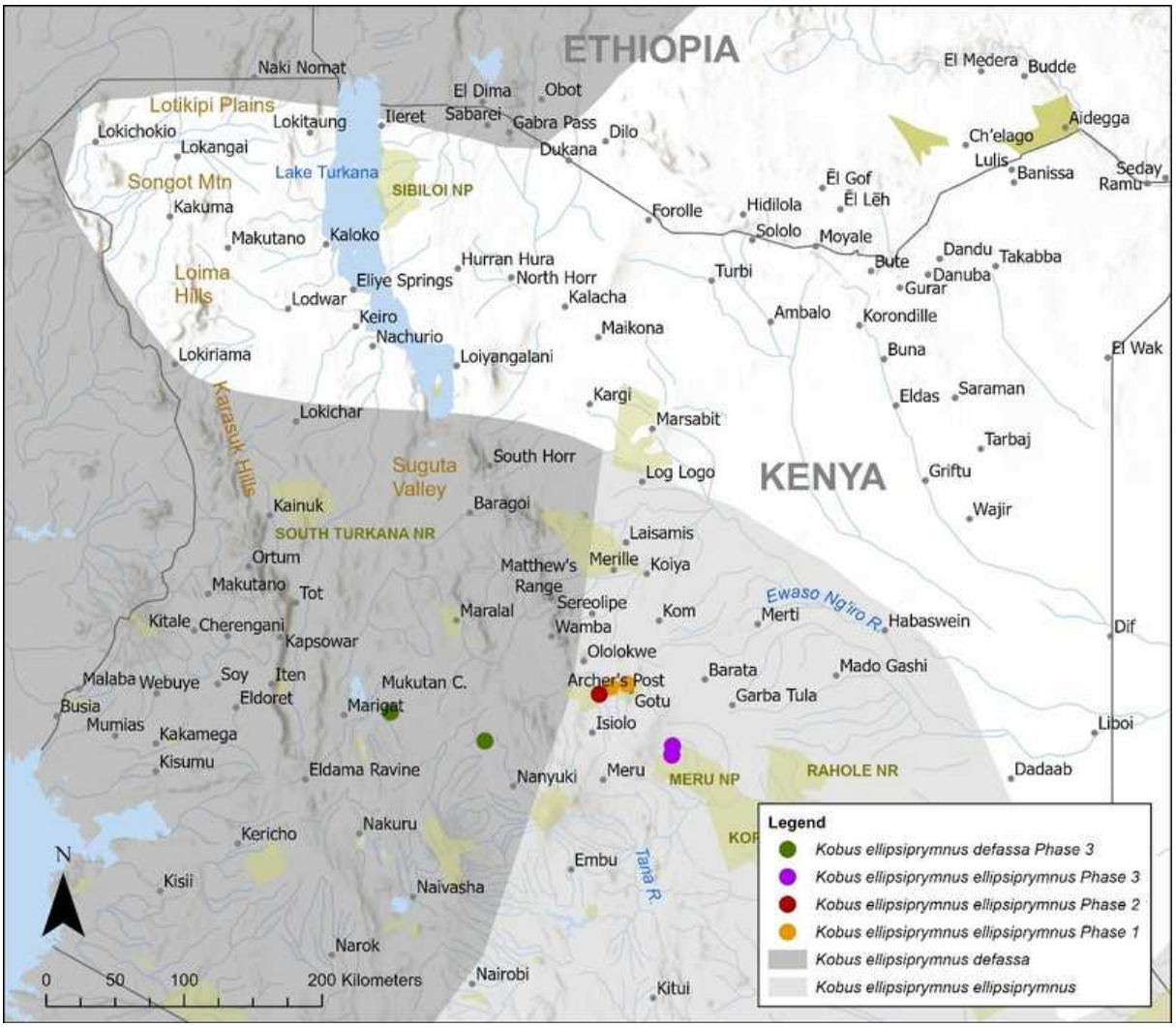

Figure 40. Encounters with Common Waterbuck *Kobus ellipsiprymnus ellipsiprymnus* during Phase Three (purple), Phase Two (red), and Phase One (orange), and with Defassa Waterbuck *Kobus ellipsiprymnus defassa* during Phase Three (green) of the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2016a).

Figure 41. Adult female Defassa Waterbuck *Kobus ellipsiprymnus defassa*, Mukutan Conservancy, western Laikipia, central Kenya.

Maasai Bushbuck *Tragelaphus scriptus delamerei* Pocock, 1900 Not Assessed

Abundance

Two Bushbuck were heard 'barking' during Phase Three, both at Mukutan Conservancy, western Laikipia, central Kenya. Phenotypically, these bushbuck should be Masaai Bushbuck *T. s. delamerei*, Pocock, 1900. Groves and Grubb (2011) treat *T. s. delamerei* as a synonym of *T. sylvaticus* (Sparrman, 1780).

Taxonomic note

Bushbuck have an extremely complex taxonomic history, mostly because phenotypes greatly vary throughout the big range. No fewer than 27 subspecies *were* recognized by Allen (1939). Groves and Grubb (2011) recognize eight species of bushbuck while the IUCN/SSC Antelope Specialist Group (2016j) recognizes but one. Here we follow Plumptre and Wronski (2013) and IUCN/SSC Antelope Specialist Group (2016j) who recognize 11 subspecies of bushbuck.

Distribution

The two Maasai Bushbuck heard during Phase Three were in Mukutan Conservancy, western Laikipia, central Kenya (Figure 43). One was heard at 1808 m asl in central Mukutan Conservancy and one in the forested southern extent of the Conservancy at 1979 m asl. The known elevation range for this species is 0–4,000 m asl (IUCN/SSC Antelope Specialist Group 2016k). None were seen or heard west of Laikipia during this survey. In October 2021 we encountered an adult male in the Karasuk Hills, northwestern Kenya (Figure 43).

Figure 42. Adult male Maasai Bushbuck *Tragelaphus scriptus delamerei,* Karasuk Hills, northwestern Kenya October 2021.

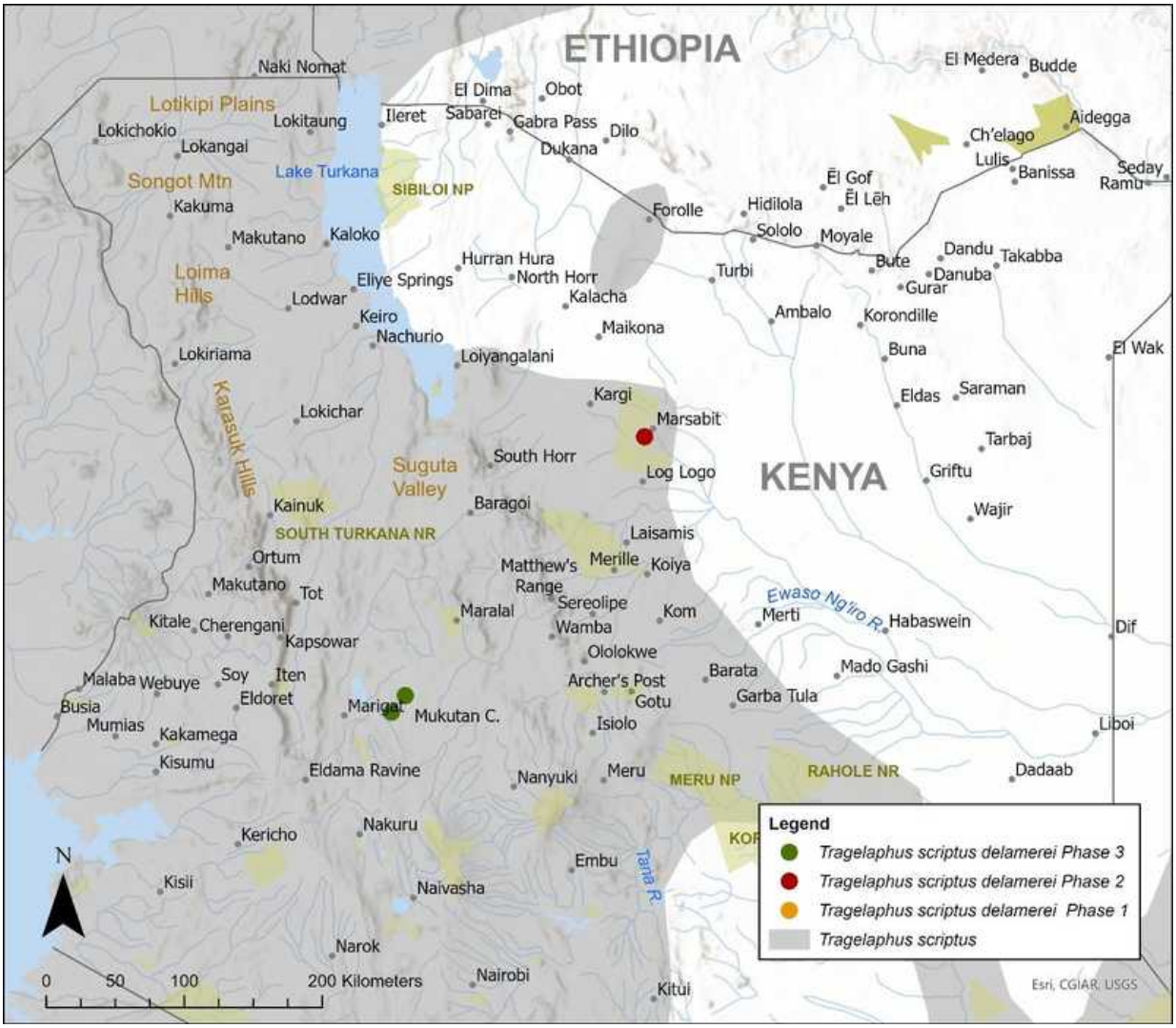

Figure 43. Encounters with Maasai Bushbuck *Tragelaphus scriptus delamerei* during Phase Three (green), Phase Two (red), and Phase One (orange) of the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2016k).

Golden Klipspringer *Oreotragus oreotragus aureus* (Heller, 1913) Not Assessed

Abundance

A pair of Golden Klipspringers *Oreotragus oreotragus aureus* (Figure 45) were observed during Phase Three. This species was not encountered during Phase One or Two of the 'Horn of Africa Antelope Survey'.

Taxonomic note

Ansell (1972), Roberts (2013), and IUCN/SSC Antelope Specialist Group (2016x) recognize 11 subspecies of *Oreotragus oreotragus.* That taxonomy is followed here. The Golden Klipspringer is given species status by Groves and Grubb (2011).

Figure 44. Klipspringer *Oreotragus oreotragus*, Lolldaiga Hills Ranch, central Kenya.

Distribution

During Phase Three, one pair of Golden Klipspringers was observed in northwestern Kenya at about 400 m (no photograph) on Murua Ngithigerr, the western foothills of Loima Hills at 1,355 m asl. This is well within this species' known geographic and elevation ranges (up to 4,380 m asl; Roberts 2013; IUCN/SSC Antelope Specialist Group 2016f).

