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Abstract: The current extinction crisis is caused primarily by human impacts upon wild populations. Large carnivores are especially sensitive to human activity; because their requirements often conflict with those of local people, predators have been actively persecuted in most regions of the world. In this paper, the impact of people upon predators is analyzed by relating local carnivore extinctions to past and projected human population densities. There are strong associations between high human density and the loss of carnivore populations from a region. Interspecific variation in ability to survive at high human densities probably reflects species' ability to adapt to human-modified habitats. However, regional and temporal variation in individual species' sensitivity to human density is more likely to reflect the activities of local people than the phenotypes of local carnivores. Local culture, government policy and international trade all influence human attitudes to predators and, therefore, the impact of people upon carnivore populations. The importance of these factors may mean that extinction risks for carnivores will continue to increase, even though human population growth is projected to decelerate during the new millennium. This points to an urgent need for techniques to resolve conflicts between people and predators at either the local or landscape level.

RESULTS

In order to obtain as accurate a picture as possible on the distribution and in some cases the status of the various large mammals and all carnivores occurring in the Hwange National Park, several different techniques were used.

These techniques have already been discussed above in the section of this report dealing with "Methods of Survey". Therefore a combination of the following methods were employed to ascertain the distribution of the large mammals:

- * "Large Carnivore survey" form handed out to visitors, researchers, etc. (Appendix C)
- * Marked transects ("road strip counts") (see Table 14)
- * Wildlife Report forms (Appendix F)
- * Wildlife Society 24 hour waterhole counts (see Table 9)
- * Aerial surveys by helicopter
- * Aerial surveys by fixed wing aircraft belonging to Pat Cox
- * National Parks & Wildlife Management annual aerial survey (see Tables 10 and 11). This was the main method of assessing status of large mammals
- * Night observations from an open vehicle using a spotlight

In this report, which by necessity has to be of a 'readable' length, it has not been possible to include **all** the raw data or even the analysis of the data of how the population of the large mammals were obtained. However, as much raw data as possible has been included in several Tables and Appendices of this report and I would refer the reader to Table 9, 10, 11 and especially Table 14. These Tables give actual numbers of animals seen as a result of at least three of the techniques used.

Other Tables with numerical data and some of the methods used to ascertain the population of various species are included under the profile of that particular species.

In the results of this year long survey discussed below, a distribution map is included for each species under discussion together with as much data as possible. It has obviously not been possible to plot the sighting of every group of animals seen on the distribution maps as this would clutter the map to such an extent that some areas would be almost black with dots. This is particularly the case as far as elephant, zebra, kudu, impala and several other species are concerned.

In many species such as lions, leopards, cheetah and others the same animal may have been seen on several occasions by different visitors in the same general area. In these cases the distribution map may show, for example, 10 different sightings of one individual in an area. In reality it often meant that it was one animal seen on 10 occasions and not 10 different animals.

In other instances such as for gemsbok, tsessebe, reedbuck, bushbuck and other less common animals, all sightings have been included on the distribution maps. In all cases the distribution of all species is discussed in detail under the profile of that species.

The habitat in which an animal was recorded has in all cases been referred to the work done by Rogers (1993) where she has given each Vegetation Type a number. Details of the Vegetation Types (i.e. habitats of this report) are given in Tables 4 and 5 of this report.

Table 14 - Result from marked transects (road strip counts) giving minimum, maximum and mean number of mammals seen

* Tran. No.	N N T C	Lion	Leopard	Cheetah	B/B Jackal	S/S Jackal	Groups B/Mongoose	Groups D/Mongoose
		min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)
1	24	0-4 (0.3)	0-3 (0.1)		0-4 (1.2)	0-2 (0.1)	0-1 (0.1)	0-4 (0.2)
2	12	0-3 (0.5)			0-3 (0.4)		0-1 (0.1)	0-1 (0.1)
3	11	0-3 (0.3)	0-1 (0.1)				0-2 (0.4)	0-1 (0.2)
4	4						0-1 (0.3)	
5	15				0-1 (0.2)		0-1 (0.1)	
6	14				0-3 (0.2)		0-1 (0.1)	
7	14							
8	5	0-5 (1.0)			0-1 (0.2)			
9	1							
10	3	0-4 (1.3)				0-2 (0.7)		
11	9	0-6 (1.7)	0-1 (0.2)		0-4 (1.6)		0-3 (1.4)	0-2 (0.7)
12	8	0-5 (1.1)			0-10 (3.8)		0-1 (0.1)	
13	3				0-3 (1.0)		0-1 (0.3)	0-1 (0.3)
14	3							
15	18				0-1 (0.1)			0-2 (0.2)
16	11	0-3 (0.3)						0-1 (0.1)
17	18	0-11 (0.9)			0-2 (0.1)			0-4 (0.4)
18	14							
19	7							
20	9			0-2 (0.2)				0-1 (0.2)
21	19				0-1 (0.1)			0-1 (0.1)
22	2							
23	1							
24	2							
25	1							
26	1	0-3 (3.0)						
27	10						0-1 (0.1)	
28	7	0-1 (0.1)						
29	12							
30	14							
31	1							
32	1				0-2 (2.0)			
33	1							
34	1							
35	3				0-1 (0.3)			
36	2							
37	1							
38	2							0-1 (0.1)
39	1							
40	1							
41	1				0-2 (2.0)			
42	1						0-1 (1.0)	
43	1	0-5 (5.0)						0-1 (1.0)
44	3	0-2 (0.7)	0-1 (0.3)		0-3 (1.7)		0-1 (0.3)	0-1 (0.3)
45	3	0-7 (3.0)		0-1 (0.3)		0-2 (1.0)	0-1 (0.3)	0-1 (0.3)
46	1							

* See Table 8 and Map 6 for details of transects
 NNTC represents number of times each transect was covered. A blank space indicates that there were no records of that species on the transects covered.

Table 14 contd...

* Tran. No.	N N T C	Group						
		S/Mongoose	S/Hyaena	Wild dog	Buffalo	Bushbuck	Eland	Gemsbok
		min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)
1	24	0-1 (0.1)	0-2 (0.1)	0-7 (1.2)	0-61 (5.4)	0-1 (0.04)	0-11 (0.9)	
2	12		0-1 (0.1)	0-6 (1.5)	0-200 (19.3)	0-1 (0.1)		
3	11	0-1 (0.2)	0-3 (0.4)	0-8 (0.7)	0-27 (2.5)			
4	4				0-7 (4.0)			
5	15				0-56 (11.6)	0-2 (0.1)		
6	14	0-1 (0.1)	0-2 (0.2)		0-250 (32.6)			
7	14							
8	5		0-1 (0.2)		0-26 (7.0)			
9	1				0-4 (4.0)			
10	3		0-1 (0.3)	0-6 (2.0)				
11	9	0-1 (0.4)	0-3 (1.0)	0-8 (2.4)	0-91 (14.9)	0-2 (0.4)	0-76 (26.8)	0-7 (1.6)
12	8				0-78 (9.8)			
13	3	0-1 (0.3)			0-7 (2.3)		0-2 (0.7)	0-1 (0.3)
14	3				0-1 (0.3)			
15	18		0-1 (0.1)					
16	11							
17	18	0-1 (0.1)	0-4 (0.2)					
18	14							
19	7							
20	9	0-1 (0.1)			0-150 (16.7)			
21	19				0-100 (5.3)			
22	2							
23	1	0-1 (1.0)						
24	2							
25	1							
26	1					0-1 (1.0)		
27	10							
28	7				0-103 (21.9)			
29	1							
30	14	0-1 (0.1)						
31	1							
32	1							0-7 (7.0)
33	1							
34	1	0-1 (1.0)					0-4 (4.0)	
35	3	0-1 (0.3)					0-4 (1.3)	
36	2							
37	1							
38	2							
39	1							
40	1							
41	1				0-25 (25.0)			
42	1				0-11 (11.0)			
43	1	0-1 (1.0)					0-12 (12.0)	
44	3	0-1 (0.3)			0-32 (12.3)		0-13 (4.3)	0-2 (0.7)
45	3				0-102 (35.0)			
46	1	0-1 (1.0)			0-11 (11.0)		0-2 (2.0)	0-1 (1.0)

* See Table 8 and Map 6 for details of transects

NNTC represents number of times each transect was covered. A blank space indicates that there were no records of that species on the transects concerned

Table 14 contd...

* Tran. No.	N N T C	Group						
		Impala	Kudu	Roan	Sable	Waterbuck	Wildebeest	Elephant
		min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)
1	24	0-309 (84.4)	0-56 (12.3)	0-4 (0.5)	0-34 (8.5)	0-18 (7.1)	0-135 (60.0)	0-166 (25.9)
2	12	0-274 (161.2)	0-19 (6.3)		0-1 (0.1)		0-50 (29.1)	0-4 (0.7)
3	11	0-72 (12.0)	0-18 (7.1)		0-10 (0.9)			0-91 (40.6)
4	4	0-41 (13.0)	0-4 (1.0)					0-22 (10.5)
5	15	0-80 (17.0)	0-20 (5.1)	0-4 (0.3)	0-3 (0.4)	0-15 (2.5)	0-40 (6.6)	0-24 (4.3)
6	14	0-100 (40.1)	0-5 (1.5)	0-3 (0.2)	0-13 (1.1)		0-42 (5.5)	0-28 (5.7)
7	14	0-19 (4.8)	0-8 (3.2)				0-7 (0.9)	0-59 (16.4)
8	5	0-37 (13.6)	0-10 (5.0)					0-43 (21.6)
9	1	0-18 (18.0)						0-1 (1.0)
10	3	0-96 (40.7)	0-9 (3.0)				0-31 (10.3)	0-4 (1.3)
11	9	0-109 (26.9)	0-32 (12.8)	0.7 (2.8)	0-35 (12.4)	0-12 (4.0)	0-520 (268.7)	0-49 (12.2)
12	8	0-98 (33.5)	0-13 (2.9)	0-1 (0.1)	0-9 (1.3)	0-20 (13.9)	0-18 (3.5)	0-4 (1.9)
13	3	0-57 (38.0)	0-9 (4.3)					0-21 (7.0)
14	3	0-9 (3.0)	0-11 (4.3)					0-5 (3.7)
15	18	0-80 (30.2)	0-6 (1.5)		0-1 (0.1)		0-12 (0.7)	0-21 (3.8)
16	11	0-40 (9.7)	0-3 (0.5)					0-16 (3.8)
17	18	0-62 (18.3)	0-20 (2.3)				0-6 (0.3)	0-53 (11.9)
18	14	0-44 (20.3)	0-6 (1.0)					0-26 (4.4)
19	7	0-37 (11.4)	0-6 (0.9)			0-4 (0.6)		0-1 (0.4)
20	9	0-75 (30.9)	0-8 (1.1)					0-20 (3.8)
21	19	0-43 (17.5)	0-4 (0.2)		0-1 (0.1)		0-5 (0.8)	0-18 (0.9)
22	2	0-6 (3.0)						0-1 (0.5)
23	1	0-20 (20.0)	0-2 (2.0)					
24	2	0-3 (1.5)						0-2 (1.0)
25	1	0-2 (2.0)	0-1 (1.0)					
26	1		0-2 (2.0)					
27	10	0-21 (3.2)	0-11 (3.1)			0-3 (0.3)		0-7 (1.3)
28	7	0-65 (12.3)	0-8 (1.3)	0-13 (1.9)				0-121 (29.6)
29	1							
30	14	0-39 (9.3)	0-3 (9.3)				0-2 (0.1)	0-58 (14.6)
31	1	0-20 (20.0)						0-5 (5.0)
32	1	0-30 (30.0)	0-5 (5.0)				0-87 (87.0)	
33	1	0-17 (17.0)	0-18 (18.0)					0-17 (17.0)
34	1							0-20 (20.0)
35	3	0-3 (1.0)	0-6 (3.0)					0-21 (10.0)
36	2							0-1 (2.0)
37	1	0-4 (4.0)		0-2 (2.0)	0-14 (14.0)			0-4 (4.0)
38	2	0-30 (20.5)	0-4 (2.0)					0-24 (17.5)
39	1	0-15 (15.0)						0-53 (53.0)
40	1	0-9 (9.0)						
41	1	0-31 (31.0)	0-2 (2.0)					0-2 (2.0)
42	1		0-4 (4.0)					0-35 (35.0)
43	1	0-42 (42.0)	0-14 (14.0)					0-33 (33.0)
44	3	0-47 (32.3)	0-9 (6.3)	0-3 (1.3)	0-33 (22.3)	0-2 (0.7)	0-165 (67.7)	0-31 (15.0)
45	3	0-42 (29.0)	0-15 (9.7)					0-19 (8.7)
46	1	0-37 (37.0)	0-9 (9.0)					0-19 (19.0)

* See Table 8 and Map 6 for details of transects

NNTC represents number of times each transect was covered. A blank space indicates that there were no records of that species on the transects concerned

Table 14 contd...

