



Kwando Carnivore Project

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Status of African Wild dogs in Bwabwata National Park, Zambezi Region, Namibia

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TEKOA

Traditional Environmental Knowledge Outreach Academy





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Introduction

African wild dogs are globally rare (IUCN, 2000) with an estimated 600 to 1000 packs in sub-Saharan Africa (Woodroffe et al., 2004). The KAZA TFCA landscape is home to a quarter of the world's wild dogs with Bwabwata National Park (BNP) and the Zambezi Region as a whole being identified as important areas of connectivity and dispersal for large carnivores within KAZA (Figure 1). Although wild dogs are known to occur in the BNP, their status was unknown.

Knowledge of wild dogs in BNP is confined to tourist sightings and incident book records, and radio-collaring efforts by the Ministry of Environment and Tourism (MET) in the core conservation areas. These core conservation areas lie adjacent to the perennial Kwando and Kavango river systems and are optimal habitat for wildlife and make up approximately 30% of the park. Until now most of the information on wild dog demography and movements in the Zambezi Region is based on the packs that use the Kwando and Buffalo core areas as part of their home ranges. There was no information on wild dog distribution, their prey species and conservation threats especially in the multiple-use areas (MUA) of BNP and for the Zambezi Region as a whole. Anecdotal evidence suggested that wild dogs occurred in the MUA, but it was unclear whether the MUA is important habitat for wild dogs, if packs are resident and/or breeding and to what extent they are dependent on moving across international boundaries and are shared by neighbouring countries.

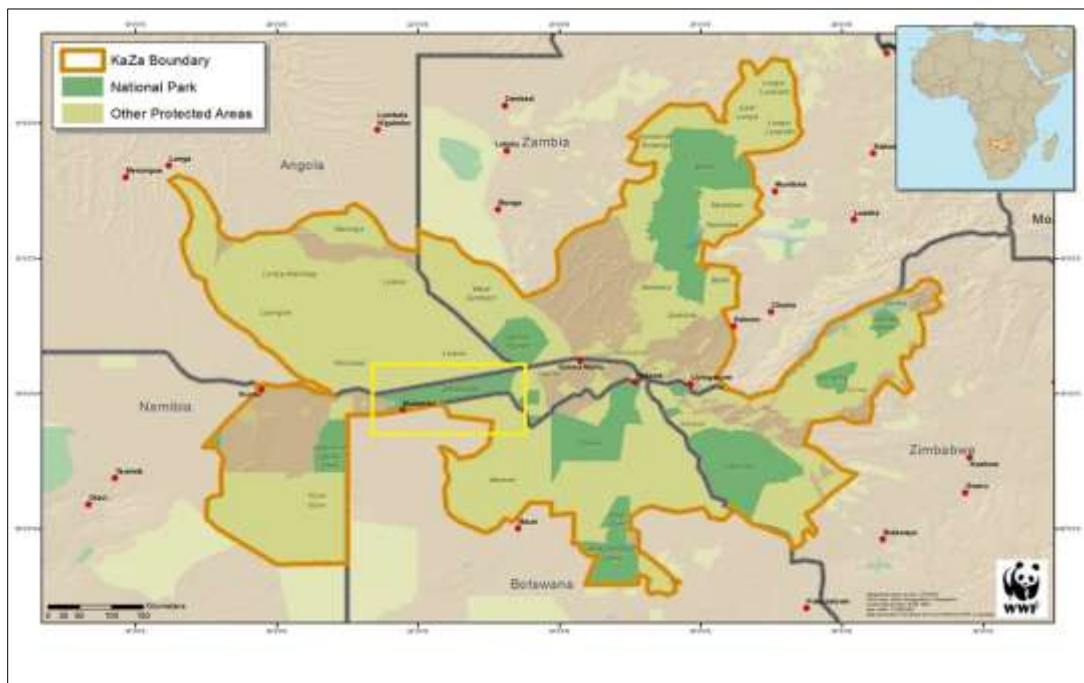


Figure 1: BNP (demarcated in yellow) and the Zambezi Region in north east Namibia are important wildlife dispersal areas within KAZA and are integral to the connectivity of large carnivore populations and habitat in Angola, Botswana and Namibia.