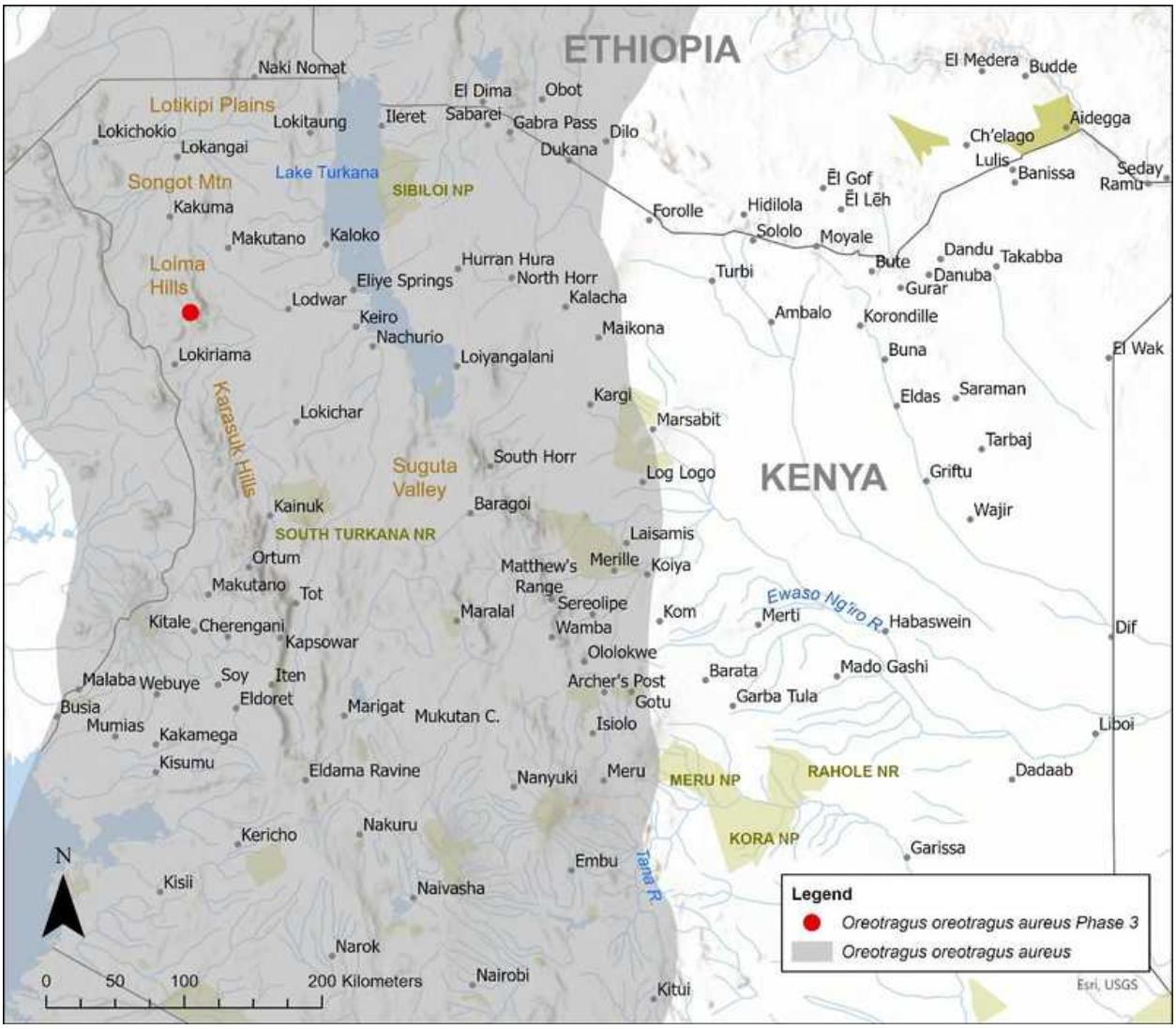

Figure 45. Encounter with Golden Klipspringers *Oreotragus oreotragus aureus* during Phase Three (red) of the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2016f).

Greater Kudu *Tragelaphus strepsiceros* (Pallas, 1766) Least Concern

Abundance

One Greater Kudu (Figure 47) was encountered during Phase Three.

Taxonomic note

Three subspecies of *Tragelaphus strepsiceros* are recognized by Kingdon (1997), but none by Owen-Smith (2013) and IUCN/SSC Antelope Specialist Group (2020). Groves and Grubb (2011) recognize four species. Here we follow the taxonomic arrangement of Owen-Smith (2013) and IUCN/SSC Antelope Specialist Group (2020).

Distribution

The one individual observed was on the Laikipia Plateau, central Kenya, at 1,699 m asl (Figure 47). This is well within the known geographic and elevation ranges of this species (0–2,400 m asl; Owen-Smith 2013; IUCN/SSC Antelope Specialist Group 2020).

Figure 46. Adult male Greater Kudu *Tragelaphus strepsiceros*, Laikipia, central Kenya.

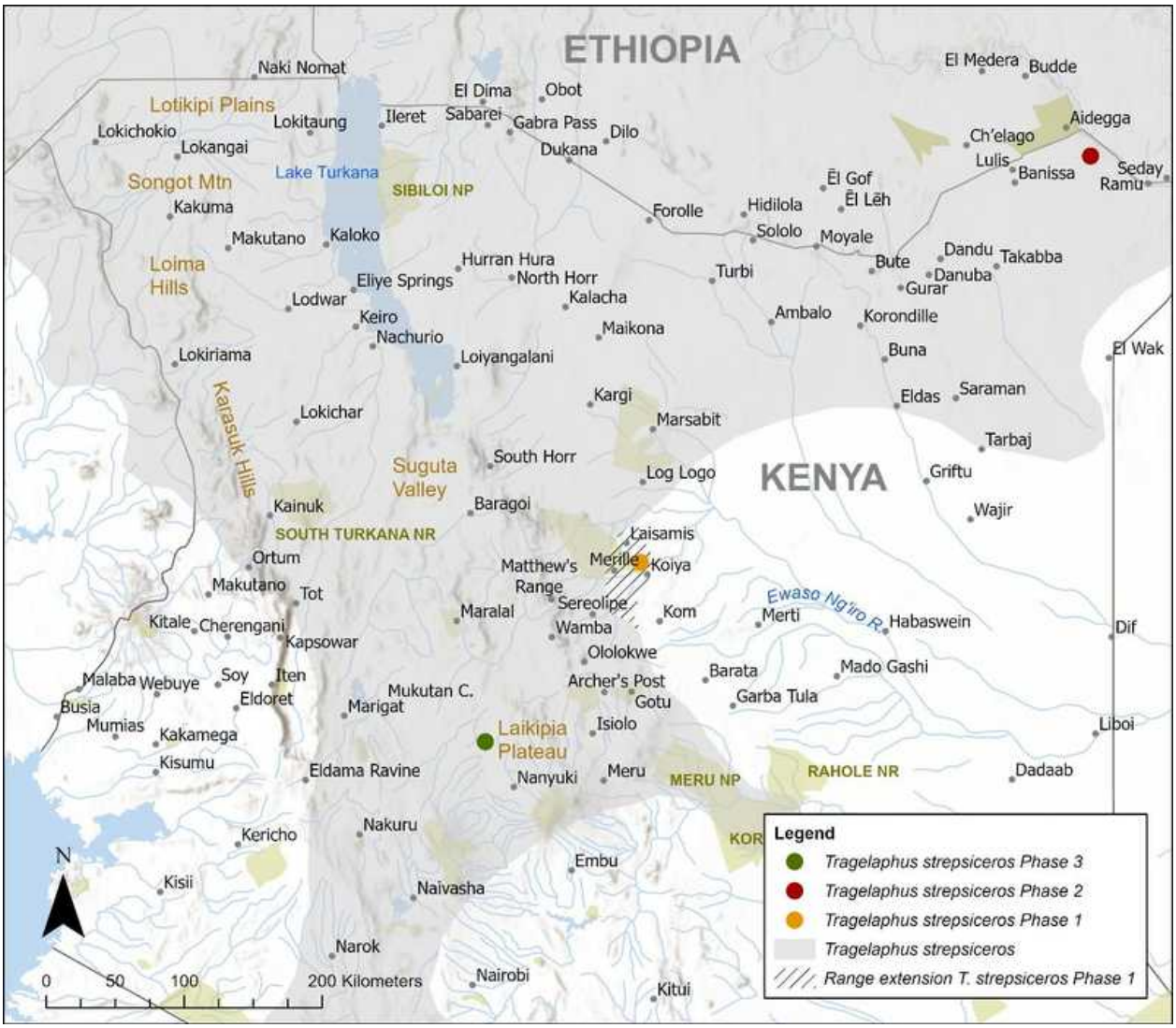

Figure 47. Encounters with Greater Kudu *Tragelaphus strepsiceros* during Phase Three (green), Phase Two (red), and Phase One (orange) of the 'Horn of Africa Antelope Survey'. Geographic range from IUCN/SSC Antelope Specialist Group (2020).

Antelope species not encountered

Of the 12 antelope species encountered during Phase Three, five species were in the region west of Lake Turkana and Suguta Valley (*i.e.,* west of the Eastern Rift Valley), north of Kainuk, east of the Uganda border, and south of the Elemi Triangle (here referred to as northwestern Kenya): Smith's Dik-Dik, Bright's Gazelle, Common Duiker, Lesser Kudu, and Golden Klipspringer.

Figure 48. Adult female Kirk's Dik-Dik *Madoqua* (*kirkii*) *kirkii,* Merti, north of the Ewaso N'jiro River, central Kenya.

We found no evidence for the following species which are expected to be present in northwestern Kenya, albeit marginally or locally:

- Cavendish's Dik-dik *Madoqua* (*kirkii*) *cavendishi*: This antelope is expected to occur northwards to about Lokichar (N 2.4°) where it is mapped as sympatric with Smith's Dik-Dik (Figure 20; De Jong and Butynski 2017a). No evidence of Cavendish's Dik-dik was obtained during Phase Three nor any of our surveys since 2001. We found no records of this species on iNaturalist.org to confirm presence in northwestern Kenya.
- Common Impala. Based on IUCN/SSC Antelope Specialist Group (2017a), this species occurs in southern northwestern Kenya, reaching the southern end of western Lake Turkana (Figure 18). No evidence of this species was obtained during Phase Three or any of our surveys since 2001. We found no records of Common Impala on iNaturalist.org for northwestern Kenya.
- Southern Gerenuk. Based on IUCN/SSC Antelope Specialist Group (2016b), this species occurs in extreme southern northwestern Kenya, reaching the eastern escarpment and Eastern Rift Valley floor in Suguta Valley, south of Lake Turkana (Rift Valley Conservation

pers. comm. 2026). No evidence of Southern Gerenuk was obtained for northwestern Kenya during Phase Three nor any of our surveys since 2001. We found no records of Southern gerenuk on iNaturalist.org for northwestern Kenya.

- Defassa Waterbuck (Figure 49). Based on IUCN/SSC Antelope Specialist Group (2017c), Defassa Waterbuck is only marginally present in northwestern Kenya (Figure 40). Although this subspecies was encountered during Phase Three, no evidence was obtained for northwestern Kenya nor on any of our other surveys since 2001. This antelope occurs in Kidepo Valley National Park (Y. de Jong and T. Butynski unpubl. data). It is, therefore, perhaps in northern Turkana County where there is perennial water (Lokichokio, Lotikipi Plains).
- Bushbuck. Based on IUCN/SSC Antelope Specialist Group (2016k), Bushbuck occur throughout northwestern Kenya (Figure x). Although this species was encountered during Phase Three (Mukutan Conservancy), no evidence was obtained for northwestern Kenya. During a survey in 2021, an adult male Bushbuck was photographed in the Karasuk Hills at 2,354 m asl (Figure 43; https://www.inaturalist.org/observations/100613615; Y. de Jong and T. Butynski unpubl. data). In addition, this species occurs in the Loima Hills (Baker 2002; I. Craig pers. comm. 2026).
- Greater Kudu. Based on IUCN/SSC Antelope Specialist Group (2020), Greater Kudu occur throughout northwestern Kenya (Figure 47). Although this species was encountered during Phase Three (Figure 47, Laikipia Plateau), no evidence was obtained for northwestern Kenya. To the best of our knowledge, the nearest validated site for this species is the eastern escarpment of the Suguta Valley, south of Lake Turkana. Here we photographed an adult female in 2022 (https://www.inaturalist.org/observations/143342749; Y. de Jong and T. Butynski unpubl. data). There are no records of Greater Kudu for northwestern Kenya on iNaturalist.org.