* Tran. No.	N N T C	Group					(Troops)	(Troops)
		Giraffe	Warthog	Zebra	C/Dulker	Steenbok	Baboon	V/Monkey
		min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)	min/max (mean)
1	24	0-44 (12.0)	0-26 (6.1)	0-210 (61.0)	0-1 (0.04)	0-2 (0.2)	0-5 (1.5)	0-1 (0.1)
2	12	0-48 (16.4)	0-37 (10.2)	0-31 (10.4)		0-2 (0.7)	0-1 (0.5)	
3	11	0-38 (10.4)	0-6 (1.2)	0-18 (8.5)	0-2 (0.5)	0-3 (1.1)	0-2 (0.5)	0-1 (0.1)
4	4	0-21 (7.8)	0-2 (0.5)	0-26 (15.3)		0-4 (2.0)	0-3 (1.5)	
5	15	0-20 (6.4)	0-5 (0.5)	0-49 (16.9)	0-1 (0.1)	0-6 (0.8)	0-4 (1.1)	
6	14	0-21 (9.5)	0-12 (3.4)	0-19 (5.6)	0-1 (0.1)	0-1 (0.2)	0-3 (0.6)	0-1 (0.1)
7	14	0-29 (6.9)	0-2 (0.3)	0-35 (9.0)		0-7 (1.4)		0-1 (0.1)
8	5	0-10 (4.8)	0-8 (2.0)	0-17 (7.6)		0-2 (0.4)	0-1 (0.2)	0-1 (0.2)
9	1	0-3 (3.0)			0-1 (1.0)	0-1 (1.0)		
10	3		0-5 (3.0)					
11	9	0-37 (14.1)	0-17 (7.2)	0-118 (77.1)	0-2 (0.6)	0-2 (0.7)	0-7 (2.3)	0-2 (0.3)
12	8	0-4 (1.9)	0-4 (0.8)	0-31 (10.8)			0-2 (1.5)	
13	3	0-13 (6.7)	0-6 (2.7)	0-22 (14.0)	0-1 (0.3)	0-3 (1.0)	0-1 (0.3)	0-1 (0.3)
14	3	0-36 (22.3)		0-11 (3.7)		0-8 (4.7)	0-2 (0.7)	0-2 (0.7)
15	18	0-23 (3.8)	0-5 (0.9)	0-49 (10.8)			0-1 (0.2)	0-1 (0.1)
16	11	0-5 (0.6)	0-11 (1.7)					
17	18	0-11 (1.7)	0-4 (0.4)	0-41 (3.3)			0-2 (0.2)	
18	14	0-4 (0.9)	0-4 (0.3)	0-11 (2.4)			0-3 (0.4)	
19	7	0-3 (0.4)						
20	9	0-11 (1.7)	0-3 (0.3)	0-7 (1.9)			0-1 (0.2)	0-1 (0.1)
21	19	0-5 (0.6)	0-7 (0.9)	0-15 (1.9)		0-2 (0.3)	0-1 (0.1)	0-1 (0.1)
22	2			0-4 (2.0)				
23	1						0-1 (1.0)	
24	2			0-1 (0.5)				
25	1			0-3 (3.0)				
26	1		0-9 (9.0)				0-1 (1.0)	
27	10	0-6 (0.6)					0-2 (0.4)	
28	7	0-4 (0.6)	0-3 (0.4)					
29	1							
30	14	0-15 (2.3)	0-3 (0.4)	0-16 (2.1)		0-2 (0.6)		
31	1					0-3 (3.0)		
32	1	0-14 (14.0)	0-12 (12.0)	0-38 (38.0)		0-3 (3.0)	0-3 (3.0)	
33	1	0-6 (6.0)				0-1 (1.0)		
34	1	0-1 (1.0)		0-6 (6.0)		0-1 (1.0)		
35	3	0-1 (0.3)	0-1 (0.3)	0-7 (5.0)		0-4 (2.3)		0-1 (0.3)
36	2			0-3 (1.5)		0-4 (2.0)		
37	1							
38	2	0-3 (1.5)		0-4 (10.0)		0-11 (10.0)		
39	1	0-1 (1.0)				0-2 (2.0)		
40	1					0-3 (3.0)		
41	1			0-7 (7.0)			0-1 (1.0)	
42	1	0-3 (3.0)	0-2 (2.0)	0-11 (11.0)		0-1 (1.0)	0-1 (1.0)	
43	1	0-2 (2.0)	0-8 (8.0)	0-18 (18.0)	0-1 (1.0)	0-3 (3.0)	0-2 (2.0)	
44	3	0-21 (9.0)	0-6 (2.3)	0-32 (20.0)		0-3 (1.3)	0-2 (1.3)	
45	3	0-4 (1.3)	0-2 (1.0)	0-19 (11.3)			0-1 (0.3)	0-1 (0.3)
46	1	0-9 (9.0)	0-2 (2.0)	0-50 (50.0)		0-2 (2.0)	0-1 (1.0)	

* See Table 8 and Map 6 for details of transects

NNTC represents number of times each transect was covered. A blank space indicates that there were no records of that species on the transects concerned

Order **PRIMATES**

Bushbabies, baboons and monkeys

Suborder **STREPSIRHINI**

Family **LORISIDAE**

Bushbabies

Subfamily GALAGINAE

Meester et al. (1986) listed three species from this region in Africa. *Otolemur crassicaudatus* (E. Geoffrey 1912); *Galago moholi* (A. Smith 1836) and *Galagoides zanzibaricus* (Matschie 1893).

The species occurring in the Hwange National Park is the South African lesser bushbaby (night ape). The Thick-tailed bushbaby (*O. crassicaudatus*) does not extend its range in Zimbabwe as far north as the Hwange National Park while the Grant's or Zanzibar bushbaby (*G. zanzibaricus*) only occurs along the eastern edge of Zimbabwe and into Mozambique.

South African lesser bushbaby (Nagapie)

Galago moholi A. Smith 1836

Galago moholi bradfieldi Roberts 1931

Colloquial name

Wilson (1975) referred to this species as the Lesser Galago or nightape. Skinner and Smithers (1990) have stated that there has never been a complete consensus in the use of the colloquial name for this species. The names of night ape, nagapie, lesser galago and bushbaby all appear in the literature.

Taxonomic notes

Wilson (1975) referred to the species occurring in the Hwange National Park as *Galago senegalensis* and mentioned that possibly one of two sub-species, i.e. *G.s. bradfieldi* or *G.s. moholi* occurred in the Park.

Smithers (1971) indicated that both of the above sub-species occurred in Botswana with *G.s. moholi* in the south eastern parts of the country and *G.s. bradfieldi* throughout the northern and north eastern part. Smithers goes on to say that intermediates between *moholi* and *bradfieldi* occur in the northern parts of eastern Botswana. Wilson (1975) therefore felt that it was *bradfieldi* that occurred in the Hwange National Park.

In 1975 I considered *moholi* as a sub-species of *senegalensis* and Smithers (1983) also treated *moholi* as a sub-species of *senegalensis*. However, recent data shows that the two species are sympatric in north eastern Tanzania (Nash et al. 1989) and Zimmerman,

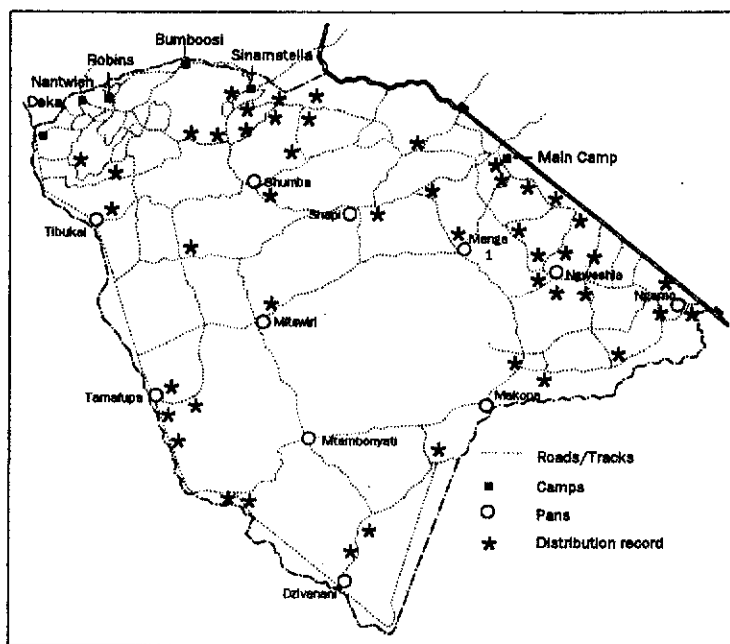
Bearder, Doyle & Andersson (1988) have provided conclusive evidence that the vocalisation of the two species are distinctly different.

Two sub-species of *G. moholi* are listed from the southern African subregion (Meester, et.al. 1986), those being *C.m. moholi* in the eastern part of the species range and *C.m. bradfieldi* from the northern Namibia, extending into Angola eastwards in Botswana and to Makgadikgadi. The sub-species for Hwange National Park is, therefore, considered to be *Galago moholi bradfieldi* (Roberts 1951).

Distribution

The lesser bushbaby is common in the Hwange National Park and has a very wide distribution. It appears to be much more common in certain areas and large numbers were recorded in the Sinamatella, Ngamo, Tamafupa, Shumba, Deteema and Ngweshla areas. It is interesting to note that during my first survey of the Park in 1969/71 (Wilson 1975) the species was not common around Tamafupa, yet during the present survey (1996) dozens were seen in the area between Tamafupa and Shabi Shabi.

The distribution of this species is no doubt determined by habitat and in areas of *Baikiaea* woodland it is a lot less common than in *Acacia* velt. (See below under Habitat for additional details).



Map 11- Hwange National Park showing localities where groups (or individuals) of lesser bushbabies were recorded. This distribution is based on actual sightings at night or from the distinctive call of the species.

Map 11 gives details of localities where the lesser bushbaby was recorded during the present survey. Not all the records were actual sightings but the species was often heard at night and its call was unmistakable and therefore used as a distribution record.

Habitat

This species is without doubt a savanna woodland species and wherever *Acacia* woodland or scrub occurs in the Hwange National Park, one would expect to find the lesser bushbaby. For example it is very common around Makwa Pan and especially in the '10 mile drive' area around Dom, Nyamandhlovu and Dopu Pans. Yet once one enters the tall *Baikiaea* woodland between Main Camp and Makwa, the sightings of the lesser bushbaby decreases.

Terminalia-Acacia and especially *Terminalia-Combretum* areas are also good habitat types in which the species is common. In the Sinamatella area below the Sinamatella Camp a large number of lesser bushbabies were seen during night observations and on numerous occasions three animals were recorded in a single tree.

Habits

The lesser bushbaby is strictly nocturnal and at no time during the present survey were they ever seen during the hours of daylight. While the species is arboreal in habits they are nevertheless still often seen on the ground, no doubt searching for insects or when moving from one tree to another.

It appears as if several animals may sleep together in small groups of up to 5 or 6 and as they leave their 'nests' at night they disperse and feed as solitary individuals. When groups of 3 or 4 are seen together it is often in the early evening and soon after they have climbed out of the hollow trees or other places where they were sleeping during the day. They are particularly fond of holes in Mopane or large Acacia trees.

As a result of sleeping all day the lesser bushbaby is extremely active early in the evening when they can be seen jumping about a great deal and often in the vicinity of the tree in which they slept during the day. As night progresses so they wander further from their nests and become less active.

The species has a wide range of vocalisation and Andersson (1969) recorded 25 different sounds made by the species of which 10 or 11 were discrete basic sounds.

