



Mammal diversity survey in Dakatcha Woodland, Kenya

Results from a four-year camera trap survey (2019 - 2022)

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ABSTRACT

The Dakatcha Woodland is one of the largest formally unprotected coastal forests in the Northern Swahili Coastal Forests bioregion and faces severe threats from widespread deforestation.

To develop a comprehensive mammal checklist for the area, we deployed 10 camera traps over four years (2019–2022), totalling 122 deployments and 6,779 trap days.

This survey identified 28 mammal species, including the Endangered Golden-rumped Sengi and the Vulnerable African Leopard. Additionally, we recorded significant human activity, in stark contrast to the higher mammal diversity and abundance observed in nearby protected areas such as the Arabuko-Sokoke Forest and Boni-Dodori Reserve.

Our findings underscore the **urgent need for enhanced protection of Dakatcha Woodland**, which is crucial for the conservation of its wildlife.

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122
Deployments

6 779
Sampling Days

5 222
Independent events

28
Species



Top: Left: Crested/Cape Porcupine *Hystrix* sp. // Middle: Caracal *Caracal caracal* // Right: Large-spotted Genet *Genetta maculata*

Middle: Left: Red Bush Squirrel *Paraxerus palliatus* // Middle: Kirk's Dik-dik *Madoqua kirkii* // Right: Golden-rumped Sengi *Rhynchocyon chrysopygus*

Bottom: Left: African Civet *Civettictis civetta* // Middle: Bushbuck *Tragelaphus scriptus* // Right: Yellow Baboon *Papio cynocephalus*



Brachystegia tree in Dakatcha Woodland

Introduction

The [Northern Swahili Coastal Forests](#) form a heterogeneous mosaic of lowland forest patches, savannah–woodlands, bushlands, and farmlands extending from coastal Somalia to southern Tanzania. This ecoregion is recognised as a globally significant biodiversity hotspot, supporting high levels of endemism, particularly within forest habitats. However, these forests are increasingly threatened by agricultural expansion and the unsustainable extraction of fuelwood for charcoal production.

Covering approximately 35,000 hectares, the Dakatcha Woodland on the Kenyan coast represents one of the largest remaining forest–woodland complexes within this ecoregion. Despite its designation as a [Key Biodiversity Area \(KBA\)](#) and its high biodiversity value, until 2014 the entire area was completely unprotected and was experiencing accelerated habitat loss posing direct threats to several Red Listed species.

In response to this [A Rocha Kenya](#) started actively purchasing land to establish a protected reserve within Dakatcha. To date almost 4,000 ha have been secured by A Rocha Kenya with a specific focus on the Endangered mammal, the Golden-rumped Sengi. To inform the conservation strategy for the creation of A Rocha’s reserve and provide robust baseline data, a four-year camera trap survey was conducted, focusing on medium- to large-bodied mammals.

The camera trap survey was designed to:

1. Establish a baseline checklist of mammal species within the A Rocha Dakatcha Nature Reserve, with particular attention to coastal endemics such as Aders’ Duiker and the Golden-rumped Sengi.
2. Quantify species abundance, activity patterns, and behaviour.
3. Compare mammal presence and relative abundance with other formally protected north coast forests, namely Arabuko-Soko Forest and Boni-Dodori Reserve, both previously assessed by Stokes et al. (2016), to evaluate the ecological importance of Dakatcha and the effects of human disturbance.
4. Provide evidence to inform land acquisition priorities for the A Rocha Dakatcha Nature Reserve.
5. Establish a baseline for future temporal and spatial monitoring.

This report presents species accounts for 28 mammal species, including two globally threatened taxa, underscoring the conservation significance of Dakatcha Woodland and reinforcing the urgency of its long-term protection.

Methods

Study area

Location

The Dakatcha Woodland (DW) is a [Key Biodiversity Area \(KBA\)](#) located approximately 150 km north of Mombasa and 25–50 km inland from the Kenyan coast (Figure 1).

It forms part of the Northern Swahili Coastal Forests, the northernmost ecoregion of the [East African Coastal Forests](#) bioregion (One Earth). This bioregion is recognised for globally significant levels of species richness and endemism (Burgess and Clarke, 2000; Mittermeier et al., 2004), yet is also among the most threatened forest biodiversity hotspots worldwide (Myers et al., 2000). Within this ecoregion, the highest levels of biodiversity are associated with closed-canopy forest vegetation (Clarke, 2000).

In Kenya, the principal protected remnants of coastal forest are Boni National Reserve (133,900 ha), Dodori National Reserve (87,700 ha), Arabuko-Sokoke Forest (37,000 ha), and Shimba Hills (5,000 ha), all shown in Figure 1. Covering approximately 35,000 ha, the Dakatcha Woodland KBA represents the largest remaining coastal forest block in Kenya that lacks formal protection. Within Dakatcha Woodland, A Rocha Kenya is currently establishing a 5,000-ha protected nature reserve (Figure 2).

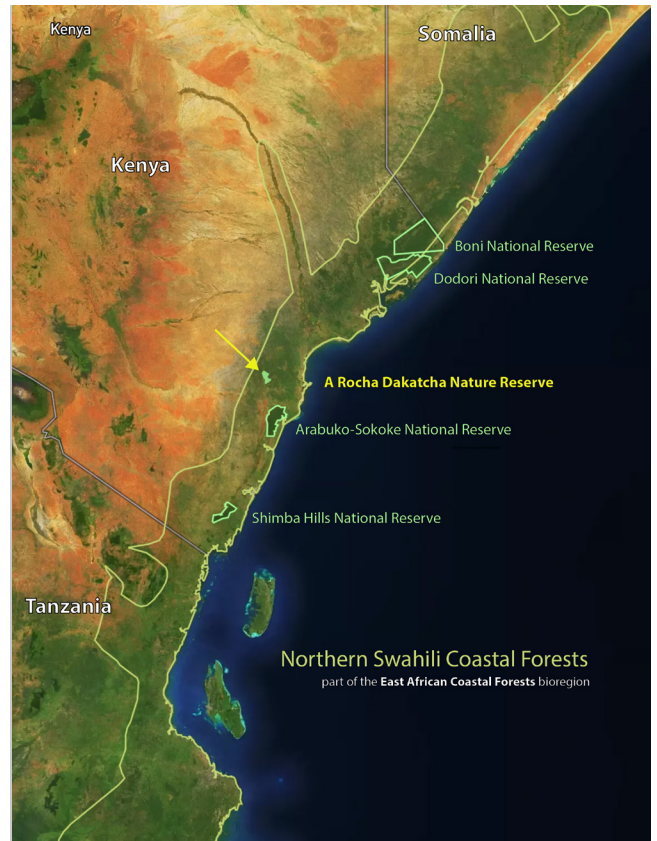


Figure 1. Map of the protected coastal forests of Kenya (green) and A Rocha Dakatcha Nature Reserve (yellow).

Vegetation type

DW comprises a diverse mosaic of forest types, savannah and seasonal wetlands. The principal habitat types include:

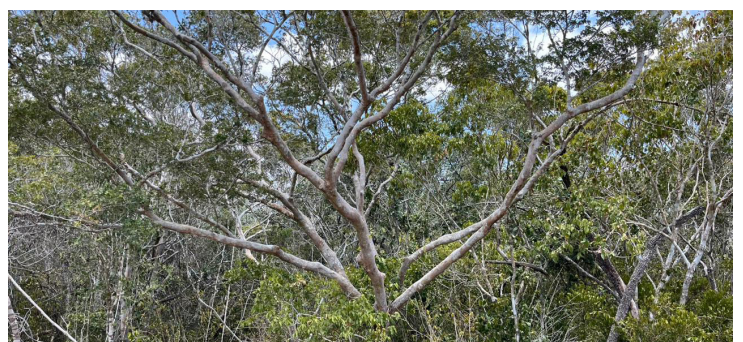
- *Brachystegia* woodland (“Miombo”), which represents the northernmost extent of this vegetation type in Africa and is estimated to cover 38% of the woodland (Nature Kenya, 2025).
- *Cynometra* forest, formerly widespread in the central part of the KBA but extensively cleared for pineapple cultivation during the 1980s and early 1990s. This habitat now occupies around 15% of the woodland largely as degraded secondary growth (Nature Kenya, 2025).
- Forest on black cotton soils, locally dominated by *Diospyros bussei* and *Newtonia hildebrandtii*.

Scattered throughout the vegetation mosaic are numerous seasonal wetlands, which support high abundances of dragonflies, amphibians, and birds during the wet season. The Sabaki River, a permanent river forming the southern boundary of the KBA, receives inflow from several seasonal streams originating within DW.

Land-use change has been substantial. By 2021, an estimated 28% of the woodland, equivalent to approximately 53,000 ha, had been converted to cropland or grassland (Nature Kenya, 2025).



Typical *Brachystegia* vegetation



Typical *Cynometra* forest

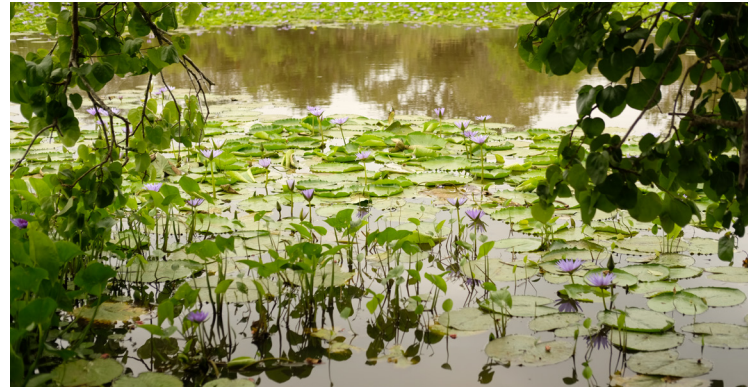
Climate

Dakatcha Woodland (DW) experiences a tropical semi-arid climate characterised by a bimodal rainfall regime, with long rains typically occurring from March to June and short rains from October to December. Mean annual rainfall ranges from approximately 500 to 900 mm, while average temperatures generally fall between 24 and 30 °C (Nature Kenya, 2025).

Biodiversity

Dakatcha Woodland (DW) harbours a high diversity of Red Listed and endemic species, including 11 Threatened and nine Near Threatened tree species, as well as ten Red-listed bird species. Historically, during the 1960s and 1970s, the northern part of DW formed part of an active hunting block and supported large populations of megafauna, including elephant, buffalo, rhinoceros, and lion. Following the ban on legal hunting in the 1970s, escalating poaching pressure led to progressive population declines, with elephant and buffalo becoming locally extirpated over the past two decades.

Despite the loss of large-bodied mammals, DW continues to support a diverse assemblage of smaller mammals, birds, and other fauna. This persistence highlights the ecological value of the remaining forest and woodland habitats and underlines their importance for biodiversity conservation in an increasingly fragmented landscape.



Threats

Local communities depend heavily on forest resources for energy, construction materials, food, and livelihoods. As a result, deforestation (Figures 2 and 3) and wildlife poaching are widespread, pressures that have intensified in recent years due to population growth and expanding coastal development.



Figure 2. Map of the area targeted for the A Rocha Dakatcha Nature Reserve (green boundary line) with a total final size of 7 000 ha. The pink colour shows deforestation since 2001. See more information on [Global Forest Watch](#).

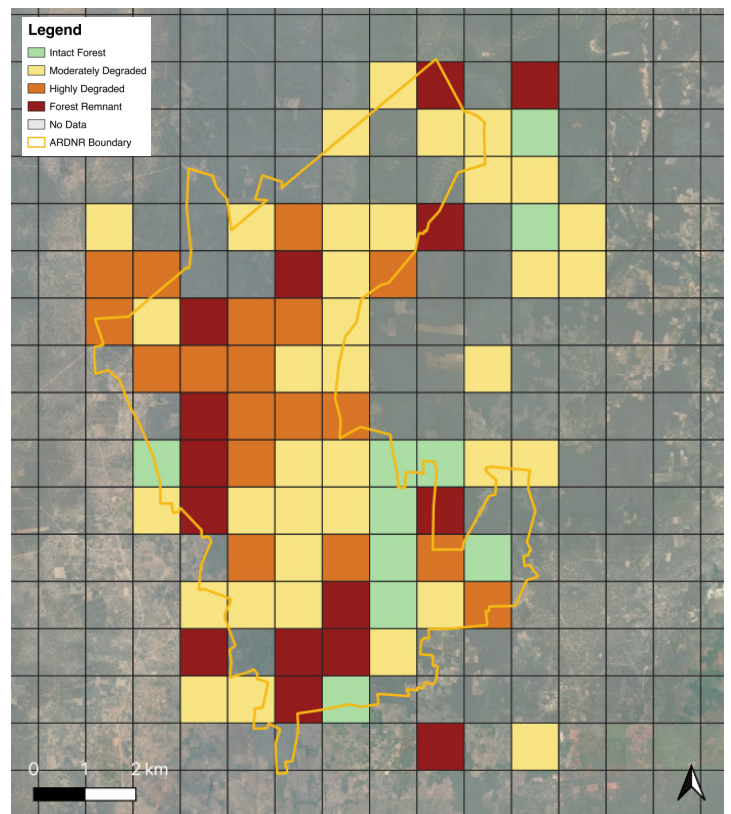


Figure 3. Map of habitat conditions in the A Rocha Dakatcha Nature reserve (boundaries of land purchased as of August 2025 in orange) based on habitat assessments (2022) and plot habitat quality from land purchase data (2025) carried out by A Rocha Kenya.

The principal threats to Dakatcha Woodland include the following:

- **Agricultural expansion.** Pineapple cultivation represents an important source of income for local farmers, as the crop grows particularly well on recently cleared red “Magarini” soils characteristic of *Cynometra*-dominated forest. However, local land-use regulations offer limited protection to remaining forest, and slash-and-burn practices are commonly used. These practices leave soils exposed to erosion, leading to rapid declines in soil fertility and eventual farm abandonment. Rising land prices and growing demand have further incentivised forest clearance, with increasing numbers of local landowners selling ancestral land as short-term profits become more attractive.
- **Charcoal production.** As forest cover has declined elsewhere in Kenya, pressure on Dakatcha Woodland for charcoal production has increased substantially. Since the early 2000s, charcoal burning has become widespread across the region, resulting in the loss of mature forest and large-scale landscape transformation. The adoption of power saws has intensified extraction rates, while the construction of new roads and the rapid expansion of inexpensive motorbike transport have facilitated access to previously remote forest areas and improved supply routes to nearby towns.
- **Unrestricted grazing.** Livestock incursions have emerged as a major threat in recent years, with herders moving south from increasingly arid regions and bringing herds of several thousand cattle, goats, and camels. These herds frequently cross farm and reserve boundaries, trampling crops and heavily browsing forest understorey. The resulting damage to vegetation regeneration, soil structure, and agricultural production threatens both conservation efforts and local livelihoods, and risks reversing years of habitat restoration.

Despite its high ecological value, and with the exception of land secured by A Rocha Kenya, the majority of Dakatcha Woodland remains formally unprotected and continues to face severe and accelerating degradation.



Survey design and camera deployment

Timing —————

Sampling was conducted between 17 April 2019 to 23 July 2022, spanning a total of four years and four months. During this period, ten camera traps were deployed simultaneously at each site for approximately two months before being relocated to the next survey area.

Material —————

Ten motion-triggered infrared camera traps (Reconyx Hyperfire) were initially deployed. After approximately one year, two cameras became non-functional, and the remaining eight cameras were used for the remainder of the study.

Survey design —————

Cameras were deployed within and around the A Rocha Dakatcha Nature Reserve. The original survey design followed a classical atlas-style approach, in which the study area was divided into 140 grid cells measuring 30 arc-seconds by 30

arc-seconds, corresponding to approximately 900 × 900m. Grid cells were selected to maximise spatial coverage while accounting for logistical feasibility, including landowner permission and the potential for future land acquisition. Owing to this partly opportunistic approach, not all grid cells were ultimately surveyed.

Within each selected grid cell, survey teams placed cameras along trails showing clear signs of mammal activity, such as footprints or droppings, and where an unobstructed field of view could be achieved. Cameras were mounted on sturdy trees at approximately knee height, around 50 cm above ground level. The geographic coordinates of each camera location and associated deployment metadata were recorded using the [Kobo Toolbox](#) mobile application.

Cameras were programmed to capture three consecutive photographs per trigger, with no delay between triggers. Camera functionality was checked after approximately one month, and batteries were replaced when necessary. To facilitate quality control and subsequent data management, survey teams deliberately triggered photographs of themselves during camera installation, servicing, and retrieval.

Data analysis

Data curation

Upon retrieval, all camera trap images were stored on a secure hard drive. Metadata associated with each camera deployment were downloaded from Kobo Toolbox and used to create deployment records on [Wildlife Insights](#), which facilitated image management and species identification.

Images were classified into four categories: wildlife, humans (camera trappers or local villagers), domesticated livestock (dogs, cattle, or goats), and blanks, defined as images in which no animal or human could be detected. Species-level identification was performed by the authors using the most recent relevant field guides and taxonomic references (Kingdon, 2015; Musila et al., 2019; Stokes et al., 2016). When uncertainty remained, external experts were consulted. If species-level identification was not possible, records were assigned to the highest confidently identifiable taxonomic level, such as family or order. Records of reptiles and birds captured during the survey are reported separately in Appendix 2. Taxonomy follows Kingdon et al. (2013).

The final curated dataset is publicly available at <http://n2t.net/ark:/63614/w12001317> (Nussbaumer et al., 2019). These data also contributed to the published mammal checklist available through GBIF (Kirao et al., 2022). Data exported from Wildlife Insights were converted into a Camtrap Data Package format (Bubnicki et al., 2024) and subsequently published on GBIF at <https://doi.org/10.15468/pyzdwf> (Nussbaumer et al., 2026).

Data analysis

All analyses were conducted in R using the CamtrapDP and CamtrapR packages (Desmet et al., 2021; Oldoni et al., 2023). For each species, we report the following metrics:

- Number of independent events, defined as detections of the same species separated by more than one hour, following Bowkett et al. (2007).
- Number of deployments with detections, used as an index of spatial occurrence.
- Camera trapping rate, calculated as the mean number of independent events per trap day multiplied by 100. While this metric does not provide an absolute measure of density, it has been shown to correlate with relative abundance (Rovero and Marshall, 2009) and is therefore interpreted here as an index of abundance.

In addition, we describe daily activity patterns, seasonal distributions of detections across the year, and spatial distributions of records using mapped camera locations.

Data comparison

The results presented here complement previous camera trap surveys conducted in the adjacent Arabuko-Sokoke Forest and the northern Boni-Dodori forest complex (Stokes et al., 2016). Direct comparisons were limited because galagos, squirrels, and rodents were not identified to species level in the earlier study and were therefore excluded from comparative analyses.

