

Khaudum National Park Wildlife Movement Patterns

Novald K. Iiyambo



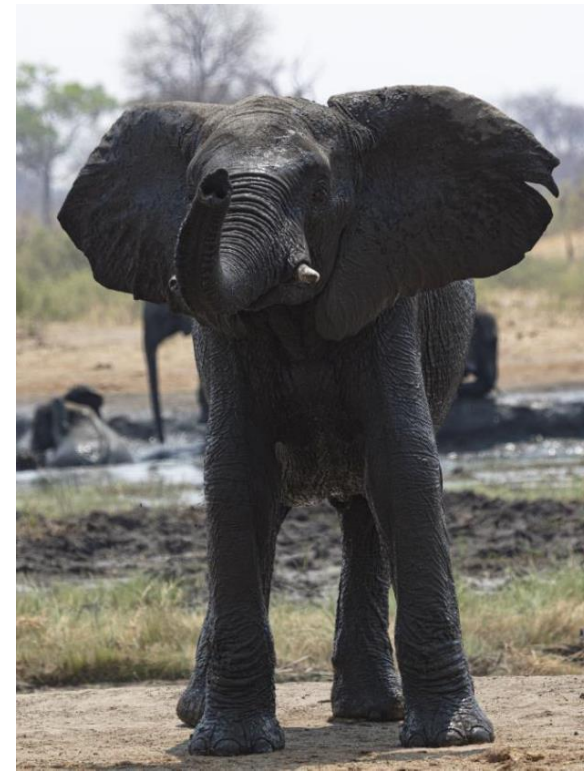
Khaudum National Park

- Preserve biological diversity
- Sustainable use of biological diversity
- Promoting biodiversity conservation



Khaudum National Park

- Habitat for rare Roan antelope and Tsessebe.
- Only park in NAM with all historical occurring large carnivores.
- Free roaming wild-dogs.
- Large population of Roans in SA.



Conservation - Increase population

- Management:
 - Fire regime
 - Grazing/ browsing resources
 - Competing species
 - Water resources



Wildlife movement patterns

- The movement paths of animals represent behavioral and ecological processes;
 - Navigation
 - Migration
 - Dispersal
 - Food searching
- Abiotic and biotic factors
 - Fences
 - Artificial waterpoints
 - Seasonality (dry/wet) vs human settlement
 - Rainfall patterns across varying landscapes
 - Breeding (mating partners)



Wildlife movement patterns

- Many threatened species, particularly those prone to conflict with humans,
 - are confined within relatively small and increasingly isolated protected areas surrounded by human-dominated landscapes (Graham et al. 2009, Bauer et al. 2015).
- Therefore, efforts are made to protect contiguous natural areas to preserve vital connections between protected areas;
 - To aid dispersal for increased and improved gene flow,
 - Rescue small subpopulations susceptible to local extinction;
- Otherwise, long-term inbreeding raises recessive breeds prone to diseases, weakness and reduced capacity of survival.





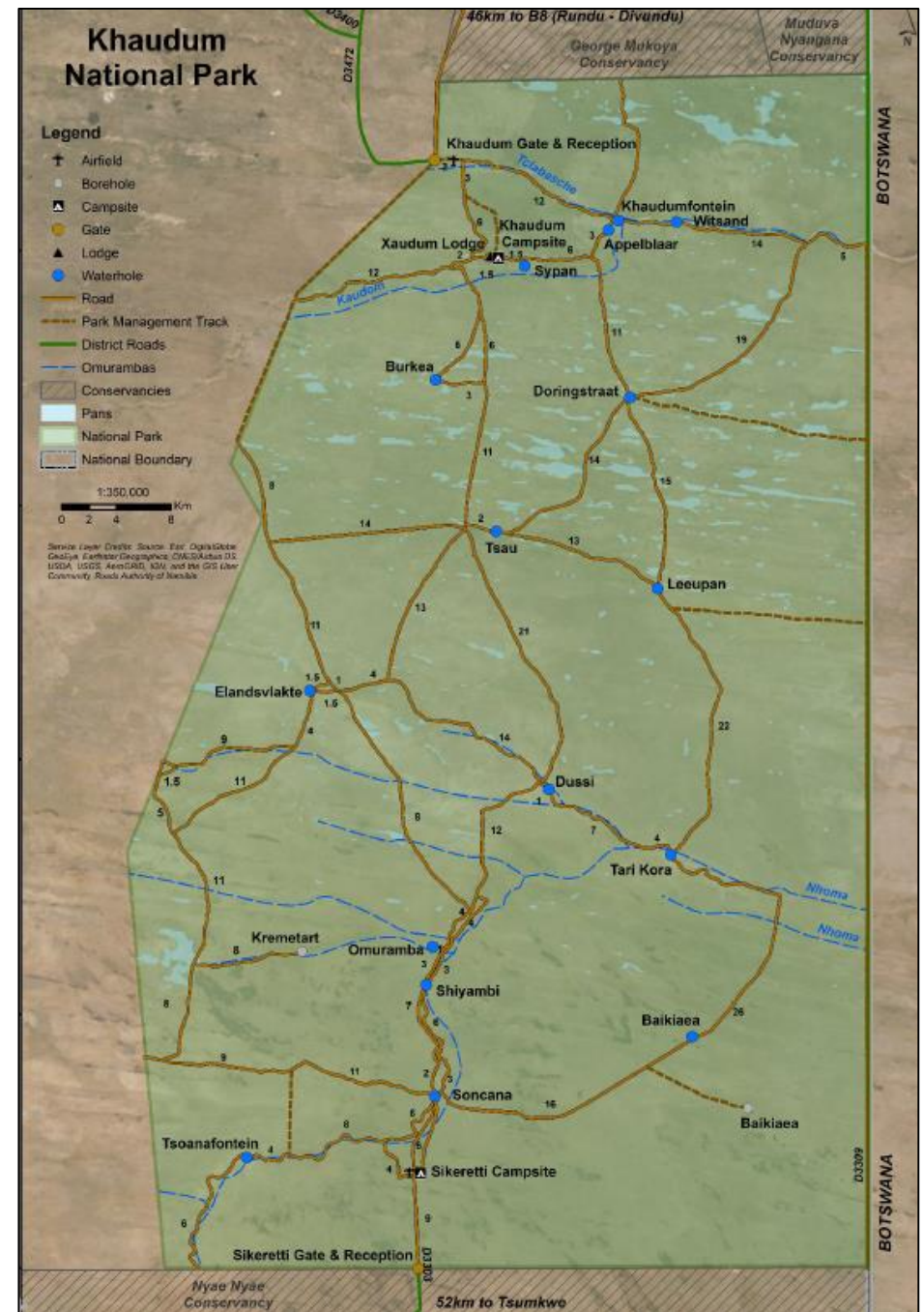
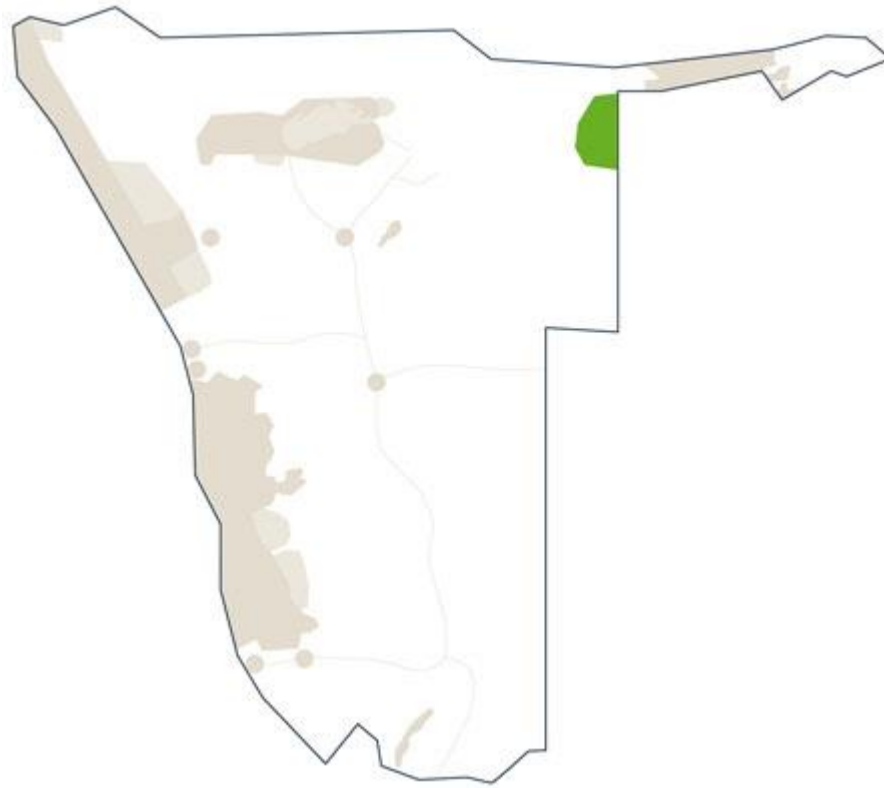
Khaudum National Park Full Moon Waterhole Game Count