The species is very easy to identify at night as their eyes shine very brightly with a deep reddish glow when a spotlight is directed at them. However, they can be confused with a genet at night but because of their tremendous leaping abilities, it does not take long to recognise the lesser bushbaby.

It has been suggested by Bearder (1987) that the home range of a female lesser bushbabies is between 4.4 and 11.7 hectares while those of males is much larger, in fact twice the area at between 9.5 and 22.7 hectares.

Food

As no specimens were collected during the present survey no additional data from the Hwange National Park is available. Wilson (1975) when discussing specimens collected during the 1969/71 survey of the Park mentioned that various small beetles were found in the stomach contents of three specimens while a fourth specimen was found to have eaten some resin from an Acacia tree just before being collected. Skinner & Smithers (1990) say the diet of the lesser bushbaby is mainly insects and gum, which exudes from certain species of trees and principally Acacia spp.

Breeding

As with food no new data on reproduction for the Hwange National Park is available and no records of breeding were obtained during the present survey. However, Wilson (1975) recorded a pregnant female collected at Tshakabika Hot Springs on 6th October 1969 with two 50 mm fetuses. One of the fetuses weighed 11 g and the other 12 g. Hair was already present on both fetuses.

Another breeding record was of a pregnant female collected at Dzivanini Pan on 23rd September 1969 and she also contained two small fetuses each weighing 8 g and with a crown to rump length of 40 mm.

Doyle, Andersson & Bearder (1971) give a gestation period of 123 days ranging from 121-

124 days. They mention the average number of fetuses as 1.8 for 30 animals with a range of 1-2. They also mention the mass at birth from about 9.3 to 9.6 g. It is of interest to note that the female collected at Tshakabika in Hwange on 6th October 1969 had fetuses which weighed 11 and 12 grams, which is much heavier than the figures quoted by Bearder (1987).

Masters (1988) recorded 97 pregnancies in captivity where 39 (40.2%) were single babies, 58 (59.8%) were of multiple births with two sets of triplets and 56 sets of twins. In Botswana, in a similar habitat to parts of the Hwange National Park, Smithers (1971) collected pregnant females for almost all months of the year excepting April to June.

From other literature it appears as if the lesser bushbaby has two periods during the year when young are born. These are in October and early November and again in late January, early February (Doyle, et.al. 1971). Bearder (1969) noted that the young leave the nest for the first time when about 11 days old.

Predation

A Giant Eagle owl (*Bubo lacteus*) was found feeding on a freshly killed lesser bushbaby in October 1969 in the Hwange National Park (Wilson 1975). This large owl was found to be very common in the Main Camp area during the present survey and they, no doubt, feed on a lot more lesser bushbabies than the single record shows.

Mass

Four adult males from the Hwange National Park ranged between 134 and 150 grams in weight with a mean of 141 g. Two gravid females weighed 190 and 200 g while a non-gravid female had a mass of 158 g. (Wilson 1975). In Botswana, an average mass of 33 males was 155.5 g with a range of between 124.8 and 189.6 g while 30 females averaged 150.7 g with a range of 132.1 and 176.7 g. (Smithers 1971).

Suborder **HAPLORHINI** Family **CERCOPITHECIDAE** Monkeys and baboons

Subfamily CERCOPITHECINAE

In the Hwange National Park the Subfamily Cercopithecinae is represented by only two species, namely the Chacma baboon, *Papio ursinus* (Kerr 1792) and the vervet monkey *Cercopithecus aethiops* (Linnaeus 1758).

The vervet monkey is a woodland species and the Chacma baboon has a much wider distribution and occurs even in very dry areas. Both species are very social in habits and in the case of the Chacma baboon very large groups of up to, and occasionally over, 100 individuals have been recorded.

Chacma baboon

Papio ursinus (Kerr 1792)

Papio ursinus griseipes (Pocock 1911)

Colloquial name

The name Chacma baboon is very well entrenched throughout southern Africa and this baboon is not known by any other name. It is of interest to note that the name was first used in French by F. Cuvier in 1819 (Hill 1970) and has remained the same ever since.

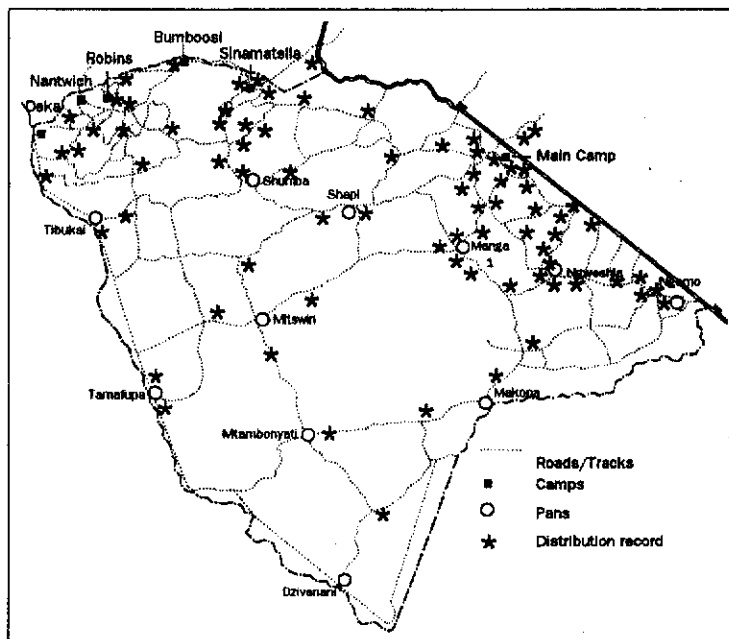
Taxonomic notes

Wilson (1975) referred to the sub-species in the Hwange National Park as *Papio ursinus griseipes*, Pocock 1911. Skinner & Smithers (1990) also indicated that *P.u. griseipes* occurred in Zimbabwe.

Distribution

There are very few places, especially around the Pans, where baboons were not recorded during the present survey. They have an exceptionally wide distribution in the Park and have been found to occur throughout. In some places such as along the Lukozi River in the Sinamatella area there are at least 4 different troops and around many pans in the Kalahari sand country there are often 2 and sometimes even 3 troops present. The species is very common around Makwa, Kennedy Vlei, Ngweshla, Ngamo, Shumba, Deteema and Mandavu Dams and along the Lukozi River.

Map 12 gives details of actual troops which are known to occur in the Park. However it is very obvious that many more troops occur in the Hwange National Park which were not recorded during the survey.



Map 12 - Distribution of Chacma baboon troops in Hwange National Park as determined from marked transects (road strip counts), Wildlife Society game count at waterholes and wildlife report forms.

Habitat

The Chacma baboon was recorded from many different habitat types throughout the Park. For example, they were common in the riverine vegetation along the Lukozi River, around the open salt pans in the Robins area, on calcrete soils around the pans at Makwa, Kennedy and Ngweshla and in the grasslands at Makolola and Ngamo. They were often seen in the broken and Kopje country north east of Shumba and even throughout the Mopane country in the south at Dzivanini and in the north around Sinamatella and Robins.

They were also seen in several dry areas in the centre of the Kaiahari sand velt and around saline pans. However, as the species needs to drink at least once a day, their distribution is no doubt determined by the availability of water. The Chacma baboon, therefore, has an extremely wide habitat tolerance and appears in most habitat types in the Hwange National Park.

Habits

As mentioned above under Distribution, Map 12 shows the location at which different troops of baboons were recorded during the year long survey. While it was often impossible to obtain an accurate count of every individual in a troop, especially when troops were encountered in denser vegetation such as along the Lukozi River, there were a number of very well known troops near the pans in Kalahari sand which were studied and accurate counts of the individuals in the troops obtained.

For example, the 3 troops (originally 2 troops at the beginning of the year) that existed at Makwa Pan were seen and watched on dozens of occasions not only by myself but also by volunteers helping with the survey. As a result, a considerable amount of data was obtained by various volunteers who spent many hours watching the groups at Makwa.

Of the 51 troops of baboons encountered the number in each group ranged from as few as 25 animals to as many as 136. The group of 136 which lived near Makwa Pan eventually split into two groups of 49 and 87 animals. However, the average troop size for the entire Park from 51 groups was 44 animals with a range of between 25 and 136 animals.

There were, during the 1996 survey, almost half the number of records compared to those obtained during the 1969/71 survey. There are two reasons for this. The first is that the original 1969/71 records were obtained over a period of 2 years whereas the present survey took only 1 year.

Secondly, the 1969/71 data is for all records or observations of baboons including groups encountered on more than one occasion whereas the 1996 data is for a definite 51 different troops. While many of the troops encountered were seen on several occasions, the figures given in Table 15 are the maximum number of baboons ever seen in any of the recognised or known troops.

During the present survey the largest troop of baboons seen anywhere in the Park was at Makwa Pan in Kalahari sand and that consisted of 136 animals. That large troop was seen and counted on no less than 11 occasions and the numbers in the troop varied from 98 to 136 animals. No doubt we often missed many of the animals as they were most probably still hiding in the vegetation near the pan.

The troop of 136 remained as a single group for 5 months of the year and in June 1996 we noticed, for the first time, that the group had split into two separate troops. Even after detailed observations for many days running it was difficult to determine what had happened to cause the troop to split. It appeared as if one very large and dominant male baboon had driven off 59 females, babies and immature males from the main troop of 136 animals and these he was protecting and trying to keep with him.

For many days there was tremendous confusion as the members of the entire group mixed and separated and even at night there was confusion as to where different individuals would sleep. At the end of about 10 days there was no doubt that the main troop of 136 animals had split into two troops of 49 and 87 animals. The large troop of 87 animals had retained in that group 4 very large males whereas in the "split off" group there was only 1 adult male.

There also appeared to have been a change in the troop size in relation to habitats between 1969/71 and 1996. In other words the largest groups were no larger in the mopane country around Sinamatella and Robins, the Lukozi River and around the dams as was the case in 1969/71. In 1996 the largest troops were encountered at Makwa, Kennedy Vlei, Ngweshla and Ngamo and even the troops in the Terminalia scrubland had increased in size. The average for 11 troops in Terminalia in 1969/71 was 23 animals (range 15-35) whereas the present survey showed that of 10 troops in the same habitat the average was 35 baboons (range 25-57). In the north of the Park the troop size had decreased (See Table 15). Additional details of the changes in troop size over the years can be seen in Table 15.

Table 15 - Baboon troop size in relation to habitat 1969/71 survey and 1996 survey

Habitat Type	No. of records	* Troop size (1969/71)		No. of records	Troop size (1996 survey)	
		Range	Mean		Range	Mean
Mopane (Robins Sinamatella area)	18	21-74	(42)	9	30-41	(35)
Mopane (Dzivanini area)	7	17-40	(31)	2	26-39	(33)
Riverine veg (Lukozi River)	15	29-67	(48)	6	25-42	(36)
Dams (Masuma, Mandavu/Deteema)	20	32-85	(49)	7	29-50	(34)
Terminalia bushland (Type 21)	11	15-35	(23)	10	25-57	(35)
Pan area between Main Camp & Ngamo	26	30-69	(46)	17	49-136	(69)
Total	97	15-85	-	51	25-136	(43)

* Details as given in Wilson (1975, page 40)

Skinner and Smithers (1990) say that in exceptional cases and under optimum conditions baboon troops will have as many as 130 individuals.

It is, therefore, assumed that conditions in the Makwa area of the Hwange Park were absolutely ideal and that is why the troop had increased to 136 animals. The 1995/96 rainy season was also exceptional and thus, with an abundance of food in the area, the mortality rate of young and adults alike would have been a lot less. However, the troop no doubt had reached its maximum size and by the middle of the dry season (June) it was obvious that the troop was too large and thus the split came.

The three troops at Makwa, the two at Kennedy 1 and the three at Ngweshla definitely had overlapping home ranges but they tended to avoid each other. The only times that they would come in contact with each other was in the early morning and late afternoon when they were returning or leaving the main pan area at which they would drink. During the rains this did not apply as there was an abundance of water everywhere and contact with each other was often avoided.

The dominant male in each group was usually found in front of the group as they were feeding or moving along an open vlei or even along the road. The less dominant and subordinate males were usually well behind the troop. It is of interest to note that during the Wildlife Societies annual game count at the waterpoints in September 1996 there were many records of single baboons and also of very small groups of from 2-10 baboons

together (see Table 16) yet from my own observations and from various people helping with the "road strip counts" there were virtually no records of small troops of baboon, excepting one group of seven seen on one occasion.