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The aim of this survey was to establish the status of wild dogs within BNP, identify threats and limitations and assess the importance of BNP as wild dog habitat within KAZA. This survey will form an important part of a process to develop a long-term monitoring system for wild dogs in the Zambezi Region.

Study area

The Zambezi Region lies in north east Namibia and is bordered by Angola and Zambia in the north, Zimbabwe in the east and Botswana in the south; and BNP is bordered by the Kavango River in the west and the Kwando River in the east separates the park from the east Zambezi Region. BNP is 190 km long, stretching from the Divundu police checkpoint in the west to the Kongola police checkpoint in the east, and is 31 km wide (Figure 2). This strip of land along with the Mahango core area, which lies on the western side of the Kavango River received national park status in 2009.

The land surface of BNP covers an area of approximately 6000 km². The landscape is shaped by thick deposits of Kalahari sands and perennial rivers with their associated floodplains. The majority of the area consists of sand dunes dominated by Kalahari woodland vegetation type (Mendelsohn et al., 1998).

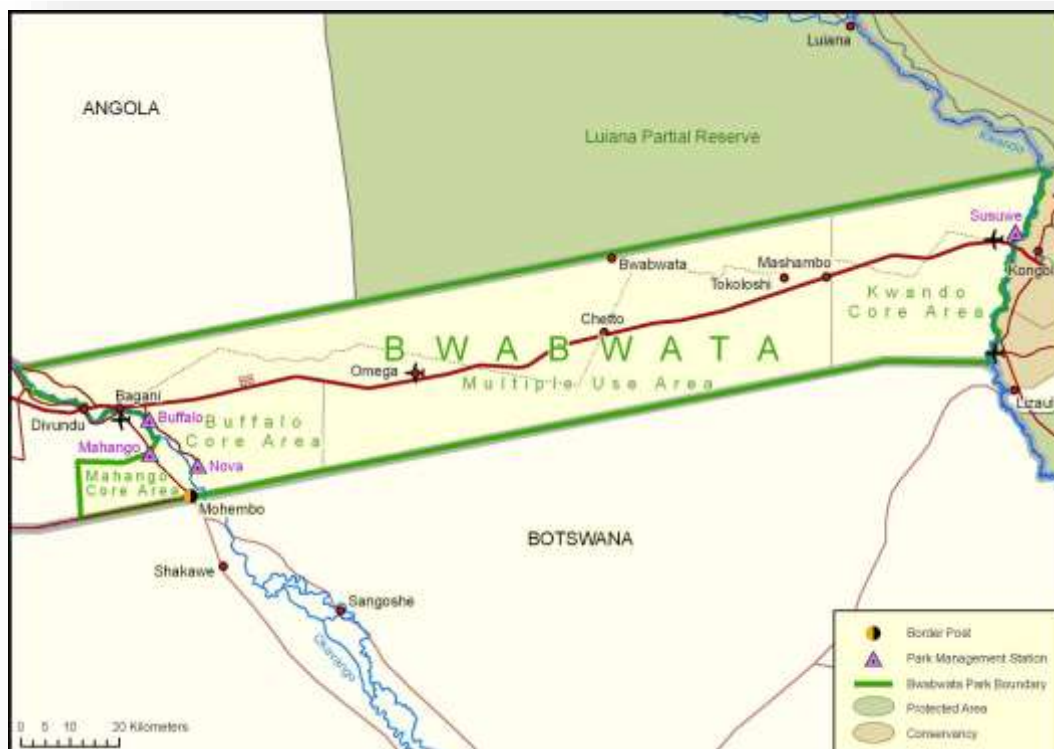


Figure 2: BNP is divided into the Buffalo (west) and Kwando (east) core conservation areas adjacent to the perennial river systems. Park residents are settled in villages within the multiple-use area (MUA) in the interior.