19 - 24 August 2021
18 - 23 September 2021
17 - 22 October 2021

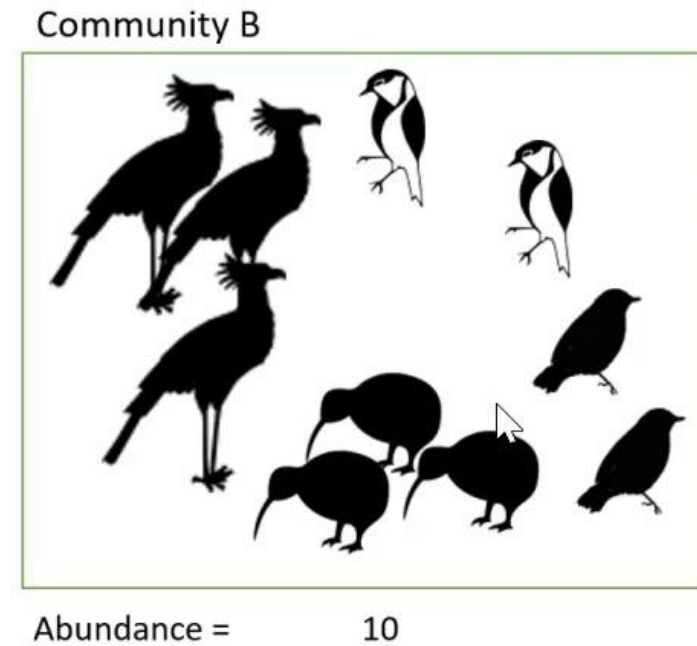
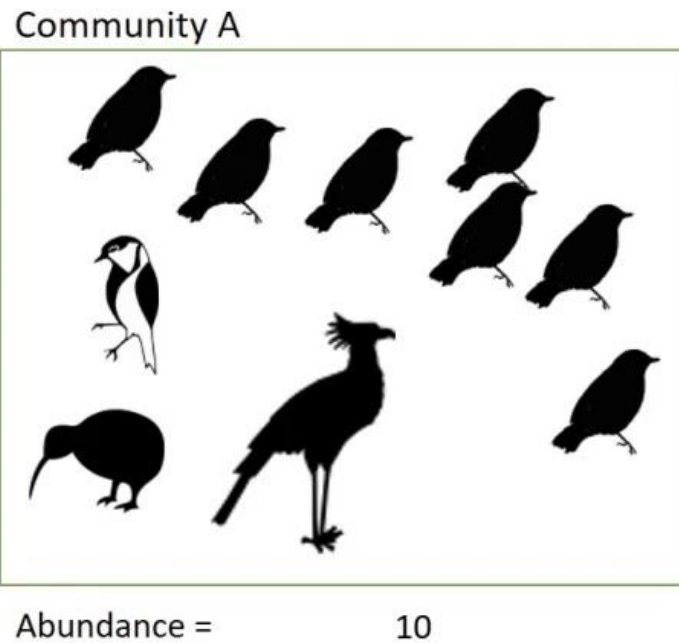


Khaudum National Park

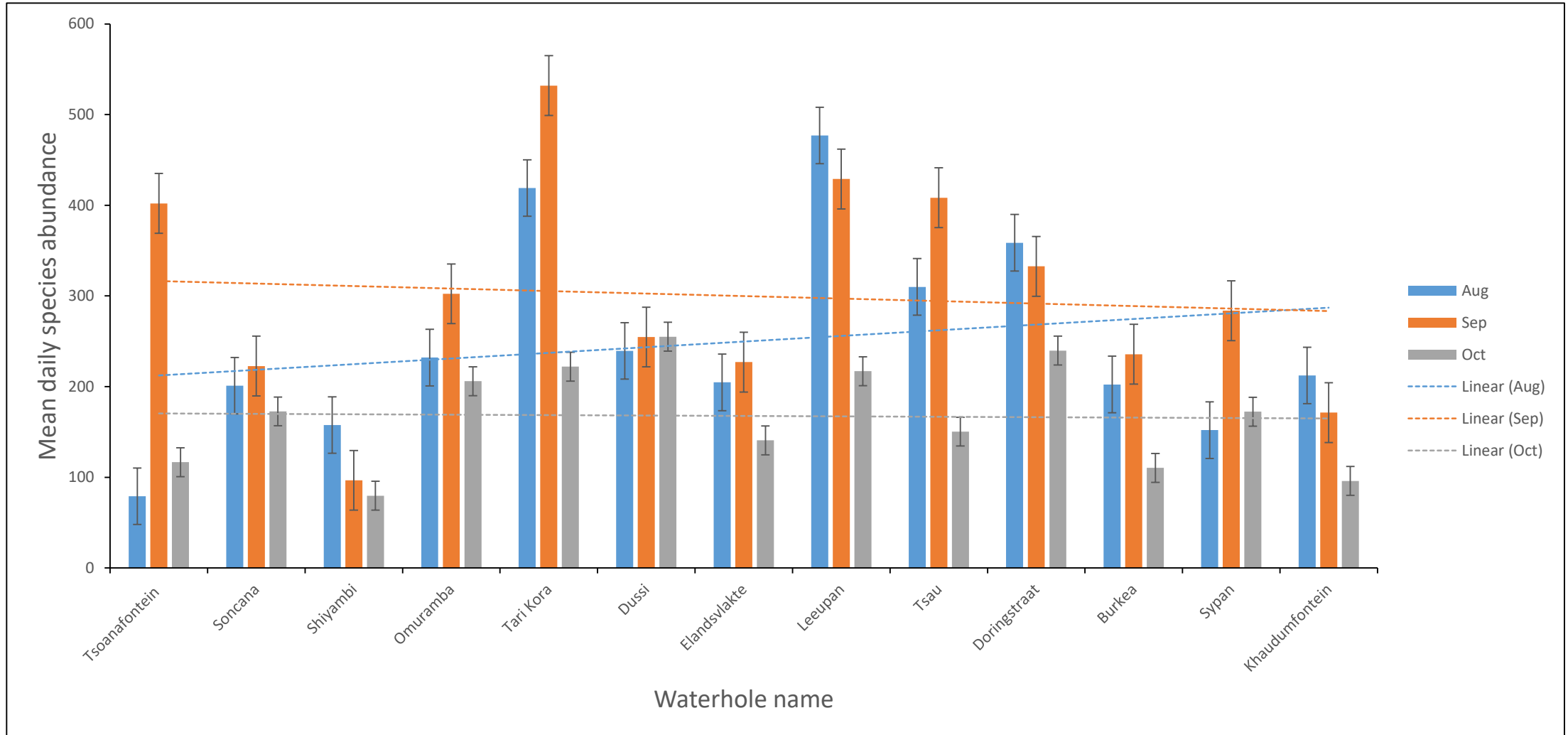


Species abundance

- Total number of individuals per species/ ecological community.



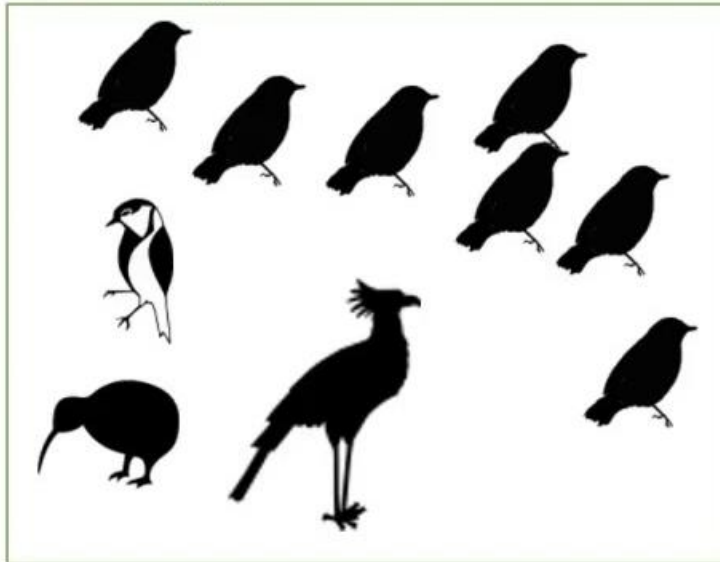
Species abundance – KNP game count 2021



Species richness

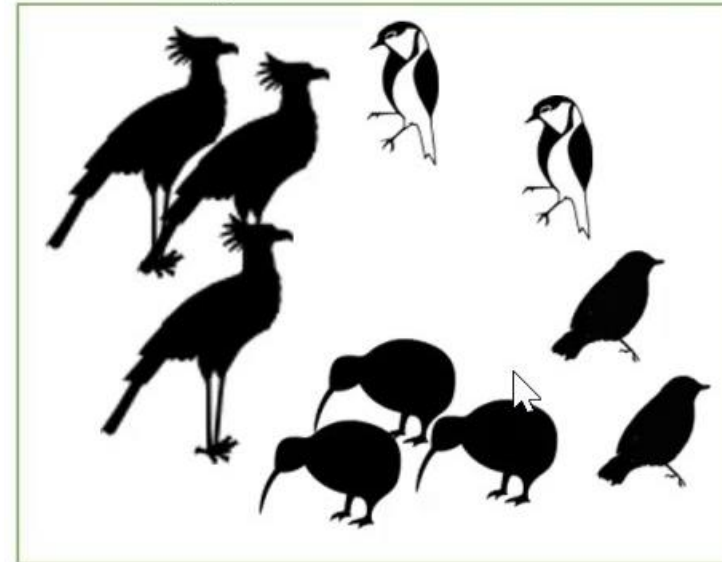
- Total number of species in a community or ecosystem.