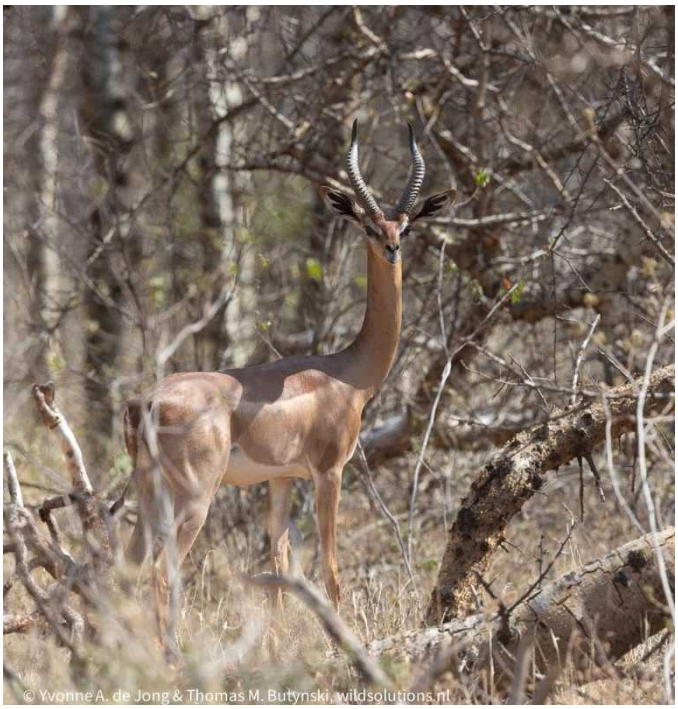

Figure 49. Adult male Southern Gerenuk *Litocranius walleri walleri*, Merti, central Kenya.

ANTELOPE CONSERVATION IN NORTHWESTERN KENYA

Of the 19 antelope species historically present in northern Kenya, 16 occur in northwestern Kenya (west of the Eastern Rift Valley, north of Kainuk, east of the Uganda border, and south of the Elemi Triangle), some only marginally. During Phase One, Two, and Three, antelope species were nowhere common in northern Kenya outside of protected areas (Butynski & De Jong 2024, 2025b). As in Phase One and Phase Two, the most common antelope species encountered during Phase Three were water-independent species (*i.e.,* Smith's Dik-Dik, Bright's Gazelle, Southern Gerenuk, Kirk's Dik-Dik). Only the following five water-independent antelope species were recorded in northwestern Kenya during Phase Three: Smith's Dik-Dik, Bright's Gazelle, Common Duiker, Lesser Kudu, Golden Klipspringer. All five species occur at very low densities. Smith's Dik-Dik appears to be the most common of the five. We suspect that additional species persist present in northwestern Kenya, albeit isolated and rare.

The paucity of antelope records from northwestern Kenya likely reflects a combination of ecological constraints and sampling bias. This region is predominantly a semi-arid with limited permanent water, strong seasonality, and fragmented suitable habitat---conditions that naturally restrict antelope abundance and distribution. These patterns are compounded by anthropogenic pressures, including livestock grazing, habitat degradation, loss and fragmentation, and poaching. Competition with livestock (cattle, camels, donkeys, sheep, goats) for food and water is a big problem. Northwestern Kenya lacks protected areas in the center and north. Logistical constraints associated with the region's remoteness and insecurity limits human access to large sections. In addition, poaching has long been a common practice in northwestern Kenya---and continues.

Figure 50. Livestock on the semi-arid plains of Turkana County, northwestern Kenya.

Northwestern Kenya is one of the most sparsely populated regions of Kenya. Turkana County has a population density of about 12.5 people km², West Pokot County about 55.9 people km², compared to a national average of approximately 82 people km² (KNBS 2019). Despite these relatively low human population densities, there are high livestock densities across much of this landscape. Consequently, competition between wildlife and livestock for forage and water is considered an important determinant of wildlife persistence in northwestern Kenya.

Man-made perennial water sources in the form of dams (Figure 51) are sparsely scattered across this region providing water to people and livestock during all or most of the year. Some of these dams are poorly maintained and unlikely to persist and, apparently, theft of infrastructure such as pumps and fences is another constraint. These water sources are often inaccessible to wildlife due to the full-time presence of people, livestock, and dogs, particularly during the dry-season and droughts. Large herds of livestock move as far as 10 km from these perennial water sources, negatively impacting the vegetation and the availability of grass and browse for wildlife. As much of northwestern Kenya is more than 10 km from sources of perennial water, the negative impact of people and livestock on the habitats and wildlife over large areas is probably not significant. As such, these areas are expected to continue to provide the food that water-independent antelopes and other indigenous water-independent species require.

Figure 51. Dam at the western foothills of Lapur Range, just south of the Elemi Triangle, northwestern Kenya.

In the semi-arid regions of northwestern Kenya, several invasive plant species have expanded widely on riverbanks and degraded sites, especially in those areas most heavily used by people and livestock. In particular, Mesquite and False Umbrella Thorn are widespread, often forming impenetrable thickets and woodlands. Although native, False Umbrella Thorn acts as an invader that alters bush–grass balance. This woody invasive reduce grass productivity and contributes greatly to declines in native plant diversity. As this species has little forage value to livestock, it is being cleared in some parts of Kenya. This, however, is a slow and expensive undertaking (NRT 2020).

Mesquite is a thorny, drought-adapted leguminous trees and shrubs native to the Americas, especially arid and semi-arid regions. It occupies dry riverbeds, floodplains, and open bushlands. This plant was introduced to Kenya in the early 1948 for fuelwood, fodder, honey, and desertification control (Van Klinken *et al*. 2009). In Kenya, Mesquite forms dense thickets and woodlands, alters vegetation structure, and competes strongly with native grasses and shrubs (Figure 52). Mesquite stands displace native vegetation, reduce forage biomass and species richness, and impedes access to grazing areas and water points. While its negative impacts on pastoral livelihoods and rangeland resilience cannot be over-stated, it provide construction materials, some animal feed, charcoal, shade, and fuelwood (Eshetu 2024). In addition, Mesquite reduces dust pollution, enhances carbon sequestration, and has medicinal value (antifungal and antibacterial; Eshetu 2024). Notwithstanding some positive traits, Mesquite is listed among the 100 'Global' worst invasive plant species' (Kamiri *et al*. 2024).

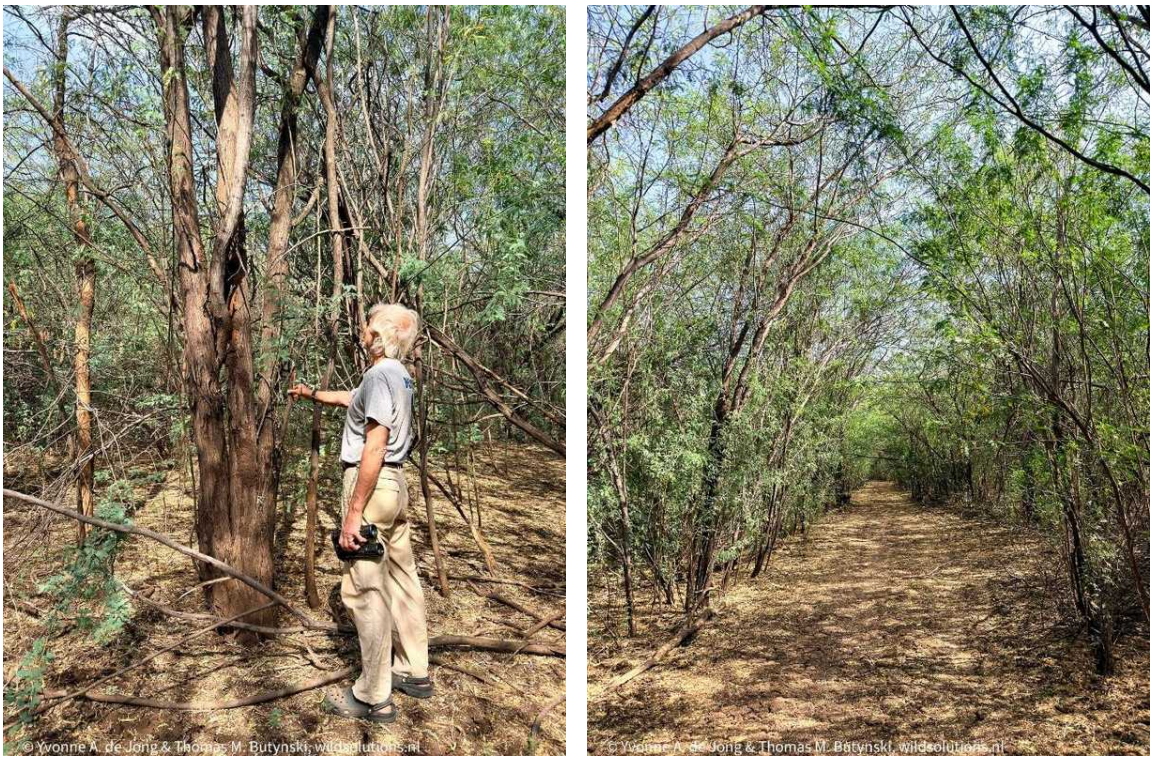

Figure 52. Mesquite *Neltuma juliflora* forest on the Lotikipi Plains, northwestern Kenya.

During Phase Three we observed extensive areas invaded by Mesquite. Large parts of northwestern Kenya (*e.g.,* Lotikipi Plains and lands west of Kakuma) are dominated by dense monotypic Mesquite bushland and forest. In fact, in Kenya, Turkana County is currently, together with Tana River, Isiolo and Baringo Counties, among the counties most affected by Mesquite with a total invaded area between 7000 km² and 12,000 km² (Eckert *et al.* 2025). Around three-quarters of Kenya is at risk of being invaded (Eckert *et al.* 2025).

Mesquite probably provides some food and shade to browsing antelope species (*e.g.*, Impala, Dik-Dik, Bright's Gazelle, Lesser Kudu, Gerenuk), particularly during droughts. This, however, does not mean that, in balance these species benefit from the presence of Mesquite. Invaded habitats are unlikely to support the same antelope diversity or abundance as intact native habitats do.

Smith's Dik-Dik is the most common antelope in northwestern Kenya, the only species of *Madoqua* present in the region. Survey four of Phase Three found Kirk's Dik-Dik to be the most common antelope in central Kenya. This is also what we found during Phase One and Phase Two (Butynski and De Jong 2024, 2025b). Both species of Dik-Dik are relatively adaptable to human-caused habitat changes. Indeed, to a certain extent, agriculture might favor them in some areas (*e.g.*, presence of food crops, more open ground, absence of large predators).

The 'Near Threatened' Southern Lesser Kudu was present in dense bushland west of the Loima Hills, near Uganda's Matheniko Game Reserve. This species is expected to occur over much of northwestern Kenya at low densities. Their numbers are reported to be in decline due to poaching, competition with livestock (particularly camels), habitat degradation and loss, agricultural expansion (in West-Pokot), and rinderpest (IUCN/SSC Antelope Specialist Group 2016i). Southern Lesser Kudu are solitary or in small herds and typically difficult to locate. As a result, it is likely that a good number of individuals along our survey routes went undetected.

Seven Uganda Crowned Duikers were observed in five encounters in northwestern Kenya during Phase Three, making this the second most encountered antelope species in the region. Although this species is typically a savanna-woodland species, it is capable of occupying a wide range of habitats, including relatively open country, woodland, dense scrubland, riverine thickets, and bushland mosaics (Wilson 2013). Although some antelope species in northwestern Kenya are declining because of the loss of open grasslands, competition with livestock, poaching, and reduced access to water, Uganda Crowned Duikers might not be much impacted by these pressures as they are primarily browsers, water-independent, habitat adaptable, relatively secretive, primarily nocturnal and solitary. It may be that the expansion of invasive woody vegetation, such as Mesquite and False Umbrella Thorn, might be somewhat beneficial to this duiker as it likely provides some shelter, browse, protection from poachers and predators, and sites that people tend to avoid. This is a subject for research.

Bright's Gazelle were recorded on two occasions (herd of three on the Lotikipi Plains and two individuals between South Turkana National Reserve and Suguta Valley). This water-independent species is almost certainly threatened by the invasion of Mesquite and, more generally, by woody

encroachment, including dense stands of False Umbrella Thorn. Additional threats to this species include increasing competition with livestock for food and poaching.