Results

Camera trap survey effort

Over the course of the study, a total of 122 camera deployments were conducted. Twelve deployments were excluded from subsequent analyses due to camera malfunction, resulting in an effective sampling effort of 6,779 trap days. The median deployment duration was 65 days. Across all deployments, the survey yielded 70,376 wildlife photographs, corresponding to 5,222 independent wildlife events, with a median of 37 events per deployment (Figure 4).

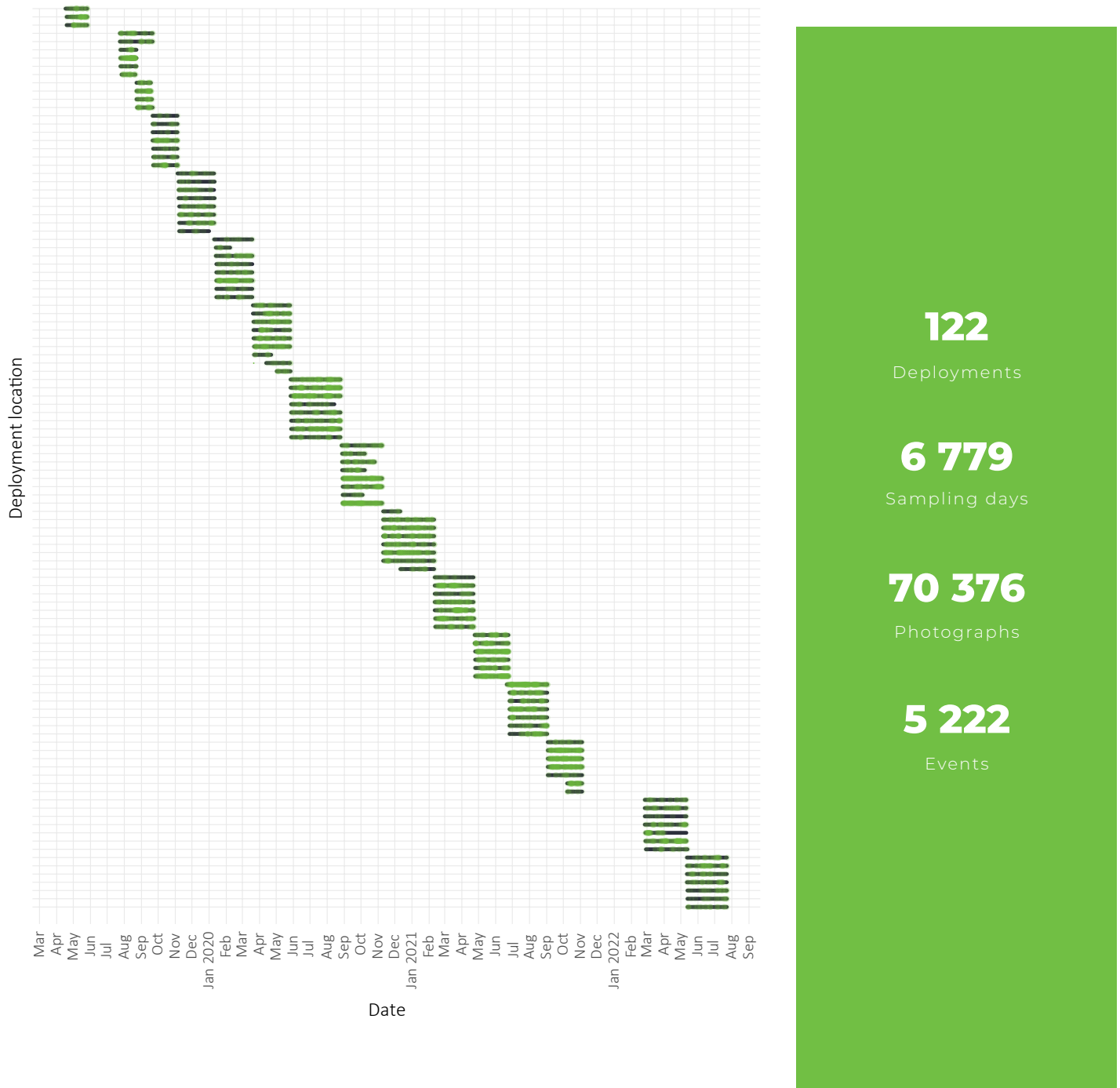


Figure 4. Illustration of the deployment coverage: continuous grey lines indicate a deployment and green dots represent each event on this deployment. Eight cameras were used almost continuously for four years (April 2019 – July 2022), changing location every two months.

Mammal diversity

In total, 28 mammal species were recorded, in addition to three domestic species (goat, dog, and cattle) and rodents that could not be reliably identified to species level. Notable records included 51 independent events of the Endangered Golden-rumped Sengi and a single detection of the Vulnerable African Leopard. The complete species list is presented in Table 1.

Species accumulation curves generated both per deployment and across all deployments are shown in Figure 5. On average, 7.56 species were detected per deployment. Ungulates, shrews, and rodents accounted for the highest numbers of records, indicating their relative abundance within the camera-trapped community (Figure 6).

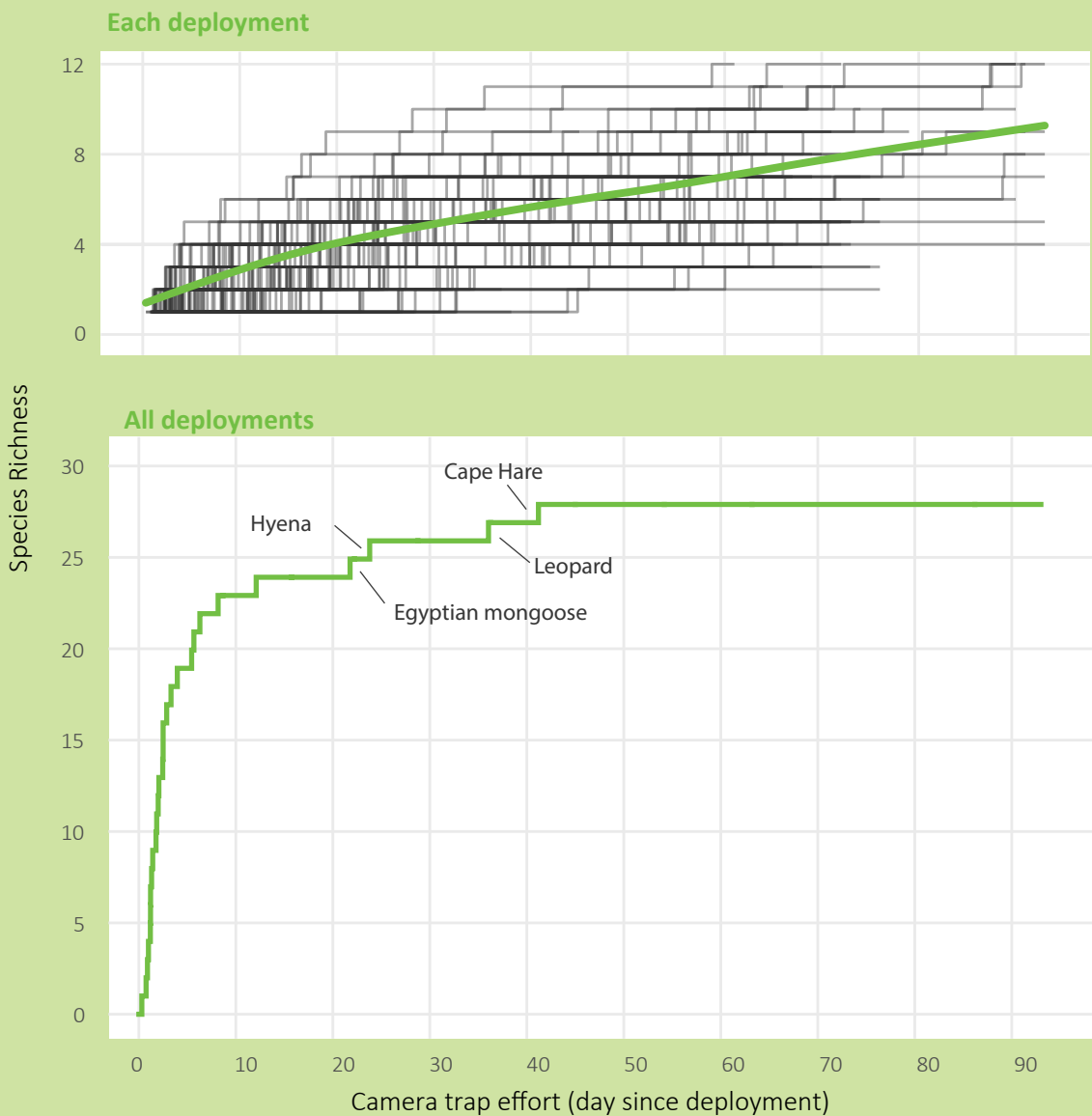


Figure 5. Species accumulation curves for a single deployment (top) and all deployments (bottom). At a single site, the number of species still increases for up to 90 days while across all sites, the last added species was after 40 days of observations thanks to the high number of deployments (110) spread across four years.

English Name	Order	Family	Scientific Name	Number of events	Number of deployments	Trapping rate
Caracal	Carnivora	Felidae	<i>Caracal caracal</i>	18	12	0.27
VU Leopard	Carnivora	Felidae	<i>Panthera pardus</i>	1	1	0.01
Common Dwarf Mongoose	Carnivora	Herpestidae	<i>Helogale parvula</i>	7	7	0.10
Egyptian Mongoose	Carnivora	Herpestidae	<i>Herpestes ichneumon</i>	6	5	0.09
White-tailed Mongoose	Carnivora	Herpestidae	<i>Ichneumia albicauda</i>	61	36	0.90
Spotted Hyaena	Carnivora	Hyaenidae	<i>Crocuta crocuta</i>	4	4	0.06
Honey Badger	Carnivora	Mustelidae	<i>Mellivora capensis</i>	18	16	0.27
African Civet	Carnivora	Viverridae	<i>Civettictis civetta</i>	41	25	0.60
Large-spotted Genet	Carnivora	Viverridae	<i>Genetta maculata</i>	166	61	2.45
Harvey's Duiker	Cetartiodactyla	Bovidae	<i>Cephalophus harveyi</i>	80	37	1.18
Kirk's Dik-dik	Cetartiodactyla	Bovidae	<i>Madoqua kirkii</i>	66	14	0.97
Suni	Cetartiodactyla	Bovidae	<i>Nesotragus moschatus</i>	2326	107	34.31
Common Duiker	Cetartiodactyla	Bovidae	<i>Sylvicapra grimmia</i>	8	5	0.12
Bushbuck	Cetartiodactyla	Bovidae	<i>Tragelaphus scriptus</i>	58	21	0.86
Bushpig	Cetartiodactyla	Suidae	<i>Potamochoerus larvatus</i>	55	36	0.81
Cape Hare	Lagomorpha	Leporidae	<i>Lepus capensis</i>	1	1	0.01
Four-toed Sengi	Macroscelidea	Macroscelididae	<i>Petrodromus tetradactylus</i>	829	62	12.23
EN Golden-rumped Sengi	Macroscelidea	Macroscelididae	<i>Rhynchocyon chrysopygus</i>	268	51	3.95
Blue Monkey	Primates	Cercopithecidae	<i>Cercopithecus mitis</i>	69	31	1.02
Vervet Monkey	Primates	Cercopithecidae	<i>Chlorocebus pygerythrus</i>	38	23	0.56
Yellow Baboon	Primates	Cercopithecidae	<i>Papio cynocephalus</i>	37	17	0.55
Lesser/Kenya Coast Galago	Primates	Galagidae	<i>Galagidae sp.</i>	23	8	0.34
Garnett's Greater Galago	Primates	Galagidae	<i>Otolemur garnettii</i>	11	11	0.16
Crested/Cape Porcupine	Rodentia	Hystriidae	<i>Hystrix sp.</i>	38	20	0.56
Gambian Rat	Rodentia	Nesomyidae	<i>Cricetomys gambianus</i>	136	34	2.01

English Name	Order	Family	Scientific Name	Number of events	Number of deployments	Trapping rate
Ochre Bush Squirrel	Rodentia	Sciuridae	<i>Paraxerus ochraceus</i>	43	16	0.63
Red Bush Squirrel	Rodentia	Sciuridae	<i>Paraxerus palliatus</i>	36	24	0.53
Greater Cane Rat	Rodentia	Thryonomyidae	<i>Thryonomys swinderianus</i>	6	2	0.09
Rodent sp.	Rodentia		<i>Rodentia</i>	226	35	3.33

Table 1. List of wild mammals recorded in Dakatcha Woodland during the camera trap survey.

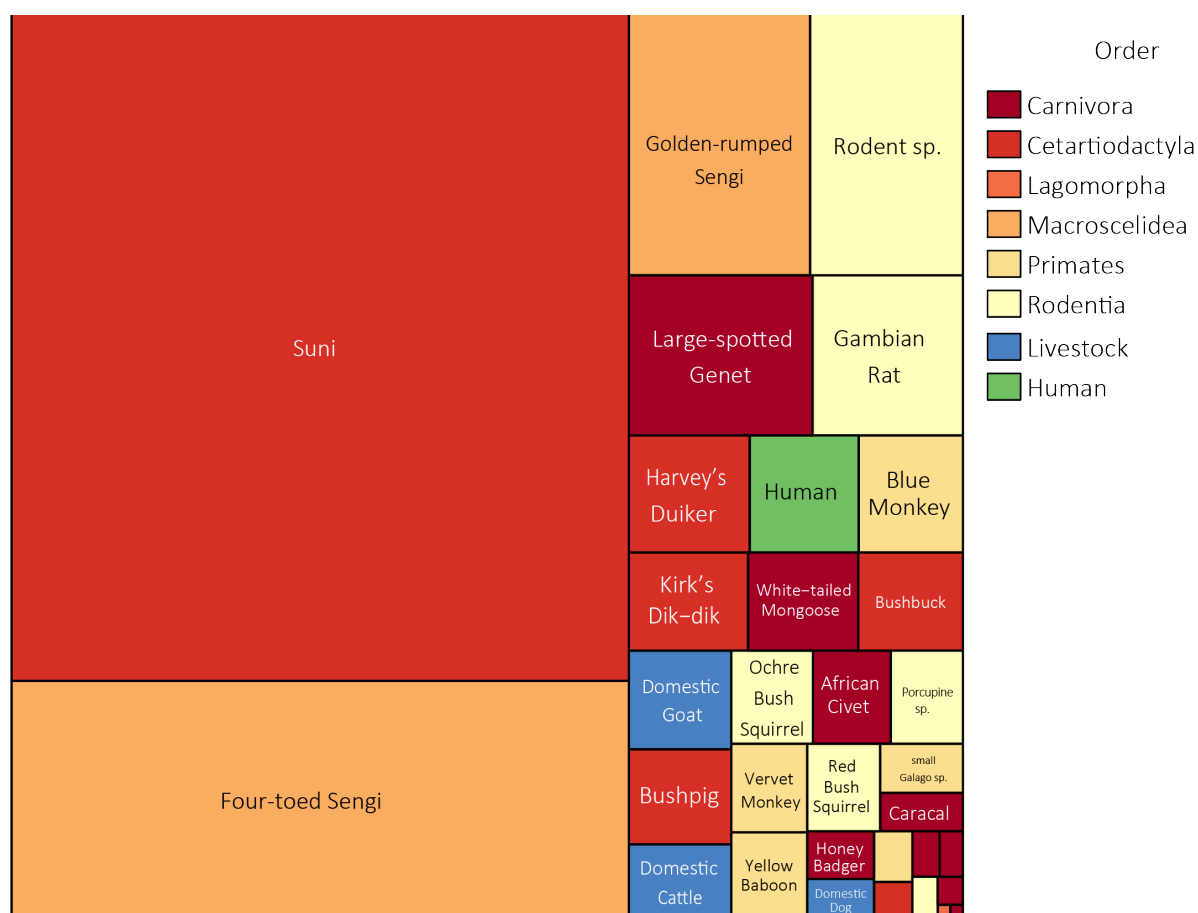


Figure 6. Treemap illustrating relative species abundance, with square size proportionate to the trapping rate. Colours indicate the taxonomic order, alongside humans (green) and domestic livestock (blue).

Species account

The following section provides detailed accounts for each wild mammal species recorded during the survey. Each species account follows a standard structure, describing in turn relative abundance and detection frequency, daily activity patterns, spatial occurrence and comparisons with adjacent sites, and ecological or conservation-relevant notes. Where relevant, species presence, relative abundance, and activity patterns are compared with those reported from adjacent camera-trap surveys conducted in the Boni-Dodori Reserve and the Arabuko-Sokoke Forest, based on the study by Stokes et al. (2016).

Carnivora > Felidae > *Caracal caracal*

Caracal

Local name: Simba Marara (Kiswahili)

- Relatively abundant, recorded in approximately 10% of camera trap deployments.
- Activity was concentrated in the early morning hours before and shortly after sunrise, with a secondary peak around dusk. Daytime activity was limited.
- Detections were spread across the reserve, consistent with a resident population.
- Caracal appears to represent the apex predator currently present within the reserve and likely plays a key role in regulating populations of medium-sized prey species.