Community A



Abundance = 10
Species Richness = 4

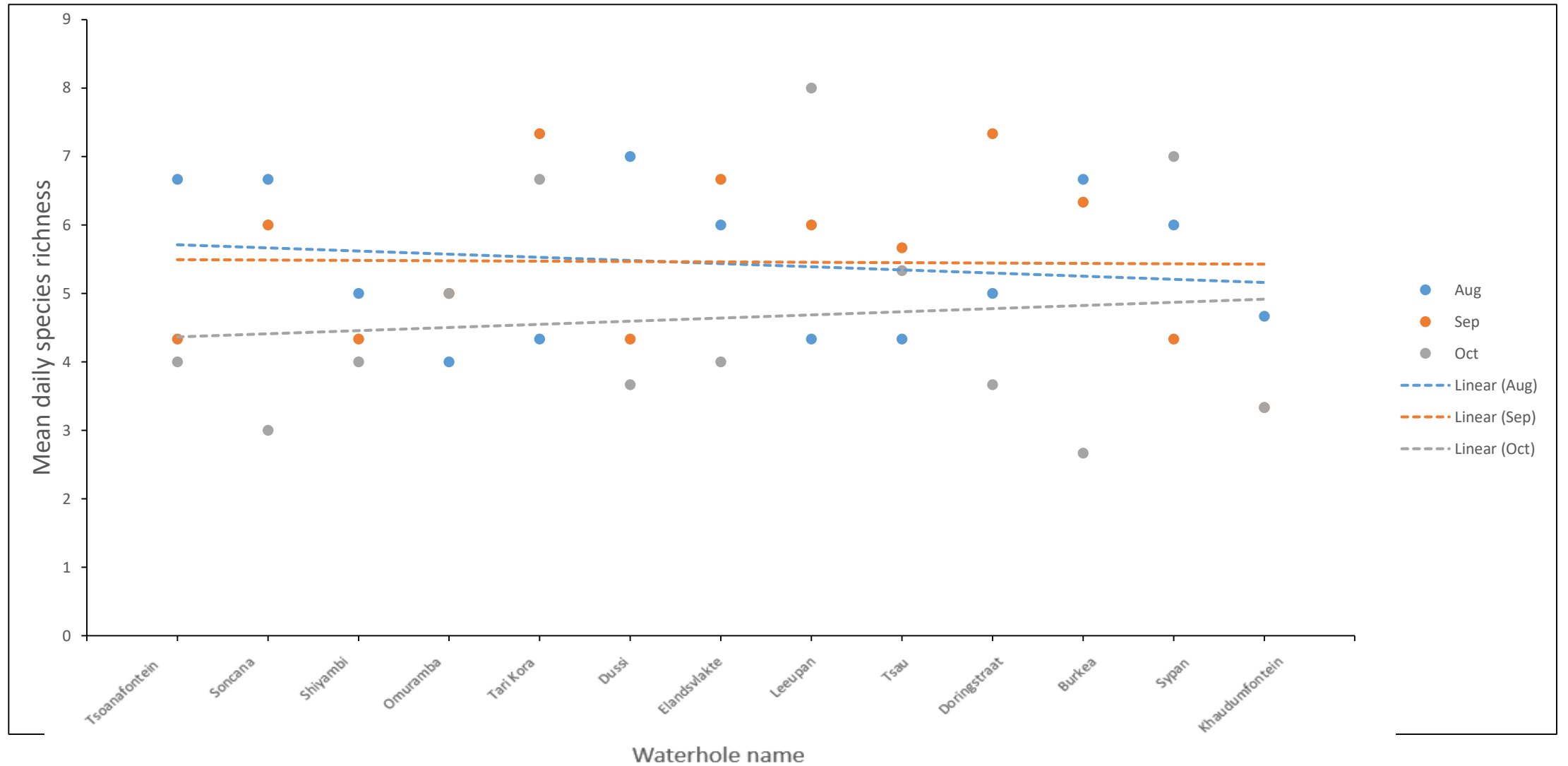
Community B



Abundance = 10
Species Richness = 4



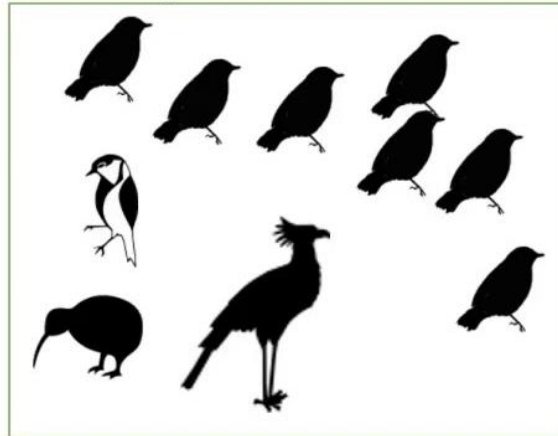
Species richness – KNP game count 2021



Species diversity

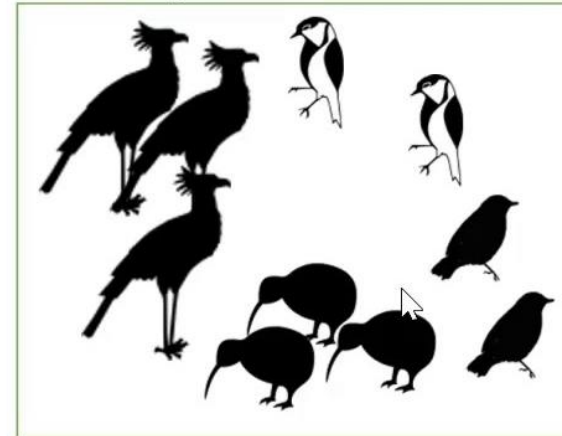
- Number of different species found in a specific ecological community.
- It represents the species richness or number of species found in an ecological community, the abundance (or number of individuals per species), and the distribution or evenness of species.

Community A



Abundance = 10
Species Richness = 4
Diversity = ?

Community B



Abundance = 10
Species Richness = 4
Diversity =



Species diversity

Shannon Diversity Index (H)

The formula: $H = -\sum(P_i) \times \ln(P_i)$



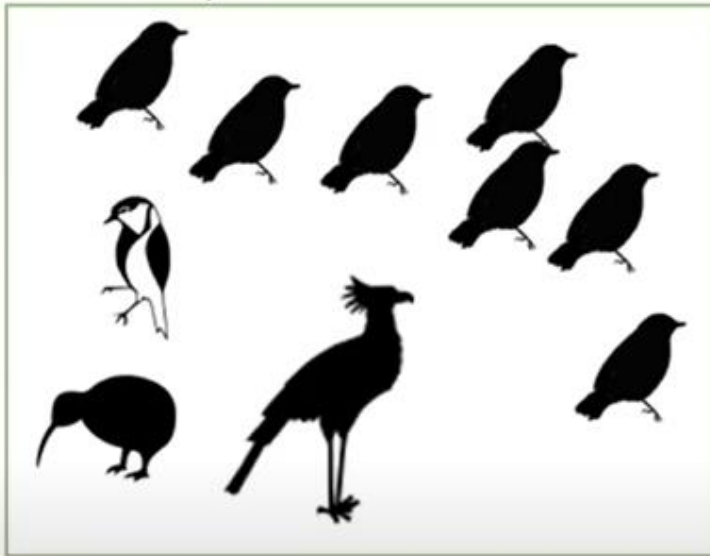
where P_i = the proportion of individuals in each species

Species	Abundance	P_i	$\ln(P_i)$	$P_i \times \ln(P_i)$
Blackbird	7	0.70	-0.51	-0.31
Kiwi	1	0.10	-2.30	-0.23
Secretary Bird	1	0.10	-2.30	-0.23
Chickadee	1	0.10	-2.30	-0.23
Total	10			-1.00