It is not known why there were so many records of small groups visiting the pans during the Wildlife Society game count and this extraordinary phenomenon should be looked into in greater detail.

On no less than 9 occasions, Banded mongooses were seen feeding with baboons. One particular troop of baboons which live near Dynamite Pan were seen on 4 occasions with a group of 18 mongooses. The mongooses actually accompanied the baboons out into the woodland, so there appears to be close association between the two species.

On one particular occasion the Dynamite Pan group were seen 3 km away from the Pan on the main Makwa/Main Camp road. The mongooses had therefore travelled over 3 km with the baboons and appeared to have been with them all day. The following day the same group of baboons and mongooses were seen 2 km from their roosting place at Dynamite Pan.

Food

Baboons were recorded feeding on the following:

Ripe fruits of *Ximenia americana* and *Ximenia caffra*.

Fallen ripe fruits of *Diospyros mespiliformis*.

Green and ripe fruits of *Flacoutia indica*.

Ficus sur fruits, also fruits of *Ficus sycomorus*.

Grewia flavescens and *G. bicolor* berries

Lannea discolor and *Lannea edulis* fruits

Various *Acacia* pods and especially the seeds from dry *Acacia erioloba* and green *A. karoo* pods.

Baikiaea plurijuga and *Guibourtia coleosperma* fallen seeds.

Dombeya rotundifolia fruits

Parinari curatellifolia fruits

Pseudolachnostylis maprouneifolia fruits

Fleuggea virosa fruits and green leaves

Terminalia sericea pods

Ziyiphus mucronata berries.

During the rains and when the ground was soft baboons were often seen digging in the soft Kalahari sand and eating small tubers. Unfortunately it was not possible to determine exactly what species of plant was being eaten. One of the most interesting observations on feeding behaviour of baboons was seen at Red Pan on the road between Sinamatella Camp and Mbala Lodge.

On Monday 15th April I watched a troop of baboons feeding on waterlillies in a Pan. It was near Mbala lodge and there were 21 large baboons in the water feeding on the bulbs of the waterlillies. Some of the larger baboons were up to their necks in water with only their heads protruding above the water line. It really looked quite funny to see a dozen or more heads sticking up out of the water. In order to get to the bulb each baboon would reach down to the base of the plant and pull it out of the mud. They would then chew and eat the tubers/bulbs and then continue with the next plant. Several of the animals were seen to dislodge the plant, drag it out of the water and then sit on the dry land and eat the tubers.

In addition there were also another 20 or more baboons that were obviously not going to get their feet wet and they watched from dry land. When one or other of the swimming

Table 16 - Number and size of baboon groups as determined by marked transects (road strip counts), Wildlife Society game count and wildlife report forms.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	0	14	2	-	-	-	16
Two	0	6	0	-	-	-	6
Three	1	5	0	-	-	-	6
Four	1	2	0	-	-	-	3
Five	2	2	0	-	-	-	4
Six	2	1	0	-	-	-	3
Seven	0	5	1	-	-	-	6
Eight	0	3	0	-	-	-	3
Nine	1	6	0	-	-	-	7
Ten	1	2	0	-	-	-	3
Eleven	0	11	0	-	-	-	11
Twelve	0	1	0	-	-	-	1
Thirteen	0	1	0	-	-	-	1
Fourteen	1	2	0	-	-	-	3
Fifteen	0	1	1	-	-	-	2
Sixteen	1	3	0	-	-	-	4
Seventeen	2	2	0	-	-	-	4
Eighteen	3	2	1	-	-	-	6
Nineteen	1	3	0	-	-	-	4
Twenty	7	3	1	-	-	-	11
21-30	9	11	3	-	-	-	23
31-40	19	7	3	-	-	-	29
41-50	23	5	0	-	-	-	28
51-100	18	10	3	-	-	-	31
101 and over	1	0	0	-	-	-	1

baboons appeared with the waterlily on the bank those waiting helped eat the plants and there was often considerable squabbling. It was also interesting to see at least 5 young baboons sitting on the shoulders of some of the bigger baboons in the water. All of these animals were completely dry with the exception of their feet which hung over the front of the adult baboons into the water. They also participated in the feeding of the waterlily once it was brought to the surface by the adults.

In addition there was an adult female waterbuck in the water feeding on the pieces of plant broken off or dislodged by the baboons and about 15 Knob-billed ducks were also taking advantage of the debris and broken plants and were feeding close to the baboons. On the bank near the baboons were two very young waterbuck both less than one month old.

Baboons in the Hwange National Park were found to feed on grasses, leaves, fruits, seeds, roots and rhizomes and several species of bulbs. They were also found feeding on the bark of trees and fallen flowers of *Acacia erioloba* and other Acacias. During the dry season baboons were often found in the open vleis feeding on grass.

Breeding

As Wilson (1975) pointed out that judging by the number of babies of different ages in the various troops of baboons studied, it appeared that there is no fixed breeding season. The gestation period of the baboon is six months and only a single young is born at a time. There is no evidence of twins and lactation continues for about 8 months (Bielert & Busse 1983).

Skinner & Smithers (1990) have indicated that at parturition the female usually retreats to cover and other females often gather in the vicinity to watch the birth. Newly born baby baboons are entirely black and right from birth are capable of clinging to the mother. During the present survey females in oestrus were seen in every month of the year and so were newly born babies. The babies were recorded in almost every troop studied and in many cases three or more newly born babies were found in the same troop at the same time.

Mass

No specimens were collected during the present survey, however, a large adult male collected near Dandari Pan during the 1969/71 survey weighed 76 lbs (34.5 kg) while 3 females had a mass of 34 lbs (15.4 kg); 36 lbs (16.3 kg) and 37 lbs (16.8 kg). Wilson (1975).

Vervet monkey

Cercopithecus aethiops (Linnaeus 1758)

C.a. ngamiensis (Roberts 1932)

Taxonomic notes

Smithers (1971) and Wilson (1975) both refer to the sub-species occurring in the north-west of Zimbabwe and north-east Botswana as *Cercopithecus aethiops ngamiensis*, Roberts 1932. Wilson (1975) has pointed out that the animals seen in the Hwange National Park have very black feet and hands which is so typical of *ngamiensis*.

Mass

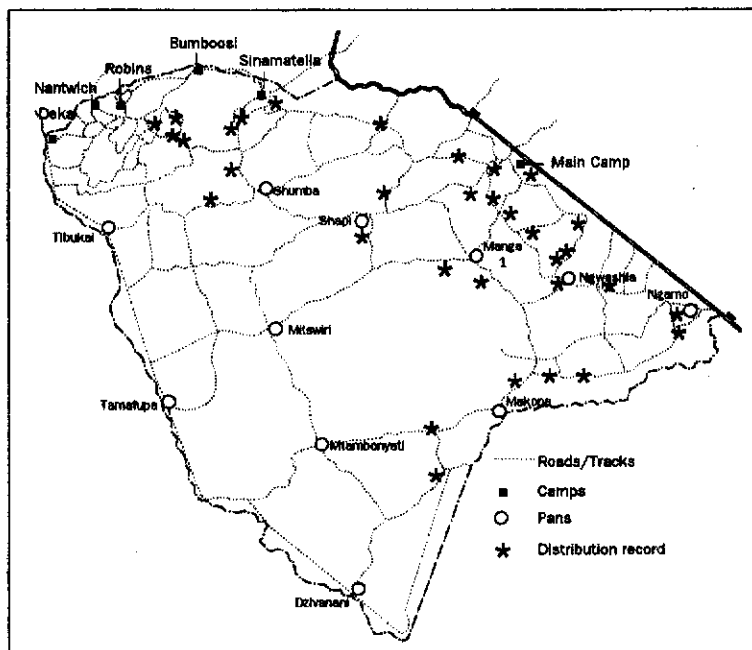
Eight females from the Hwange National Park had a mass of between 7¾ lbs (3.5 kg) and 11 lbs (5.0 kg) with a mean of 4.0 kg while a large adult male had a mass of 5.0 kg (Wilson 1975).

Smithers (1971) gives the average mass of 29 males from Botswana as 5.5 kg with a range of 3.9 kg to 8 kg while 30 females averaged 4.1 kg (range 3.4 to 5.2 kg).

Distribution

There are far fewer records of vervet monkeys in the Hwange National Park during the present survey than there were 25 years ago (Wilson 1975). However, they nevertheless still have a very wide distribution in a wide range of habitat types. They were also recorded at most of the pans by the Wildlife Society during their 24 hour game count in September 1996.

Map 13 shows the distribution of the species in the Hwange National Park as determined from all methods of survey already discussed above, with the exception of aerial surveys and night observations.



Map 13 - Distribution of Vervet monkey troops as determined from marked transects (road strip counts), Wildlife Society game count and wildlife report forms.

Habitat

The vervet monkey was recorded in a number of habitat types including the following:

Veg. Type 1	: <i>Combretum-Boscia angustifolia</i> open scrub and thicket	- 7 records
" Type 2	: <i>Mopane-Acacia</i> woodland	- 6 records
" Type 4	: Castle Kopje mixed woodland	- 14 records
" Type 7	: <i>Mopane-Combretum</i> woodland	- 3 records
" Type 10	: Riverine vegetation	- 16 records
" Type 16	: <i>Mopane-Acacia-Grewia bicolor</i> stunted woodland	- 2 records
" Type 17	: <i>Mopane</i> woodland- <i>Combretum</i> bushed grassland	- 5 records
" Type 19	: <i>Combretum hereroense-Hyphaene</i> bushed grassland	- 4 records
" Type 20	: <i>Acacia-Mundulea sericea</i> bushland	- 1 record
" Type 22	: <i>Mopane-Combretum apiculatum</i> wooded bushland	- 3 records
" Type 23	: <i>Baikiaea-Combretum</i> woodland	- 14 records
" Type 24	: <i>Terminalia sericea-Acacia erioloba</i> bushland	- 8 records
" Type 27	: <i>Baikiaea-Guibourtia</i> woodland	- 15 records

While the vervet monkey is typically a savanna species it does however occur in a wide variety of habitats but appears to be absent from very dry Kalahari sand areas where water is scarce during many months of the year.

In the Hwange National Park the species appears to be more common in the riverine vegetation along the Lukozi and other large rivers in the north of the Park and also in the broken Castle Kopje mixed woodland north and east of Shumba. There are also many records of the species in the tall *Baikiaea-Guibourtia* woodland.

Habits

The vervet monkey is very much a diurnal and gregarious species occurring in the Hwange National Park in groups of from 10 to 31 animals. Unfortunately it has not been possible to accurately determine the size of all the troops encountered as the species in the Park is very shy and secretive. On being watched, members of the troop will very often hide which obviously makes counting almost impossible. The smallest group seen consisted of 10 animals and the largest 31 but this data should be regarded with caution.

At night the vervet monkey sleeps in the tops of very large trees and once concealed are very difficult to see. Activity starts very early in the morning and in the Hwange National Park they are far more active much earlier than the Chacma baboon and disperse from their roosting place very quickly.

While there are no actual records of predation on vervet monkeys from the Hwange National Park an adult Martial eagle (*Polemaetus bellicosus*) was observed harassing a group of vervets on the Lukozi River in May 1996.

Table 17 gives details of group sizes seen during the present survey. Once again, and as with baboons, it is of interest to note the large number of single monkeys and small groups seen by the Wildlife Society during their game count. Yet none of the marked transects (road strip counts) recorded small groups or single animals.

Food

Wilson (1975) recorded vervet monkeys in the Hwange National Park feeding on the following plants:

Diospyros mespiliformis fruits,
Euphorbia ingens stems,
Ziziphus mucronata fruits.

During the present survey there were very few records of the monkeys feeding on any plants. However, the following observations were noted:

Ximania caffra (ripe and semi ripe fruits)
Acacia erioloba (chewing dry pods and extracting seeds)
Acacia karroo (green pods)
Bauhinia tomentosa (flowers)
Combretum molle (freshly flushed green leaves)
Guibourtia coleosperma (collecting and eating seeds from ground)

Breeding

Both Smithers (1971) discussing Botswana and Wilson (1975) when referring to the Hwange National Park, suggest that the vervet monkey breeds throughout the year. During the present survey newly born babies were seen with their mothers during the following months: January 4; February 2; March 1; May 11; June 3; July 1; August 2; November 3 and December 1. These data again suggests a year long breeding period.