The 'Near Threatened' Southern Lesser Kudu was found in dense bushland west of the Loima Hills, near Uganda's Matheniko Game Reserve. This antelope probably occurs at low densities throughout northwestern Kenya. Numbers are reported to be in decline due to poaching, competition with livestock (particularly camels), habitat degradation and loss due to agricultural expansion (in West-Pokot), and rinderpest (IUCN/SSC Antelope Specialist Group 2016h). Southern Lesser Kudu are solitary or in small herds and are often difficult to locate. As a result, it is likely that a good number of individuals along our survey routes went undetected.

Most of northwestern Kenya has been historically unsuitable for the water-dependent Common Impala. During the Horn of Antelope Survey, this species has only been encountered in central Kenya, the most western record obtained from Mukutan Conservancy (survey three of Phase Three) where water is available year-round throughout this conservancy. The Leleshwa *Tarchonanthus camphoratus* bushland in Mukutan Conservancy is part of a heterogeneous dryland matrix important for antelope conservation as it provides browse, shelter, and landscape connectivity. Management of this, sometimes dense, bushland should aim to maintain a balance between woody cover and grassland since excessive bush reduces grass availability, restricts movement, for grazing and mixed-feeding antelopes. This conservancy is restoring parts of its landscape by clearing bushland to increase mixed-feeders, including Common Impala, Bright's Gazelle, and Defassa Waterbuck (all confirmed during survey) and, to a lesser extent, Common Duiker and Common Eland. Maasai Bushbuck and Smith's Dik-Dik, both predominantly browsers, are also present on Mukutan Conservancy.

Figure 53. Arid plains of the southern Elemi Triangle.

Defassa Waterbuck were not encountered in northwestern Kenya. This subspecies is reported to only occur on the fringes of the study area. Waterbuck are highly water-dependent. Due to habitat loss, competition with livestock over water and grassland, and the invasion of woody vegetation, particularly in moist areas, it is likely that this species has been extirpated from northwestern Kenya. Waterbuck are susceptible to poaching due to their sedentary nature (close to water) and attraction to cultivation (Spinage 2013). Although edible, they are generally not a preferred bushmeat species. This species remains in Kidepo Valley National Park, northeast Uganda, which might act as a source of individuals to northwestern Kenya.

Maasai Bushbuck were not encountered in northwestern Kenya. This water-dependent browser is less tolerant of arid conditions than species such as Dik-Dik or Lesser Kudu. The cryptic pelage and behaviour, and the fact that it is predominantly solitary and lives in dense woody cover makes this antelope difficult to detect. Bushbuck might benefit to some extent from the expansion of invasive woody vegetation in some parts of northwestern Kenya. However, dense stands of Mesquite can simplify plant communities and replace native vegetation by reducing the diversity of preferred browse species. In response to increasing human-impacts (*e.g.,* over-grazing by livestock, frequent bush fires, poaching), Bushbuck are reported to be replaced by smaller antelope species such as Common Duiker (Kumanenge 1980 in Plumtre and Wronski 2013).

A pair of Golden Klipspringers were observed on a rocky outcrop on Murua Ngithigerr, the western slopes of the Loima Hills. The IUCN/SSC Antelope Specialist Group (2016f) distribution map shows Golden Klipspringers throughout northwestern Kenya. This small antelope is, however, highly dependent on rocky mountainous terrain. As such, most of northwestern Kenya is unsuitable for this species. Golden Klipspringer are one of the more secure antelopes of northwestern Kenya. It is likely that isolated populations persist on the several large, isolated, arid mountains of northwestern Kenya (*e.g.*, Lapur Range, Karasuk Hills, Loima Hills, Loriu Plateau, Murua Ngithigerr). This water-independent browser is able to occupy areas inaccessible by people and is, therefore, not seriously threatened by agriculture, livestock, or people. Klipspringers are probably not a primary target of poachers. Based on the above, Golden Klipspringers are likely among the least threatened species of antelope in northwestern Kenya.

The 'Least Concern' Greater Kudu is historically only patchily distributed and naturally uncommon across its range in northwestern Kenya (Figure 47; Stewart and Stewart 1963; IUCN/SSC Antelope Specialist Group 2020). Despite being largely water-independent, this species becomes water-dependent when the vegetation is dry (Owen-Smith 2013). Greater Kudu occur in small herds in well-developed woodland, dense bushland, and rocky hill country, and are often difficult to detect. It is likely that some individuals along our survey routes went undetected. This species is primarily threatened by poaching, degradation, loss, and fragmentation of woodland, competition with browsing livestock, and prolonged drought. Although well adapted to semi-arid environments, its dependence on extensive woodland makes it vulnerable to charcoal production, fuelwood harvesting, and agriculture.

Common Eland are historically present on the Lotikipi Plains of northwestern Kenya where it is naturally rare and almost certainly declining---if not absent. This browser moves great distances and is able to go without drinking water for long periods (Thouless 2013). The principal threats include poaching, competition with livestock, prolonged drought, and habitat degradation, loss, and fragmentation as a result of human activities. Although listed 'Least Concern' on the IUCN Red List of Threatened Species (IUCN SSC Antelope Specialist Group. 2016i), in northern Kenya this species was not encountered during our surveys As such, it should be regarded as a species of conservation concern in across northern Kenya. The Boma–Badingilo landscape in southern South Sudan and Kidepo Valley National Park in northwestern Uganda might serve as regional refugia for this species.

Tiang is exclusively a grazer that was historically present on the floodplains and other grasslands near water on both sides of northern Lake Turkana. Today, it is scare in, or extirpated from, northwestern Kenya. Any remaining individuals are likely north of Turkana County in the Elemi Triangle and dependent on dispersal from very large population in southeastern South Sudan. The principal threats include poaching, competition with livestock for seasonal grazing, and prolonged drought. Although listed 'Least Concern' on the IUCN Red List of Threatened Species (IUCN SSC Antelope Specialist Group. 2017b), in northwestern Kenya this species was not encountered and should be regarded as a species of conservation concern in Turkana County. The Boma–Badingilo Landscape in southeastern South Sudan, where a large population remains, may act as regional refugia for this species. Conservation of Tiang in Kenya is, therefore, closely linked to maintaining habitat connectivity and wildlife movements across the Kenya–South Sudan border.

Figure 54. Adult female Southern Gerenuk *Litocranius walleri walleri*. Merti, central Kenya.

Chanler's Mountain Reedbuck are specialist grazers, historically present on a few mountains in northwestern Kenya. This Endangered species was not encountered during Phase Three (Avenant 2013; IUCN SSC Antelope Specialist Group 2017d). Mountain Reedbuck are habitat specialist, confined to isolated mountains, ridges and hillsides in broken rocky country and high-elevation grasslands (often with some tree or bush cover) from 1,500–5,000 m (East 1999; Avenant 2013). High elevation grassland is an uncommon habitat in northwestern Kenya. Unlike Golden Klipspringers, which occur on rocky outcrops, Chanler's Mountain Reedbuck require high-elevation grasslands and steep hillsides with permanent grass cover and water. We found no evidence that Chanler's Mountain Reedbuck persist in northwestern Kenya, but we did not survey the mountains where it might still occur. This is likely one of the most vulnerable species within the study area based on its need for high-elevation grasslands and water. That its habitat is often remote and difficult to access may provide some protection from poaching and other human activities. Climate change may negatively affect this species in what is already a semi-arid and hot region.

Oribi marginally occur in northwestern Kenya (Brashares and Arcese 2013; IUCN SSC Antelope Specialist Group 2016g). This region contains little of its preferred mesic grassland habitat. Oribi inhabit savanna woodlands, floodplains, and other open grasslands. They are primarily a mesic grassland antelope of grasslands reaching highest density on floodplains, especially in association with larger grazers. Principal threats include competition with livestock for high-quality grasses, habitat degradation through overgrazing and shrub encroachment, poaching, and prolonged drought. Mesquite, False Umbrella Thorn, and other woody invasive species likely reduce habitat suitability by replacing open grasslands with dense shrubland. It is unlikely that this species still occurs in northwestern Kenya.

The 'Endangered' Beisa Oryx was not encountered species during Phase Three. This 'Near Threatened' species once occurred in parts of northwestern Kenya in grasslands and bushlands, avoiding tall grass and dense dry bush (Wacher and Kingdon 2013). Beisa oryx are well adapted to arid environments, being largely water-independent. These grazers can tolerant extreme heat (Wacher and Kingdon 2013). Unlike some species that are naturally rare at the edge of their range, the Beisa oryx was historically a widespread and characteristic large herbivore of Kenya's arid and semi-arid rangelands. Today, it appears rare across much of its former range due to a combination of human pressures. In northwestern Kenya, the principal threats are poaching, increasing competition with livestock for seasonal grazing, habitat degradation, and prolonged drought. Although this species is capable of switching between grazing and browsing, continued degradation of productive grasslands and increasing human pressure is a threat to the remaining populations. The Boma–Badingilo ecosystem in southeastern South Sudan may serve as a refuge and potential source population for Beisa oryx occurring in northernmost Kenya. This species longer occurs in Uganda (UWA 2026).

Table 6 presents our view on the vulnerability of each species of antelope in northwestern Kenya.

Table 6. Vulnerability of the 16 antelope species of northwestern Kenya.

Vulnerability northwestern Kenya	Species
Critical	Tiang, Defassa Waterbuck, Chanler's Mountain Reedbuck, Common Impala, Oribi
Very high	Beisa Oryx, Common Eland, Kirk's Dik-Dik
High	Greater Kudu, Southern Lesser Kudu, Maasai Bushbuck
Moderate	Bright's Gazelle, Uganda Crowned Duiker, Smith's Dik-Dik, Golden Klipspringer, Southern Gerenuk

Figure 55. North of Lokichogio, Turkana Country, northwestern Kenya.

NOTES ON OTHER MAMMALS

Other than antelopes, 49 mammal species were encountered during this survey, one of which was not identified to species level (hare). Seven of the species are 'threatened' (Vulnerable, Endangered, or Critically Endangered) according to the IUCN Red List of Threatened Species (Table 7; 2026). Below, we highlight six of the non-antelope taxa that we observed.

Figure 56. Rufous Sengi *Galegeeska rufescens*, Urum, northwestern Kenya.

Table 7. Species of mammal, other than antelopes, encountered during Phase Three of the 'Horn of Africa Antelope Survey'.