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The areas adjacent to the perennial rivers within BNP are considered core conservation areas and extend for approximately 30 km into the interior. These areas have the highest concentration of wildlife particularly during the late dry season when the perennial rivers are the only sources of water in the park. The Buffalo Core Conservation Area in the west and the Kwando Core Conservation area in the east make up approximately 1500 km² of BNP.

The interior of BNP that covers approximately 4500 km² is known as the multiple-use area (MUA) and is home to approximately 6500 park residents that live in villages and settlements. The majority of people living inside the park boundaries are concentrated around the defunct military bases of Omega 1 and Omega 111 as well as the settlement of Chetto. The mostly Khwe San community are largely dependent on gathering veld foods for survival and some keep livestock on a subsistence basis (Alpers, 2011). The MUA has no natural permanent water. Ephemeral pans, which dry up towards the end of the hot dry season, provide the only water for wildlife.

Field activities and data collection

During the wild dog denning season (May to September 2015), our team made up of one researcher, two TEKOA specialists and MET covered all vehicle tracks and some game trails throughout the Buffalo core conservation area and the entire Multiple Use Area (MUA) by vehicle and on foot to identify signs (spoor and scat) of wild dogs. Wild dog spoor were located by two trackers sitting on a tracker seat mounted in front of the vehicle. Field work was carried out from first light until eleven o'clock in the morning and again from five o'clock in the afternoon until dark. This survey was an attempt to count wild dog packs and numbers as opposed to an indirect spoor survey.

Infra-red camera traps were placed at dens to record the number of puppies in litters. Adult wild dogs visiting the den were also captured on camera and identified through their unique coat patterns. These cameras were later removed as our visits disturbed denning activities resulting in packs moving dens to new locations. Additionally, camera traps were placed at all water-filled pans as well as along game trails leading up to those pans in order to count adult pack members and to identify game species and herd sizes.

Wild dog scat was collected opportunistically and around den sites in order to identify prey remains. Sites where kills were made were examined and hunting behaviour and prey species were interpreted through tracking skills. Hunting behaviour was occasionally observed by sitting quietly at water-filled pans in the late afternoon where wild dogs were observed to chase prey. Observations of wild dog hunting behaviour by park residents was also recorded.

Information on wild dog mortality, human-wild dog conflict and perception by the community towards wild dogs were shared by park residents. Tourists and the general public have also contributed their wild dog observations and experiences with us.