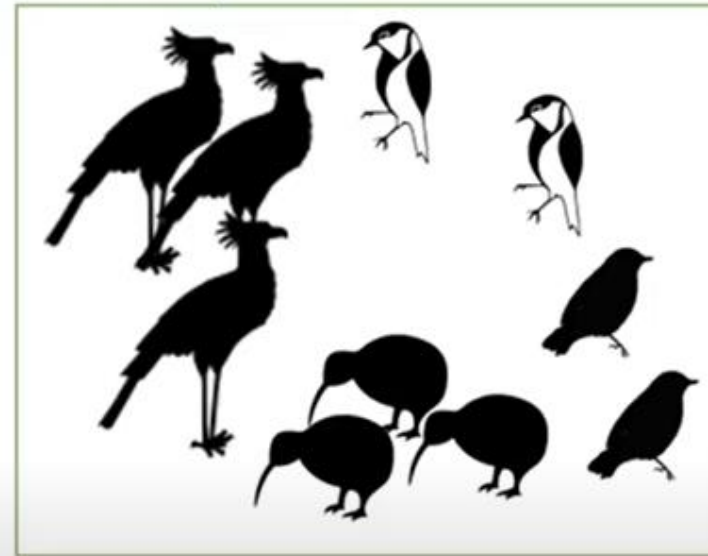
Species diversity

Community A



Abundance = 10
Species Richness = 4
Diversity = 1.00

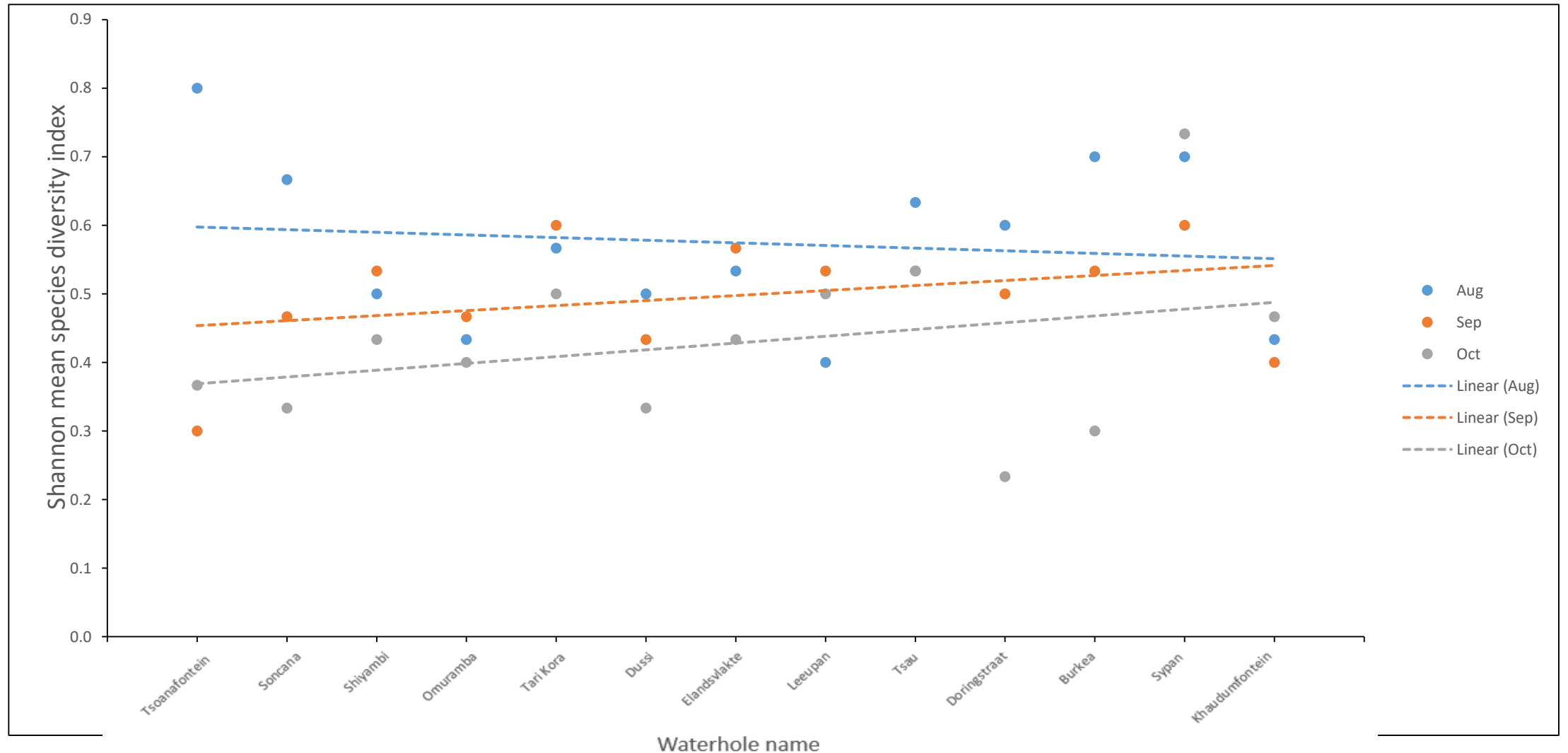
Community B



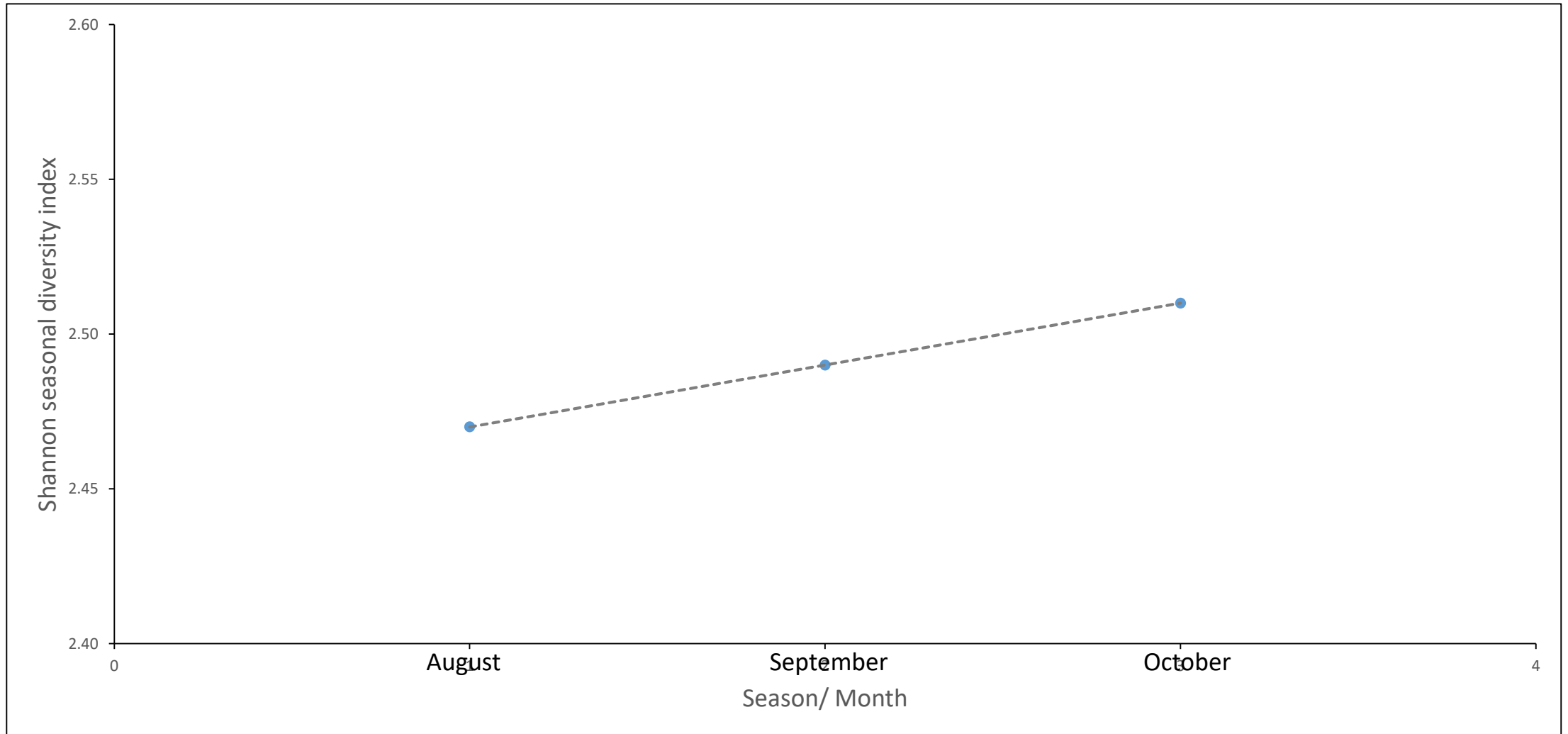
Abundance = 10
Species Richness = 4
Diversity = 1.37



Species diversity – KNP game count 2021



Species diversity – KNP game count 2021



Species-specific Movement Patterns



Elephants

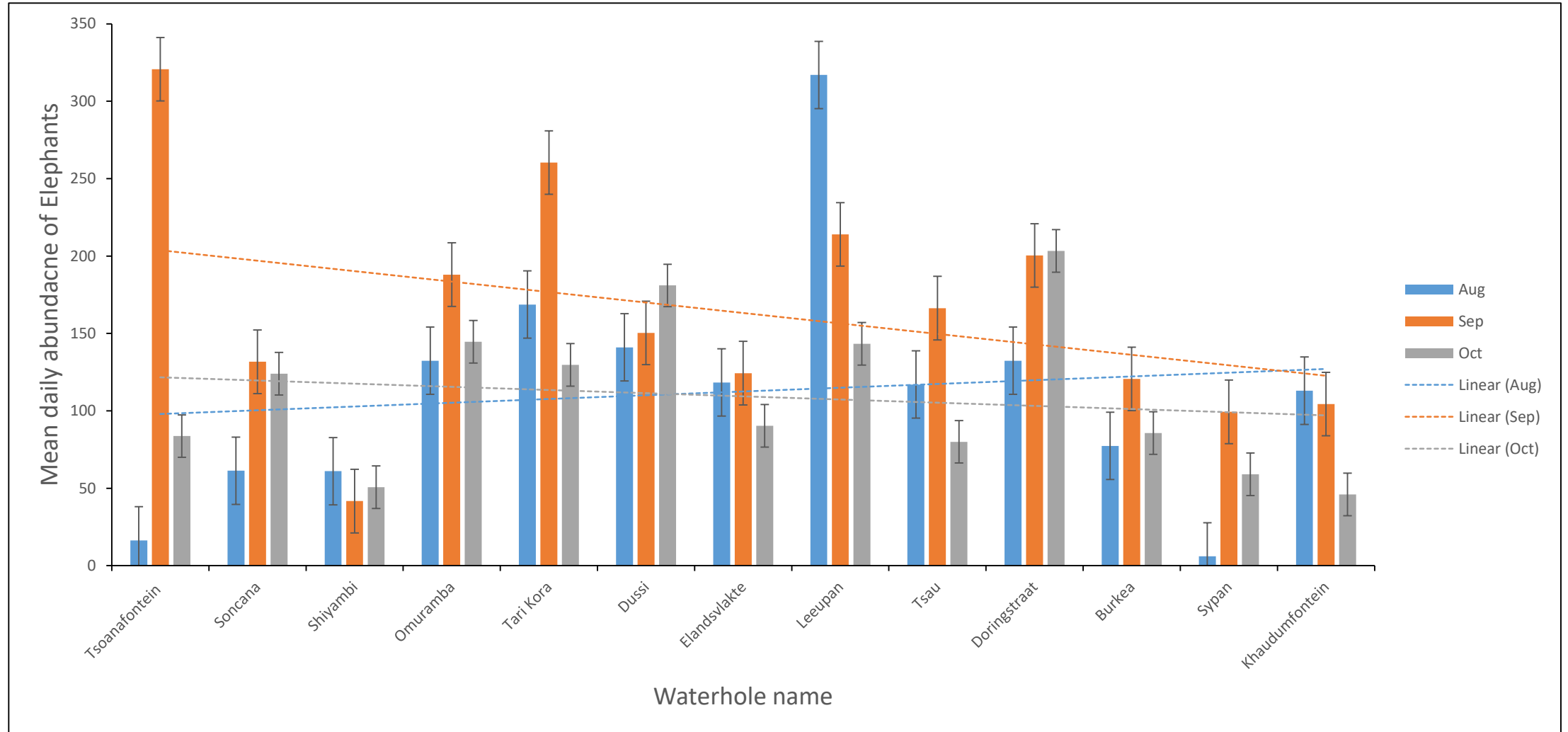
- Umbrella species
- Keystone species, transform habitats;
 - Knocking down trees
 - Pulling up grass
 - Plowing trails through dense brush
 - Digging for water that others animals can access