Non-antelope Species	IUCN Red List Status 2024	Locality (or Vicinity) Encountered
Savanna Elephant *Loxodonta africana*	EN	Laikipia County, Samburu County, Merti region, Barata region. Dung and recent tree damage observed on Loima Hills and near Oropoi. Small herd seen on Loima Hills by I. Craig (pers. comm. 2026).
Rufous Sengi *Galegeeska rufescens*	LC	Loima Hills, Urum region
Aardvark *Orycteropus afer*	LC	Kakuma west
Common Hippopotamus *Hippopotamus amphibius*	VU	Ruko Conservancy (Baringo County)
African Buffalo *Syncerus caffer*	NT	Mukutan Conservancy (Laikipia)
Reticulated Giraffe *Giraffa reticulata*	EN	Laikipia County, Kom region, Merti region
Rothschild's Giraffe *Giraffa camelopardalis rothschildi*	NT	Ruko Conservancy (Baringo County)
Grévy's Zebra *Equus grevyi*	EN	Laikipia County
Plains Zebra *Equus quagga*	LC	Laikipia County
Common warthog *Phacochoerus africanus*	LC	Laikipia County, Urum
Northern Crested Porcupine *Hystrix cristata*	LC	Oropoi, Loima Hills, Urum, Kakuma west, Samburu County, Merti region
Olive Baboon *Papio anubis*	LC	Over much of the study area where there are perennial sources of water.
Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria*	LC	Baringo County, West-Pokot County, Loima Hills, Urum, Oropoi region, Kakuma west, Merti region, Garba Tulla region, Meru National Park, Timau region
Eastern Vervet Monkey *Chlorocebus pygerythrus centralis*	LC	Laikipia County
Eastern Patas Monkey *Erythrocebus patas pyrrhonotus*	VU	Karasuk Hills, western Loima Hills, Lokichokio, western Lotikipi Plains, Kakuma west (evidence from residents only, no sightings)
Mount Kenya Colobus *Colobus guereza kikuyuensis*	LC	Nyahururu
Mau Forest Colobus *Colobus guereza matschiei*	LC	Eldoret region
Kolb's Monkey *Cercopithecus mitis kolbi*	LC	Mukutan Conservancy (Laikipia)
Somali Lesser Galago *Galago gallarum*	LC	Merti region, Barata region, Meru National Park
Kenya Lesser Galago *Galago senegalensis braccatus*	LC	Loima Hills region, Oropoi region, Mukutan Conservancy (Laikipia), Urum north, Kakuma west
Rock Hyrax *Procavia capensis*	LC	Loima Hills, Samburu County
Bush Hyrax *Heterohyrax brucei*	LC	Laikipia County, Baringo County, Loima Hills, Samburu County

Southern Tree Hyrax *Dendrohyrax arboreus*	LC	Mukutan Conservancy (Laikipia)
Unstriped Ground Squirrel *Xerus rutilus*	LC	Baringo County, Turkana County
Striped Ground Squirrel *Euxerus erythropus*	LC	Baringo County, Laikipia County, Karasuk Hills
Gambian Sun Squirrel *Heliosciurus gambianus*	LC	Marich Pass, Oropoi, Kakuma west
Common genet *Genetta genetta*	LC	Oropoi, Lokichokio region, Milima region, western Suguta Valley, Loima Hills, Kakuma west, Merti region
Rusty-spotted Genet *Genetta fieldiana*	LC	Meru National Park
Dwarf Mongoose *Helogale* species?	-	Laikipia County, Baringo County
Somali Dwarf Mongoose *Helogale hirtula*	LC	Kom region, Garba Tulla region
Slender Mongoose *Herpestes sanguineus*	LC	Laikipia County, Baringo County, Lapur Range, western Suguta Valley, Merti region
White-tailed Mongoose *Ichneumia albicauda*	LC	Lokichokio, Loima Hills, Urum, Karasuk Hills, Merti region, Barata region, Meru National Park
African Civet *Civettictis civetta*	LC	Oropoi region, Loima Hills, Garba Tulla region
Black-backed Jackal *Canis mesomelas*	LC	Oropoi region, Lokichokio, Laikipia County, Loima Hills, Urum region, Kakuma west, Merti region
African Golden Wolf *Canis lupaster*	LC	Lotikipi Plains, Elemi Triangle, western Suguta Valley, Kakuma region, Merti region
Honey Badger *Mellivora capensis*	LC	Loima Hills
Bat-eared Fox *Otocyon megalotis*	LC	Oropoi region, Urum region
Aardwolf *Proteles cristatus*	LC	Loima Hills
Striped Hyaena *Hyaena hyaena*	NT	Kom (Samburu County), Merti region
Spotted Hyaena *Crocuta crocuta*	LC	Oropoi region, Laikipia County, Kakuma west, Kom (Samburu County), Barata region, Meru National Park
Serval *Leptailurus serval*	LC	Urum region
Lion Panthera leo	VU	Meru National Park
Leopard *Panthera pardus*	VU	Mukutan Conservancy (Laikipia), Loima Hills
Caracal *Caracal caracal*	LC	Kakuma west, Barata region
African Wildcat *Felis lybica*	LC	Urum region, Merti region
Hare *Lepus* species?	-	Western Suguta Valley, Turkana County, Samburu County, Laikipia County, Merti region
Four-toed Hedgehog *Atelerix albiventris*	LC	Lodwar region, Merti region
Zorilla *Ictonyx striatus*	LC	Lodwar region
Naked Mole Rat *Heterocephalus glaber*	LC	Barata region, Meru National Park

LC, Least Concern; NT, Near Threatened; VU, Vulnerable; EN, Endangered; CR, Critically Endangered; DD, Data Deficient; NA, Not Assessed

During Phase Three of the Horn of Africa Antelope Survey, we captured camera trap videos of a wide range of mammal species. Please find a selection here: https://www.wildsolutions.nl/turkana/.

Figure 57. Adult Aardvark *Orycteropus afer*, south of Oropoi, northwestern Kenya.

Figure 58. Naked Molerat *Heterocephalus glaber*, Meru National Park, central Kenya.

Figure 59. Nile Crocodile *Crocodylus niloticus*, Kamaru, central Kenya.

Figure 60. Martial Eagle *Polemaetus bellicosus*, Merti, central Kenya

Northern Lesser Galago *Galago senegalensis* E. Geoffroy, 1796 Least Concern

During the first and third survey of Phase Three we identified nine new localities for Senegal Lesser Galago *Galago senegalensis senegalensis* in northwestern Kenya (Figure 63). Although this species is indicated as present in the area (Nash *et al*. 2013; De Jong and Butynski 2023), records are scarce. All nine localities fill major gaps and help better define the outer limits of the known geographic range of this subspecies. The known elevation range for Senegal Lesser Galago is 1,140–2,600 m asl (De Jong and Butynski 2023). During Phase Three we encountered this subspecies between 697 m asl and 1,387 m asl, 443 m lower than earlier reported.

Figure 61. Adult Senegal Lesser Galago *Galago senegalensis senegalensis* in tall riverine vegetation, Oropoi, northwestern Kenya.

During the second survey of Phase Three, at least 16 Kenya Lesser Galagos *Galago senegalensis braccatus* were seen or heard at and near Lera Camp (1,812 m asl), central Mukutan Conservancy, in tall *Acacia* [*Vachellia*] *xanthophloea* woodland. These are the westernmost records for this subspecies (Figure 63).

Figure 62. Adult Kenya Lesser Galago *Galago senegalensis braccatus* in tall acacia woodland at Mukutan Conservancy, Laikipia, central Kenya.

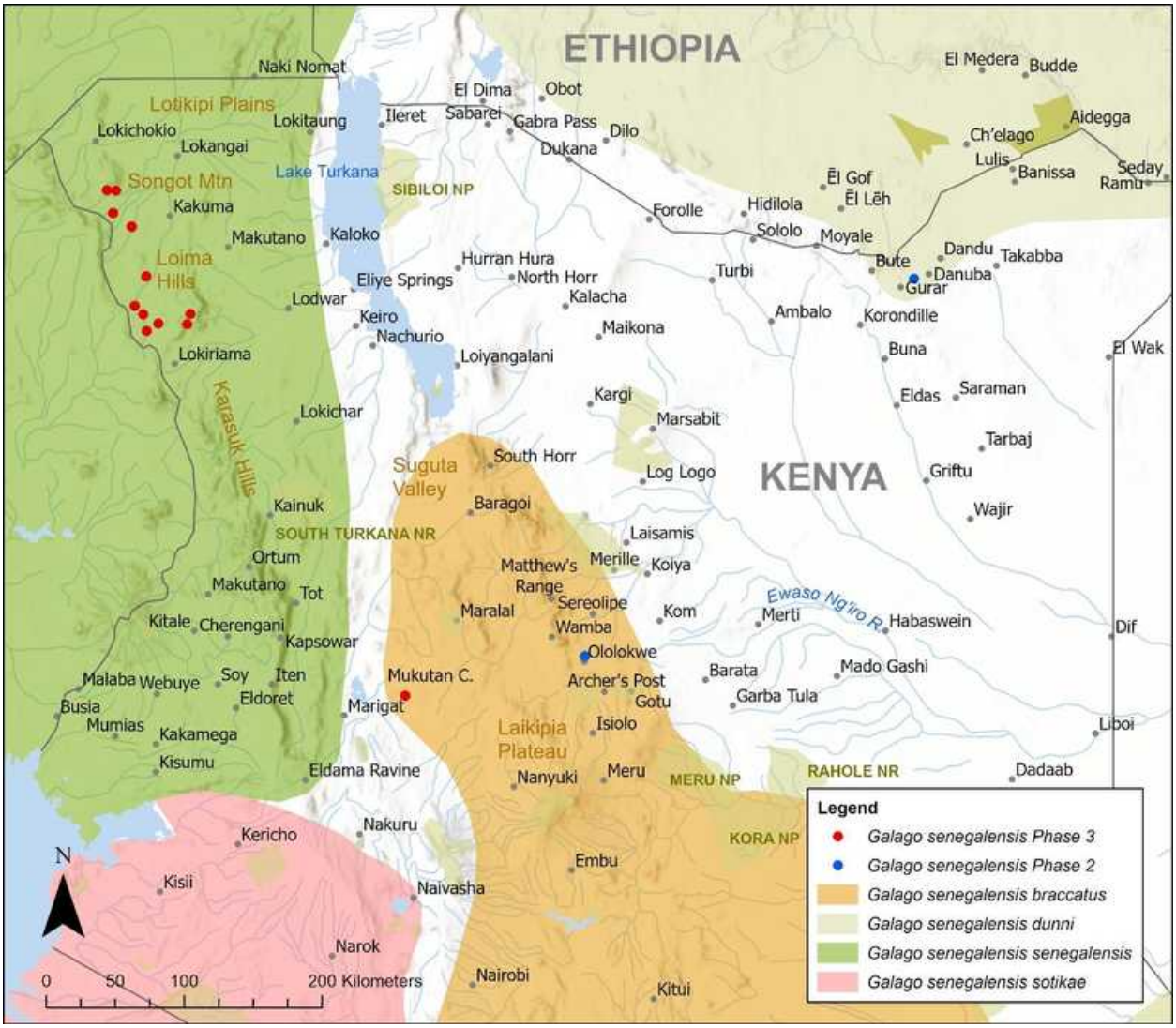

Figure 63. Encounters with Northern Lesser Galago *Galago senegalensis* during Phase Three (grey) and Phase One (purple) of the 'Horn of Africa Antelope Survey'. Geographic ranges adopted from Butynski and De Jong (2019, 2024) and De Jong and Butynski (2023).

Somali Lesser Galago *Galago gallarum* Thomas, 1901 Least Concern

During Phase Three, we found Somali Lesser Galago *Galago gallarum* at four sites, three of which are new localities. During Phase One we briefly saw a lesser galago east of Barata (central Kenya south of the Ewaso N'jiro River) but could not identify the species. During the fourth survey of Phase Three we found Somali Lesser Galago at this site (Figure 64). This species was encountered between 375 m asl and 595 m asl. The known elevation range of Somali Lesser Galago is from sea level to 1,530 m asl (Deritu, Oromiya, Ethiopia), with most of the geographic distribution <1000 m asl (De Jong and Butynski 2023, in prep). Similar to Phase One and Phase Two, all of these new records contribute to determining the outer limits of this poorly known species (Figure 64).