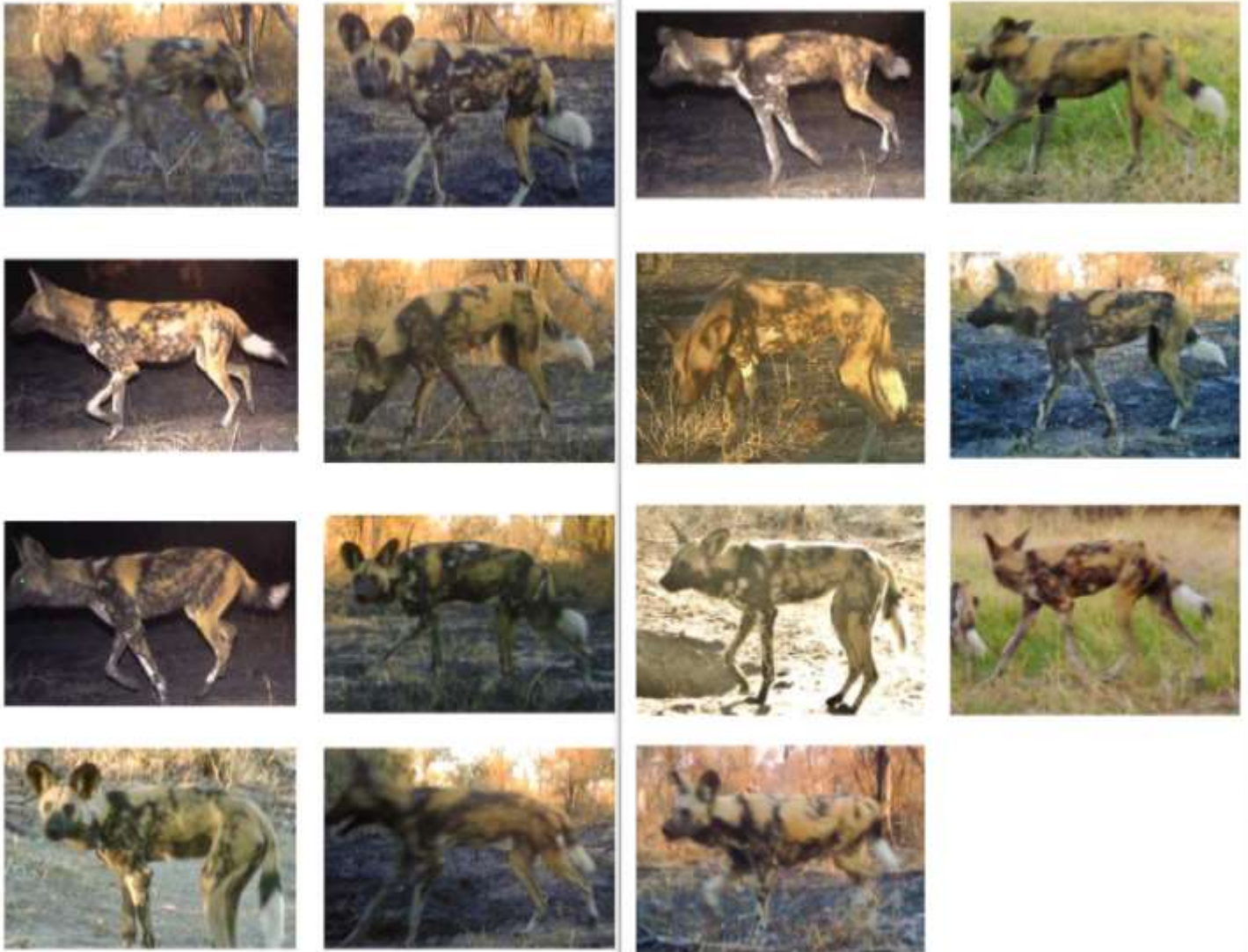


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The survey was an opportunity to share technical skills in field work with MET personnel and park residents. It is our hope to build further capacity within BNP for ongoing monitoring of all the large carnivore species.



The Chetto Pack has fifteen adult dogs, which were identified through their unique coat patterns from photographs taken on trails near their den and at water-filled pans near by. This collage shows the individual coat patterns on the left flank of all fifteen pack members.

Results

Wild dog distribution, pack size and litter size

Wild dogs occurred throughout BNP and were relatively evenly distributed in the core conservation areas and the MUAs (Figure 3). A total of four breeding packs ranging in size from 12 to 15 adult dogs were identified in BNP during this survey. Although no litter sizes were recorded, in previous years litters of 12 to 14 puppies were recorded in BNP packs. An additional twelve dogs were counted in dispersing groups made up of one to four dogs. Pack size and pack location within BNP are presented in Table 1.



Figure 3: A map of BNP with settlements (blue) showing where wild dog packs and wild dog tracks and other sign were observed during the survey.

Table 1: Breeding packs of 12 to 15 adult dogs were found in both the core conservation and multiple use areas of BNP.

AREA STATUS	LOCAL AREA	PACKS	PACK SIZE (ADULTS AND SUB-ADULTS)
CORE CONSERVATION AREA	Buffalo	Buffalo	12
	Kwando	Susuwe	13
MULTIPLE-USE AREA	Chetto	Chetto	15
	Omega 111	Omega 111	12
TOTAL		4	52



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The Chetto pack produced 12 puppies during 2014, which were counted from photos taken by infra-red cameras placed at the den site.