Table 17 - Number and size of Vervet monkey groups as determined by marked transects (road strip counts), Wildlife Society game count and wildlife report forms.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	1	15	0	-	-	-	16
Two	1	5	0	-	-	-	6
Three	0	5	1	-	-	-	6
Four	0	7	0	-	-	-	7
Five	0	4	0	-	-	-	4
Six	0	3	0	-	-	-	3
Seven	0	3	0	-	-	-	3
Eight	0	1	0	-	-	-	1
Nine	0	2	0	-	-	-	2
Ten	0	4	0	-	-	-	4
Eleven	1	0	0	-	-	-	1
Twelve	0	3	0	-	-	-	3
Thirteen	0	3	0	-	-	-	3
Fourteen	0	0	0	-	-	-	0
Fifteen	0	2	0	-	-	-	2
Sixteen	0	0	0	-	-	-	0
Seventeen	0	0	0	-	-	-	0
Eighteen	1	0	0	-	-	-	1
Nineteen	0	0	0	-	-	-	0
Twenty	0	0	0	-	-	-	0
21-30	0	0	0	-	-	-	0
31-40	1	0	0	-	-	-	1
41-50	0	0	0	-	-	-	0
51-100	0	0	0	-	-	-	0
101 and over	0	0	0	-	-	-	0

The gestation period of the vervet monkey is recorded as between 150-160 days (Skinner & Smithers 1993). Two born in captivity at the Chipangali Wildlife Orphanage near Bulawayo had gestation periods of 152 and 159 days. One was born in August 1981 and the other June 1987.

Status

The vervet monkey is not uncommon in the Hwange National Park but there are far fewer records of this species compared to the much larger Chacma baboon. Vervet monkeys were recorded at the following pans during the Wildlife Society annual game count in September 1996:

Bumbutsa	- 22	Chingahobi Dam	- 3	Deteema Dam	- 10
Dom	- 5	Dopi	- 4	Tshebe Tshebe	- 9
Dynamite	- 2	Inyantue Dam	- 1	Josivanini	- 15
Kennedy I	- 1	Kennedy II	- 26	Mandavu North	- 9
Mandiseka	- 10	Manga III	- 1	Manzichisa I	- 7
Masuma	- 4	Mbazu	- 16	Ngamo II	- 3
Ngweshla	- 12	Salt Springs	- 4	Secheche	- 16
Shapi	- 10	Sinanga	- 12		

This gives a total of 202 monkeys seen at 24 pans and waterpoints over a 24 hour period. See also Map 13 for distribution records. It is of interest to note that during the 1995 Wildlife Society game count 307 vervet monkeys were seen at 26 pans while during the same month of the year 240 vervet monkeys were seen at 20 pans during 1994 (see also Table 9).

It is almost impossible to give an accurate figure of the number of vervet monkeys in the Hwange National Park. However taking the various census methods employed during the year long survey into account, we can safely say there are no less than 22 different troops of vervet monkeys in the Park with an absolute minimum number of 400 individuals. This is indeed a very conservative estimate as no doubt many more troops were not encountered during the year.

Order **CARNIVORA**

While most of the carnivores of the Hwange National Park are generally speaking predators, and in fact most species are meat eaters, there are however, a number of species which are almost entirely insectivorous and others such as the civet, *Civettictis civetta* which eats a great deal of fruit and other vegetable matter.

It is indeed very sad that in the 68 years of the history of the Hwange National Park, apart from a small amount of work being undertaken on wild dog, not a single major study of any of the carnivores of the Park has ever been undertaken.

Apart from the very limited time available during the present survey of the Hwange National Park no studies whatsoever have ever been done on lions, leopards, cheetah and any of the smaller cats and other small carnivores.

Considering that a large numbers of lions, hyaena, leopard and other large carnivores are shot by safari operators to the north and east of the Hwange National Park, we have no idea what effect these hunting operations have on the population of the large predators within the National Park.

In a very recent scientific publication on the competitive limitation of African wild dogs (Creel & Creel 1996) in east Africa a table giving the ratio of wild dogs to spotted hyaenas to lions is given for several important areas of southern Africa. These include the Selous Game Reserve (Tanzanian), Kruger National Park (South Africa), Ngorongoro (Tanzania) and a few other places.

It is worth noting that in this scientific publication (Creel & Creel 1996) Zimbabwe's Hwange National Park is one of the only places listed where we do not have any data or even idea on the ratio of wild dogs to the other large major predators. This is the case in spite of the fact that two full time and separate teams have been working on the Hwange wild dogs for over 10 years. However, apart from a thesis on wild dogs by Clare Davies (1993) not a single substantial report or scientific publication has been produced on wild dogs for the past 10 years.

The data that follows under the profile of each of the carnivores is indeed very scanty and has been accumulated over a period of the one year (1996) of the survey.

The data presented below is at least a start. It may not be a great deal but it does give some indication of the status of the carnivores of the Hwange National Park which has been hitherto unknown and completely neglected in the past.

Family **PROTELIDAE**

Aardwolf

Genus **PROTELES**, I. Geoffrey 1824.

Aardwolf

Proteles cristatus (Sparrman 1783)

Proteles cristatus cristatus (Sparrman 1783)

Colloquial name

The word aardwolf literally mean earth-wolf and this Afrikaans name no doubt was given to the species as a result of the animal living and hiding in holes in the ground.

Another colloquial name, also in Afrikaans, is maanhaarjakkals, and this name is commonly used in South Africa. It refers to the long mane of hair on the upper parts of the body which is erect when the animal is alarmed.

Taxonomic notes

According to Meester et.al. (1986) there is only one sub-species of aardwolf occurring in our area and that is *Proteles cristatus cristatus* (Sparrman 1783). The other sub-species, namely *P.C. septentrionalis* W. Rothchild 1902 occurs in east and north east Africa, giving the species a discontinuous distribution.

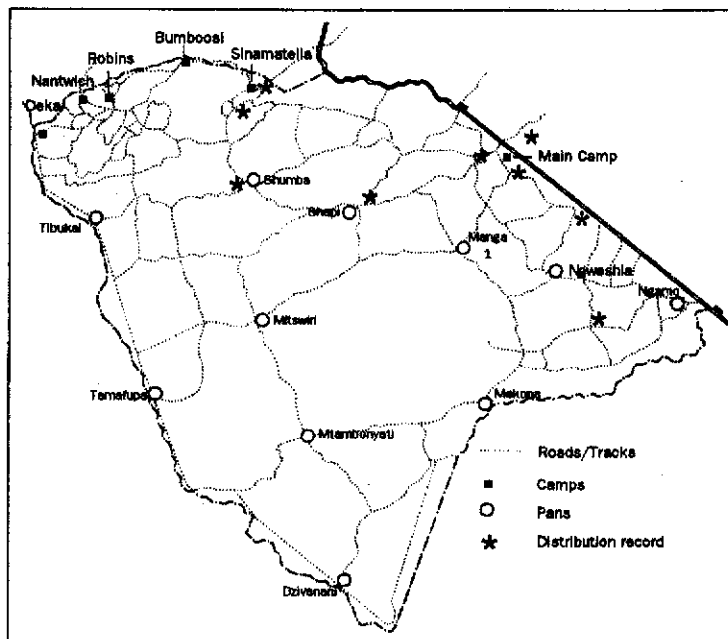
Mass

A male collected in the Hwange National Park during the 1969/71 survey weighed 18 lb (8.2 kg) and two females had a mass of 18 lb (8.2 kg) and 20 lbs (9.1 kg). Smithers (1971) shows that six males from Botswana averaged 19 lb 2 oz (8.7 kg) while eight females averaged 21 lb 3 oz (9.6 kg).

Smithers & Wilson (1979) have given the average mass of 10 adult males from Zimbabwe as 8.91 kg and five females averaged 8.73 kg.

Distribution

As a result of the aardwolf being a strictly nocturnal animal the species was never seen during the hours of daylight. The few records that we have for the Hwange National Park were all seen at night with the aid of a spotlight and during the Wildlife Society waterhole count and from wildlife observation forms. Map 14 gives localities where these specimens were seen.



Map 14 - Distribution of aardwolf as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms and night observations

There were many more visual records of the occurrence of the aardwolf during the 1969/71 survey (Wilson 1975) but this is no doubt due to the fact that a lot more night work

was undertaken during that survey and secondly, the 1969/71 survey covered a period of two full years while the present survey (1996) was for only one year.

I believe that the aardwolf is a lot more common in the Hwange National Park than the few records show.

Habitat

Of the 14 locality records of aardwolf from the Hwange National Park, 10 were from areas of short grass and four from the fringes of pans. The aardwolf was found to occur on Kalahari sandveld in the south east of Hwange National Park in the Nyamandhlovu-Dom-Dopi area as well as on basalt soils in the Sinamatella area and close to the Sinamatella Camp.

Wilson (1975) also recorded the species in Terminalia woodland along the Botswana border while Smithers & Wilson (1979) say that species has a wide habitat tolerance but they do prefer open areas.

Habits

In the Hwange National Park all visual records of the aardwolf are during the hours of darkness. However, Skinner & Smithers (1990) have indicated that in some areas of southern Africa the species does emerge soon after sunset especially if termites are available at that time.

Every animal seen at night with the aid of a spotlight made no effort to run away and they appeared unconcerned by the bright light. In fact, two of the animals encountered continued feeding on termites in spite of the bright light directed at them.

Table 18 gives a breakdown of the 14 groups seen.

Table 18 - Number and size of aardwolf groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms, and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	0	1	3	3	0	3	10
Two	0	0	0	2	0	1	3
Three	0	0	0	1	0	0	1

Food

Even though the aardwolf has very well developed canines the checkteeth are small and redundant. Their main diet in the Hwange National Park and indeed throughout its range in southern Africa are termites. The nasute harvester termites of the Genus *Trinervitermes* are the main species eaten. In the Hwange National Park it is the termite *T. rhodesiensis* that is fed on in very large numbers by the aardwolf.

Smithers & Wilson (1979) also recorded other Isoptera from the stomach contents of aardwolf in Zimbabwe, namely: *Trinervitermes rapulum*, *T. dispors*, *Macrotermes latericus*, *Odontotermes latericius* and *Pseudacanthotermes militaris*. The aardwolf will also feed on beetles, spiders and other insects (Wilson 1975).

In one animal found dead on the road in the Hwange National Park during the 1969/71 survey, Wilson (1975) recorded that the stomach contents alone had a mass of 500 gr of which 100% were of *T. rhodesiensis* termites.

Breeding

There are no records of reproduction during the present survey but Wilson (1975) mentioned two small fetuses in a female in May and another female was found to be lactating in March. However, Skinner & Smithers (1990) say that cubs are born from October to December although in Botswana pregnant females were found in May and others were lactating in April. The gestation period is approximately 90 days (Brady & Lyon in Skinner & Smithers 1990).

Family **HYAENIDAE**

Hyaenas

Genus **HYAENA** (Brissan 1762)

Brown hyaena

Hyaena brunnea (Thunberg 1820)

No sub-species are recognised

Colloquial name

The English name of Brown hyaena is most descriptive and appropriate as this hyaena is typically a distinct brown colour. The Afrikaans name of Strandwolf, which in fact means "beach wolf", is as a result of the animal often found on the beaches of Namibia searching for carrion.

Taxonomic notes

No sub-species are recognised.

Mass

Smithers & Wilson (1979) give the mass of an adult male as 38.14 kg while two females had a mass of 38.14 kg and 41.77 kg.

Skinner and Smithers (1990) give an average mass of 12 males as 40.2 kg with a range of 35.0 to 43.3 kg and 16 females averaged 38.38 kg with a range of 28.0 to 47.5 kg. These weights were from animals obtained in Zimbabwe and the Kalahari.

Distribution

During the 1969/71 mammal survey of the Hwange National Park, (Wilson 1975) indicated that there were very few visual records of the species in the Hwange National Park and the distribution map of Brown hyaena gave only 6 localities obtained over a period of two years. Distribution records for the 1969/71 survey gave localities as Tamafupa, Mitswiri, near Tendele Pan, Timbamoyo, Mbala Lodge and Deteema.

During the present survey and after a considerable amount of travelling in the Park by day and night and after several census methods, no Brown hyaena were recorded.