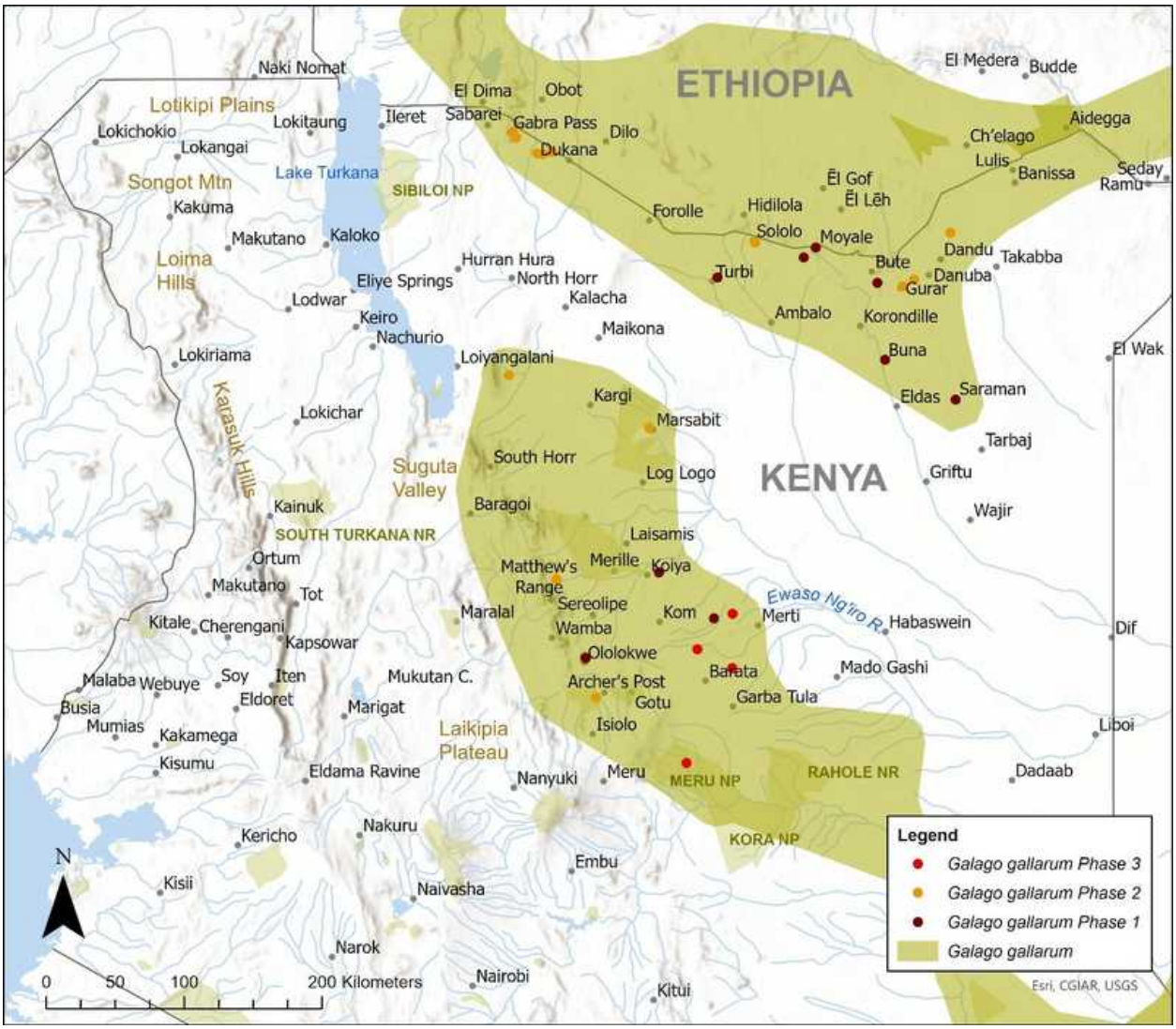

Figure 64. Encounters with Somali Lesser Galago *Galago gallarum* during Phase Three (red), Phase Two (orange) and Phase One (blue) of the 'Horn of Africa Antelope Survey'. Geographic range adopted from De Jong and Butynski (2023).

Figure 65. Adult Somali Lesser Galago *Galago gallarum* near Merti, central Kenya.

Figure 66. Adult Somali Lesser Galago *Galago gallarum* near Merti, central Kenya.

Savannah Monkey *Chlorocebus* Gray, 1870

The Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria* is patchily distributed over West-Pokot County and Turkana County. To the west, in eastern Uganda, Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti* occurs (Figure 68; De Jong and Butynski 2023; Butynski and De Jong 2025a) and to the north, in southwestern Ethiopia and southern South Sudan, Common Grivet *Chlorocebus aethiops aethiops* is present. Butynski and De Jong (2017) reported that *C. t. budgetti, C. a. aethiops,* and *C. p. arenaria* occur in extensive 'phenotypic clines' in northwestern Kenya and northeast Uganda, with no obvious geographic barriers observed. As a result, the situation is complex. They called for more research to describe the phenotypes of *Chlorocebus* in this region and to map the phenotypic clines. The main distinguishing traits of these three species of *Chlorocebus* are presented in Table 8.

Table 8. Main distinguishing phenotypic traits of adult male Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria*, Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti,* and Common Grivet *Chlorocebus aethiops aethiops.*

Taxon	**Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria***	**Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti***	**Common Grivet *Chlorocebus aethiops aethiops***
Browband	Broad, arched, continuous with whiskers	Narrow, sinuous, separated from whiskers by black line	Narrow, arched, continuous with whiskers
Cheek whiskers	White. Medium to long, sweeping upwards	White. Long, sweeping upwards	Pure white. Long, sweeping backwards
Dorsum and crown	Light brown, greyish brown, olive brown, or brownish-yellow	Intense yellow to greenish	Pale, olive-fawn to greyish green
Whitish lateral tufts of hair at tail base	Absent	Present	Present
Tail tip	Dark grey, blackish or jet black. No tuft	Whitish. No tuft	Pure white to creamy white. Tuft present
Hands and feet	Dark grey, blackish or jet black	Grey	Pale grey with brownish tinge

During earlier surveys, *C. t. budgetti* was encountered at Agoro-Agu Forest Reserve, central north Uganda (Butynski and De Jong 2017). According to Nakagawa (2013), this site lies within the area of overlap with *C. p. hilgerti* (currently referred to as *C. p. arenaria*). We, however, found no evidence for *C. p. arenaria* within or near Agoro-Agu FR. We confirmed *C. t. budgetti* to be present in Kidepo Valley National Park, northeastern Uganda. One intermediate looking adult male was observed north of Mount Kadam (central eastern Uganda; Butynski and De Jong 2017, Y. de Jong and T. Butynski unpubl. data; Figure 68). He exhibited a small tuft of white hair on either side of the base of the tail, a trait both *C. aethiops* and *C. t. budgetti* have (Table 8; Butynski and Kingdon 2013; Nakagawa 2013).

During surveys one and three of Phase Three, we encountered 48 groups of Savanna Monkeys, 38 groups of which were in northwestern Kenya, including two groups near Ortum, West Pokot. All 38 groups showed intermediate phenotypic traits in some or all adult males. Figure 67 to 75 depict the phenotypic traits of groups encountered in northwestern Kenya. Groups near Ortum resemble *C. p. arenaria* with some phenotypic traits of *C. t. budgetti* (Figure 67). About 185 km

farther northwest, west of the Loima Hills on the border with Matheniko National Reserve in Uganda, adult males with traits of all three taxa were found (Figures 69-73). About 90 km farther north, east of Oropoi, adult males mostly meet the description of *C. t. budgetti* with slight intermediate traits of *C. t. budgetti* (*e.g.*, shorter cheek whiskers; Figures 74-75) and *C. a. aethiops* (creamy white tail tuft).

These are the first records of *C. t. budgetti* in Kenya. The nearest records of *C. t. budgetti* to Oropoi are less than 40 km to the west, in Kidepo Valley National Park, northeastern Uganda (Butynski and De Jong 2017). To the best of our knowledge, the nearest record of *C. a. aethiops* is in Boma National Park, South Sudan, 260 km north of Oropoi (I. van den Meiracker pers. comm.).

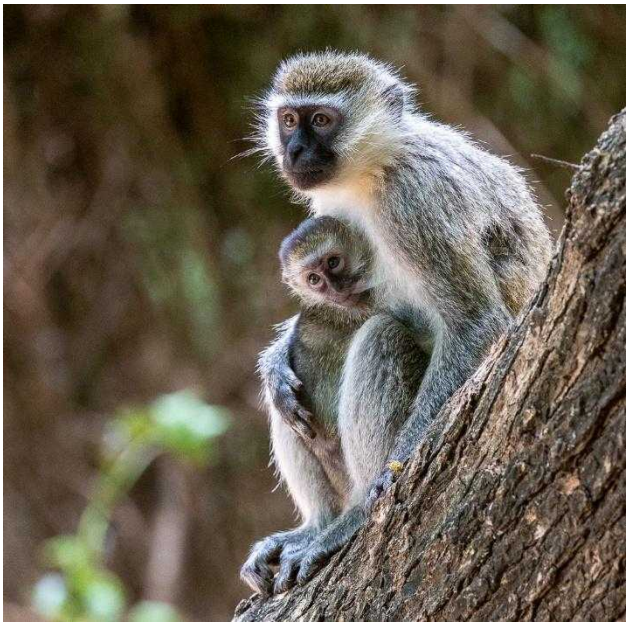

Figure 67. Adult male (left) and adult female (right) Northeastern Vervet Monkeys *Chlorocebus pygerythrus arenaria* near Ortum. Individuals in this group meet the phenotypic description of *C. p. arenaria* (see Table 8) except that they exhibited lateral white tufts at the base of the tail, a trait of Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti*.

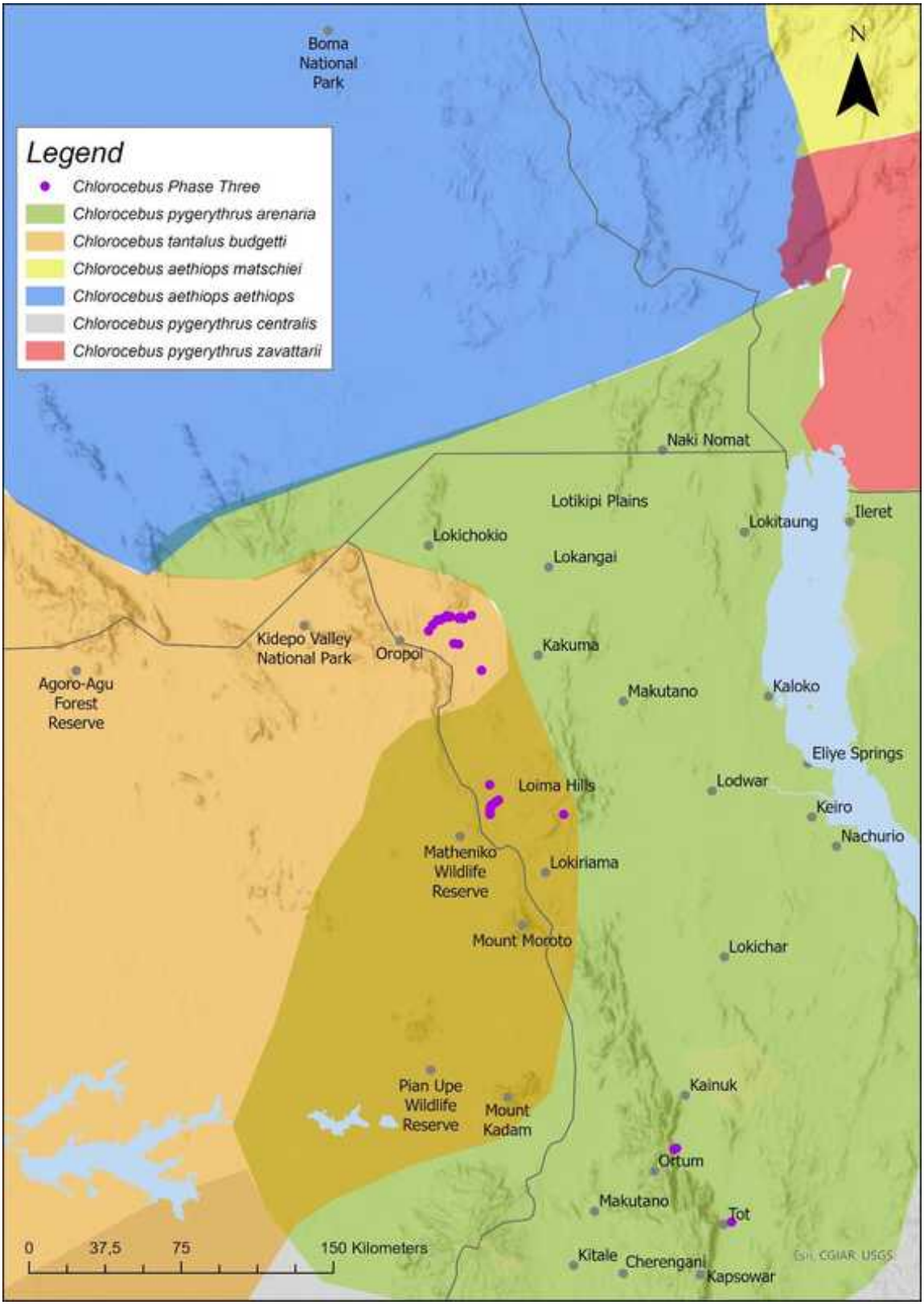

Figure 68. Encounters with Savanna Monkeys *Chlorocebus* during Phase Three of the 'Horn of Africa Antelope Survey'. Geographic range adopted from De Jong and Butynski (2023).