18

Independent events

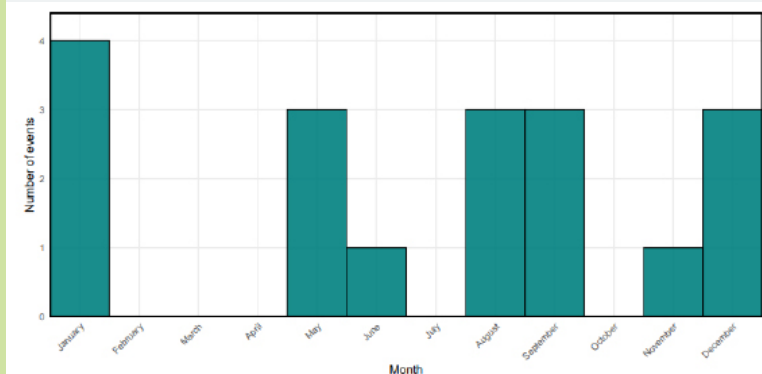
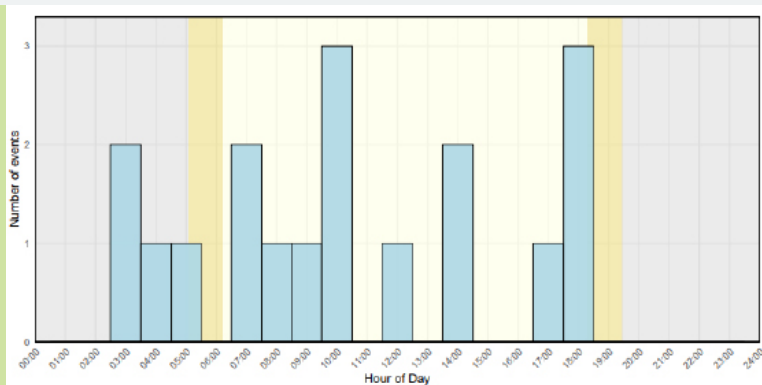
12

Deployments on which species was present

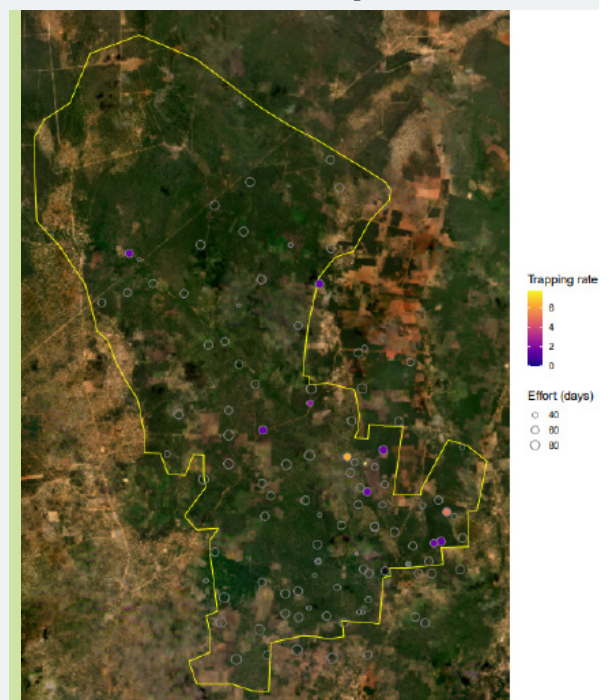
0.27

Trapping rate (#/100 days)

Activity



Presence map



Carnivora > Felidae > Panthera pardus

Leopard

Local names: Tsuwi (Giriama), Chui (Kiswahili)

- A single photographic record was obtained at 01:00 on 27 April 2020.
- The lone detection occurred during the night, consistent with the predominantly nocturnal behaviour of the species.
- The species is relatively common in Boni-Dodori Reserve, but this represents the first confirmed record of Leopard south of the Tana River in nearly 40 years. It was later recorded in Arabuko-Sokoke Forest in 2022 (Ochieng, 2023).
- The detection suggests occasional use of Dakatcha Woodland by dispersing or wide-ranging individuals rather than the presence of a resident population.



1

Independent event

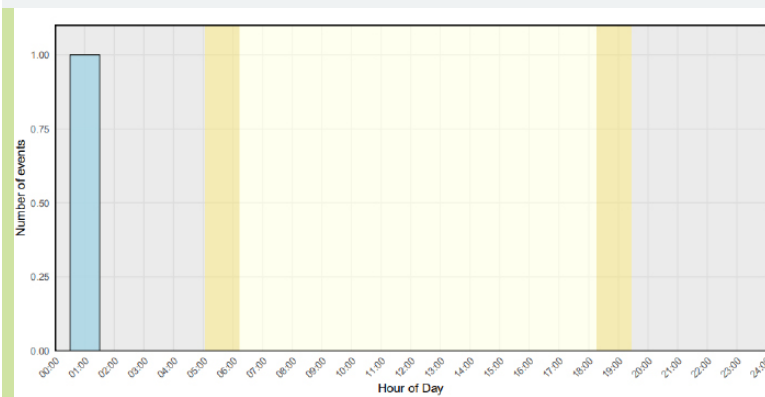
1

Deployment on which species was present

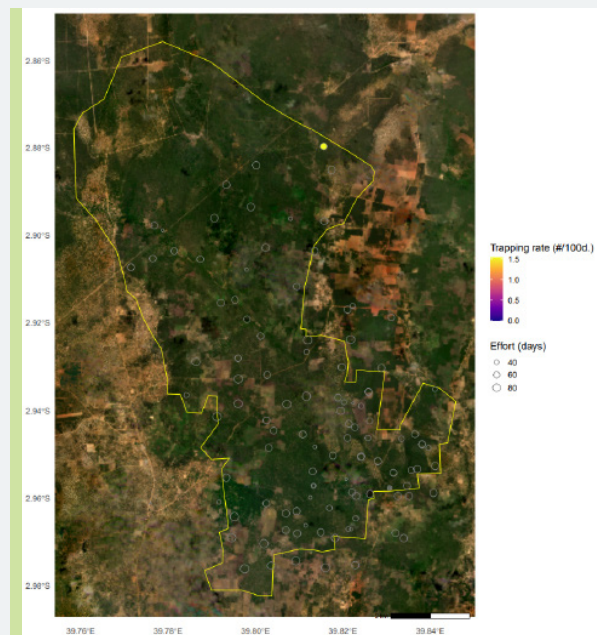
0.01

Trapping rate (#/100 days)

Activity



Presence map



Carnivora > Herpestidae > Helogale parvula

Common Dwarf Mongoose

Local name: Kibwala (Giriama)

- Recorded infrequently, with a few independent events across the study period, indicating low abundance within the surveyed area.
- All detections occurred during daylight hours, consistent with the species' strictly diurnal behaviour.
- The species was repeatedly recorded at the same camera locations, suggesting territorial use of specific areas.
- Although the Somali Dwarf Mongoose could not be fully excluded, habitat characteristics make its presence unlikely.
- The species is social and typically occurs in groups of up to ten individuals; however, camera records showed a maximum of three individuals together, possibly reflecting group fragmentation during foraging.



7

Independent events

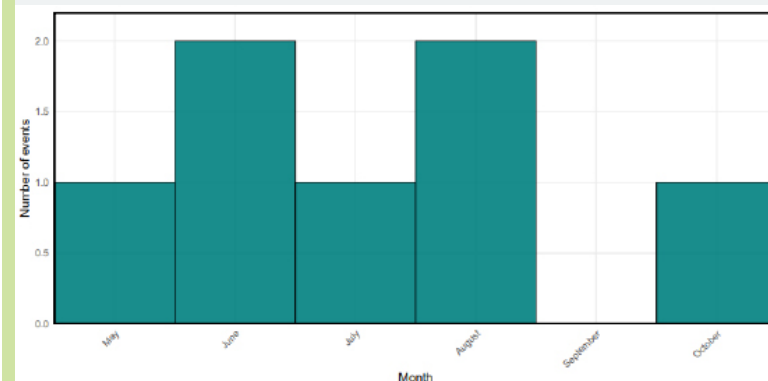
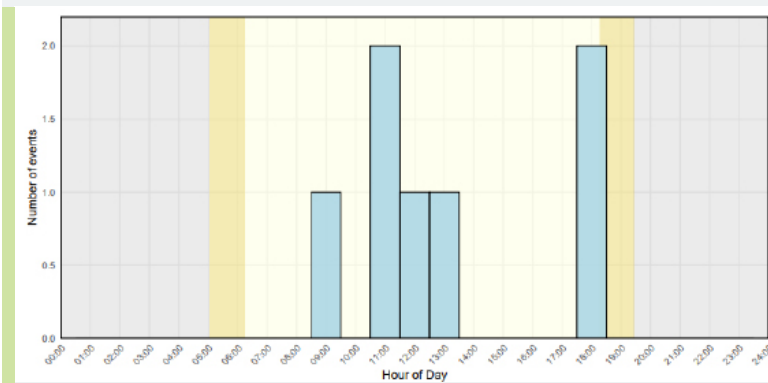
7

Deployments on which species was present

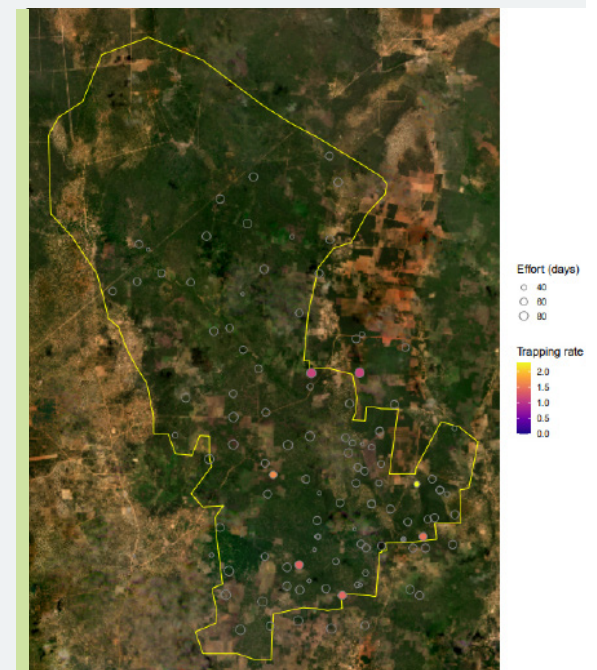
0.1

Trapping rate (#/100 days)

Activity



Presence map



Carnivora > Herpestidae > *Helogale parvula*

Egyptian Mongoose

Local name: Kiru (Kiswahili)

- Recorded infrequently.
- All detections were diurnal.
- This constitutes the first confirmed record of the species on the Kenyan coast. Egyptian Mongoose was not recorded during camera trap surveys in Boni-Dodori Reserve or Arabuko-Sokoke Forest in 2010 and 2015, although it has since been reported from Arabuko-Sokoke Forest through ongoing camera trap deployments
- The species is typically associated with disturbed habitats and farmland rather than closed forest, and is well known for depredation on domestic poultry. Its presence likely reflects increasing habitat modification around Dakatcha Woodland.



6

Independent events

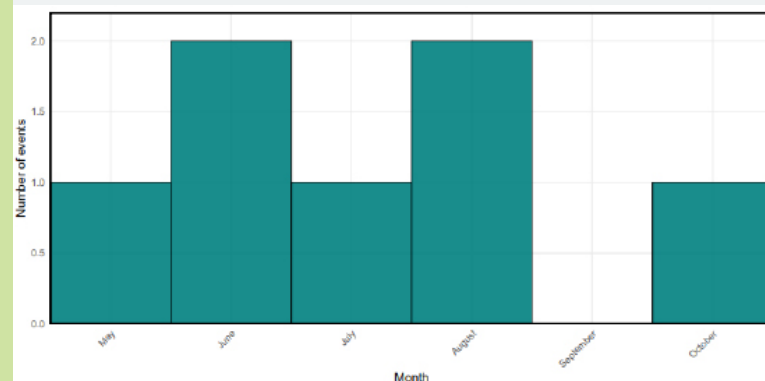
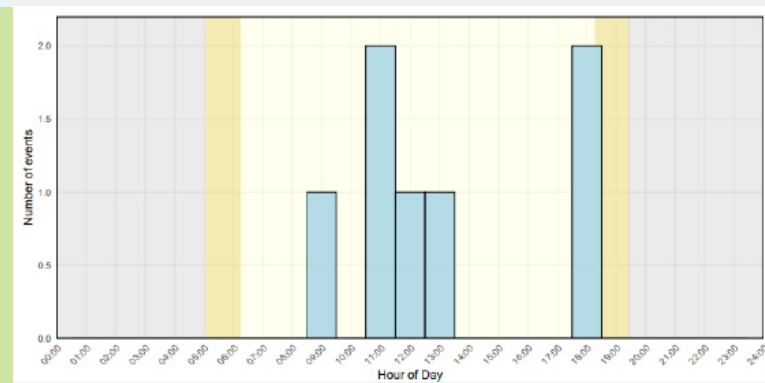
5

Deployments on which species was present

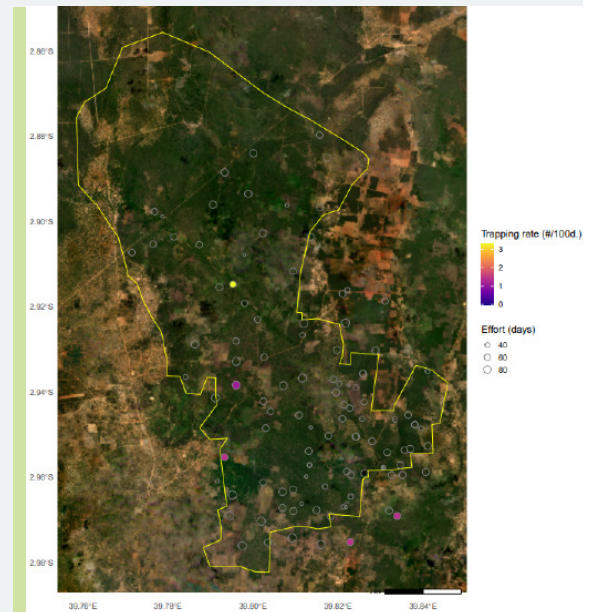
0.09

Trapping rate (#/100 days)

Activity



Presence map



Carnivora > Herpestidae > *Ichneumia albicauda*

White-tailed Mongoose

Local name: Kalakonje (Giriama)

- Most frequently detected mongoose species, occurring in approximately 33% of deployments.
- The species was strongly nocturnal. Activity peaked during the long rains (March - June) and was unexpectedly low during the short rains (October - November).
- Detections were widespread across the study area. The species is known to be common throughout Kenya.
- The pronounced seasonality in activity may reflect prey availability or shifts in habitat use linked to rainfall patterns.



61

Independent events

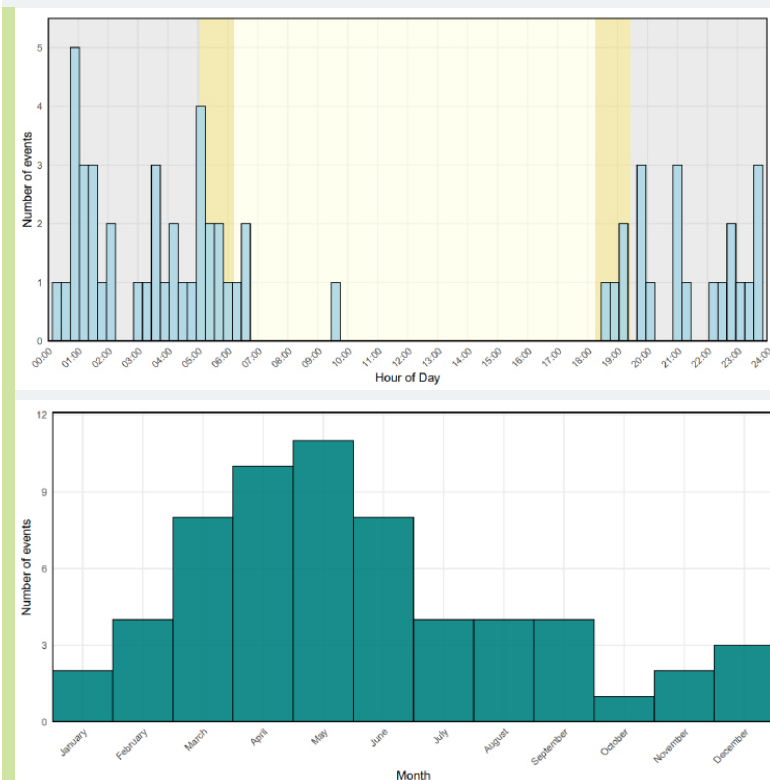
36

Deployments on which species was present

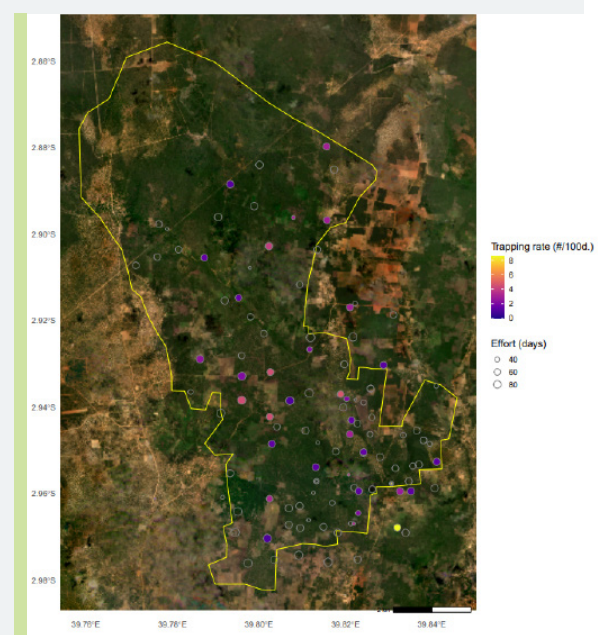
0.9

Trapping rate (#/100 days)

Activity



Presence map



Carnivora > Hyaenidae > *Crocuta crocuta*

Spotted Hyaena

Local names: Fisi (Giriama), Fisi (Kiswahili)

- Recorded infrequently, suggesting low abundance within the reserve.
- All detections occurred at night.
- Two detections on the same night (15 October 2019), recorded at 19:53 and 21:12 on separate camera traps, indicate movement of approximately 3.05 km within 1 hour and 20 minutes. The species was subsequently recorded twice at a nearby deployment three months later, with individuals moving in opposite directions. Spotted Hyaena is common in Boni-Dodori Reserve but has been reported only once from Arabuko-Sokoke Forest.
- The records suggest occasional use of the reserve, likely by individuals ranging from the adjacent Galana Ranch, rather than a resident population.



4

Independent events

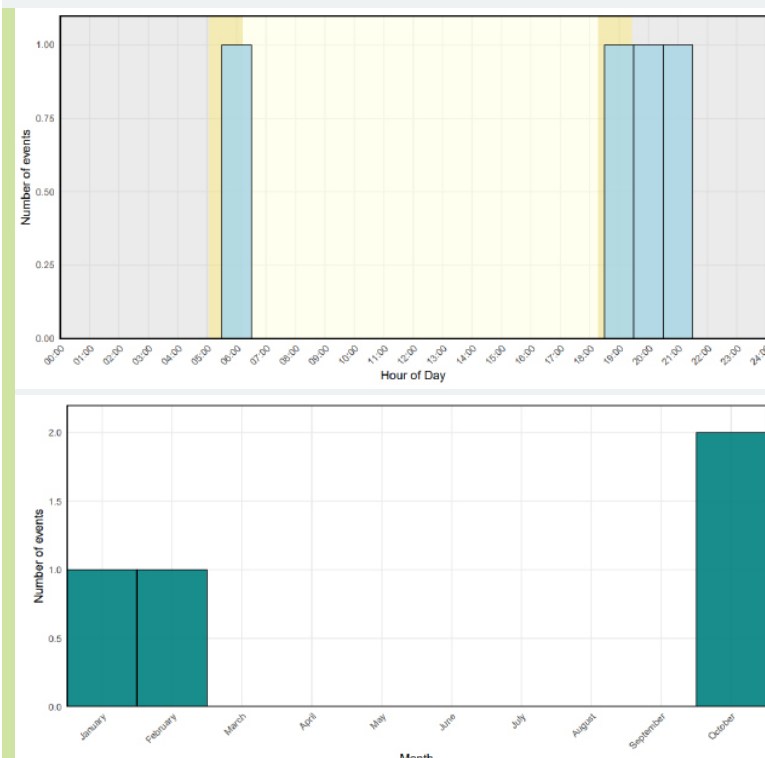
4

Deployments on which species was present

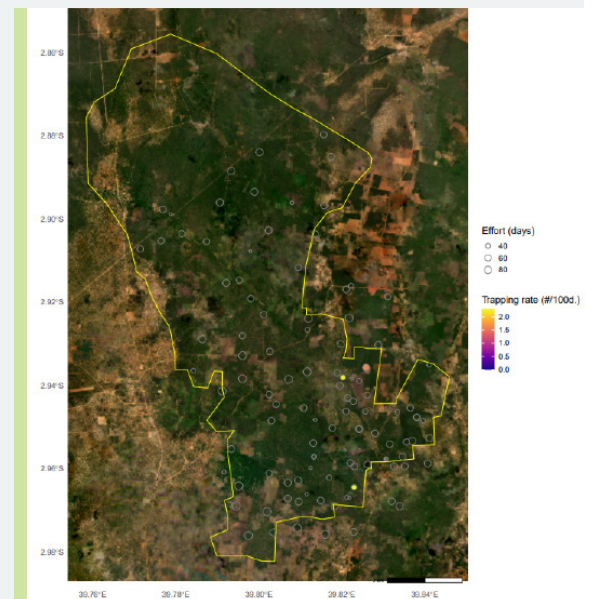
0.06

Trapping rate (#/100 days)

Activity



Presence map



Carnivora > Mustelidae > Mellivora capensis

Honey Badger

Local name: Kanyegere (“the stubborn one” in Giriama)

- Recorded at multiple sites and appeared relatively evenly distributed across the surveyed area.
- Most detections occurred at night.
- The nocturnal bias closely matches patterns observed in Arabuko-Sokoke Forest. In contrast, activity in the more remote Boni-Dodori Reserve is less strictly nocturnal.
- The stronger nocturnal activity in Dakatcha Woodland may reflect avoidance of human disturbance, suggesting behavioural flexibility in response to local pressures.