Habitat, habits, food & breeding

No new data is available. For data obtained during the 1969/71 survey see Wilson (1975), page 44.

Status

The Brown hyaena no doubt still occurs in the Hwange National Park and while there were no visual or any other records from the Park during the present survey, it is assumed that the species is still present. Additional survey work on the status of this species is essential.

Genus CROCUTA (Kaup 1828)

Spotted hyaena

Crocuta crocuta (Erleben 1777)

No sub-species are recognised

Colloquial name

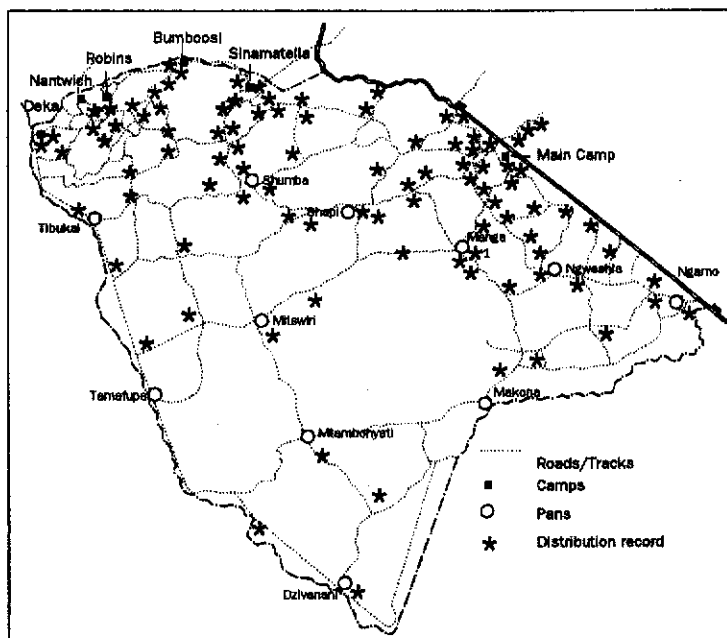
There is only one name and always has been only the one name for the Spotted hyaena. The species is easily distinguished from the Brown hyaena as it has spots and round ears while the Brown hyaena has a long shaggy coat, is brown in colour and has pointed ears.

Taxonomic notes

Meester, et. al. (1986) did not recognise any of the sub-species that were described from the continent of Africa, even though Allen (1939) listed six sub-species. Matthews (1939) indicated that there was a very wide individual variation in the colour of the Spotted hyaena which was previously used to separate the sub-species. Therefore, no sub-species are recognised.

Distribution

This species has an exceptionally wide distribution in the Hwange National Park and certainly occurs throughout and in every possible habitat type. While there are no visual records from many areas especially in the south west and central parts of the Park there



Map 15 - Distribution of Spotted hyaena as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms, night observations and finally from the very distinctive call at night

is no doubt that it occurs throughout those areas.

Map 15 gives the distribution of the Spotted hyaena which was determined from the marked transects (road strip counts), from animals seen at waterholes by members of the Wildlife Society during their annual game count in September 1996, from the carnivore survey results, from all aerial surveys and also from night observation and finally from their very distinctive calls at night.

Mass

Wilson (1975) mentioned that no data on the size and mass of Spotted hyaena from the Park was available during the 1969/71 survey. Now, some 26 years later, there is still no data from Hwange on the size and mass of the hyaena. However, Smithers (1971) gives the mass of two Botswana males as 178 lbs (80.9 kg) and 175 lbs (79.5 kg) while the average for four females was 162 lbs (73.6 kg) with a range of 128 lbs (58.1 kg) to 185 lbs (84.1 kg).

Habitat

In the Hwange National Park the Spotted hyaena is very often associated with open plains, grassy areas around pans and even in Baikiaea and Mopane woodland. In fact the species occurs wherever there is a plentiful and constant supply of food and where antelope populations are high. They have also been recorded from some very dry areas of the Park and as long as there is even the smallest amount of water available they will remain in the dry Kalahari sand country.

Habits

As is well known, the Spotted hyaena has a social organisation based on a matriarchal system of clans (Kruuk 1972). Studies carried out in the Transvaal Lowveld in South Africa show that clans of 9-18 animals occupy clearly delineated territories of 25-130 km² (Bearder 1977; Henschel 1986) and density is estimated at 0.06-0.18/km² (Mills 1985). In the Etosha National Park, density in three clans of 15 individuals each the mean territory size was 360 km². (Gasaway, Mossestad & Stander 1989).

In most areas of Africa and especially in east and southern Africa detailed studies have been carried out on the Spotted hyaena and especially where they occur in large numbers. It is indeed a great pity that Zimbabwe and Hwange National Park in particular is one of the very few places where the hyaena has not been studied and, therefore, we are unable to compare what happens in Hwange with any other area in Africa.

Wilson (1975) mentioned single and occasionally pairs of animals and even larger groups of up to four or more together. Much more recent and up-to-date data now shows that those small groups or individuals are often part of the clans mentioned above which live in a well demarcated territory. Full details of the size of the various groups of hyaena seen are given in Table 19.

Food

Wilson (1975) mentioned that Spotted hyaena in the Hwange National Park were recorded feeding on the carcasses of elephant, buffalo, eland, giraffe, zebra and wildebeest, and on one occasion, 17 Spotted hyaena were seen together on a giraffe carcass near the Lukozi River.

The only evidence at that time (i.e. 1969/71 survey) of them actually hunting for themselves was of an impala killed while being dazzled by a light during culling operations.

Pienaar (1969) lists the following species killed by hyaena in the Kruger National Park: impala 104; wildebeest 20; zebra 1; waterbuck 19; kudu 17; buffalo 2; warthog 1;

Table 19 - Number and size of Spotted hyaena groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	4	112	0	152	4	4	276
Two	3	23	0	50	0	3	79
Three	0	9	0	18	0	2	29
Four	1	1	0	16	0	1	19
Five	0	3	0	8	0	0	11
Six	0	0	0	8	0	0	8
Seven	0	1	0	6	0	0	7
Eight	0	0	0	5	0	0	5
Nine	0	0	0	0	0	0	0
Ten	0	1	0	1	0	0	2
Eleven	0	0	0	1	0	0	1
Twelve	0	0	0	0	0	0	0
Thirteen	0	0	0	0	0	0	0
Fourteen	0	0	0	0	0	0	0
Fifteen	0	0	0	1	0	0	1
Sixteen	0	0	0	0	0	0	0
Seventeen	0	0	0	0	0	0	0
Eighteen	0	0	0	0	0	0	0
Nineteen	0	0	0	2	0	0	2
Twenty	0	1	0	2	0	1 *	4
21-30	0	0	0	1	0	0	1
31-40	0	0	0	0	0	0	0
41-50	0	0	0	0	0	0	0
51-100	0	0	0	0	0	0	0
101 and over	0	0	0	0	0	0	0

* spread out over the Nyamandhlovu Plain near the Pan

bushbuck 5; Sharpe's grysbok 1 and scaly anteater 2.

Unfortunately there are no records whatsoever of any hyaena hunting for themselves or even of hyaena at carcasses in the Hwange National Park over the last 10 years or more (B. Russell, pers. comm) and, therefore, we have no idea of what has been the situation for many years.

However, during the present study (1996) I was fortunate to see two Spotted hyaena kills within minutes of it happening. One was of a young impala male killed by a single hyaena near Dom Pan at 6.30am in December 1996 and a few days later two hyaena had killed a female sable at Makwa Pan, also about 6.00am.

In addition to the above Spotted hyaena have been seen on the following carcasses: elephant 3; giraffe 2; kudu 1; zebra 1 and buffalo 2. In all instances more than one hyaena was seen at each carcass.

Visitors sightings of large carnivores as recorded on the Carnivore Survey forms are most interesting and some of the details that were given on the forms are included below. Tables 20 and 21 give details of Spotted hyaena actually hunting or present at a carcass.

Table 20 - Observations of hyaena actually hunting or closely associated with other large predators

Reference record	Date	Time	No. of hyaena	Locality	Observations
SH/148	21.4.96	8.00am	8	Nyamandhlovu	Hunting - stalking wildbeest
SH/67	27.7.96	7.30am	8	Kennedy I	Hunting - chasing warthogs
SH/39	27.4.96	9.43am	3	Manzimbomvu	Hunting - attacking young giraffe. Female giraffe chasing off other hyaena
SH/33	11.4.96	8.00am	1	Lukozi River	Hunting - stalking kudu
SH/166	27.9.96	8.10am	2	Nyamandhlovu	Following 2 male lions
SH/158	26.9.96	11.45pm	20	Nyamandhlovu	Lion lying at pan and hyaena appeared and tormented them (full moon)
SH/140	24.8.96	4.55pm	2	Inyantue	Following close to wild dogs
SH/137	228.96	6.15am	1	Masuma	Following leopard
SH/69	1.8.96	7.30am	1	Makwa	Following lions
SH/127	24.6.96	6.30am	2	Dom	Being chased by pack of wild dogs

In addition to the above records, on 5th December 1996 at 5.45am Ms. Julia Salnicki was watching a pack of 8 wild dogs as they chased an impala into a seasonal pan near Dom Pan. The impala swam 10-12 lengths of the pan as the dogs tried to catch it. When the impala was very tired and could no longer swim the dogs entered the water and killed the impala. Even before the wild dogs had a chance to eat the impala, two Spotted hyaena appeared on the scene and grabbed the impala from the wild dogs. More hyaena suddenly appeared and within minutes there was nothing left of the impala and the dogs did not get any of the carcass.

On another occasion on 15th October 1996 at 5.55pm I was travelling along the road between Umtshibi Camp and Main Camp and near Dynamite Pan I noticed that two safari vehicles had stopped in the middle of the road. Both vehicles had clients in them. I immediately pulled up beside one of the vehicles and then saw two Spotted hyaena with part of a cheetah carcass. One hyaena had the carcass in his mouth while the other was trying to grab it from him. The carcass consisted of the head and neck, thorax and front

legs of the cheetah. The heart and lungs had already been removed and no doubt eaten.

As a result of being disturbed by the vehicles and clients, the hyaena with the carcass ran off into the Baikiaea woodland closely followed by the second hyaena. After they disappeared I questioned the drivers of the safari vehicles as to what had happened before I arrived.

Apparently when the first safari vehicle arrived the cheetah was surrounded by a pack of 6 hyaena and it stood its ground to defend itself. After a short time the hyaena attacked the cheetah and in the struggle that followed they tore the cheetah into pieces. Four of the hyaena ran off with most of the carcass while two remained behind on the road with the front portion of the cheetah.

Table 21 - Spotted hyaena seen at various carcasses or associated with other carnivores

Reference record	Date	No. of hyaena	Locality	Observations
SH/254	11.1.96	1	Nyamandhlovu	Feeding on adult male impala
SH/21	14.1.96	1	Nyamandhlovu	Feeding in pan on impala carcass
SH/27	6.2.96	1	Ngweshla	Close to lion kill - lions present
SH/29	10.2.96	2	Ngweshla	Feeding on zebra carcass
SH/30	12.2.96	8	Samavundla	At carcass (species unknown)
SH/259	13.4.96	2	Lukozi River	Watching very sick lioness
SH/48	15.4.96	5	Makolola	Watching 4 lions on eland carcass
SH/49	19.4.96	1	Main Camp	At carcass (species unknown)
SH/43	21.4.96	5	"	At wildebeest carcass
SH/40	28.4.96	15	Kashawe loop	One hyaena carrying impala leg
SH/54	12.5.96	1	Balla Balla	At carcass (species unknown)
SH/128	25.6.96	4	Dopi	At carcass (species unknown)
SH/58	3.7.96	7	Dopi	At giraffe carcass
SH/103	16.7.96	5	Near Caterpillar	At giraffe carcass
SH/113	28.7.96	4	Sedina	At carcass (species unknown)
SH/114	18.7.96	4	Main Camp	At wildebeest carcass
SH/68	30.7.96	20+	Dopi	At large carcass (possibly giraffe)
SH/118	10.8.96	6	Boss Longone	At leopard kill, leopard in tree also present 4 wild dogs and 8 vultures
SH/125	18.8.96	7	Balla Balla	At carcass (species unknown)
SH/143	18.9.96	20+	Nyamandhlovu	On wildebeest carcass
SH/146	19.9.96	4	"	At buffalo carcass in water
SH/150	25.9.96	10	Dom	At buffalo carcass
SH/233	9.10.96	3	Kennedy I	At carcass (species unknown)
SH/230	25.10.96	2	Dom	At giraffe carcass
SH/248	26.12.96	1	Main Camp	At carcass (species unknown)
SH/249	26.12.96	6	10 mile drive	At carcass (species unknown)
SH/253	26.12.96	2	Dynamite	At wildebeest
SH/279	27.12.96	2	Nyamandhlovu	At carcass (species unknown)

Under the profile dealing with cheetah I have mentioned that only one cheetah occurred in the Dom/Nyamandhlovu/Main Camp area and that animal was seen on numerous occasions by visitors to the Park. I also personally saw the animal on one occasion.