Figure 69. Adult male (right) and adult female (left) Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria* near Ortum. Individuals in this group meet the phenotypic description of *C. p. arenaria* (see Table 8) except for the lateral white tufts at the base of the tail, a trait of Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti*.

Figure 70. Adult male (right) and adult female (left) Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria* near Ortum. Individuals in this group meet the phenotypic description of *C. p. arenaria* (see Table 8) except for the lateral white tufts at the base of the tail, a trait of Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti*.

Figure 71. Adult male Savanna Monkey *Chlorocebus* west of Loima Hills with intermediate phenotypic traits. The grey hands, feet and tail tip, white lateral tuft at the base of the tail, and narrow, slightly sinus-shaped browband are traits of Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti*. The greyish brown dorsum and medium length cheek whiskers are traits of Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria*.

Figure 72, 73. Adult male Savanna Monkey *Chlorocebus* west of Loima Hills with intermediate phenotypic traits. The grey hands, feet and tail tip, white lateral tufts at the base of the tail, and narrow, slightly sinus-shaped browband are traits of Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti*. The greyish brown dorsum and medium length cheek whiskers are traits of the Northeastern Vervet Monkey *Chlorocebus pygerythrus arenaria*.

Figure 74. Adult male Budgett's Tantalus Monkeys *Chlorocebus tantalus budgetti* at Oropoi. These are the first records of this species in Kenya.

Figure 75. Adult male Budgett's Tantalus Monkey *Chlorocebus tantalus budgetti* at Oropoi. These are the first records of this species in Kenya.

Olive Baboon *Papio anubis* (Lesson, 1827) Least Concern

Forty-six groups of baboon *Papio* were encountered during Phase Three. Olive Baboon were the most common non-human primate species observed during this survey. Baboon groups were encountered between 391 m asl and 2289 m asl.

Olive Baboon have an elevation range of 540–3,310 m asl in East Africa (De Jong and Butynski 2023) and 200–3,850 m asl in Northeast Africa (Palombit 2013, Butynski and De Jong 2022). During Phase One we encountered a group of baboons northeast of Barata, central Kenya, at 360 m asl. This group showed phenotypic traits of both Olive Baboon and Ibean Yellow Baboon *Papio cynocephalus ibeanus* Thomas, 1893 (Butynski and De Jong 2024). The slightly pointed crown, pale grey muzzle, grizzled yellowish-grey whiskers, prominent pointed ears, kinked tail, and a yellow wash on the outer hindlimbs are traits of Yellow Baboon. This group appears to be part of an Olive Baboon-Ibean Yellow Baboon phenotypic cline (Butynski and De Jong 2024). Phenotypic clines are reported in several regions of eastern Africa where one baboon species is overtaken by one, or even two, other species of baboon (De Jong and Butynski 2025).

To further document this phenotypic cline we surveyed the Barata region again during Phase Three. We encountered six groups in the Barata region which showed adult males with phenotypic traits of both Olive Baboon and Ibean Yellow Baboon. Figure 77 shows all encounters with baboons (purple). Groups with intermediate phenotypic traits are depicted in red. Intermediate Baboons were encountered in northwestern Meru National Park, a phenotypic cline earlier reported (De Jong and Butynski 2009). All six records lie within the geographic range of Olive Baboon as we currently know it, the furthest about 75 km from the geographic range of Ibean Yellow Baboon (De Jong and Butynski 2023). Surveys between Garba Tula, Mado Gashi and Habaswein are required to depict the eastern extent of this phenotypic cline.

Figure 76. Adult male baboon with phenotypic traits both of Olive Baboon *Papio anubis* and Ibean Yellow Baboon *Papio cynocephalus ibeanus,* northeast Barata, central Kenya.

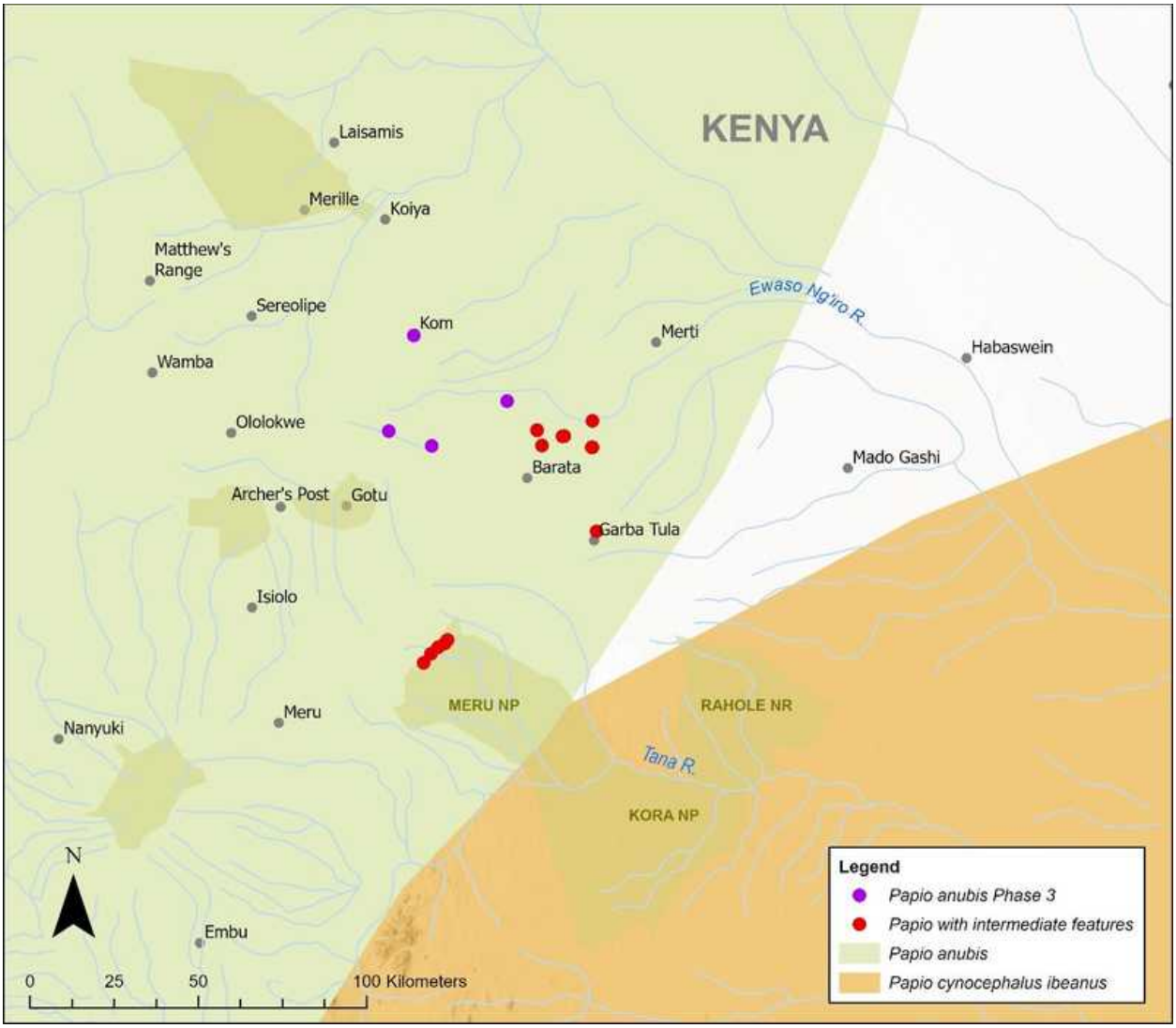

Figure 77. Baboon *Papio* encountered during Phase Three of the 'Horn of Africa Antelope Survey' with Olive baboon *Papio anubis* depicted in purple. Baboons with intermediate phenotypic traits (including Phase One) depicted in red. Geographic range adopted from De Jong and Butynski (2023) and Butynski and De Jong (2024).

Figure 78. Baboons with phenotypic traits both of Olive Baboon *Papio anubis* and Ibean Yellow Baboon *Papio cynocephalus ibeanus,* northeast Barata, central Kenya.

Figure 79. Adult male baboon with phenotypic traits both of Olive Baboon *Papio anubis* and Ibean Yellow Baboon *Papio cynocephalus ibeanus,* northeast Barata, central Kenya.

Figure 80. Adult female baboon with phenotypic traits both of Olive Baboon *Papio anubis* and Ibean Yellow Baboon *Papio cynocephalus ibeanus,* northeast Barata, central Kenya.

Figure 81. Adult female Baboon *Papio* with phenotypic traits both of Olive Baboon *Papio anubis* and Ibean Yellow Baboon *Papio cynocephalus ibeanus,* northeast Barata, central Kenya.

RIVER PRINIA *PRINIA FLUVIATILIS* CHAPPUIS, 1974 Least Concern

The River Prinia *Prinia fluviatilis* is a small passerine of the family Cisticolidae, restricted to waterside vegetation in otherwise arid landscapes. Its distribution consists of a series of isolated wetland "islands" along the Sahelian belt, from Senegal in the west to northwestern Turkana County in the east (eBird 2026). Its most eastern record, 20 km southeast of Lokichokio, Turkana County, is as recent as 2001 (Finch 2005). This was an eastward range extension of more 2,000 km and the first record for Kenya and East Africa.

Within its broad and fragmented range, River Prinia is typically confined to tall grasses, reeds, and bushes along permanent or seasonally flooded rivers, streams, and marshes in moist shrublands and swamps within the Sahel (Birdsoftheworld 2026). They can be locally common (BirdForum 2026). The River Prinia is an invertivore, foraging on invertebrates from stems and leaves of grasses and shrubs. Like other prinias, it moves actively through dense cover, often in small groups or pairs (Oiseaux 2026).

Figure 82. River Prinia *Prinia fluviatilis* in Mesquite *Neltuma juliflora*, Lotikipi Plains, northwestern Kenya.

During the first survey of Phase Three we encountered River Prinia twice on the Lotikipi Plains of northwestern Kenya and once in the Elemi Triangle. All encounters were east of Lokichokio, extending the range 140 km to the northeast (Figure 83). All three records were confirmed by Adam Scott Kennedy and Brian Finch.

All three encounters with River Prinia were in Mesquite *Neltuma juliflora* monoculture. This is probably the only suitable habitat for this species in the region. These monoculture 'Mesquite forests' held trees as tall as 14 m and with a diameter at breast height' of up to 30 cm.