18

Independent events

16

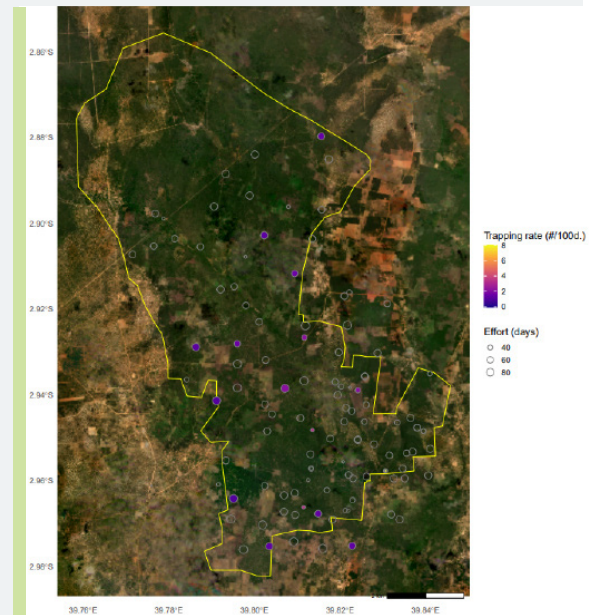
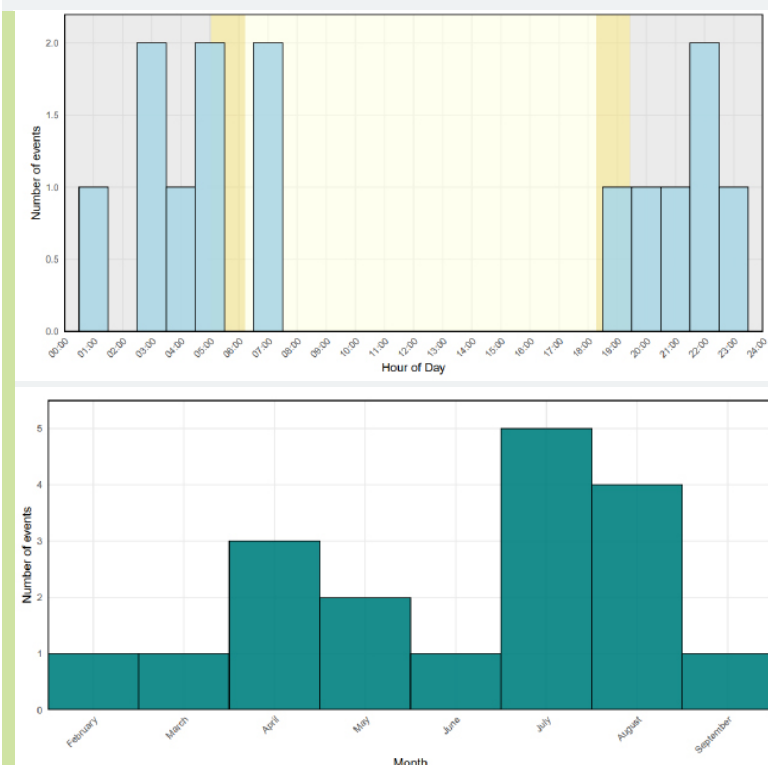
Deployments on which species was present

0.27

Trapping rate (#/100 days)

Activity

Presence map



Carnivora > Viverridae > *Civettictis civetta*

African Civet

Local name: Fungo (Giriama)

- Relatively common and recorded across much of the surveyed area, with higher detection frequency in the southern half of the reserve where forest cover is denser.
- Strongly nocturnal.
- Most detections occurred during the long rains between April and June.
- Seasonal peaks in activity likely reflect increased prey availability and favourable foraging conditions during wetter periods.



41

Independent events

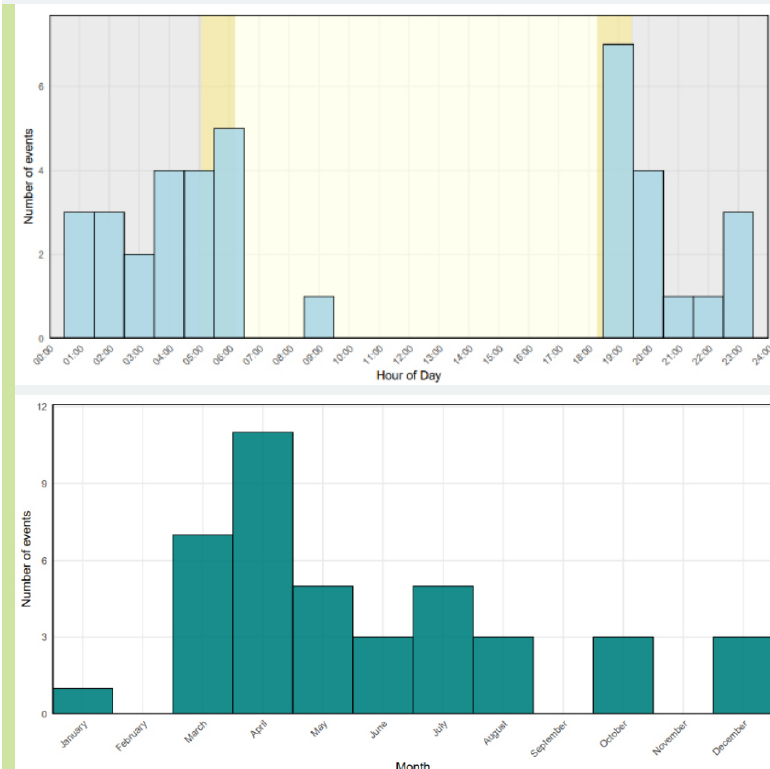
25

Deployments on which species was present

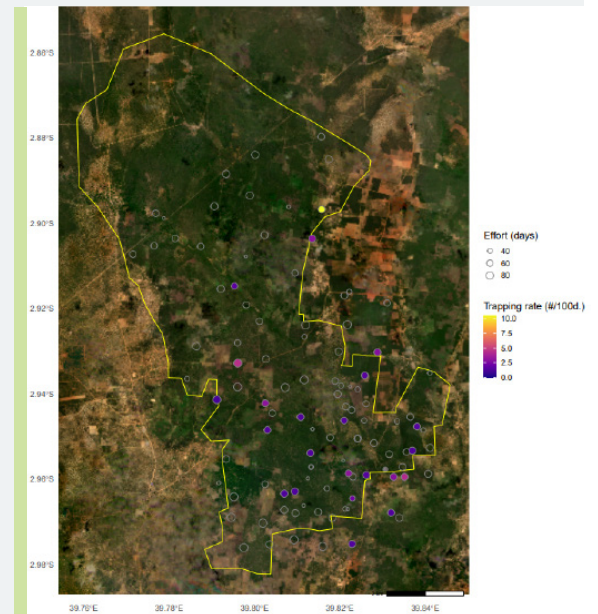
0.6

Trapping rate (#/100 days)

Activity



Presence map



Carnivora > Viverridae > Genetta maculata

Large-spotted Genet

Local names: Monzo (Giriama), Kadzonzo (Kiswahili)

- The most frequently recorded small carnivore and widespread throughout the reserve.
- Activity predominantly nocturnal.
- Detection rates lower between December and April, corresponding to the hottest and driest period of the year.
- Species identification was not always certain, and the presence of Common Genet cannot be fully excluded. One individual was recorded with an apparent injury to the left eye.



166

Independent events

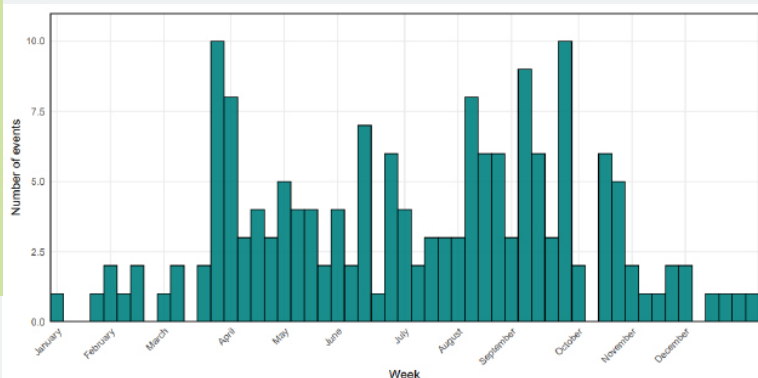
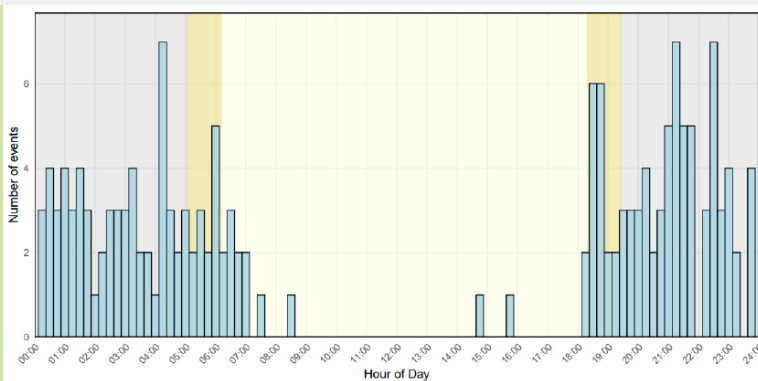
61

Deployments on which species was present

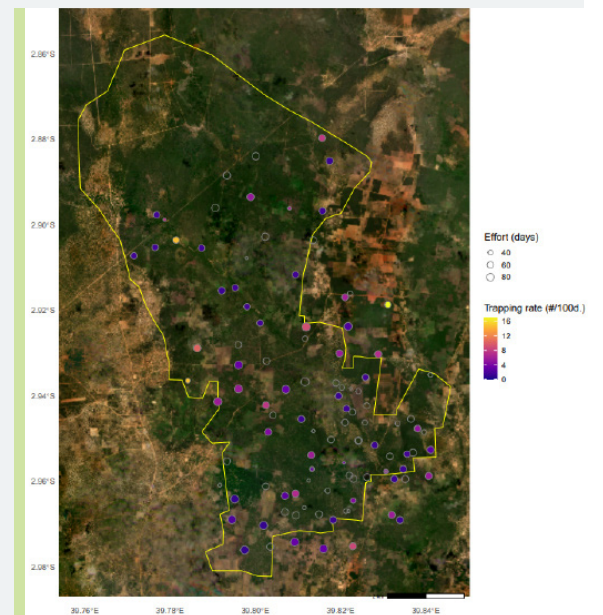
2.45

Trapping rate (#/100 days)

Activity



Presence map



Cetartiodactyla > Bovidae > Cephalophus harveyi

Harvey's Duiker

- The second most frequently recorded bovid after Suni, despite being heavily targeted by local hunters.
- Activity peaked at dawn and dusk and extended into the mid-morning hours.
- Records were distributed across the reserve.
- A direct interaction with Egyptian Mongoose was captured on camera.



80

Independent events

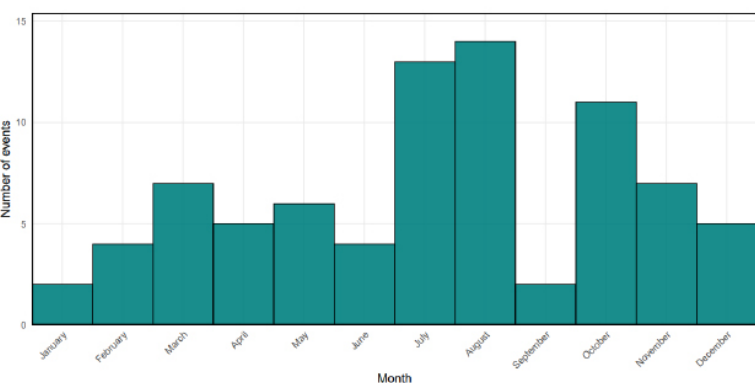
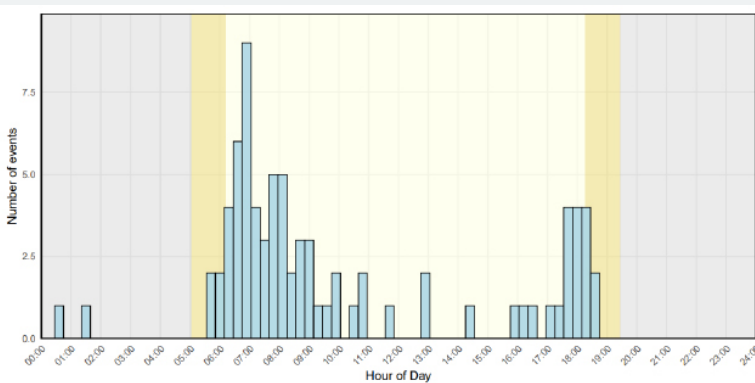
37

Deployments on which species was present

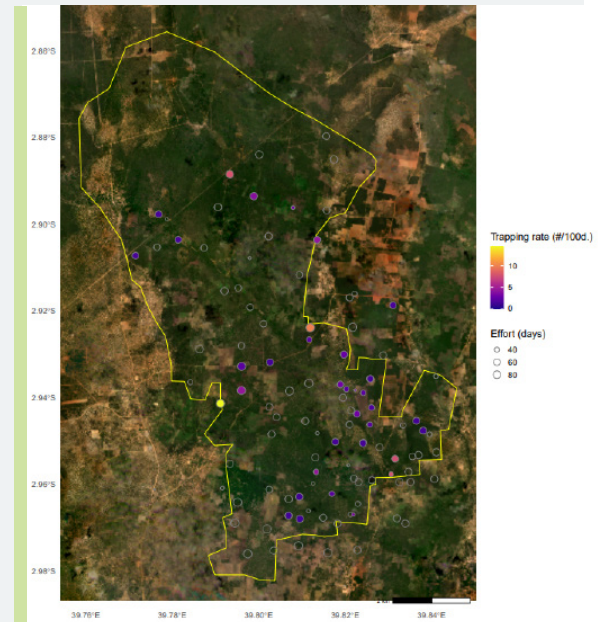
1.18

Trapping rate (#/100 days)

Activity



Presence map



Cetartiodactyla > Bovidae > Madoqua kirkii

Kirk's Dik-dik

- A relatively abundant species but detections were spatially restricted to the outer margins of the study area.
- Strictly diurnal.
- All records occurred outside the core forest block.
- This spatial pattern is consistent with the species' association with open coastal scrub rather than closed-canopy forest.
- Also referred to as Naivasha Dik-dik *Madoqua cavendishi*



66

Independent events

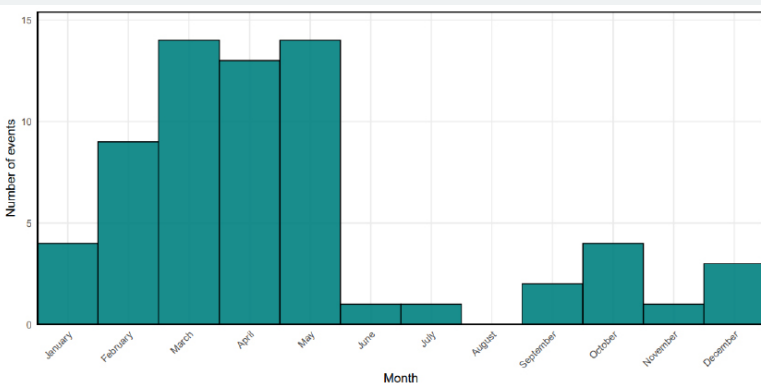
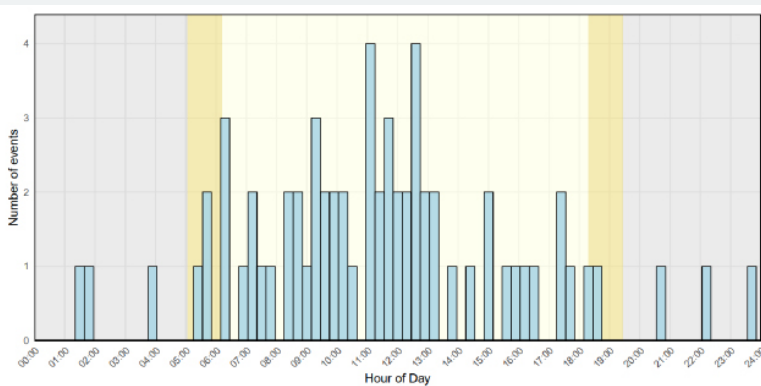
14

Deployments on which species was present

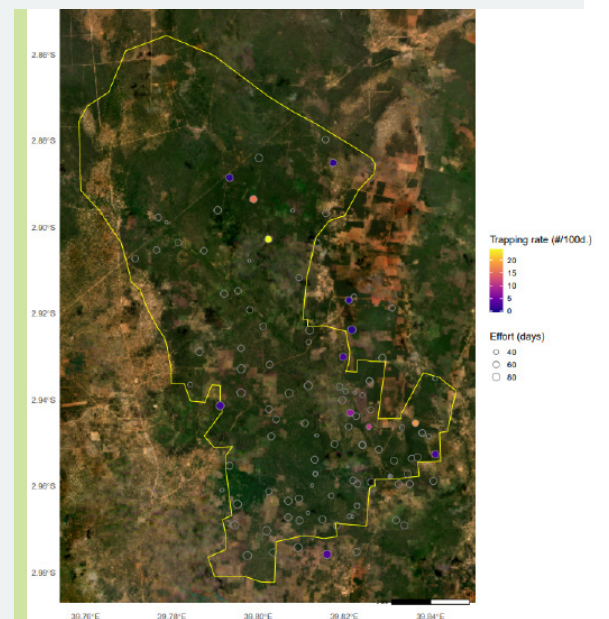
0.97

Trapping rate (#/100 days)

Activity



Presence map



Cetartiodactyla > Bovidae > Nesotragus moschatus

Suni

Local name: Kapala (Giriama)

- The most frequently recorded species in the survey, detected on 97% of deployments.
- Activity peaked at dawn, with a smaller secondary peak at dusk.
- Abundance was comparable to that reported from Arabuko-Sokoke Forest.
- Although often considered forest-associated, detections suggest a strong link to coastal scrub habitats; in Boni-Dodori Reserve the species was recorded only outside forest.