It is of interest to note that from 15th October 1996 onwards and after the cheetah had been killed by the hyaena, there were no further sightings of cheetah in the Main Camp/Nyamandhlovu/Dom area. Obviously it was that single cheetah that was seen so often by visitors that was killed by the pack of 6 Spotted hyaena.

As I have mentioned before in this report, we know so little about the large predators of Zimbabwe's premier National Park and it is very obvious that a detailed study is long overdue.

Breeding

In spite of the very large number of hyaena sightings throughout the Park during 1996 it is indeed surprising that there are no records of breeding of this species during the year.

Status

With the limited amount of time available during this year long survey covering over 50 species of large mammals, it has been impossible to obtain an accurate figure of the size of the Spotted hyaena population. In order that this is achieved a full time and detailed study covering several years will be necessary and even then a large number of hyaena will have to be captured, fitted with radio collars and released again.

Wilson (1975) estimated the Spotted hyaena population in the Hwange National Park as around 500 animals in 1973. Jones (1989) in a departmental report felt the Spotted hyaena population in the Hwange National Park was about 1500 animals but he did say the figures were crude extrapolations and educated guesses.

During the annual waterhole counts of game undertaken by the Wildlife Society of Zimbabwe in September each year, they recorded 418 Spotted hyaena in 1994, 423 in 1995 and only 246 in 1996. (See this report, Table 9). No doubt the reason for the very low figure obtained during the 1996 count was as a result of the large amount of water still existing in the seasonal pans throughout the Park and as a result, much of the wildlife was still greatly dispersed. This was not the case during the 1994 and 1995 game counts.

During the present survey, data obtained from the Carnivore Survey forms indicated 152 records of single hyaena, 50 records of two together, 18 records of three together etc. (See Table 19). There are also two records of 19 together and another 2 records of twenty in a group and 1 record of over 21 Spotted hyaena seen together. (See Table 19). The total number of Spotted hyaena seen during the carnivore survey was 657 animals. Now while many of these may well have been repeat sightings there are also a vast number that were not seen and recorded, especially in the Robins, Sinamatella and in the south central parts of the Park. Table 19 also gives details of other hyaena seen by other survey methods.

From Map 15 it is obvious that the Spotted hyaena has a very wide distribution in the Park and as almost all our sightings and records are from the main tourist areas and roads, especially around Main Camp, it is obvious that many hundreds of other hyaena have not been seen.

As with previous guesses by myself and other scientific investigators, it is postulated that the Spotted hyaena population in the entire Hwange National Park would lie between 1000 and 1 500 animals. Again I would very much like to emphasise that a detailed study of the large carnivores of Hwange National Park is essential of which the Spotted hyaena should be part of that survey.

Family **FELIDAE**

Cats

Genus **ACINONYX** (Brookes 1828)

Cheetah

Acinonyx jubatus (Schreber 1775)

Acinonyx jubatus jubatus (Schreber 1775)

Colloquial name

The name cheetah has been used throughout its range for many decades and is derived from the Hindu chita (Skinner & Smithers 1990).

Taxonomic notes

The only sub-species recognised from southern Africa is *A.j. jubatus* (Smithers 1975). As a result of biochemical analysis it has now been established that the southern African cheetah population is genetically uniform (Monomorphic) which unfortunately makes them very susceptible to disease (O'Brien, Wildt & Bush 1986).

Mass

Skinner & Smithers (1990) gives the average mass of 7 males from Namibia as 53.9 kg with a range of between 39.0 and 59.0 kg while 6 females had an average mass of 43.0 kg (range 36.0 to 48.0 kg).

No data is available from the Hwange National Park.

Distribution

During the 1969/71 survey, (Wilson 1975) indicated that the cheetah was recorded in the Deteema, Salt Pans, Tshowe Drive, Ngamo and Shumba areas where fair numbers existed. They were at that time also recorded from Kennedy II, Makolola and on the Manga vlei. One animal was seen on the Botswana border at Cement Pan.

During the 1969/71 survey there were 15 records of single cheetah, seven records of two together, five records of three, seven records of four (all at Ngamo and possibly the same group seen seven times), one record of five animals, one record of six cheetah together and a single record of eight animals. The present 1996 survey has seen a great reduction not only in the range of cheetah but also in numbers. The status is to be discussed below.

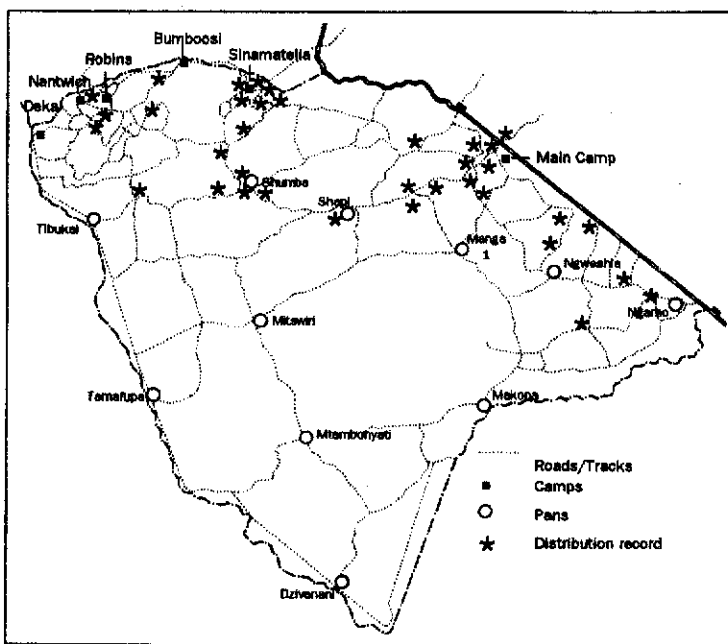
A single cheetah was seen in the Hwange National Park on 29 occasions of which 19 sightings were from the Main Camp/ Dom/ Balla Balla/ Nyamandhlovu area. This animal was eventually killed by hyaenas near Main Camp on 15th October 1996 and therefore no longer seen in the area thereafter. There are also three records of a single cheetah on the Kashawe loop in the Sinamatella area, two records of single cheetah at Shumba Pan, two records from Guvulala and single records of lone animals at Bembezi, near Robins Camp and at Masuma. This gives 29 records of single animals from 7 localities. (See Table 22).

Groups of two cheetah together were from Salt Pans (three times), Chingahobi (once), Mbiza (twice), Sinamatella (twice), Shumba (twice) and Kennedy II (once). Three cheetah together were seen on 5 different occasions. Three records are from Sinamatella area, 1 record from the Kashawe loop (possibly same animals as seen at Sinamatella) and 1

record of three from Guvulala. (See Map 16). There are no records of cheetah groups larger than three animals.

Table 22 - Number and size of cheetah groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and carnivore survey forms.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	1	0	1	29	-	-	31
Two	1	0	0	11	-	-	12
Three	0	0	0	5	-	-	5
Four	0	0	0	0	-	-	0
Five	0	0	0	0	-	-	0



Map 16 - Distribution of cheetah as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms and wildlife observation forms

Food

During the 1969/71 survey, (Wilson 1975) gave a list of cheetah prey as follows: impala 18; waterbuck 8; ostrich 5; zebra (foals) 4; kudu 2; warthog 2; duiker 1; steenbok 1; sable yearling 1; buffalo calf 1 and reedbuck 1.

During the present 1996 survey there are no records at all of cheetah on any prey species but the three cheetah seen at Guvulala were stalking impala and the single cheetah in the Dom/Nyamandhlovu Pan area was on one occasion seen stalking a young kudu.

Breeding

The 1969/71 survey (Wilson 1975) recorded a female with three cubs about 1 month old at Salt Pans, another female with two cubs also at Salt Pans and a female with three cubs

at Nehimba. There were no records of young with females during the present survey.

Status

There is no doubt that 1 animal existed in the Dom/Nyamandhlovu/Balla Balla area, a single animal near Sinamatella, another at Shumba, at Guvulala and single animals at Bembezi, near Robins and at Masuma. This gives a definite 6 different animals. Different groups of two were recorded at Salt Pans, Chingahobi, Mbiza, Sinamatella, Shumba and Kennedy II. This could represent another 10 different animals. Three together were from Sinamatella and another from Guvulala. In all there appeared to be at least 21 different cheetah seen.

Wilson (1975) estimated that during 1973 there were a maximum of eighty cheetah in the Hwange National Park. At the present time (1996) it appears as if there has been a substantial decrease in the numbers of cheetah in the Park and it is postulated that it is unlikely that more than 50 animals now remain in the Park.

No cheetah were seen by the Wildlife Society members during their 1996 animal game count although one was seen soon after the count and has been recorded above under the single records.

Once again, and as with the Spotted hyaena, a detailed research programme should be undertaken to determine the status of the cheetah in the Hwange National Park.

Genus PANTHERA (Oken 1816)

Leopard

Panthera pardus (Linnaeus 1758)

Panthera pardus melanotica (Gunther 1855)

Colloquial name

The name leopard is derived from the Greek word panther which means leopard.

Taxonomic notes

The sub-species occurring in the southern part of Africa including the Hwange National Park is *Panthera pardus melanotica* (Gunther 1885) with the type locality being recorded as Grahamstown district in the Cape Province of South Africa. (Skinner & Smithers 1990).

Mass

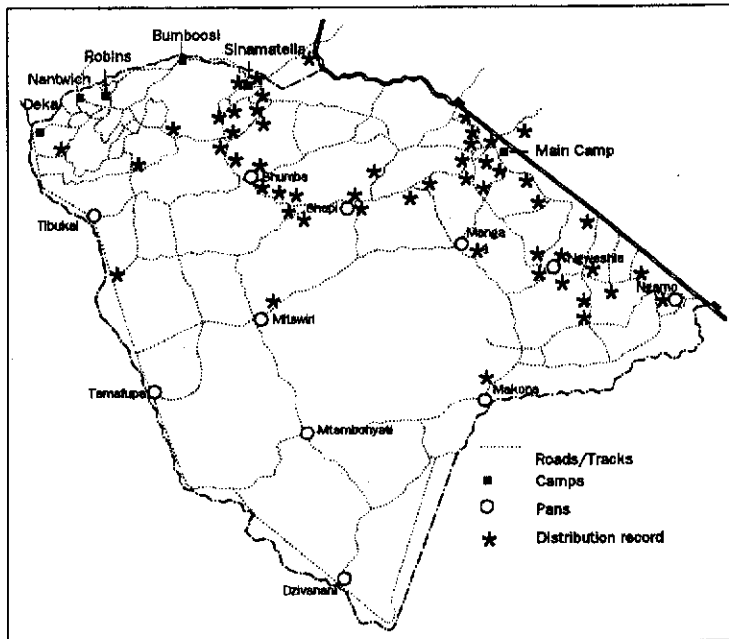
A sick male leopard shot by National Parks staff at Robins Camp in May 1970 had a mass of 106 lbs (48.2 kg). The specimen was very thin and no doubt when in its prime would have weighed a lot more (Wilson 1975). No other data from the Hwange National Park is available.

Smithers & Wilson (1979) gave the average mass of thirteen males obtained in the Matetzi Safari areas by P. Johnstone as 59.68 kg (range 51.76 kg to 71.28 kg) while seven females averaged 31.52 kg (range 28.15 kg to 34.96 kg).

Distribution

Leopard were recorded from many places along the tourist routes in the Main Camp/ Shumba/ Ngweshla/ Sinamatella areas. There are no records of leopards from the

southern and western areas of the Hwange Park and this is no doubt due to the fact that tourists do not operate in those areas. The distribution of leopard in the Hwange National Park is therefore biased in favour of the areas visited by safari operators and tourists.