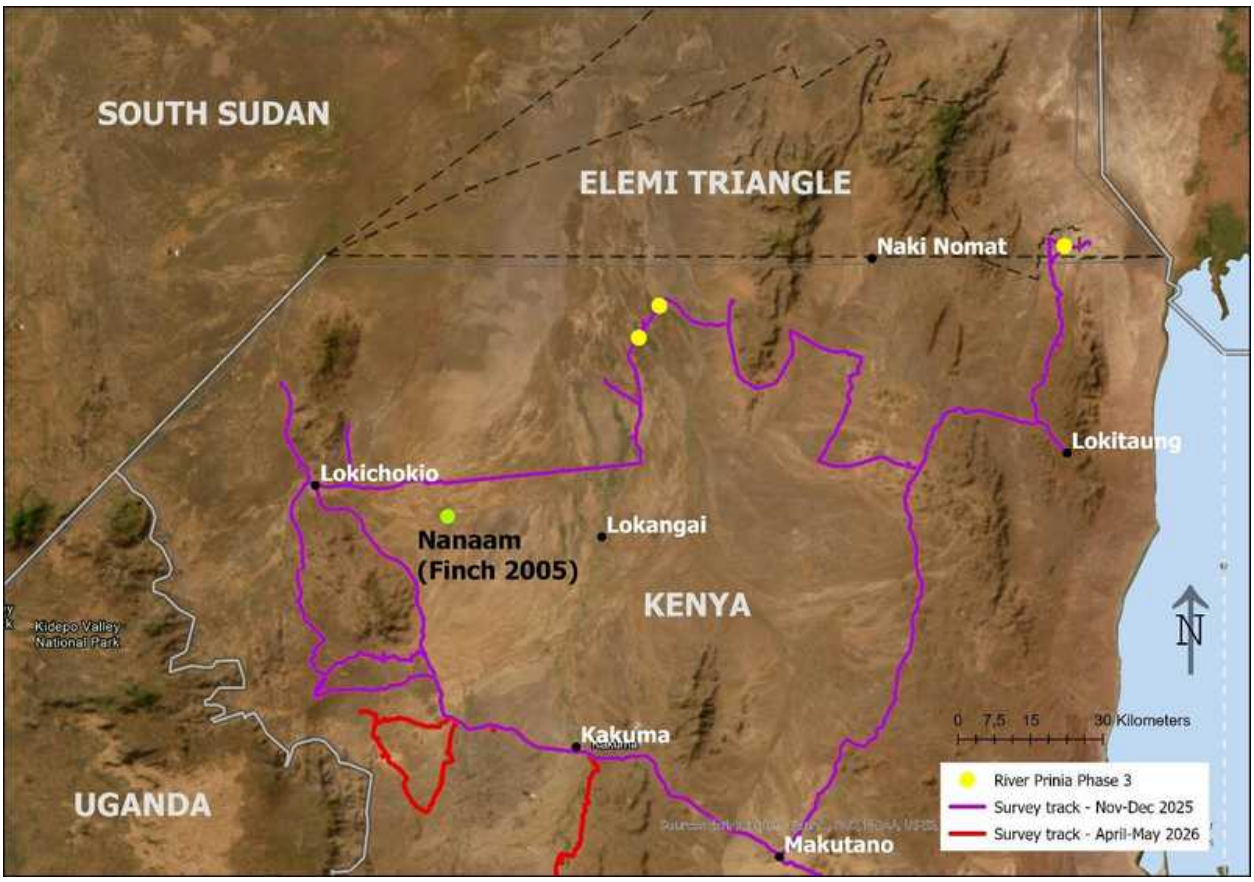

Figure 83. Encounters with River Prinia *Prinia fluviatilis* during Phase Three depicted in yellow. The site of the first record of this species in Kenya is depicted in green (Finch 2005).

The Lotikipi Plains of northwestern Kenya comprise an extensive semi-arid savanna ecosystem dominated by a heterogeneous mosaic of open perennial grassland, acacia–commiphora bushland, dwarf shrubland, and localized riparian woodland associated with seasonal drainage lines. Vegetation structure and productivity are primarily determined by a highly variable rainfall, soil characteristics, and seasonal flooding. The grassland is dominated by drought-tolerant perennial grasses interspersed with annual herbs following rainfall, while woody vegetation consists mainly of *Acacia* (*Vachellia*), *Commiphora*, *Balanites*, *Boscia*, and *Grewia* species. In recent decades, large areas have undergone substantial woody encroachment due to the rapid expansion of Mesquite and, to a lesser extent, the native but aggressively spreading False Umbrella Thorn *Vachellia*

reficiens. This has resulted in a reduced grass cover, altered habitat structure, and diminished forage availability for grazing ungulates.

The River Prinia is currently assessed as Least Concern on The IUCN Red List of Threatened Species (BirdLife International 2018). Its dependence on a narrow band of riparian and wetland habitats, however, makes this bird potentially vulnerable to changes in water regimes, drainage of wetlands, overgrazing, and agricultural expansion along drainages. In northwestern Kenya, Mesquite forest appears to be the stronghold for the River Prinia.

Figure 84. River Prinia *Prinia fluviatilis* in Mesquite *Neltuma juliflora*, Lotikipi Plains, northwestern Kenya.

SCORPIONS

Six species of scorpions were encountered during Phase Three, all of which were present in northwestern Kenya:

- *Neobuthus kloppersi*
- Eastern Nomad Scorpion *Hottentotta trilineatus*
- Pallid Thicktail Scorpion *Parabuthus pallidus*
- *Lychas obsti* (Figure 85)
- Black-Tipped Thicktail Scorpion *Parabuthus maximus* (Figure 86)
- *Uroplectes fischeri*

All of our records, with photographs, are on iNaturalist.org.

Figure 85. *Lychas obsti,* Mount Sorongot, east of Oropoi, northwestern Kenya.

Figure 86. Black-Tipped Thicktail Scorpion *Parabuthus maximus,* east of Oropoi, northwestern Kenya.

CONCLUSIONS

The antelope community of northwestern Kenya is impoverished, with only a small number of predominantly water-independent species persisting at low densities across a landscape that lacks protected areas. Five of the 16 antelope species known to occur in northwestern Kenya were encountered during Phase Three of the 'Horn of Africa Antelope Survey', all of which are water-independent; Smith's Dik-Dik, Bright's Gazelle, Common Duiker, Lesser Kudu, and Klipspringer. All five species occur at very low densities. Smith's Dik-Dik is the most common of the five. We strongly suspect that additional species of antelope are present in northwestern Kenya, albeit highly isolated and rare. The paucity of antelope records from the region likely reflects a combination of ecological constraints and sampling bias. The survival of Tiang, Defassa Waterbuck, Chanler's Mountain Reedbuck, Common Impala, and Oribi appears at most risk in northeastern Kenya, followed by Beisa Oryx, and Common Eland. Kirk's Dik-Dik and Gerenuk were not recorded during this survey but are historically only marginally present in the region.

Although the semi-arid environment naturally limits ungulate abundance and distribution, our findings indicate that anthropogenic pressures might outweigh ecological constraints for many species. Reported widespread poaching, extensive pastoralism, and intense competition with livestock for forage and access to perennial water sources have likely contributed to the decline and local disappearance of many medium- and large-bodied antelopes, particularly grazers and water-dependent species. Habitat degradation is further exacerbated by the expansion of invasive woody vegetation, especially Mesquite and False Umbrella Thorn, which together reduce the extent and quality of open grasslands while altering native savanna structure. Although some browsing species may derive localized benefits from the increased woody cover, these invaded habitats are unlikely to sustain the diversity or population sizes characteristic of intact rangelands. The absence of protected areas across central and northern northwestern Kenya, combined with local insecurity and limited wildlife monitoring and law enforcement, further increases the vulnerability of remnant populations. Consequently, the persistence of northwestern Kenya's antelopes depends on controlling invasive woody species where feasible, greatly reducing poaching, maintaining landscape connectivity, safeguarding remaining native grassland and woodland mosaics, and implementing rangeland management strategies that promote coexistence between wildlife and pastoral livelihoods.

In addition to rivers, lakes, and lagas, man-made perennial dams provide water to antelopes and other wildlife in northern Kenya. Many of these water sources are, however, fenced and/or occupied by people, livestock, and dogs. The vegetation in and around settlements is typically severely degraded by livestock and dominated by invasive plants.

Forty-nine mammal species, other than antelopes, were encountered during this survey, seven of which are 'threatened' (Vulnerable, Endangered, Critically Endangered (https://www.iucnredlist.org; Table 7). During this survey we found one new primate species for Kenya---Budgett's Tantalus Monkey. Intermediate looking savanna monkeys were encountered in central northwestern Kenya. A baboon phenotypic cline was found northeast of Barata, central Kenya. We obtained elevation range extensions, geographic range extensions, and natural history

data for Somali Lesser Galago and Senegal Lesser Galago. Phenotypic and bioacoustics comparisons are planned in which the field data and museum data now in our database will be used.

During Phase Three we encountered the River Prinia twice on the Lotikipi Plains of northwestern Kenya and once in the Elemi Triangle. These encounters extend the geographic range of this species about 140 km to the northeast.

More than 10,000 photographs were taken in RAW format during Phase Three, mostly of antelopes, primates, and birds, but also of reptiles, amphibians, insects, scorpions, plants, and habitats. Most of the more important and interesting records have been uploaded to our account on iNaturalist.org. Many photographs have been shared with taxonomic and species authorities and will be used for blogs, reports, articles, and IUCN Red List reassessments by us and others.

Audio recordings obtained during this survey are stored in our AudioDataBase and many have been, or will be, shared on iNaturalist.org. Recordings of primates will be placed on our website [www.wildsolutions.nl] and used in future research.

Figure 87. Leopard *Panthera pardus*, Loima Hills, northwestern Kenya.

NEXT STEPS

1. Similar to the reports produced in Phase One and Phase Two of the 'Horn of Africa Antelope Survey' (Butynski and De Jong 2024, 2025b), we made use of the antelope range maps compiled by the IUCN/SSC Antelope Specialist Group, downloaded from the IUCN Red List of Threatened Species website (https://www.iucnredlist.org). We will update antelope range maps, and those of some other taxa.
2. During Phase Three we obtained range changes for the Northeastern Vervet Monkey, Budgett's Tantalus Monkey, Somali Lesser Galago, and Kenya Lesser Galago. The shapefiles for these species, and others, will be updated using ArcGIS.
3. Extensive areas of unsuitable habitat are included in most of the current antelope range maps (*Mammals of Africa*, (https://www.iucnredlist.org) but also in range maps of many other species, such as Reticulated Giraffe and Olive Baboon.
4. A note concerning the discovery of the Budgett's Tantalus Monkey in Kenya will be submitted to a peer-reviewed Journal
5. An ongoing biogeography study of the lesser galagos of northern Kenya is on-going. Phenotypic comparisons and bioacoustic data collected during Phase One, Phase Two, and Phase Three will be used.
6. During our 25 years of surveys in East Africa, we compiled a large database of locality records. We will use these records to fine-tune the limits of the geographic ranges of all nine antelope species and some of the other taxa encountered during these surveys. We will communicate the range extensions with the species authorities. For example, we know that the geographic range of Beisa Oryx extends southwards in central Kenya to at least Ol Pejeta Conservancy and Lolldaiga Hills Ranch in Laikipia County, that the range of Gerenuk extends southwards in central Kenya (Soita Nyiro Conservancy, Mpala Ranch, and Lolldaiga Hills Ranch in Laikipia County), and that the geographic range of Reticulated Giraffe can be adjusted southwards in central Kenya and elsewhere in Kenya. Once adjustments have been made, we will make the shapefiles available to the IUCN/SSC Antelope Specialist Group for the next IUCN Red List assessments of each taxon.

Figure 88. Black-chested Snake Eagle *Circaetus pectoralis*. Merti region, central Kenya.

We will submit a fourth grant proposal to ZGAP in support of our 'Horn of Africa Antelope Survey' (Phase Four). We aim to undertake Phase Four during January 2027–January 2028; three 2-week surveys totaling at least 42 field days. These surveys will be conducted along approximately 8,000 km of road and include foot-surveys in the vicinity of at least 42 night camps. The methods applied will be the same as used in Phase One, Phase Two, and Phase Three of the 'Horn of Africa Antelope Survey'. In Phase Four we aim to collect data on the antelopes of (1) Loima Hills and Urum region, northwestern Kenya, and in (2) Pian Upe Wildlife Reserve, Matheniko Game Reserve, and Kidepo Valley National Park in northeastern Uganda (Figure 89).

Figure 89. 'Phase Four' study area of the 'Horn of Africa Antelope Survey' with major roads depicted in red.

Figure 90. Adult Rusty-spotted Genet *Genetta fieldiana*, Meru National Park, central Kenya.

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Figure 91. Juvenile Southern Gerenuk *Litocranius walleri walleri.* Merti, central Kenya.