2326

Independent events

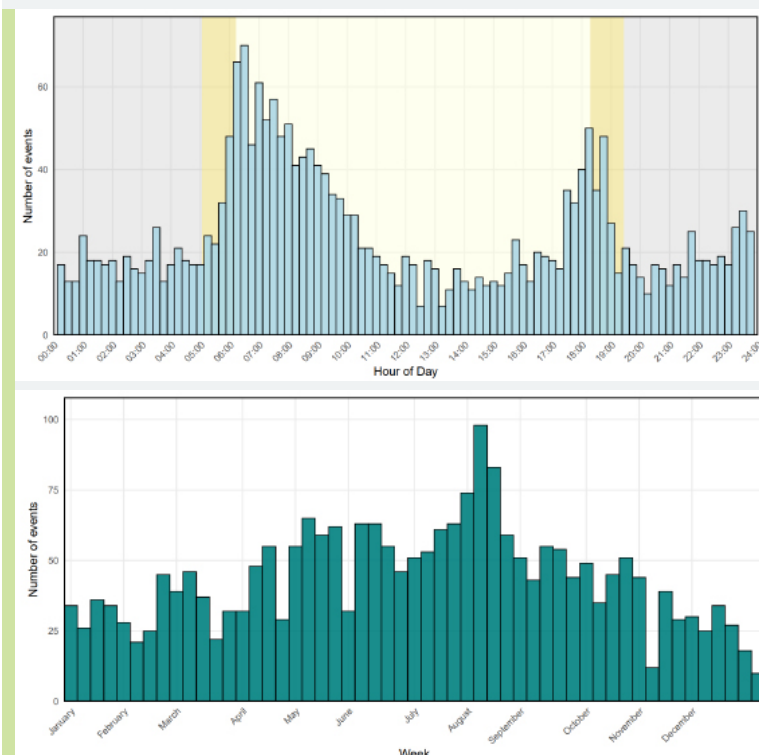
107

Deployments on which species was present

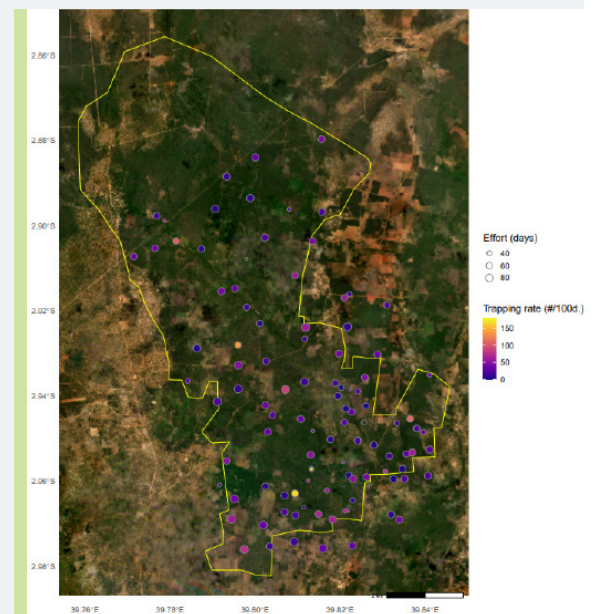
34.31

Trapping rate (#/100 days)

Activity



Presence map



Cetartiodactyla > Bovidae > Sylvicapra grimmia

Common Duiker

Local name: Kasa (Giriama)

- Recorded infrequently, with uncertain species-level identification.
- If correctly identified, the species appears more common in Dakatcha Woodland than in both Boni-Dodori Reserve and Arabuko-Sokoke Forest.
- Further targeted surveys or higher-resolution imagery are required to confirm identification and assess status.



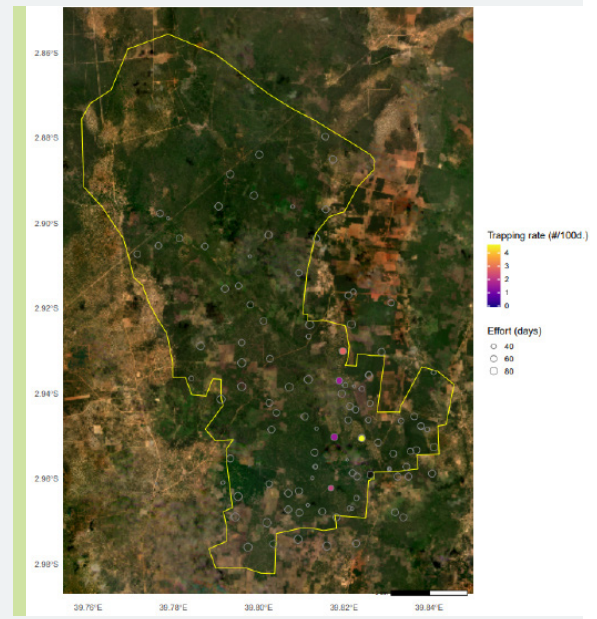
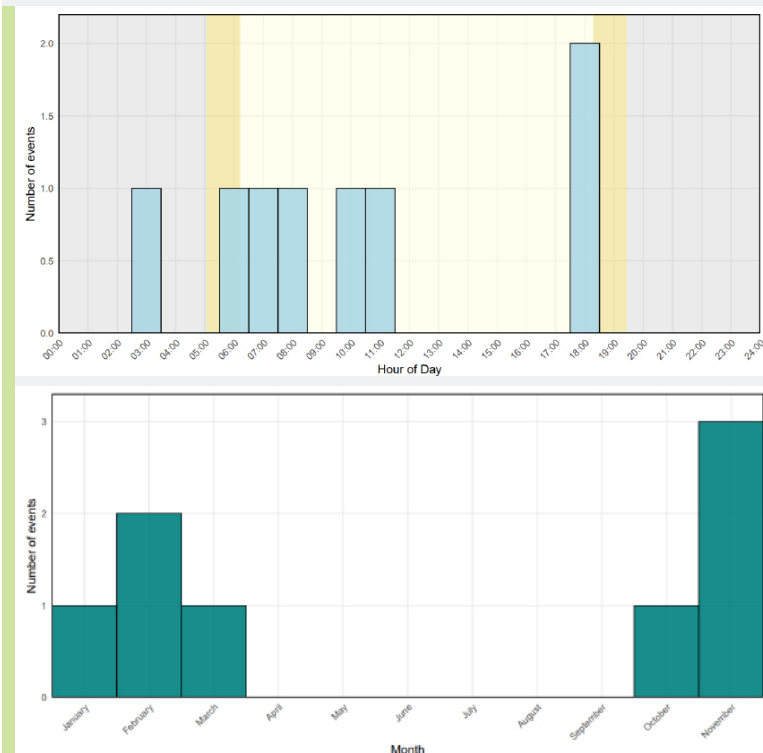
8
Independent events

5
Deployments on which species was present

0.12
Trapping rate (#/100 days)

Activity

Presence map



Cetartiodactyla > Bovidae > Tragelaphus scriptus

Bushbuck

Local names: Mbala for females and Khulungu for males (Giriama)

- Widespread across the reserve.
- Recorded during both daytime and night-time hours.
- Detections were spatially dispersed across habitat types.
- A nocturnal interaction with a Large-spotted Genet was recorded.



58

Independent events

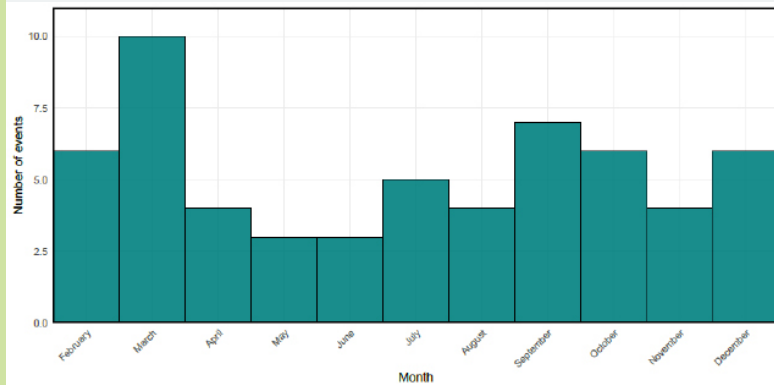
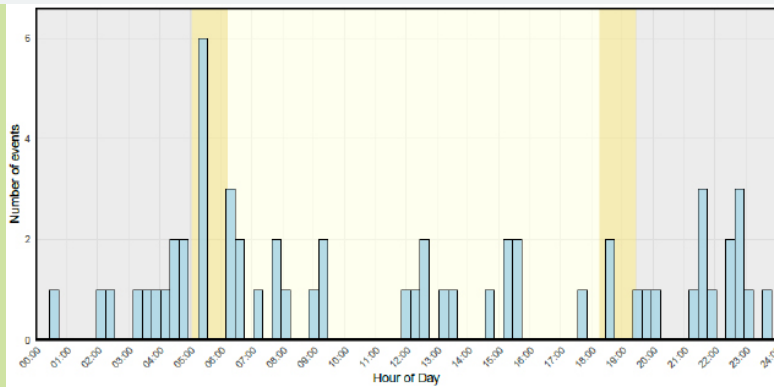
21

Deployments on which species was present

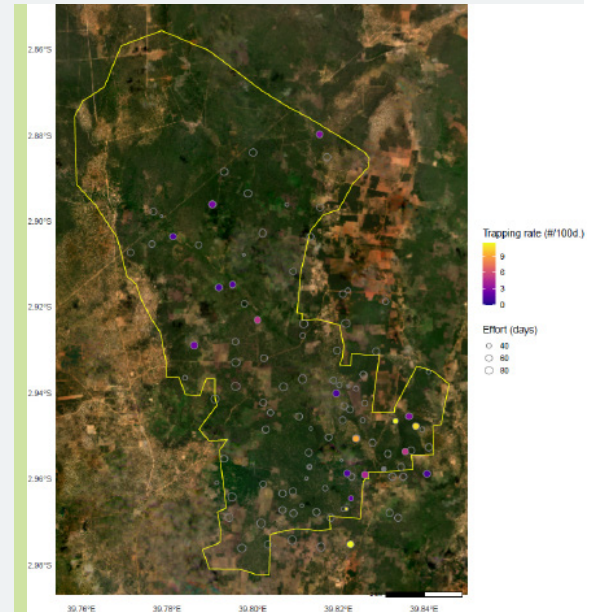
0.86

Trapping rate (#/100 days)

Activity



Presence map



Cetartiodactyla > Suidae > Potamochoerus larvatus

Bushpig

Local name: Nguluwe (Giriama)

- Recorded regularly across the study area.
- Activity was limited to night-time and crepuscular periods in the early morning and late afternoon.
- Spatial use appeared broad, though detections were fewer than in Boni-Dodori Reserve.
- Individuals were often recorded in small groups, consistent with the species' social behaviour.



55

Independent events

36

Deployments on which species was present

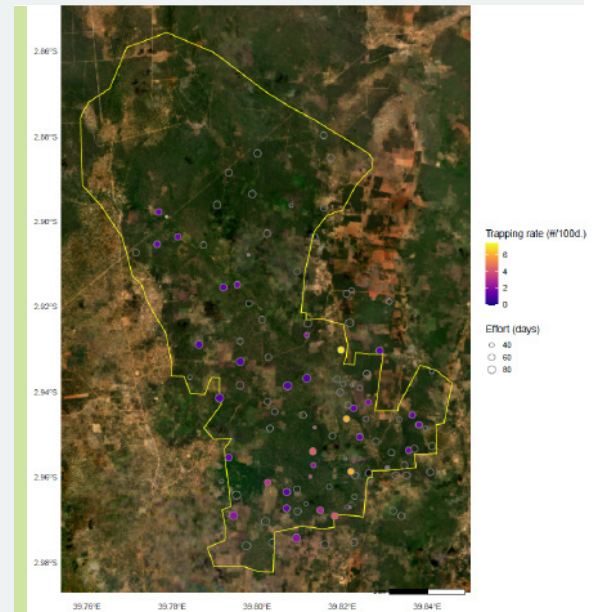
0.81

Trapping rate (#/100 days)

Activity



Presence map



Lagomorpha > Leporidae > Lepus capensis

Cape Hare

Local name: Katsungula Iwanda (Giriama)

- A single detection was recorded on 8 April 2022.
- Specimens of this species are almost indistinguishable from those of *L. victoriae*, and the two species are parapatric or sympatric across parts of Kenya (Kingdon et al., 2013). However, based on the known distributions of the two species (Drew et al., 2008) and their habitat preferences (*L. victoriae* is absent from the Kenyan coast and the arid regions of eastern and northern Kenya) the individual is most likely a Cape Hare.
- Ongoing deforestation and bush clearance may facilitate future expansion of this open-habitat species.



1

Independent event

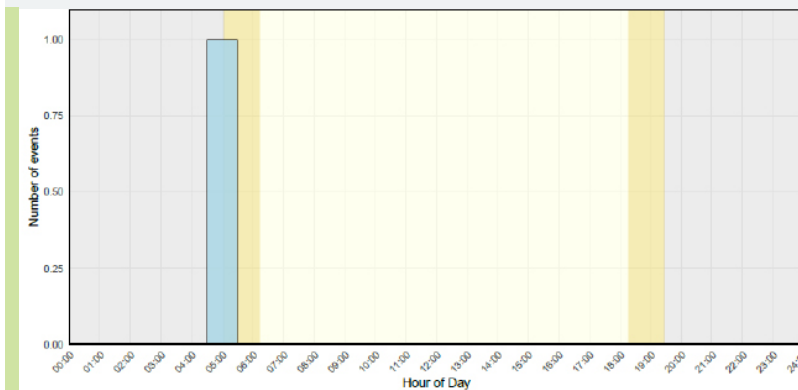
1

Deployment on which species was present

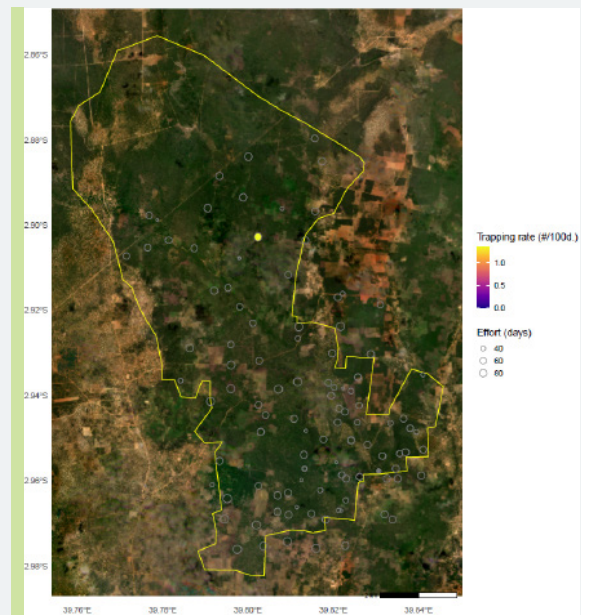
0.01

Trapping rate (#/100 days)

Activity



Presence map



Macroscelidea > Macroscelididae > Petrodromus tetradactylus

Four-toed Sengi

Local name: Tsanje (Giriama)

- The second most frequently recorded species after Suni.
- Predominantly nocturnal, with a marked increase in activity at dusk; only two records were obtained in full daylight.
- Detections were widespread across the reserve.
- Records are assumed to represent Four-toed Sengi based on habitat, although Rufous Sengi could not be confidently excluded.



829

Independent events

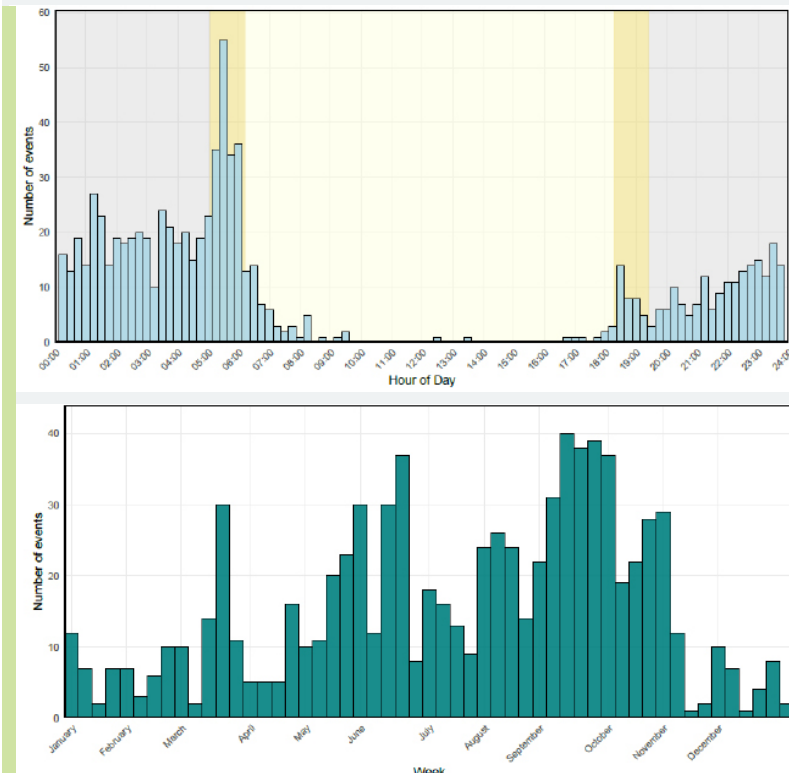
62

Deployments on which species was present

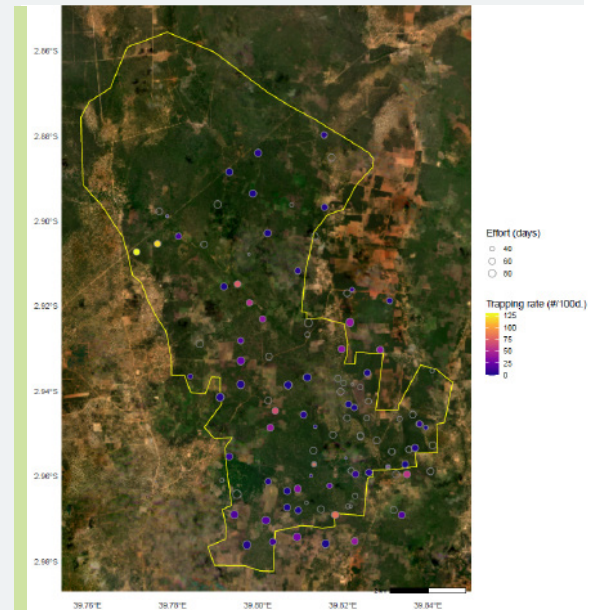
12.23

Trapping rate (#/100 days)

Activity



Presence map



Macroscelidea > Macroscelididae > *Rhynchocyon chrysopygusvula*

Golden-rumped Sengi

Local name: Fugu (Giriama)

- Recorded frequently and widespread throughout the woodland.
- Activity showed a clear peak after dawn and remained high throughout the day, with no nocturnal records.
- The strongly diurnal pattern contrasts sharply with that of Four-toed Sengi, reducing the likelihood of confusion between the two species.