Elephant movement patterns



Elephant movement patterns — KNP game count 2021

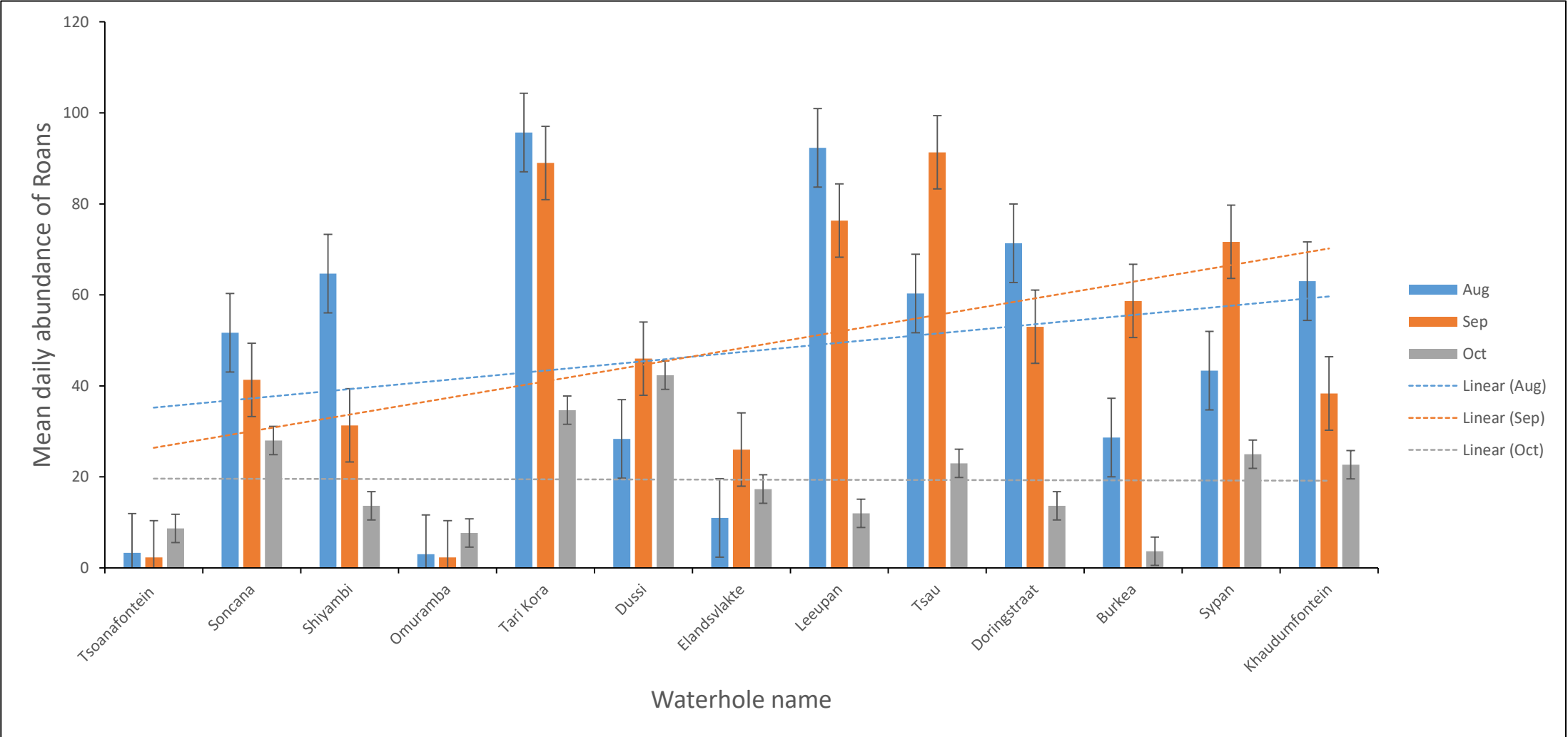


Roan antelope

- One of Africa's largest bovids, only exceeded in size by the African Buffalo and Eland.
- IUCN "Least Concern", but if the present trends continue, status may eventually decline to threatened status as it disappeared from large parts of its current range due to poaching and loss of habitat.



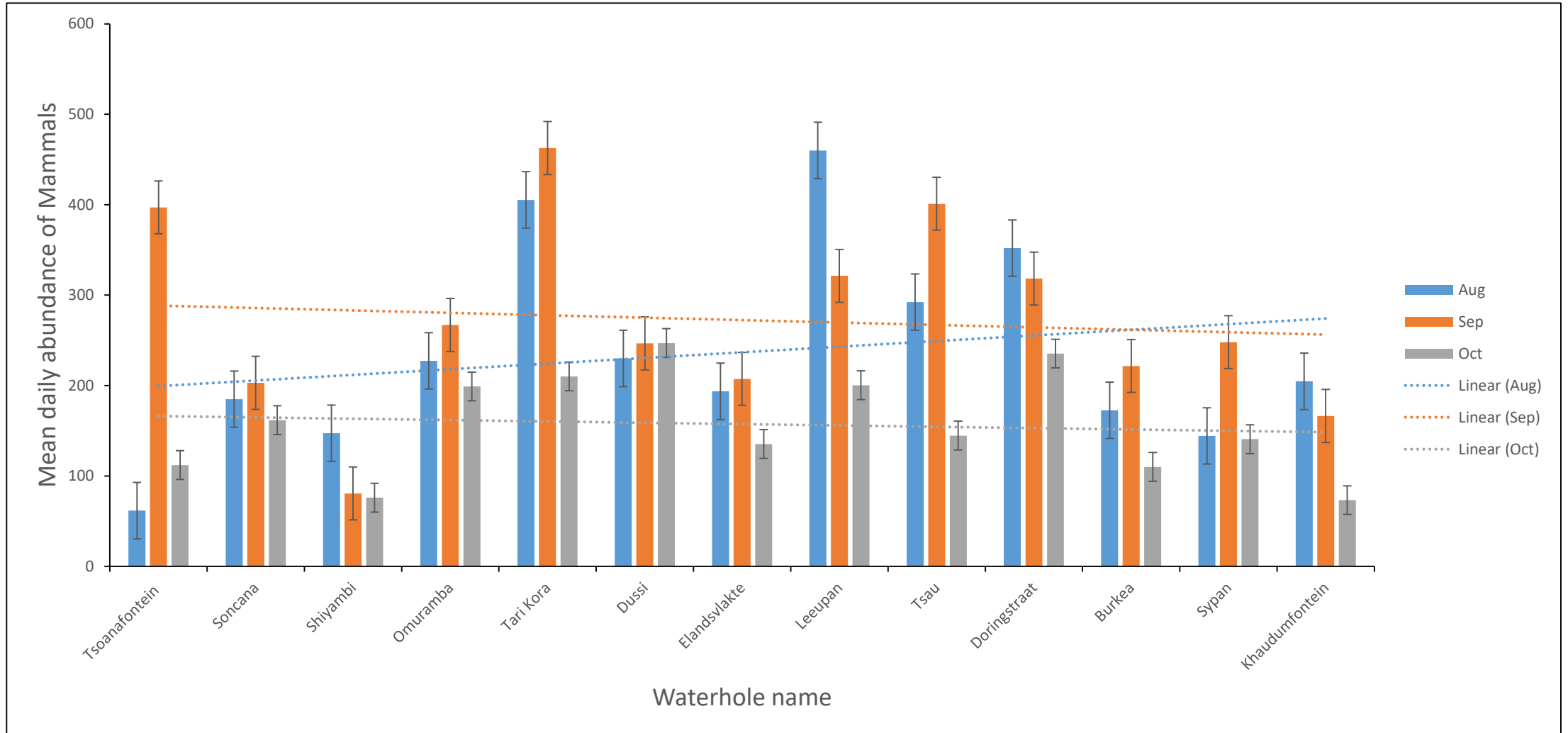
Roan antelope movement patterns — KNP game count 2021