Density and population estimate

Based on our observations, we estimated the wild dog population of BNP to be 64 adults and subadults, with possibly an additional 32 - 52 pups born during the survey period. This represents an upper estimate of about 116 wild dogs in BNP. A breakdown of this estimate is presented in Table 2 below.

Table 2. Wild dog population estimate and structure for BNP is based on known pack sizes, litter size and dispersing individuals

Population structure	Lower estimate	Upper estimate
Adults and sub-adults (four packs)	52	52
Dispersers	12	12
Puppies (four packs)	-	52*
Total	64	116

**Known litters range in size from 12 to 14 puppies.*



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This population estimate is similar to the results from a large carnivore spoor survey during 2014 where the wild dog population was estimated at 79 adults and sub-adults (range 10 – 148; 95% CL) and 4 to 6 breeding packs. This estimate was derived from spoor frequency, which is strongly positively correlated with carnivore density using the equation $x_i = (t_i - 0.4)/3.15$, where x_i is carnivore density and t_i is carnivore track frequency (Funston *et al.*, 2010; 2014).

Diet and prey species

Prey species of wild dogs was identified through direct observations of chasing prey as well as locating and identifying kills. Hunting activity was observed in woodland, around pans, along omurambas and floodplains. Wild dogs have also been observed chasing animals alongside the main tar highway. Prey species identified through observing hunts and investigating kills sites included adult zebra, warthog, roan calf, buffalo calf, sable calf, duiker and female kudu (two in one morning).

Scat was collected in order to isolate hair of prey species, which will be identified through their unique microstructure. Reedbuck, impala, kudu, duiker and sable have been identified in preliminary analysis of wild dog scat collected in BNP. Wild dogs have been recorded scavenging on carcasses from road mortality (kudu), lion kills (buffalo and kudu) and hyaena bait (beef).

Threats

Road mortality

Motor vehicles seem to be the biggest cause of mortality in BNP. Wild dogs are regularly killed by passing trucks in the early hours of the morning when they often lie on the tar road. Wild dog carcasses attract pack mates that become secondary victims to passing vehicles. Mortality hotspots are located where the tar road bisects omurambas that are important to and regularly used by wild dogs. Results from our 2014 large carnivore spoor survey found that wild dogs frequent omurambas almost twice as often as sandy ridges in BNP (Funston *et al.*, 2014).

Den disturbance

There is a moderate amount of den disturbance in the MUA of BNP with people collecting devil's claw often investigating wild dog dens, sometimes resulting in packs relocating their dens. Although wild dogs are thought to predate on some livestock belonging to park residents, they are not persecuted by killing pups in the dens.



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Setting cameras up at dens resulted in the most disturbance and was disruptive to breeding behaviour as dogs moved puppies to new dens soon after cameras were set up, although these dens may also have been disturbed by harvesters.

Poisoning

Wild dogs were observed scavenging road kill and from carcasses within the park, which could make them vulnerable to poisoning. In the past three years, a number of poisoning incidents that resulted in mass die offs of white-backed vultures occurred within BNP, the Kwando Concession Area in Botswana, as well as Luiana national park in Angola. These were all within range of BNP wild dogs. Poisoning remains a potential hazard to wild dogs although no poison-related mortality has been recorded.

Snaring

Only one fatal snaring case of a wild dog is known of in the Zambezi Region. A dog that was collared by MET in BNP (*Piet Beytell, pers. comm.*) was found dead from a snare in the Mashi Conservancy (*Chief Mayuni, pers. comm.*). Snares found by community game guards on patrol are regularly removed from the conservancies and thus within Namibia, and surrounding countries, wild dogs are at some risk from wire snares. High numbers of snared spotted hyaenas adjacent to Sioma Ngwezi National Park, Zambia, suggest that this is an area of higher risk for snaring.