268

Independent events

51

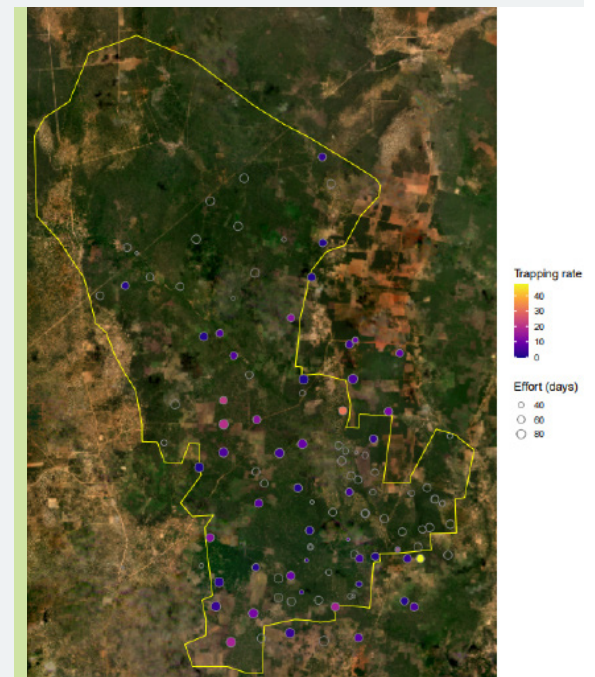
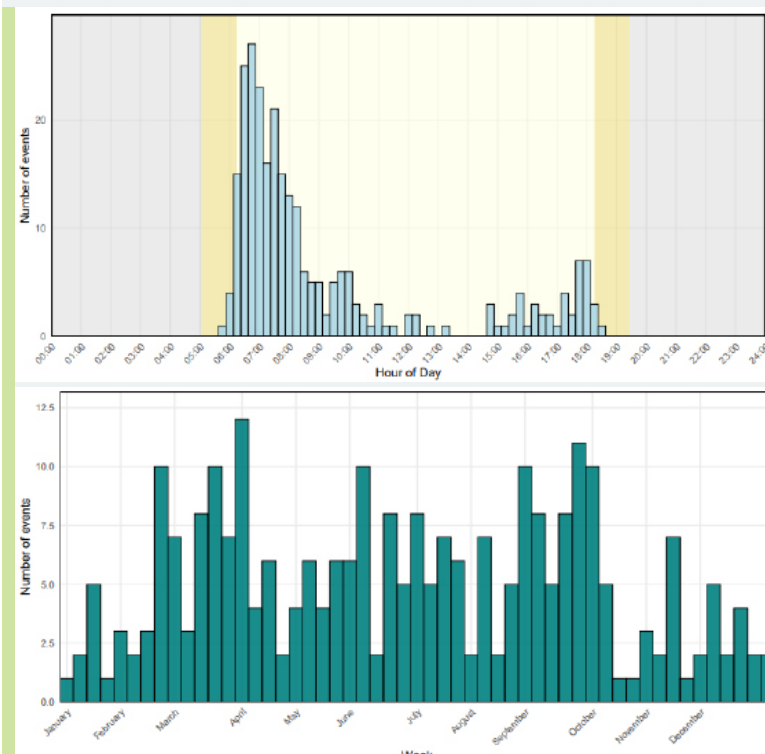
Deployments on which species was present

3.95

Trapping rate (#/100 days)

Activity

Presence map



Primates > Cercopithecidae > Cercopithecus mitis

Blue Monkey

Also called Sykes's Monkey. Local name: Kima (Giriama)

- Recorded regularly across the study area.
- Strictly diurnal activity pattern.
- Detections were associated with forested habitats.
- Previous work assigned different subspecies to Boni-Dodori Reserve (*albotorquatus*, Vulnerable) and Arabuko-Sokoke Forest (*albobularis*). In Arabuko-Sokoke Forest, the species is strongly associated with *Cynometra* forest.



69

Independent events

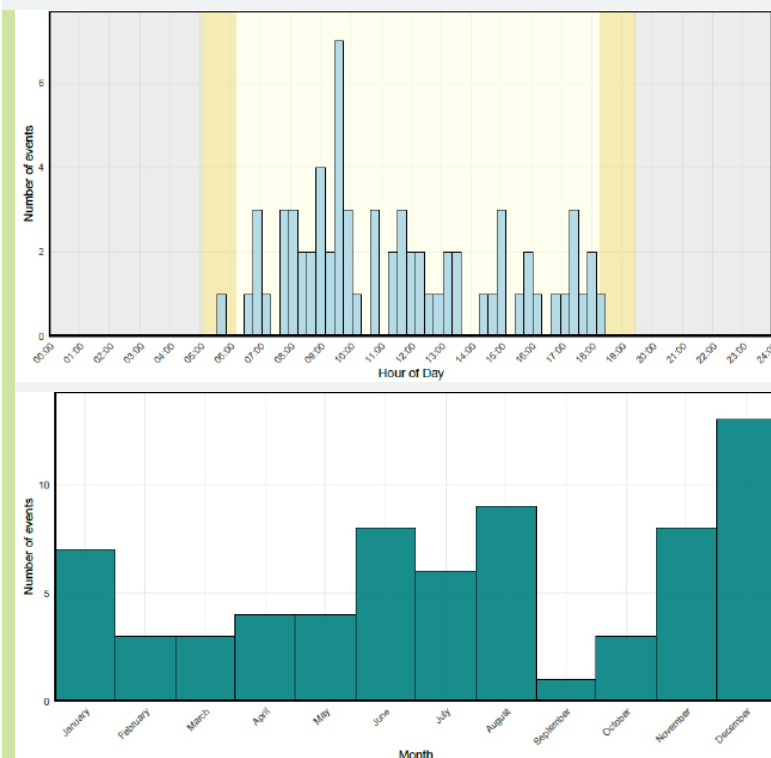
31

Deployments on which species was present

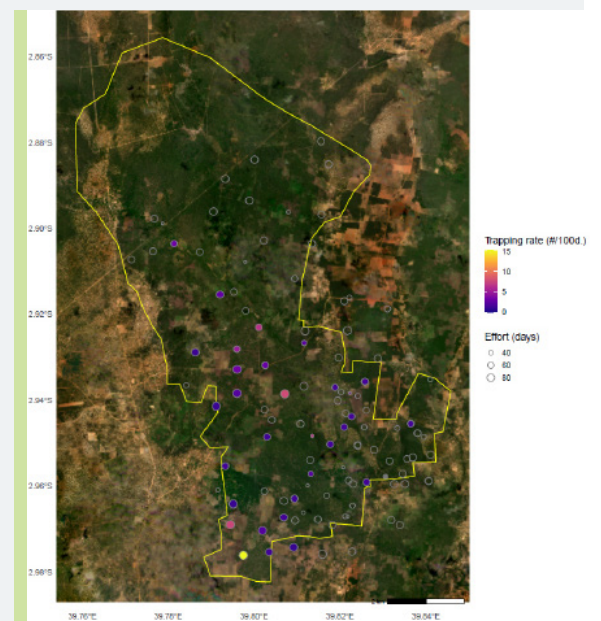
1.02

Trapping rate (#/100 days)

Activity



Presence map



Primates > Cercopithecidae > *Chlorocebus pygerythrus*

Vervet Monkey

Local name: Tsalu (Kiswahili)

- Recorded infrequently within the reserve.
- Strictly diurnal.
- Detections were almost entirely absent between September and February.
- The species was recorded regularly along the coastal edge of Boni-Dodori Reserve, where habitat is more open, but was not recorded in Arabuko-Sokoke Forest.



38

Independent events

23

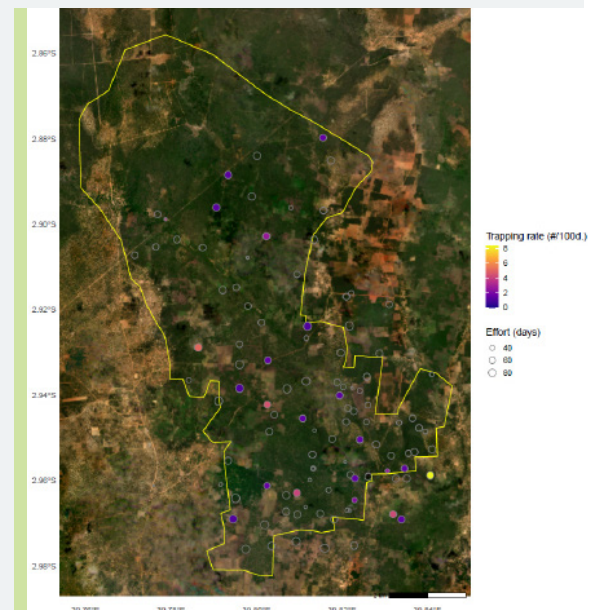
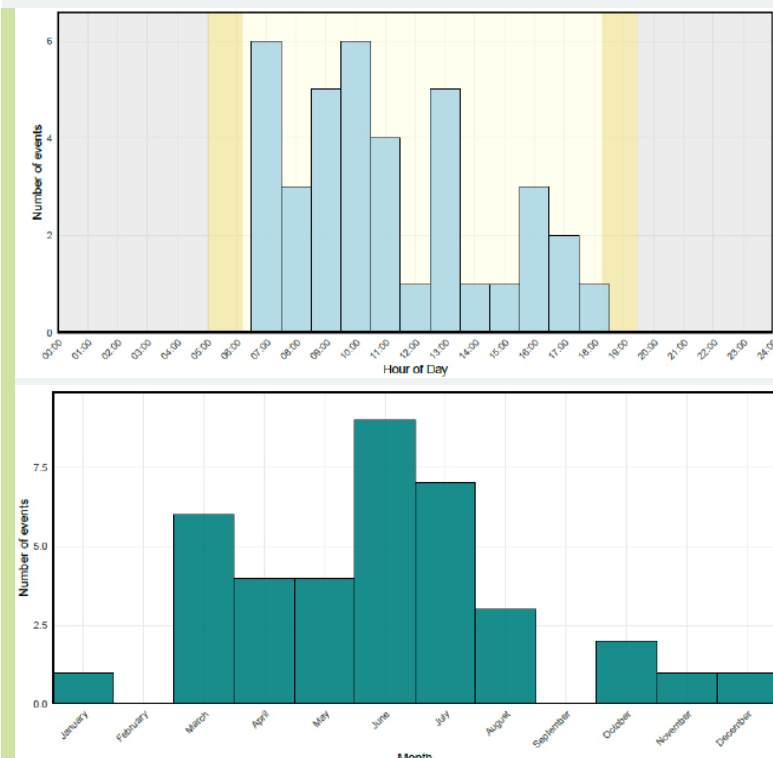
Deployments on which species was present

0.56

Trapping rate (#/100 days)

Activity

Presence map



Primates > Cercopithecidae > *Papio cynocephalus*

Yellow Baboon

Local name: Kima (Kiswahili)

- Recorded regularly and often in large groups.
- Strictly diurnal activity pattern.
- The species is typically associated with *Brachystegia* woodland, consistent with published accounts.



37

Independent events

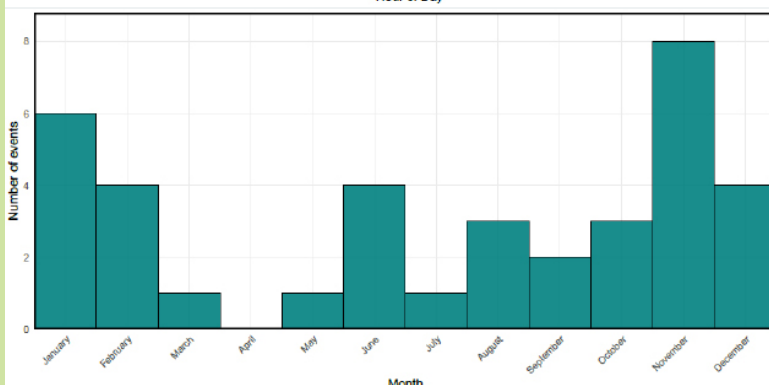
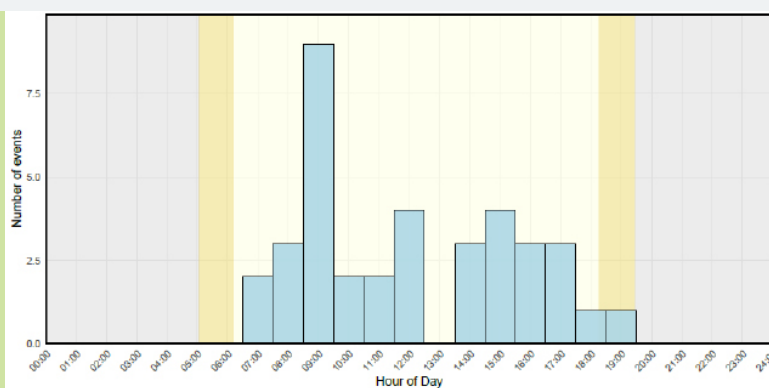
17

Deployments on which species was present

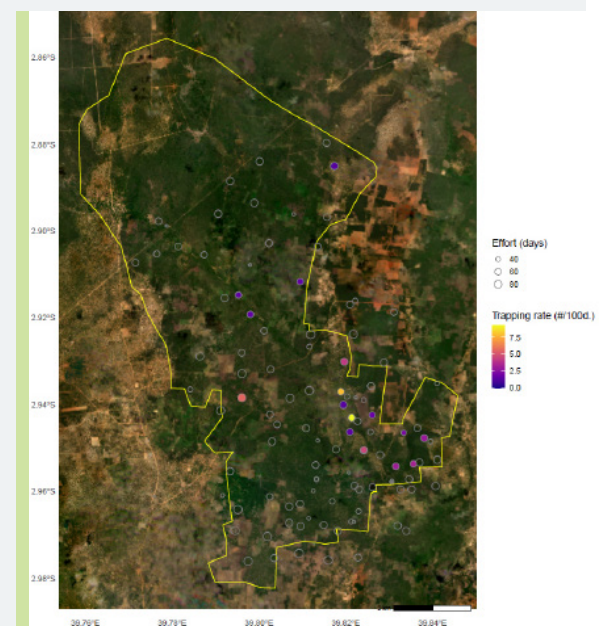
0.55

Trapping rate (#/100 days)

Activity



Presence map



Primates > Galagidae > Galagidae sp.

Lesser/Kenya Coast Galago

Local name: Kadzina (Kiswahili)

- Identification remains uncertain; Likely either Kenya Coast Galago *Paragalago cocos* or Northern Lesser Galago *Galago senegalensis*.
- Recorded occasionally.
- Strictly nocturnal and arboreal, as expected for galagos.
- Activity was most frequently recorded during July and August.
- Increased ground-level detections during mid-year months may reflect seasonal food availability.



23

Independent events

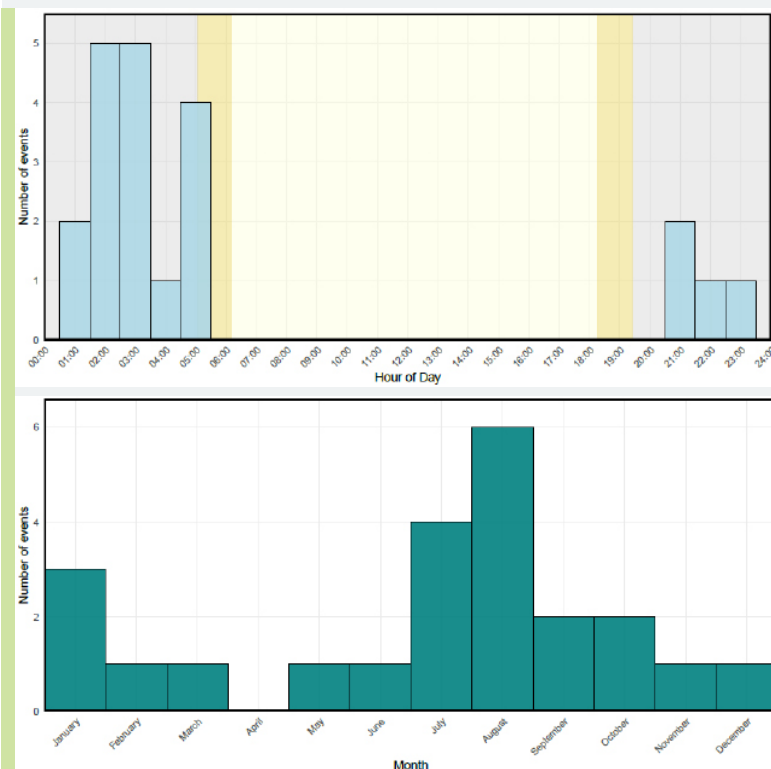
8

Deployments on which species was present

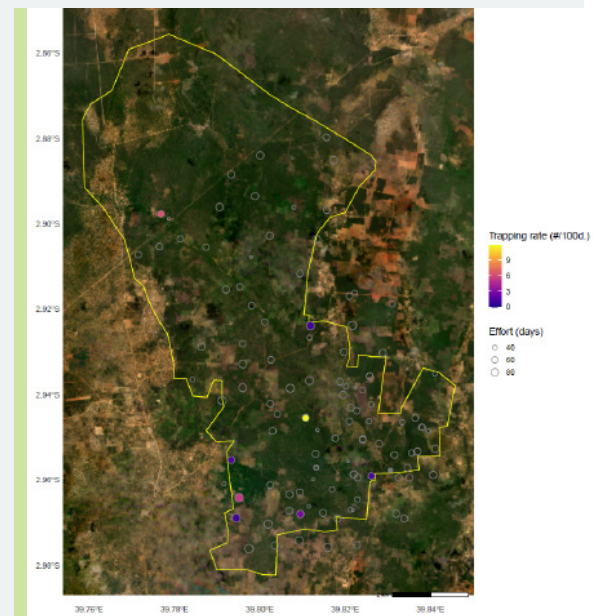
0.34

Trapping rate (#/100 days)

Activity



Presence map



Primates > Galagidae > *Otolemur garnettii*

Garnett's Greater Galago

Local name: Khomba (Kiswahili)

- Recorded infrequently across the study area.
- Strictly nocturnal activity pattern.
- Thick-tailed and Brown Greater Galagos (*Otolemur crassicaudatus*) were excluded based on known distribution ranges. Earlier surveys also suggested the presence of Garnett's Greater Galago in coastal *Brachystegia* habitats, although confirmation has been limited by image quality.