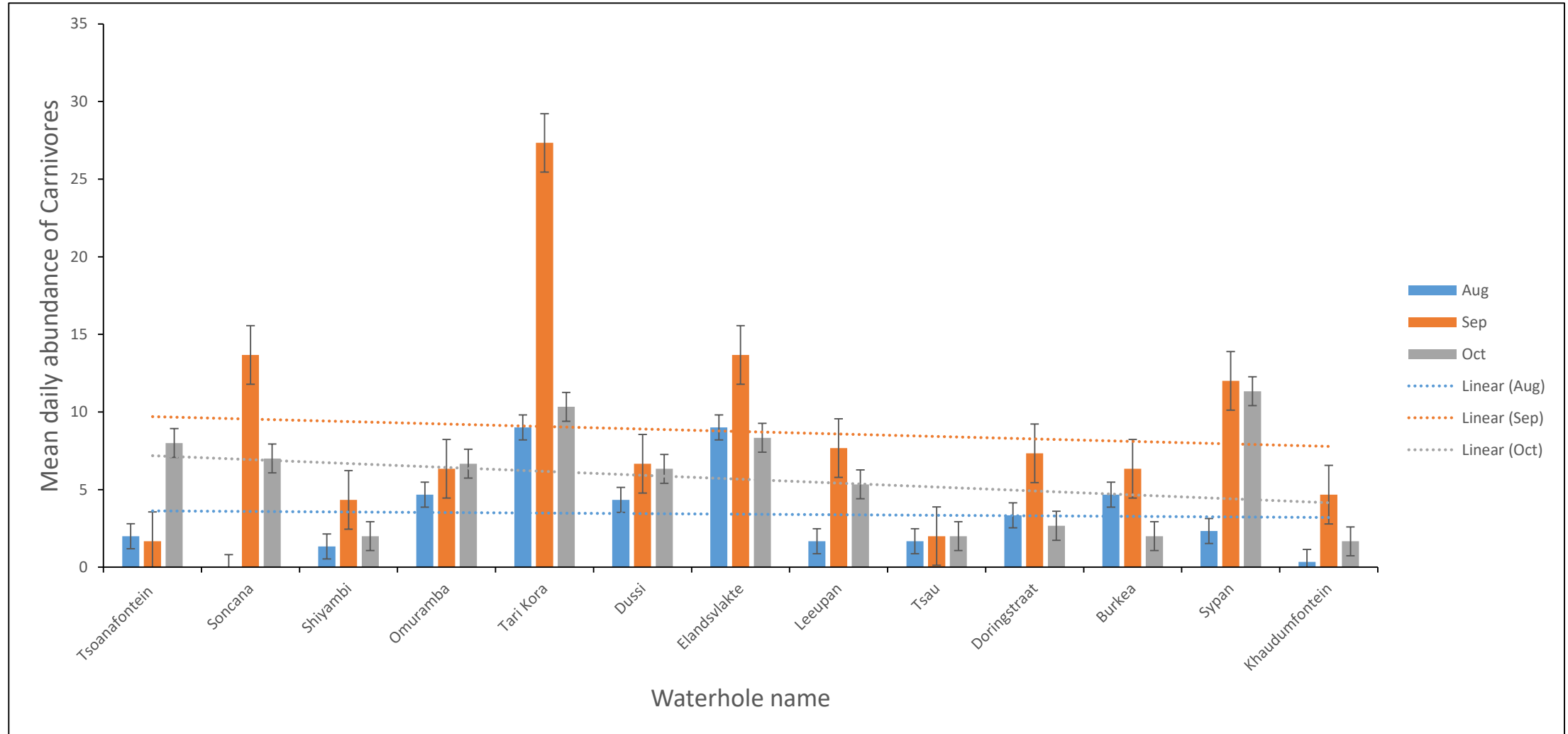
Animal-class-specific Movement Patterns



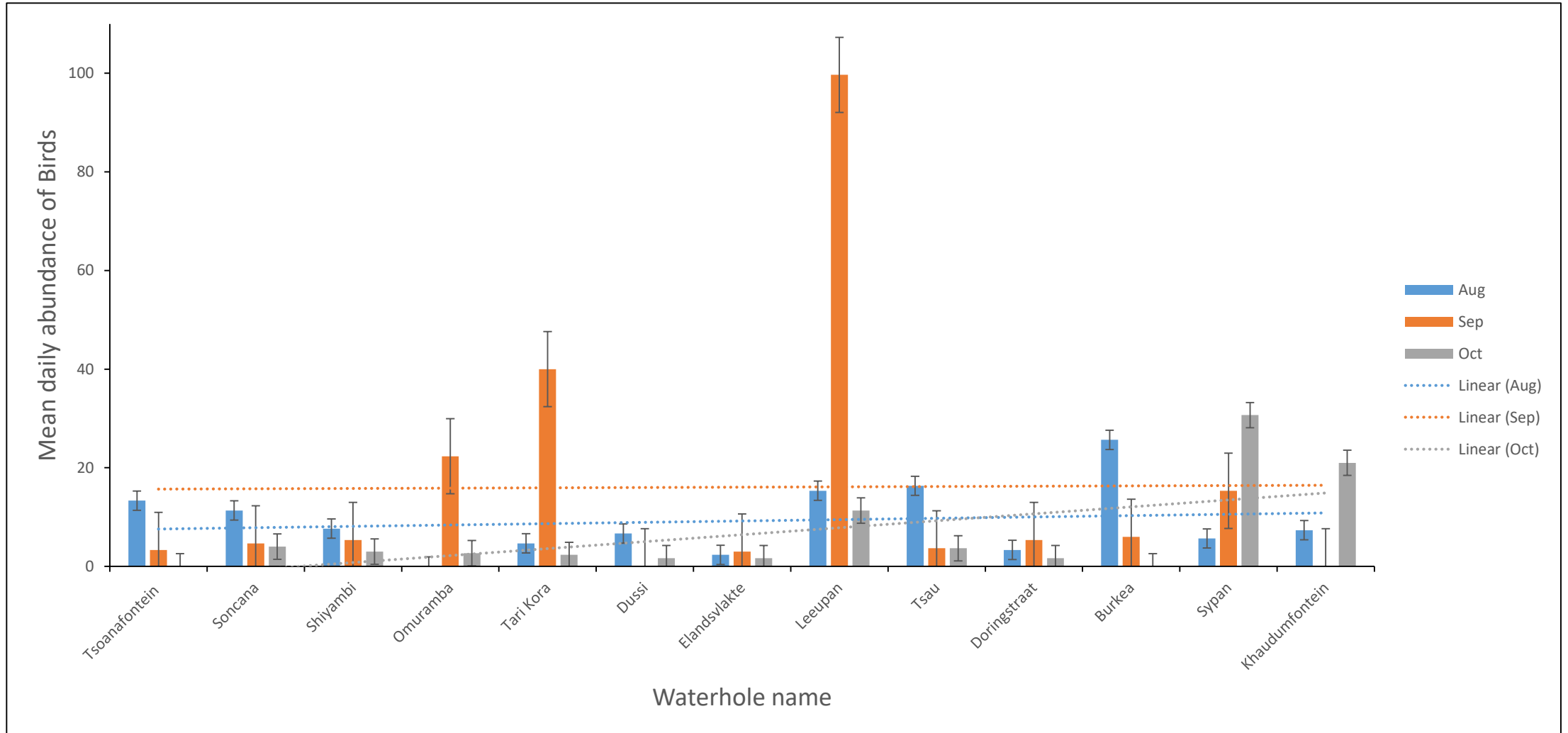
Mammal species abundance - KNP game count 2021



Carnivore species abundance - KNP game count 2021



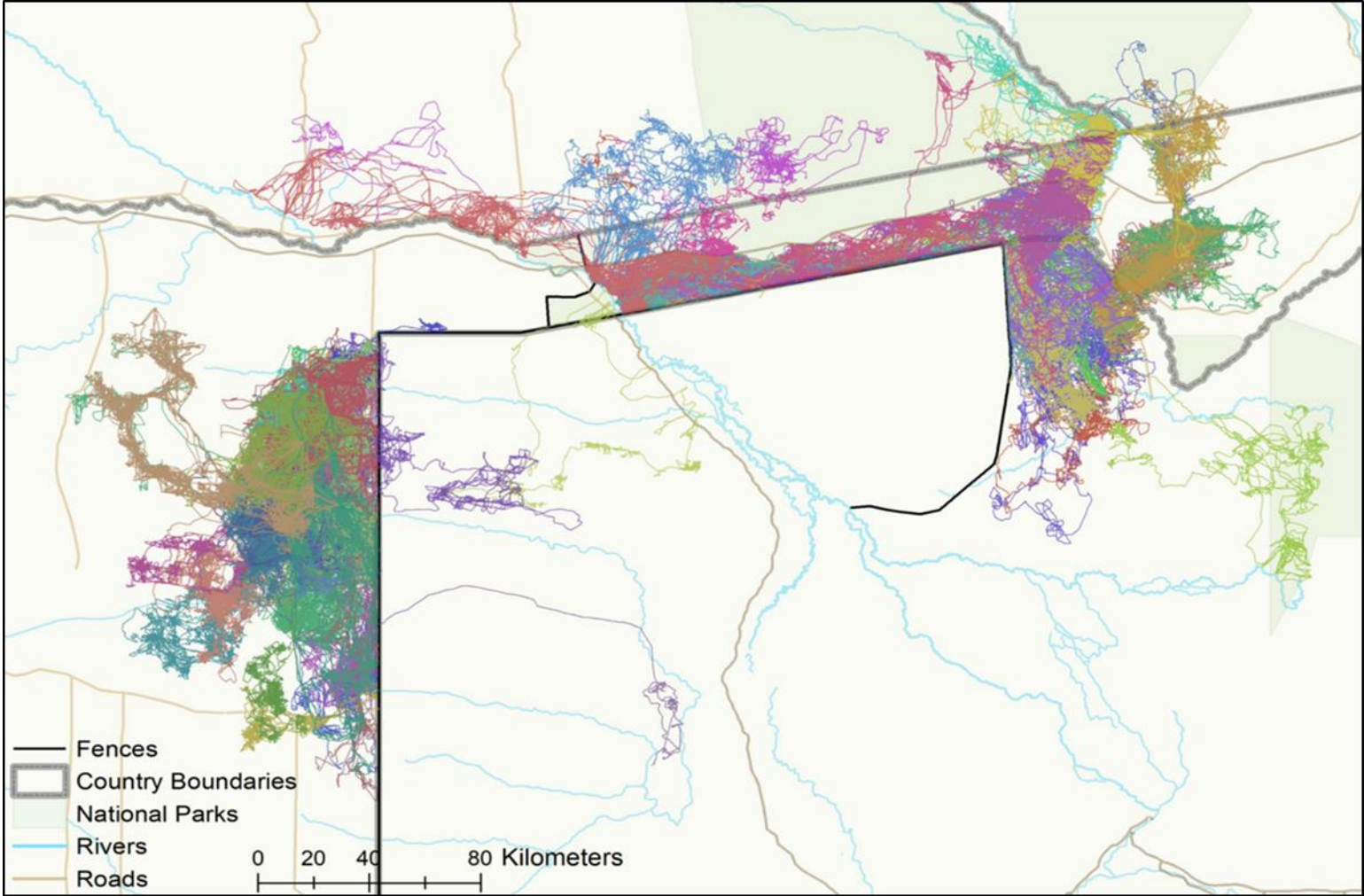
Birds species abundance - KNP game count 2021