Human-wildlife conflict

Although wild dogs do not regularly kill cattle, local communities often perceive that they do so especially if the wild dogs become highly visible in a localised area (Rasmussen 1999; Woodroffe et al. 1998). Increasing cattle numbers around Omega 1 in BNP does potentially increase the risk of human-wildlife conflict related mortality for wild dogs. During 2010, a pride of lions was poisoned near Omega 1 due to cattle depredation.

Discussion and recommendations

The BNP seems to have a healthy and stable population of wild dogs that make up a significant portion of Namibia's wild dog numbers. Wild dogs living within BNP are part of a large dynamic transboundary population shared with Angola, Botswana, Zambia and possibly other countries. The MUA and the core conservation areas are equally important habitat in supporting BNP's wild dogs and facilitating transboundary movement and dispersal. Free movement across the broader KAZA landscape is vital for the persistence of wild dogs in BNP and the Zambezi Region.

At any one time wild dogs from BNP could just as easily be in Botswana or Angola, which does confound making density estimations. The most important and consistent measure is how many packs of wild dogs are regularly utilising BNP, how often they breed there, and survival rates of litters. Individual pack sizes



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fluctuate from denning season to denning seasons, rapidly inflating when the new pups join the pack, and declining again when subgroups splinter off to form new packs. For example, a pack in the Kwando Core Area fluctuated from 9 to 24 individuals during one denning season (*L. Hanssen, pers. obs.*). Resident packs within BNP can differ from year to year, but this does not necessarily mean high turnover in the wild dog population. The pack utilizing the Kwando Core Area during the 2015 denning season is an entirely different pack to the Susuwe pack that were established there from 2010 to 2014. The 2015 pack established in the Chetto area in the MUA is also different to the 2014 pack denning in the same area.

Wild dogs require frequent and large amounts of food relative to other large carnivores (Mills et al. 1993) and subsist on prey that range in size from 10 to 120 kg (Creel et al. 2002). From camera trapping evidence, the MUA supports a diversity of antelope species in large herds (*See appendix 1.*) well into the dry season, making it ideal habitat for wild dogs.

Park residents in the MUA are traditionally a hunter gatherer culture and are tolerant of large carnivores even though wild dogs are known to occasionally kill their goats and donkeys that stray away from villages (*B. Alfred; B. Kupinga; A. Tchadau; N. Jaga, pers. comm.*). A potential threat to wild dogs in the MUA is the growth and expansion of cattle numbers around Omega 1 and perceived livestock depredation by wild dogs.

At present vehicles seem to be the largest contributor to wild dog mortality as wild dogs occasionally lie on the warm tarmac at sunrise and dusk make them vulnerable to passing traffic. This is particularly prevalent in the core areas and where omurambas that are important for wild dog movement are bisected by the highway. Over the last two years, mortality along the road appears to have declined, which could be due to wild dog warning signs placed at mortality hotspots by MET, but this has not been quantified. Traffic slowing measures at omurambas and important crossing areas, such as the Malombe Pan turn off, are likely to have a positive impact. In addition, it might be worth considering closing the park to general transit traffic from early evening to sunrise (coinciding to border closure times) to reduce mortality of nocturnal wildlife in general.

Monitoring of wild dogs should be ongoing, with the monitoring of den sites being discouraged as we found this activity to be particularly disruptive to breeding activities. A general large carnivore spoor survey every three years along with regularly collating public information and reports of group size and mortality are sufficiently sensitive to flag conservation concerns. Development or human settlement in and around omurambas or near ephemeral pans should be discouraged as they are important to the movement and dispersal of many wildlife species in the park.

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Appendix 1. Mammal species identified in the MUA of BNP during the survey

African Wild Cat
Baboon
Buffalo
Bush pig
Caracal
Cheetah
Duiker
Eland
Elephant
Giraffe
Honey badger
Kudu
Leopard
Monkey
Porcupine
Roan
Sable
Scrubhare
Serval
Side striped jackal
Spotted hyaena
Springhare
Steenbok
Warthog
Wild dog
Zebra