11

Independent events

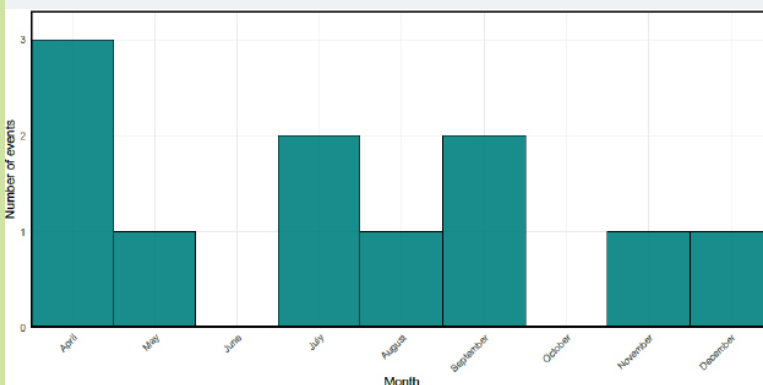
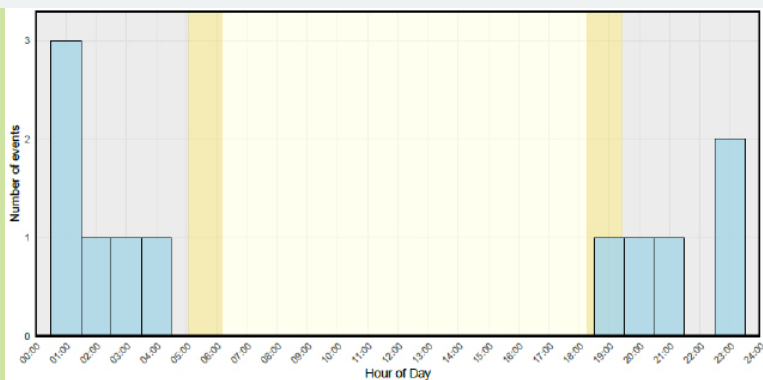
11

Deployments on which species was present

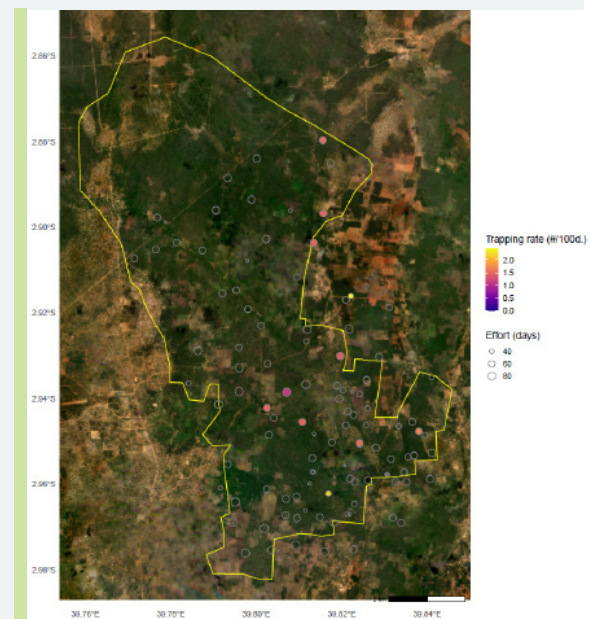
0.16

Trapping rate (#/100 days)

Activity



Presence map



Rodentia > Sciuridae > *Paraxerus ochraceus*

Ochre Bush Squirrel

Local name: Kavare (Kiswahili)

- Recorded regularly, widespread across the reserve.
- Strictly diurnal activity pattern.
- Most records could be confidently distinguished from Red Bush Squirrel. Although Zanj Sun Squirrel may occur in coastal forests, it could not be confidently identified in the images.



43

Independent events

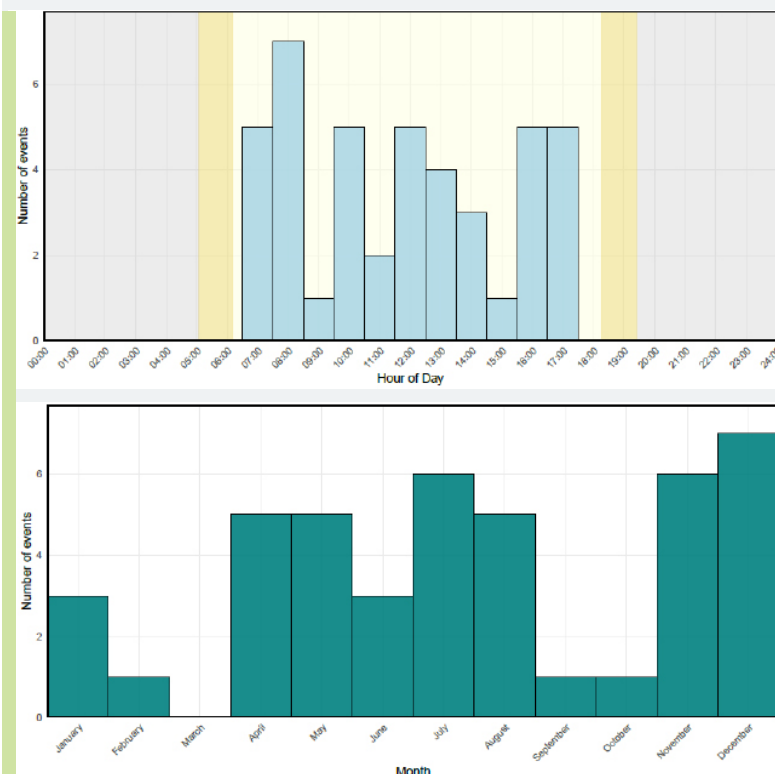
16

Deployments on which species was present

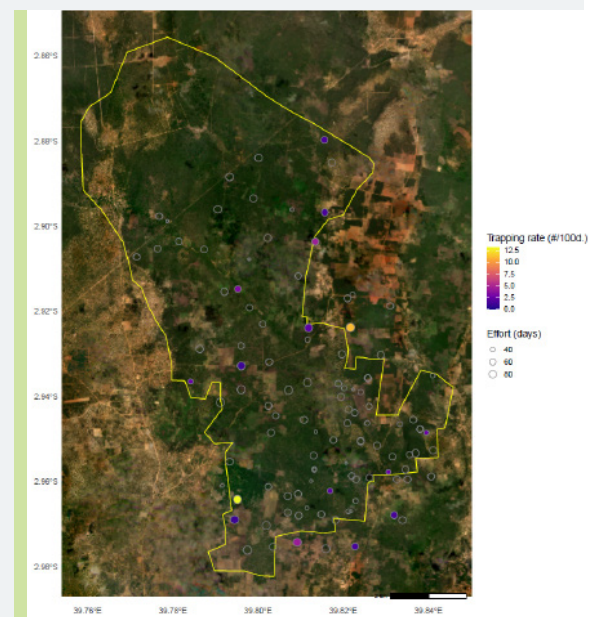
0.63

Trapping rate (#/100 days)

Activity



Presence map



Rodentia > Sciuridae > Paraxerus palliatus

Red Bush Squirrel

Local name: Kindi (Kiswahili)

- Recorded less frequently than Ochre Bush Squirrel.
- Strictly diurnal.
- Detections were more spatially dispersed than Ochre Bush Squirrel, mainly on higher ground along the eastern and western edges of the reserve.
- Likely more arboreal than Ochre Bush Squirrel and therefore less frequently detected by ground-based cameras. The species was also recorded in both Boni-Dodori Reserve and Arabuko-Sokoke Forest.



36

Independent events

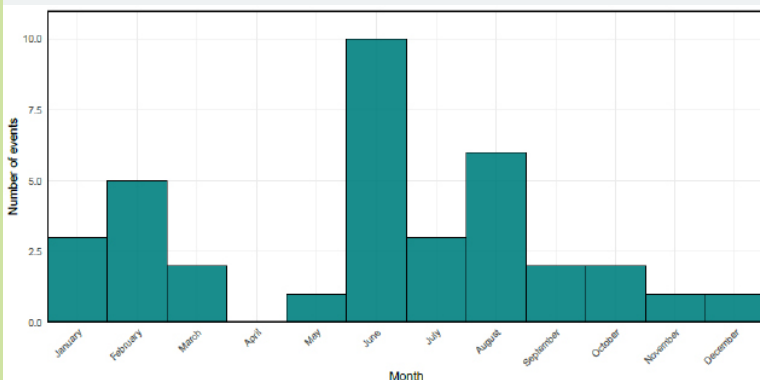
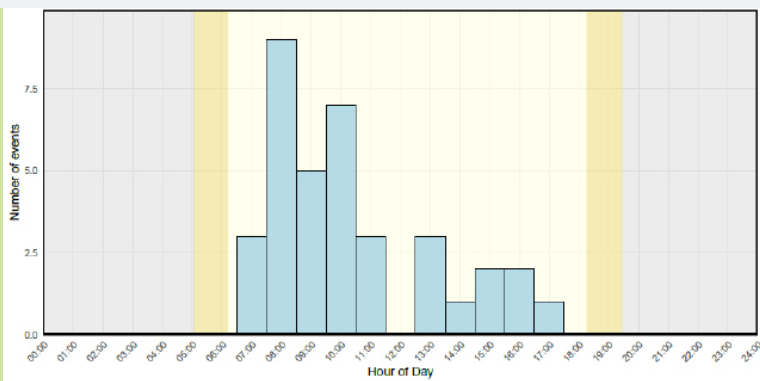
24

Deployments on which species was present

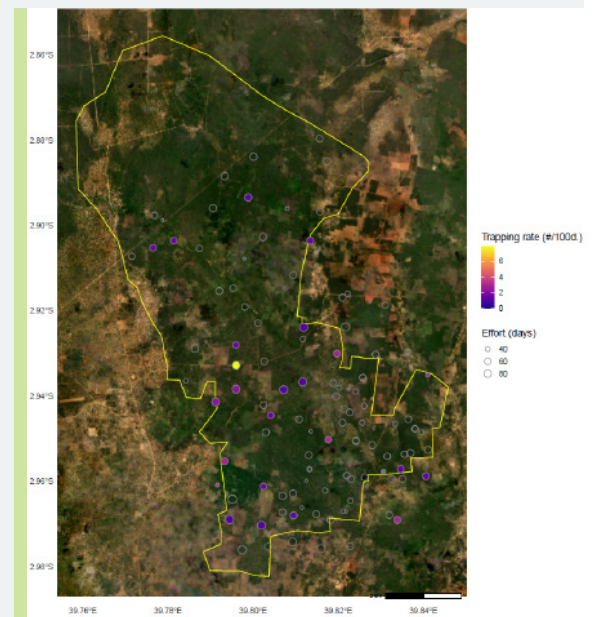
0.53

Trapping rate (#/100 days)

Activity



Presence map



Rodentia > Nesomyidae > *Cricetomys gambianus*

Gambian Rat

Local name: Khuhe (Kiswahili)

- Commonly recorded throughout the surveyed area.
- Strictly nocturnal activity pattern.
- Alternatively known as Southern Giant Pouch Rat *Cricetomys ansorgei*



136

Independent events

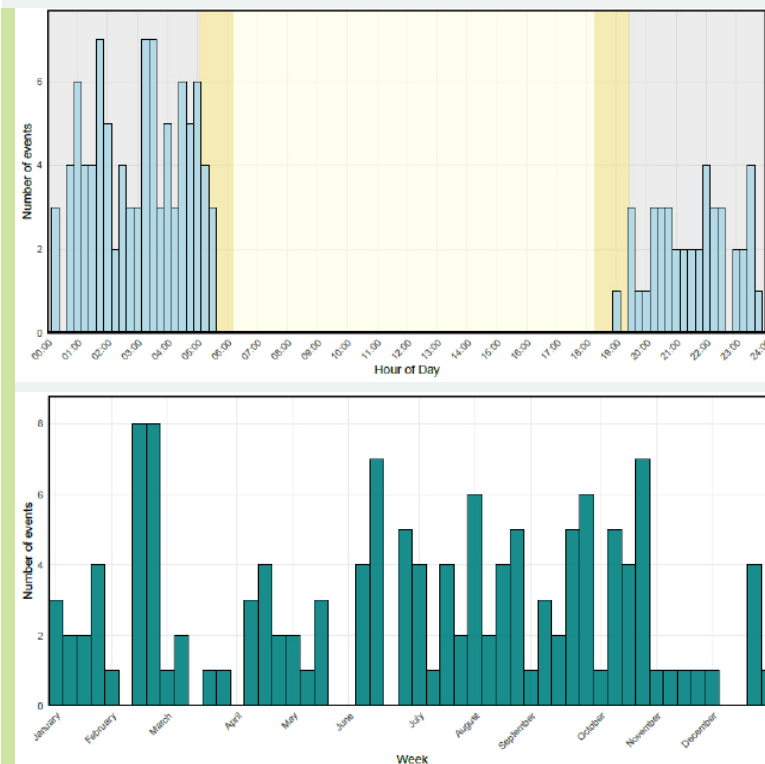
34

Deployments on which species was present

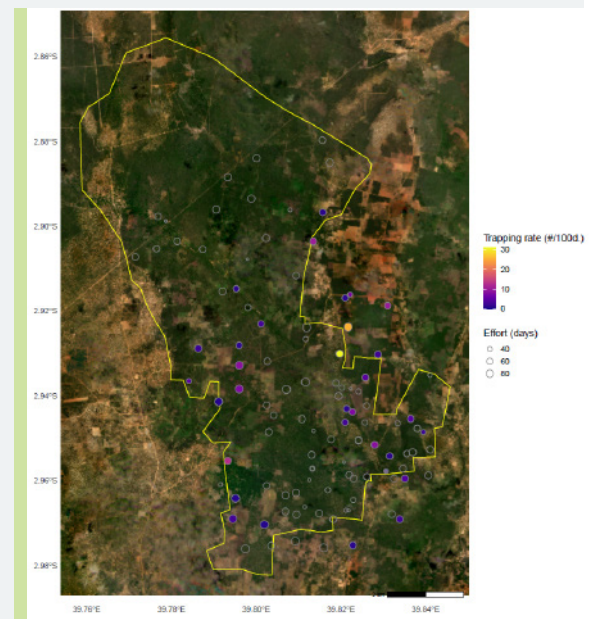
2.01

Trapping rate (#/100 days)

Activity



Presence map



Rodentia > Hystricidae > *Hystrix* sp.

Crested/Cape Porcupine

Local name: Nungu (Kiswahili)

- Recorded regularly across the reserve.
- Predominantly nocturnal, with a peak in activity around dawn.
- Either Crested and Cape Porcupine, which are sympatric and impossible to distinguish in camera trap images.
- Mating behaviour was recorded on 1 March 2021 at 22:39. Reduced detections in May may reflect periods when adults remain in burrows caring for young.



38

Independent events

20

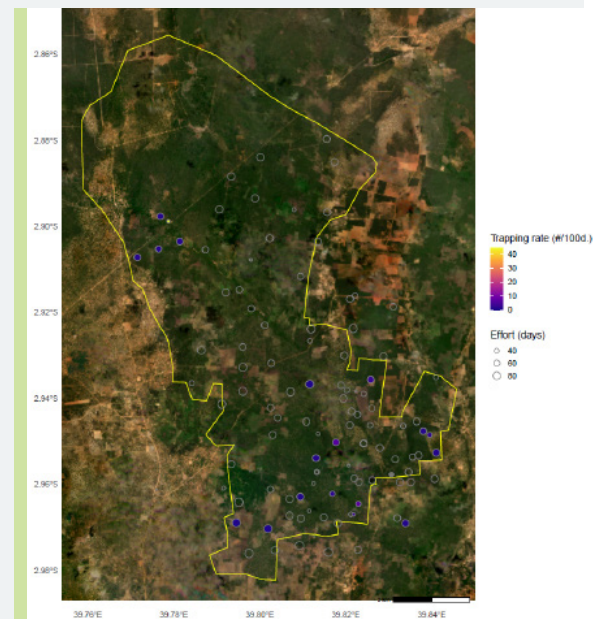
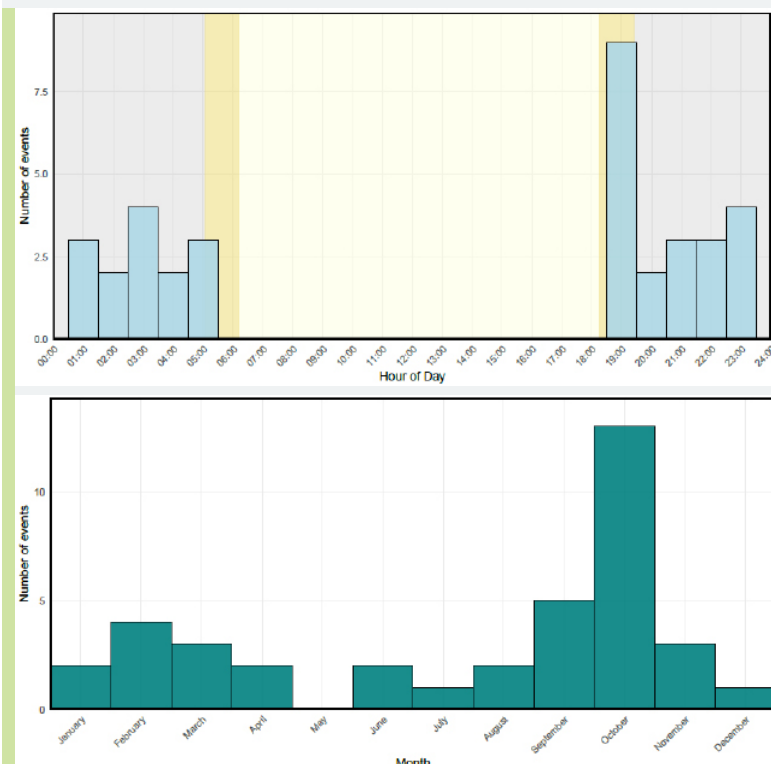
Deployments on which species was present

0.56

Trapping rate (#/100 days)

Activity

Presence map



Rodentia > Thryomyidae > *Thryonomys swinderianus*

Greater Cane Rat

Local name: Ngwerezi (Kiswahili)

- Uncommon within the study area, with six events recorded across two deployments. Records included solitary individuals, pairs, and one adult with two juveniles.
- Mostly nocturnal, with one daytime and one early-morning record.
- Identification was confirmed based on distribution and tail length relative to hindfoot.
- The species was not recorded in Boni-Dodori Reserve or Arabuko-Sokoke Forest and may represent the first confirmed record for the Kenyan coast.