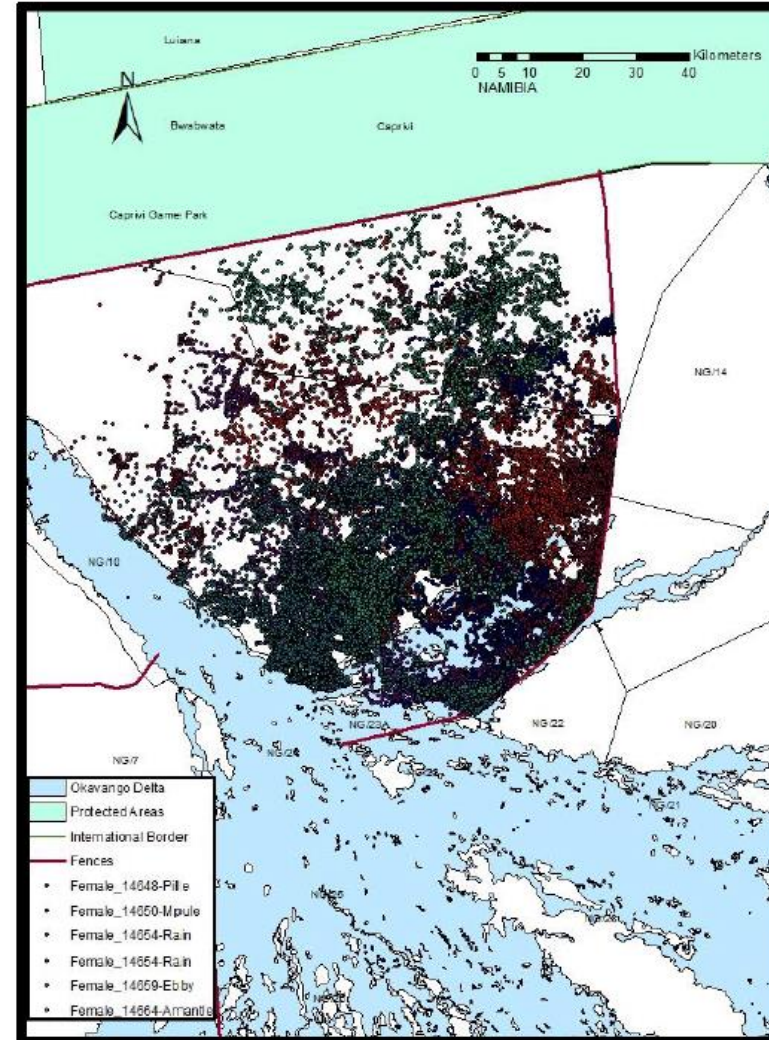
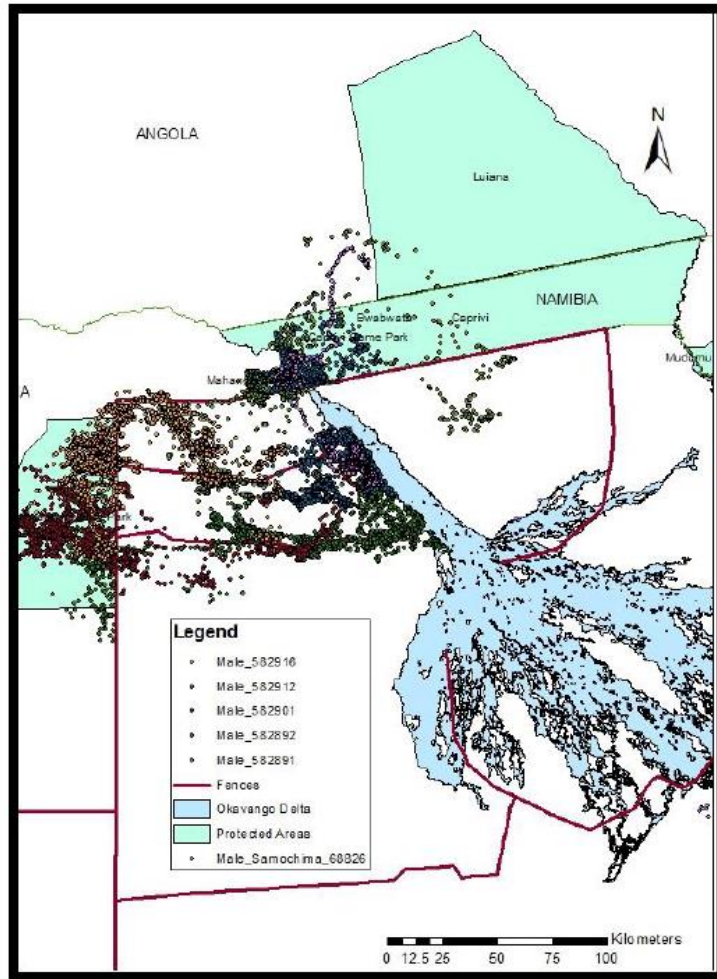
Other wildlife monitoring activities in NE/KAZA region