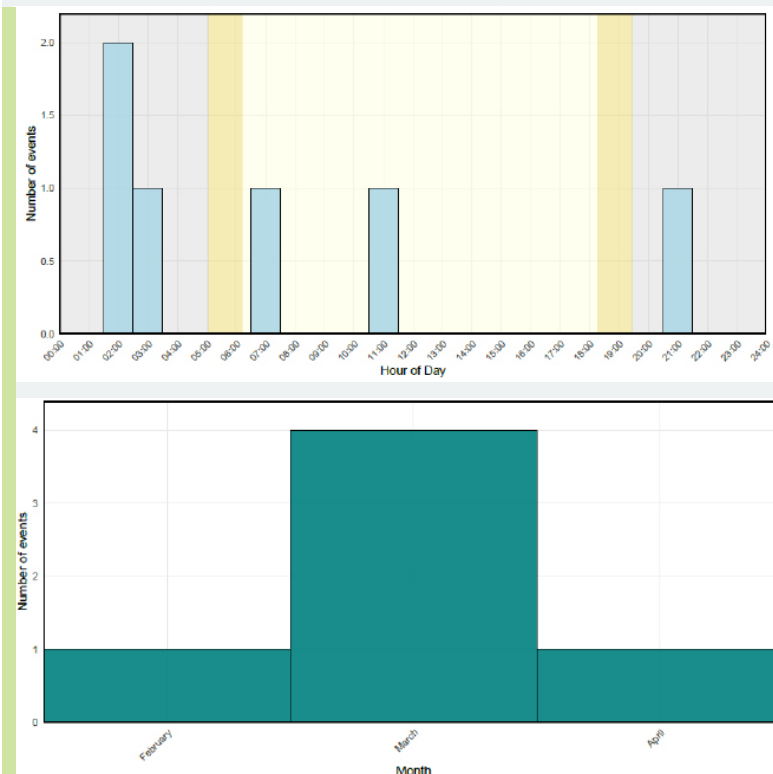


6
Independent events

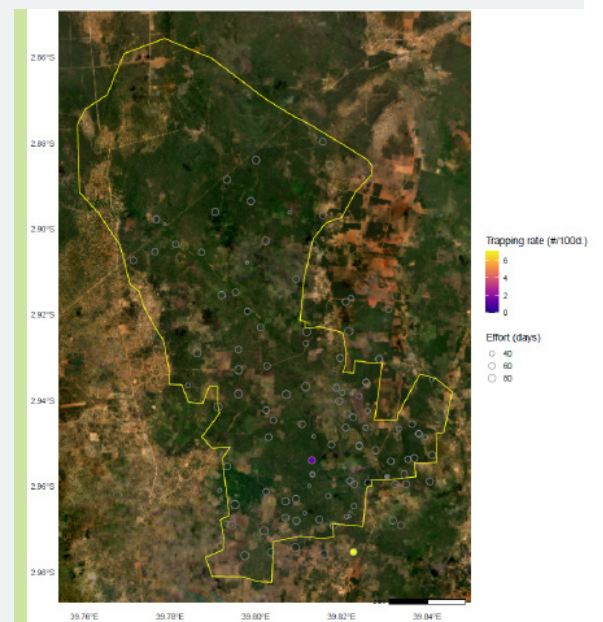
2
Deployments on which species was present

0.09
Trapping rate (#/100 days)

Activity



Presence map



Rodentia

Rodent

Local name: Thali (Kiswahili)

- Recorded frequently but could not be identified to species level due to poor image quality. The majority of pictures seem to indicate Gerbil (*Gerbilliscus*).
- Exclusively nocturnal.
- Detections increased during the main wet season and subsequent months (May - October).
- Records likely represent multiple species, but reliable taxonomic assignment was not possible.



226

Independent events

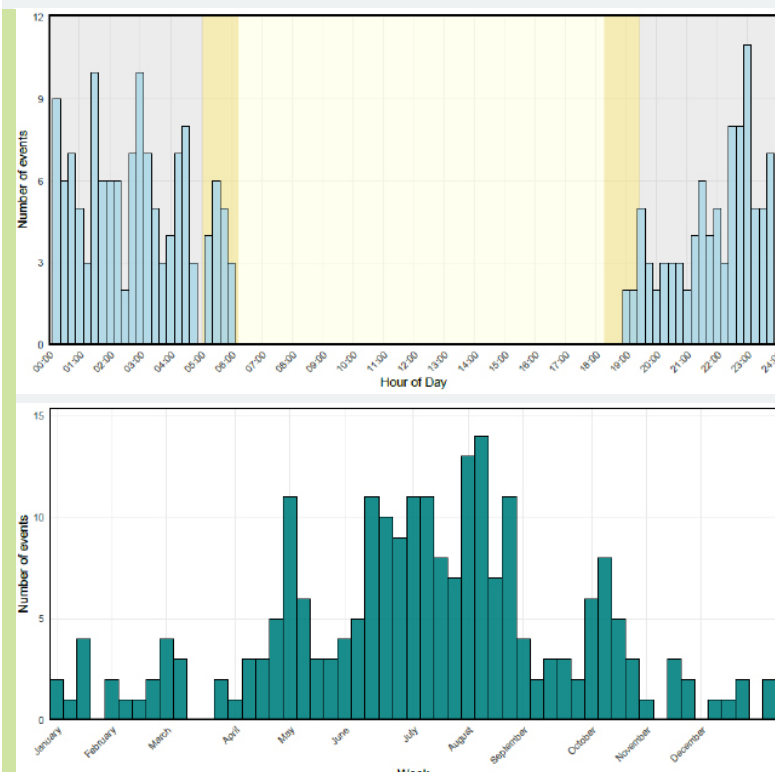
35

Deployments on which species was present

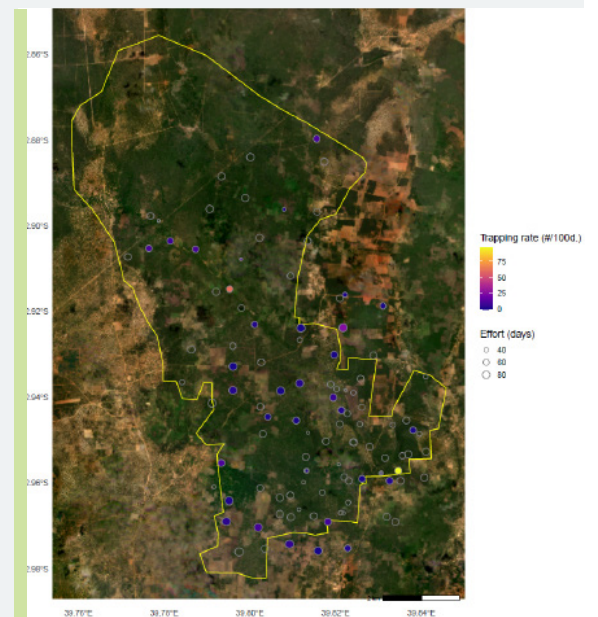
3.33

Trapping rate (#/100 days)

Activity



Presence map



Domestic species and human detections

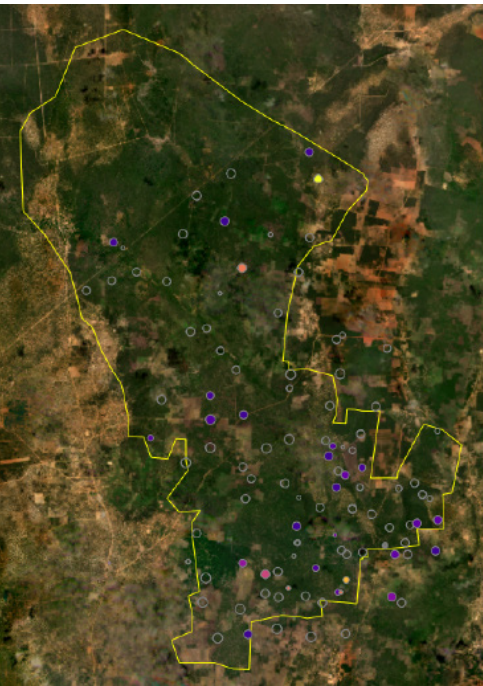


Figure 7. Map of human records.

A total of 187 independent events involving domestic animals or humans were recorded during the survey. Humans accounted for 72 events across 30 deployments, excluding camera trappers, and were detected throughout much of the surveyed area (Figure 7). Domestic animals accounted for the remaining 115 events (Table 2).

The widespread spatial distribution and frequency of these records indicate substantial human presence and associated disturbance within and around the surveyed area.

Name	# events	# deployments	Trapping rate
Human	72	30	1.06
Goat	57	15	0.84
Cattle	43	7	0.63
Dog	15	10	0.22

Table 2. Records of human disturbance, including both hunters and domestic animals.



Discussion

Note-worthy records



Golden-rumped Sengi

EN

This survey provided the **first photographic evidence** confirming the presence of the Endangered Golden-rumped Sengi (*Rhynchocyon chrysopygus*) in Dakatcha Woodland. Although the species was previously reported from the area by reported by FitzGibbon (1994), no verifiable photographic or specimen-based evidence had been available until now. Its occurrence in Dakatcha was anticipated, as the woodland contains habitat structurally similar to nearby Arabuko-Sokoke Forest, where the species occurs at high densities, especially in *Cynometra* forest (Amin et al., 2021; Ondoro et al., 2023).

Golden-rumped Sengi was the third most abundant species detected in the survey, with a camera trapping rate of 3.95 events per 100 trap days. However, this rate is substantially lower than those reported in the nearby Arabuko-Sokoke Forest (14-16 events per 100 trap days) and slightly lower than estimates in Boni-Dodori Reserve (5-8 events per 100 trap days). This discrepancy is most plausibly explained by higher levels of human disturbance and habitat degradation in Dakatcha Woodland, reinforcing the importance of effective protection for biodiversity-rich habitats. The species is classified as Endangered by the IUCN, primarily due to anthropogenic habitat degradation within its already restricted range, as well as subsistence hunting pressure (FitzGibbon and Rathbun, 2015).

African Leopard

VU

Although African Leopard remains relatively common further north in the Boni and Dodori National Reserves, this survey provides **the first evidence that the species is still present between Boni Dodori and Shimba Hills** in over 40 years. The detection suggests occasional use of Dakatcha Woodland by wide-ranging individuals rather than the presence of a resident population. The species has since been recorded twice in Arabuko-Sokoke Forest in 2022 and 2023 (Ochieng, 2023), indicating a possible broader re-occupation of coastal forest habitats. African Leopard is currently classified as Vulnerable by the IUCN due to ongoing threats including persecution, habitat fragmentation, and illegal wildlife trade (Stein et al., 2025).



Egyptian Mongoose and Greater Cane Rat

Both Egyptian Mongoose and Greater Cane Rat are widely distributed across sub-Saharan Africa and are reported in the literature as occurring along the Kenyan coast. However, this survey provides the first confirmed records of both species for the Kenyan coastal region. Their detection fills important gaps in the documented distribution of medium-sized mammals along the coast and highlights the value of systematic camera-trap surveys in under-sampled habitats. The presence of these species also suggests that, despite substantial anthropogenic pressure, Dakatcha Woodland continues to retain elements of a relatively intact mammal community compared to other coastal forests.

Comparison with nearby coastal forests

Mammal diversity has previously been surveyed using camera traps in two other coastal forest systems in Kenya: the Arabuko-Sokoke Forest, located approximately 30 km south of Dakatcha Woodland, and the Boni-Dodori Reserve, approximately 100 km to the north (Stokes et al., 2016). These surveys provide a valuable basis for comparing the mammal community of Dakatcha Woodland with that of nearby, more formally protected forest systems.

Species diversity and abundance

Overall species composition and relative abundance patterns were broadly comparable across the three forests. Nevertheless, five species recorded in Arabuko-Sokoke Forest and Boni-Dodori Reserve were not detected in Dakatcha Woodland (full list in Appendix 1). Boni-Dodori Reserve is substantially larger, encompasses a wider range of habitat types, and remains largely undisturbed, which likely explains the presence of species absent from both Dakatcha and Arabuko-Sokoke.

More revealing differences emerge when comparing Dakatcha Woodland with Arabuko-Sokoke Forest, which is geographically close and shares broadly similar vegetation types, including *Brachystegia*, *Cynometra*, and mixed forest. Several large mammals, including African Elephant, African Buffalo, and Aardvark, were recorded in Arabuko-Sokoke Forest but were absent from Dakatcha Woodland. Historical accounts indicate that these species occurred regularly in Dakatcha within the past two decades and were likely resident earlier, but increasing human population density and disturbance have led to local extirpation or displacement.

Marked differences were also observed among smaller ungulates. Blue Duiker was common in Arabuko-Sokoke Forest, with 101 recorded events, yet was absent from Dakatcha Woodland. In contrast, Harvey's Duiker was considerably more abundant in Dakatcha, with 80 events compared to only 16 in Arabuko-Sokoke. The Vulnerable Ader's Duiker was recorded infrequently in Arabuko-Sokoke Forest but was not detected in Dakatcha Woodland.

In addition to these compositional differences, overall detection rates were lower in Dakatcha Woodland than in the two protected forests. Mean event rates were approximately 1.55 events per deployment day in Arabuko-Sokoke Forest, 1.38 in Boni-Dodori Reserve, and 0.77 in Dakatcha Woodland. While higher detection rates may reflect greater overall abundance, these values are also influenced by camera placement and habitat structure and should therefore be interpreted cautiously.

Human disturbance

Humans and domestic animals were recorded on 32% of all camera deployments in Dakatcha Woodland, corresponding to 39 out of 122 deployments. Humans alone accounted for 72 independent events, making them the ninth most frequently recorded "species" in the dataset. These records indicate substantial human presence and movement throughout the study area, with clear potential for disturbance. Evidence of poaching was also documented.

This level of human activity contrasts sharply with patterns reported from nearby protected forests. Stokes et al. (2016) noted that people moving through Arabuko-Sokoke Forest were detected only on a handful of occasions, while no human detections were recorded in the more remote and sparsely populated Boni-Dodori forest system. The comparison highlights the strong influence of protection status and human pressure on mammal communities along the Kenyan coast and provides further context for the patterns observed in Dakatcha Woodland.



Conclusion

This study confirms that Dakatcha Woodland supports a high diversity of mammals and represents a site of major importance for mammal conservation within the Northern Swahili Coastal Forests. Alongside this biodiversity, however, we document substantial human and domestic animal presence, indicating levels of disturbance that are markedly higher than those recorded in the nearby protected forests of Arabuko-Sokoke Forest to the south and the Boni-Dodori Reserve to the north.

Despite broadly comparable vegetation systems, both Arabuko-Sokoke Forest and Boni-Dodori Reserve exhibit higher mammal diversity and camera-trapping rates than Dakatcha Woodland. This contrast strongly suggests that effective protection and reduced human pressure contribute to higher mammal abundance and diversity. In the face of intensifying threats, particularly extensive livestock grazing and charcoal production, the biodiversity documented in Dakatcha clearly warrants comparable levels of protection to ensure its long-term persistence.

To safeguard this important habitat, A Rocha Kenya is actively securing land to establish a protected nature reserve, supported by community-based patrols and initiatives that promote sustainable local livelihoods. These efforts represent a critical step toward balancing biodiversity conservation with human needs in one of Kenya's most threatened coastal forest landscapes.



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Appendix 1: Mammal species expected but not detected

Below, we list species expected to occur in Dakatcha Woodland based on nearby records and published literature but not detected during this survey.

	Present in Boni-Dodori Reserve and/or Arabuko-Sokoke Forest	Absent from all three coastal forest systems surveyed
Expected in DW	<ul style="list-style-type: none"> • Blue Duiker: common in ASF and a single sighting in BDR. • Aders' Duiker: abundant in BDR and observed occasionally in ASF • Aardvark: recorded in both BDR and ASF (<i>Cynometra</i> forest). • Slender Mongoose: few encounters in both BDR and ASF • Sokoke Bushy-tailed Mongoose: abundant in BDR and ASF (<i>Brachystegia</i> forest). 	<ul style="list-style-type: none"> • African Hedgehog • Wild Cat • Serval • African clawless Otter • Zorilla • Haggard's Oribi • Guenther's Dik-dik • Other Galago sp.
Not expected in DW	<ul style="list-style-type: none"> • African Buffalo • African Elephant • Lesser Kudu* • Waterbuck* • Common Hippopotamus* • African Wild Dog* • Common/Desert Warthog* • African Lion • Marsh Mongoose* <p><i>* species detected in BDR only</i></p>	

Appendix 2: Birds and reptiles recorded in the survey

A total of 19 bird species were identified to species level from camera trap images, in addition to one unidentified nightjar and three further records of unidentified birds (Table 3). The only reptile recorded during the survey was the White-throated Monitor.



Bearded Scrub-Robin



African Goshawk



White-throated Monitor



Crested Guineafowl

English Name	Scientific Name	# events	# deployments
Birds			
Eastern Crested Guineafowl	<i>Guttera pucherani</i>	52	31
Crested Francolin	<i>Dendroperdix sephaena</i>	45	15
Emerald-spotted Wood-dove	<i>Turtur chalcospilos</i>	37	22
Red-eyed Dove	<i>Streptopelia semitorquata</i>	14	5
Bearded Scrub-robin	<i>Tychaedon quadrivirgata</i>	9	7
White-browed Coucal	<i>Centropus superciliosus</i>	8	5
Zanzibar Boubou	<i>Laniarius sublacteus</i>	6	4
Vulturine Guineafowl	<i>Acryllium vulturinum</i>	5	2
Coqui Francolin	<i>Peliperdix coqui</i>	5	4
Nightjar sp.	<i>Caprimulgus sp.</i>	4	2
Thrush Nightingale	<i>Luscinia luscinia</i>	3	1
Bird sp.	<i>Aves</i>	3	3
Scaly Babbler	<i>Turdoides squamulata</i>	2	2
African Goshawk	<i>Accipiter tachiro</i>	1	1
Tambourine Dove	<i>Turtur tympanistris</i>	1	1
Helmeted Guineafowl	<i>Numida meleagris</i>	1	1
Yellow-necked Spurfowl	<i>Pternistis leucoscepus</i>	1	1
Eastern Nicator	<i>Nicator gularis</i>	1	1
Northern Brownbul	<i>Phyllastrephus strepitans</i>	1	1
Black-bellied Starling	<i>Notopholia corusca</i>	1	1
Reptiles			
White-throated Monitor	<i>Varanus albigularis</i>	6	4

Table 3. Records of bird and reptile species, organized by most to least frequent.