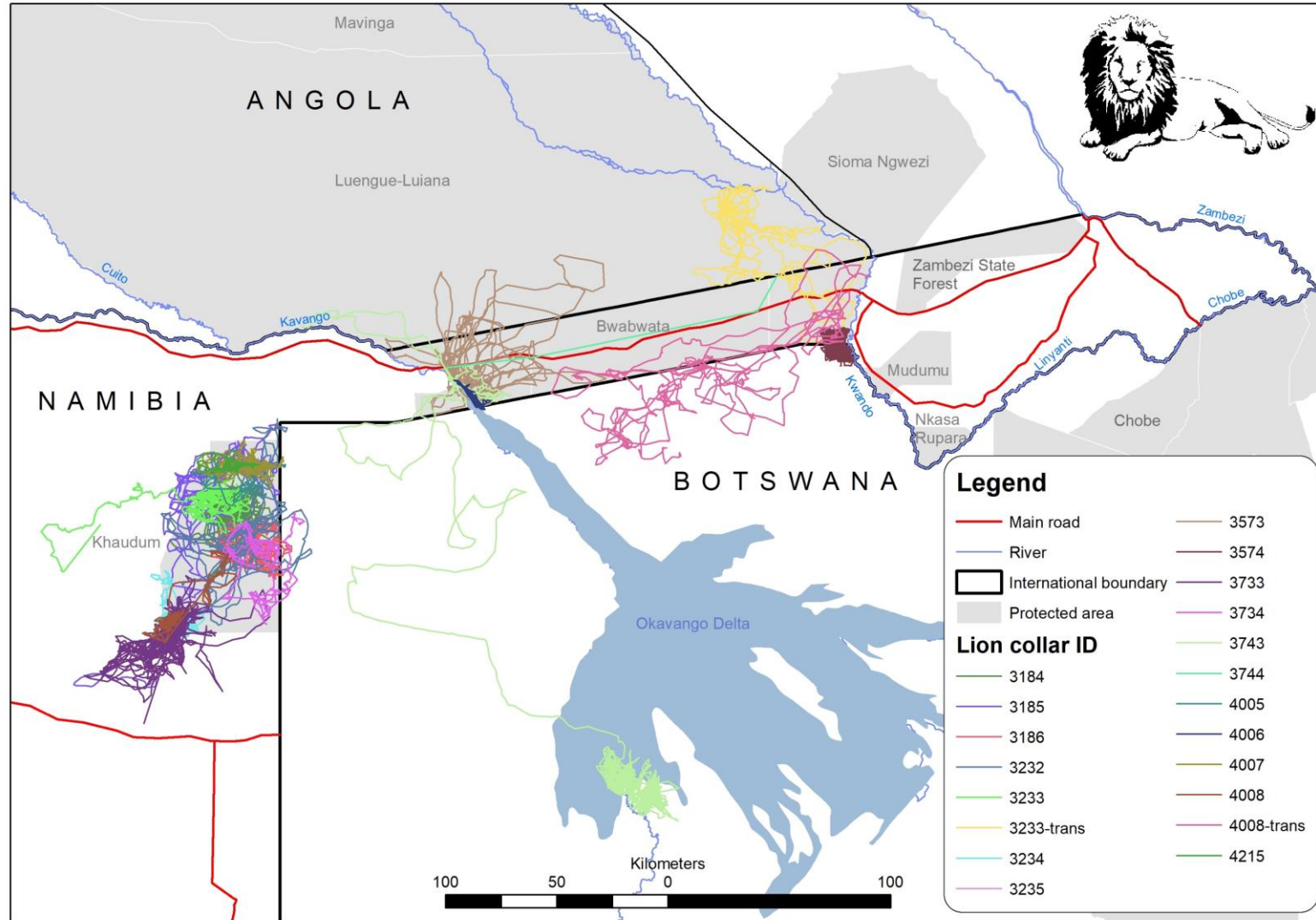
Elephant movement in NE/KAZA region



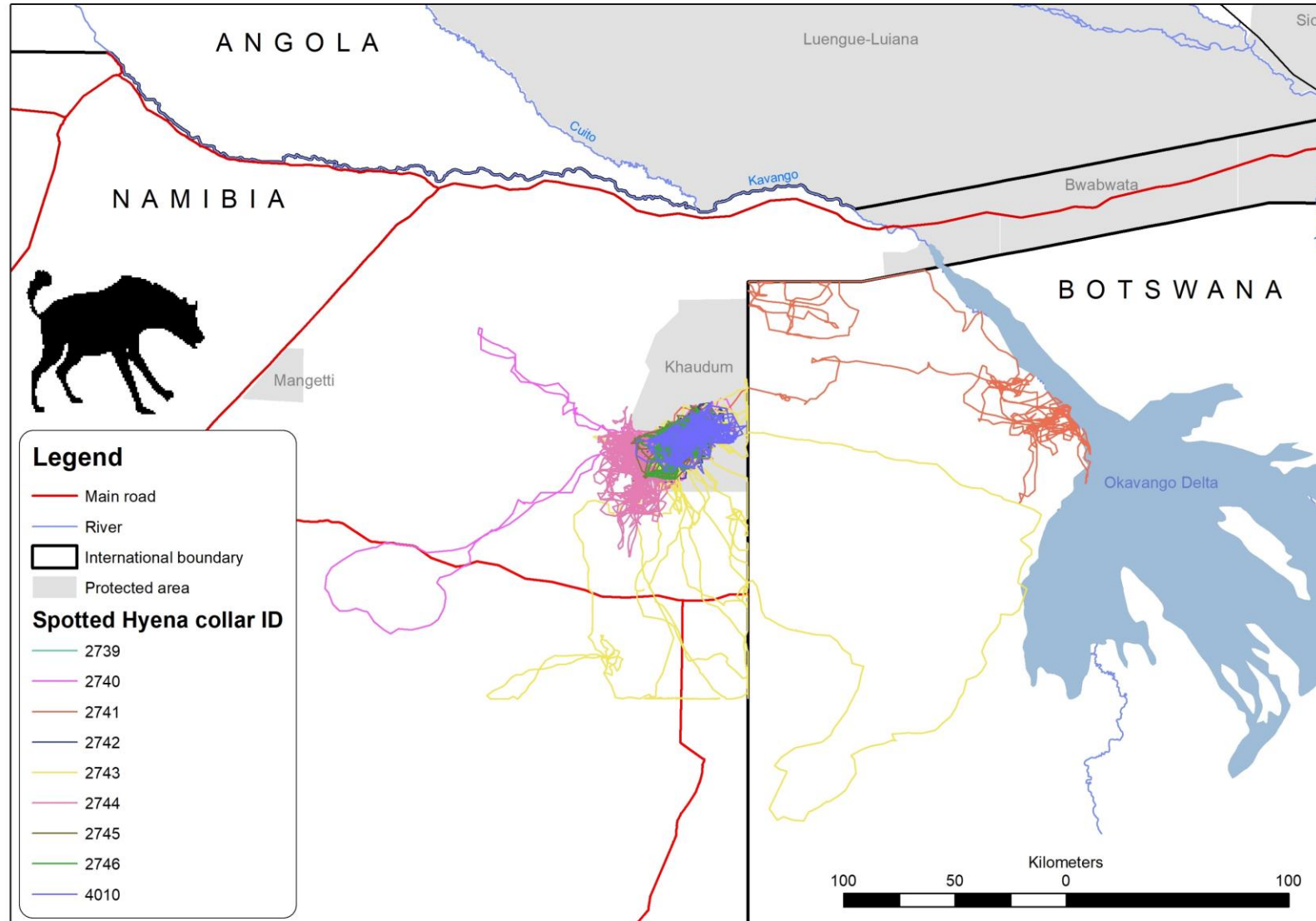
Elephant movement in NE/KAZA region



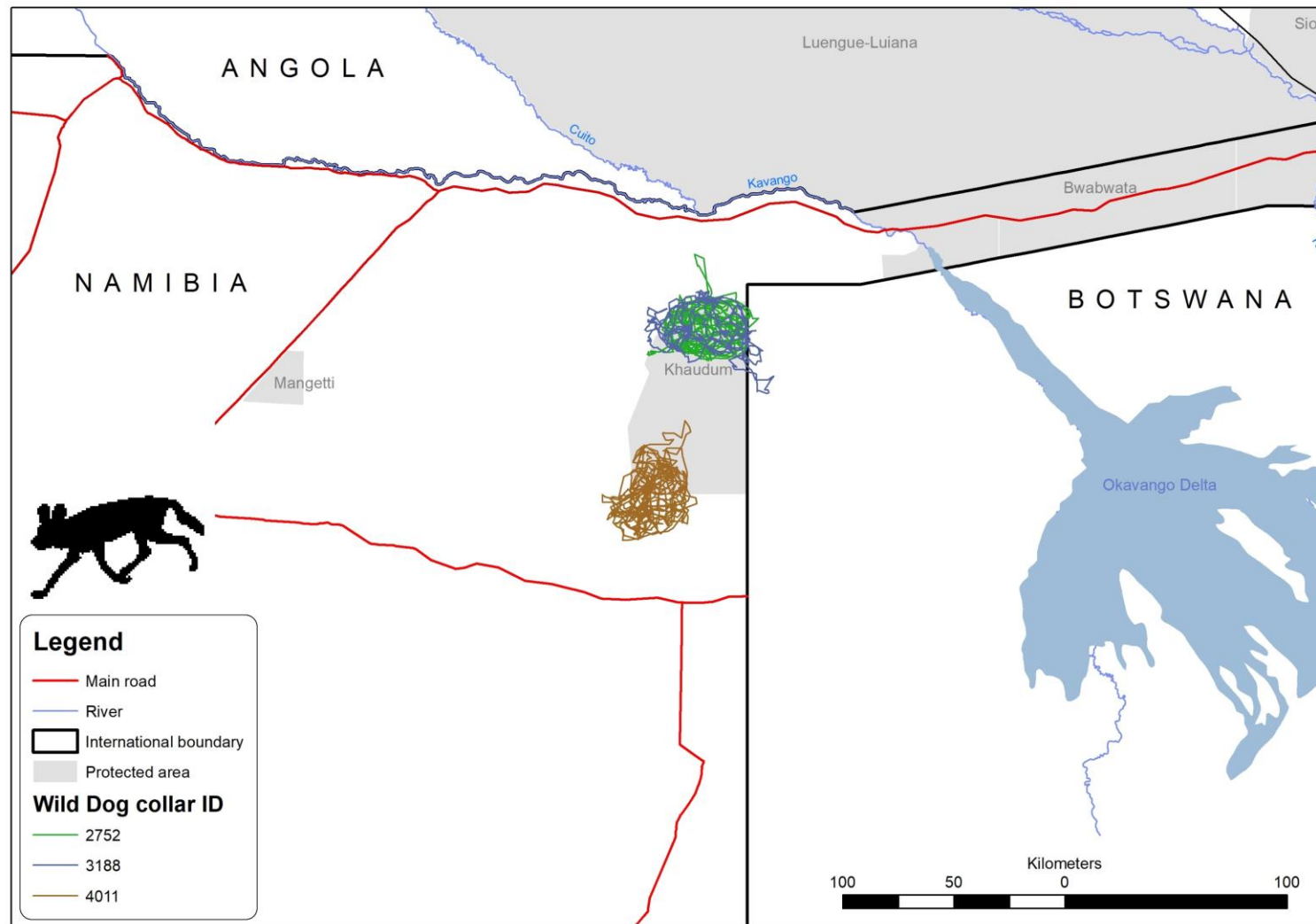
Lion movement in NE/KAZA region



Hyena movement in NE/KAZA region



Wild Dog movement in NE/KAZA region




Southern Ground Hornbill conservation



Ground hornbills are the largest and heaviest of the hornbill species.


RANGE



Southern Ground Hornbill
(*Bucorvus leadbeateri*)
VULNERABLE

During breeding season, males inflate their gular air sacs to make a series of deep, booming notes.

Southern ground hornbills are monogamous, but they are also slow breeders. A mated pair may only produce one brood of two chicks every nine years, and only one of the chicks will likely see adulthood.



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SG-Hornbill – data gathering

- GPS coordinates
- Photo of sighting
- No. of individuals
- Age of individuals
- Sex of individuals



SOUTHERN GROUND-HORNBILL ID KIT

 <p>ADULT FEMALE: Facial skin red with violet blue below the bill.</p>	 <p>ADULT MALE: Facial skin entirely red.</p>
 <p>SUB-ADULT: Facial skin entirely red, still white on the bill.</p>	 <p>IMMATURE 2: Facial skin red, white/cream at the edges, white on the bill (~2-3 years)</p>
 <p>IMMATURE 1: Facial skin still pale with some colouring (~1-2 years)</p>	 <p>JUVENILE: Pale facial skin (grey then cream) (~0-1 years)</p>



SG-Hornbill - Why data?



- Find natural nesting grounds
- Tag individual groups
- Monitor movement patterns
- Understand social aspects of community influence on species.



SG-Hornbill conservation and monitoring



SG-Hornbill conservation and monitoring

WHERE ARE OUR GROUND-HORNBILLS?



MINISTRY OF ENVIRONMENT,
FORESTRY AND TOURISM

PLEASE SEND US:
DATE
TIME
LOCATION
GROUP SIZE
PHOTOS WELCOME



 **+264 81 323 0038**



Pangolin conservation



Protect Pangolins
report any suspicious activity
 related to the killing or capture of pangolins or the trade in pangolin parts
 (this includes people asking about pangolins or offering pangolins or pangolin parts for sale)
 and receive a
\$ CASH REWARD \$
 for information leading to the arrest of culprits or the seizure of pangolins or pangolin products
wildlife crime is an economic crime against local communities and the nation

Call or send an alert sms to
 081 413 2214
 081 423 2231
 all information will be treated with strict confidentiality

PROTECT PANGOLINS
keep them in the wild

It is **ILLEGAL** to capture, keep, transport, injure or kill a pangolin
 or be in possession of any pangolin parts.
PANGOLINS have the same protection under Namibian law
 as rhinos and elephants.

REPORT SUSPICIOUS ACTIVITY BY SMS TO THE HOTLINE:
55555
 all information will be treated with strict confidentiality

SUSPICIOUS ACTIVITY INCLUDES:

- Killing or capturing pangolins
- Keeping pangolins in captivity
- Possessing pangolins and/or pangolin parts
- Trading pangolins (dead or alive) and/or pangolin parts
- Asking about pangolins or offering pangolins or pangolin parts for sale

Any person giving information leading to the **ARREST** of culprits
 or the **SEIZURE** of pangolins or pangolin parts will receive a **CASH REWARD**.
NO REWARD is given for bringing in a pangolin, only for helping to catch criminals.
 You will be charged as a criminal if you remove a pangolin from the wild.

IF YOU SEE A PANGOLIN IN THE WILD, LEAVE IT ALONE.

WILDLIFE CRIME is an economic crime
 against local communities and the nation.

Pangolins are extremely useful animals and they are harmless to people. They eat only ants and termites and a single pangolin can eat billions of these insects per year. Pangolins reduce the impact of these insects on grasslands and crops, as well as on fence poles, homesteads and other infrastructure. This also means farmers have more grazing for their livestock with pangolins present. They provide a natural pest control for the environment. Pangolins are protected in Namibia and throughout their entire range. Local and international trade in pangolins is prohibited. Collecting or killing pangolins, as well as trade in pangolin parts, is against the law in Namibia and punished with severe prison sentences.



Pangolin conservation



Pangolin conservation



Challenges – game count activity

- Night vision equipment
- Lack of species identification
- Zero estimates of large herds of animals
- Data entry and analyses – need for assistance



Challenges – elephant studies/management

- Inability to investigate collars that stopped functioning in neighboring countries
- Elephant movement is limited by the southern boundary of Bwabwata with Botswana and eastern boundary with Khaudum NP
- Small-scale farmers on the western Khaudum will suffer EHC in the future
- Increased population density leads to dispersal of young bulls causing problems on commercial farms (Grootfontein farmers)



Recommendation - game count activity

- Emergency information for teams, does and don'ts
- Note the conditions of the waterholes during the count ... helps with understanding the use of waterpoints



Recommendation – elephant studies/management

- Cull big herds and make beef and leather
- Removal of fences between Namibia and Botswana
- Replacement of collars in time for continuous long-term data collection



Recommendation – park management

- Rain gauge for each waterhole (automatic)
- Close off artificial waterpoints during rainy season to give opportunity for repairs and maintenance



Appreciations

- Pumping of water at waterholes during the count
- Cleaning the waterholes (Tarri Kora)
- All help is appreciated
- Appreciate the privilege given ... only park in Namibia were such activity is allowed



Thank you