Map 17 - Distribution of leopard as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation and night observations

Almost all the data on sightings of leopard during the 1996 survey were from the Carnivore Survey forms. Map 17 gives detailed localities of all sightings but I believe the species occurs throughout the Park and only additional surveys will confirm this.

Habitat

The leopard occurs in most habitat types and as long as there is a constant supply of small to medium sized prey and water the leopard will be present. There are many records of the species from the Kalahari sand areas around Main Camp, on the basalt soils and Mopane woodland near Sinamatella and in the broken granite rocky outcrop areas east of Shumba. They are also common along the Lukosi River in the riverine vegetation.

Habits

While the leopard is essentially a nocturnal animal and very rarely seen during the hours of daylight, those that occur in the "10 mile drive" area around Balla Balla, Dom and Nyamandhlovu are now so accustomed to safari and other vehicles that they are very often seen during the early morning and late afternoon. This certainly was not the case 25 years ago when leopard were very rarely seen during the day.

There were a total of 132 records of solitary leopard seen during the year of which 126 were from the Carnivore Survey and three were seen during the Wildlife Society annual game count. There are eight records of two leopards together and three records of three leopards together. One of the records of three together was a female with two cubs that I personally saw on the main road just a few kilometres south of Makwa Pan in September 1996. Another record of three together was another female with two young seen at Balla Balla Pan on 4th September 1996.

See Table 23 for details of leopard sightings

Table 23 - Number and size of leopard groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, Carnivore Survey forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	3	3	0	126	0	3	135
Two	0	0	0	8	0	0	8
Three	1	0	0	3	0	0	4

Food

Wilson (1975) gave a detailed list of leopard prey from the Hwange National Park which was obtained during the 1969/71 survey. These included: impala 14; reedbuck 5; steenbok 5; duiker 4; kudu (calves and yearlings) 4; warthog 4; zebra (1 adult and foals) 3; buffalo (calves) 3; eland (calves) 2; waterbuck (calves) 2; sable (yearling and adult male) 2; wildebeest (yearling) 1; bushbuck 1; bushpig 1; gemsbok (calf) 1; Scrub hare 1; Vervet monkey 1; Banded mongoose 1; python 1; tortoise 1; civet 1; cheetah 1 and ostrich 1.

Unfortunately no recent data on leopard kills in the Hwange National Park has been collected for many years (B. Russell, pers. comm). However, during the present survey some data is available all of which was obtained during 1996. Details are given in Table 24.

Table 24 - Records of leopard prey or hunting obtained during present (1996) survey

Reference record	Date	Time	Locality	Details
LE/78	28.9.96	6.30am	Nyamandhlovu	Single leopard stalking wildebeest
LE/80	26.9.96	10.00am	Balla Balla	Single leopard caught a warthog and placed it in a tree.
LE/83	10.8.96	8.00am	Boss Long One Pan	At kill in tree. Also present 4 wild dogs, 6 hyaena & 8 vultures
LE/82	9.8.96	7.00am	Near Guvulula	Eating kudu at side of road
LE/67	5.8.96	10.45am	Nyamandhlovu	Stalking steenbok
LE/68	15.7.96	1.45pm	Kennedy II	Chasing a warthog
LE/41	23.6.96	10.00am	Nyamandhlovu	Chasing warthog
LE/104	6.6.96	9.12am	Ngwenya Pan	Chasing kudu
LE/16	14.4.96	10.30am	Robins area	Chasing a young giraffe
LE/59	29.3.96	5.00pm	Long One Pan	Crossing road with small prey in mouth?
LE/101	28.2.96	11.30am	Sinamatella	Eating impala on top of termite mound
LE/14	24.1.96	6.45am	Linkwasha	Stalking a Kori bustard

Breeding

There are only two records of females with cubs. One was by myself when on 12th September 1996 just south of Makwa Pan a female was seen on the road with two babies about 20 cm high. This was at 5.50pm. On 4th September 1996 two visitors, Mr. & Mrs. A.C. Smith of Harare saw a female with two cubs near Balla Balla at 7.40a.m.

Wilson (1975) reported a female with two very small cubs in February 1972 while Van Heerden (in Wilson 1975) saw three cubs about the size of a domestic cat on 6th June 1969.

Status

Wilson (1975) mentioned a leopard population of about 300 for the Hwange National Park in 1973. Jones (1989) gave a population of 1000 but indicated that this figure was an educated guess. I believe that the leopard population is certainly a lot higher than it was 25 years ago and the figure of 300 given by Wilson (1975) for 1973 period no longer applies. Perhaps the figure of 1000 as given by Jones (1989) would now be a more realistic figure.

Once again it is obvious that detailed studies on the large carnivores of the Hwange National Park is evident and in fact essential.

Lion

Panthera leo (Linnaeus 1758)

Monotypic species. No sub-species are recognised

Colloquial Name

No other name has ever been used for this species. The name lion originates from the Greek word for the species, leon. (Skinner & Smithers 1990).

Taxonomic notes

Allen (1939) lists 10 sub-species of lion from Africa. Many sub-species have been described over the years with most of them being based on inadequate material or from specimens found in zoological collections in different parts of the world, and where the origin of the animal was not always known. Ellerman, Morrison-Scott and Hayman (1953) did not recognise any of the sub-species mentioned by Allen (1939) and as a result the same position has been followed by several others. Smithers (1971); Skinner & Smithers (1990). In this work the lion is again considered to be a monotypic species

Mass

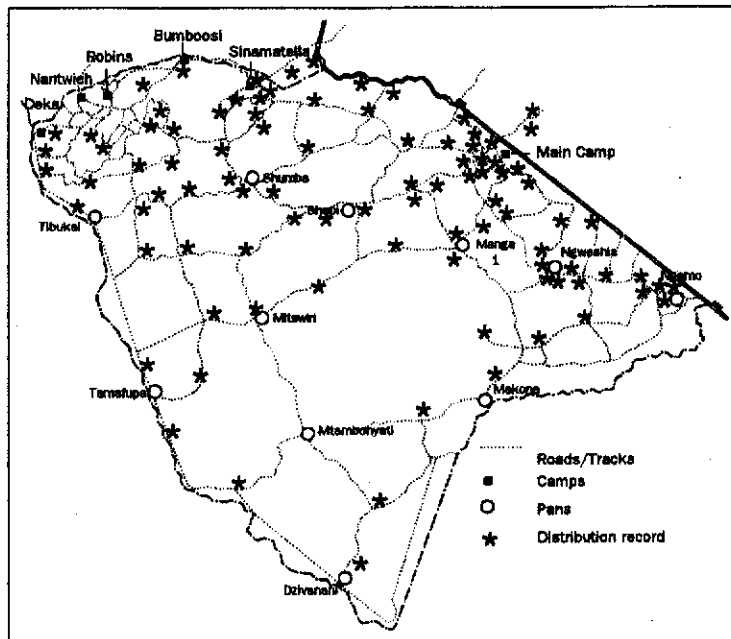
Van der Meulen (1976) found the mean mass of 17 adult male lions from the Matetzi area as 188 kg with a mass range of 172-205 kg. 18 females from the same area were considerably smaller with a mean mass of 132 kg and a range of 110 to 165 kg. The heaviest adult female had a mass of less than the lightest adult male.

Distribution

During the 1969/71 survey of the mammals of the Hwange National Park, Wilson (1975) indicated that the lion, during that period, had a very wide distribution in the Park but felt that there were less in the Dzivanini area than in the Main Camp and Robins area. This he attributed to the fact that there were fewer and less permanent large antelopes around Dzivanini.

The situation in this respect has not changed over the last 26 years and there are still fewer prides of lions in the south west of Hwange National Park in comparison to the main tourist routes in the Ngweshla, Main Camp, Robins and Sinamatella areas. This is not entirely due to more sightings by more tourists in these areas but it is as a direct result of the far greater concentrations of large mammals and a lot more permanent water in these areas.

Map 18 gives details of all lion prides seen during the survey and this data has been obtained as a result of the many survey techniques used. In several instances, especially along the Botswana border and in the south west of the Park, the distribution data was obtained as a result of hearing lions roar at night or from fresh tracks on the roads.



Map 18 - Distribution of lion as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms, night observations, fresh tracks on the ground and from lions roaring at night.

Habitat

Lions were recorded in almost every habitat type existing in the Hwange National Park. They were very common in the dry Kalahari sand country, in Mopane woodland and in the riverine vegetation along the large and small rivers in the north. They were recorded in very dry areas along the Botswana border, and also in the more open grassland around Shumba, Shabi Shabi and Nehimba. They were also often seen in the broken granite hills east of Shumba and in tall *Baikiaea* woodland south of Main Camp. As a result of the lions ability to go without drinking for many days, they were also seen in extremely dry areas of the Park.

Habits

Wilson (1975) recorded prides of up to 22 lions in the Deteema area during his 1969/71 survey and there were also prides of 19 and 21 lions in the south east of the Park during 1973.

The following prides were actually recorded during that survey.

Single lion	-	15	records	Seven	-	3	records	Fourteen	-	1	record
Two	-	8	"	Eight	-	2	"	Fifteen	-	1	"
Three	-	9	"	Nine	-	2	"	Seventeen	-	1	"
Four	-	5	"	Ten	-	1	"	Eighteen	-	1	"
Five	-	9	"	Eleven	-	1	"	Nineteen	-	1	"
Six	-	2	"	Twelve	-	1	"	Twenty One	-	1	"
								Twenty Two	-	1	"

Table 25 - Number and size of lion groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	8	3	0	109	2	0	122
Two	7	8	0	69	0	2	86
Three	5	2	0	60	0	1	68
Four	3	0	0	64	0	1	68
Five	3	1	0	36	1	1	42
Six	0	2	0	26	0	0	28
Seven	2	1	0	20	1	0	24
Eight	0	0	0	22	0	1	23
Nine	0	0	0	12	0	0	12
Ten	0	1	0	5	0	0	6
Eleven	1	0	0	8	0	0	9
Twelve	0	0	0	4	0	0	4
Thirteen	0	0	0	2	0	0	2
Fourteen	0	0	0	6	0	0	6
Fifteen	0	0	0	2	0	0	2
Sixteen	0	0	0	2	0	0	2
Seventeen	0	0	0	2	0	0	2
Eighteen	0	0	0	0	0	0	0
Nineteen	0	0	0	0	0	0	0
Twenty	0	0	0	1	0	0	1
21-30	0	0	0	0	0	0	0
31-40	0	0	0	0	0	0	0
41-50	0	0	0	0	0	0	0
51-100	0	0	0	0	0	0	0
101 and over	0	0	0	0	0	0	0

During the 1996 survey there were a considerable number of records of the size of lion prides and this was as a result of the carnivore survey. A total of 628 prides or single lions were observed and details of these were recorded on the special forms designed for the survey. (See Table 25). The size of prides ranged from single animals up to prides of twenty. There were also two records of seventeen lions in a pride, two records of sixteen, two records of 15 lions and six records of fourteen lions. The most frequently seen group consisted of two lions together which were recorded on 69 occasions while single animals were seen on 109 occasions.

Table 26 gives details of all the prides of lions of 7 and above seen during the survey. However, these figures require some explanation. On 20th June 1996 a pride of 15 lions was seen relaxing near Dopi Pan. On 4th July 1996 a pride of 20 were also seen on the road between Dopi and Dom pans.

Three days later a pride of 17 lions was seen again at Dopi Pan and then they were not seen for some three weeks. A pride of 14 lions were then seen at Ngweshla Pan on 31st July 1996 and two weeks later a pride of 15 lions was again seen at Ngweshla and they were hunting. A few days later i.e. 16th August 1996 16 lions were back at Dopi Pan and they were on a buffalo carcass which I believed they must have killed. The next day (17th August 1996) there were 17 lions at the same carcass and later in the day another visitor saw 16 lions at the same buffalo carcass. Then still another visitor saw 14 lions on the buffalo carcass on the same day (17th August 1996).

Therefore I believe that the 9 different observations of 9 prides of lions ranging in size from 14 to 20 animals are indeed the same pride. Therefore, instead of there being 144 lions in that area it appears as if there were no less than 20 lions which were seen on 9 occasions. This pride no doubt moved between Ngweshla and Dopi Pans, both areas supporting large numbers of large mammals.

The other prides of 14 lions were seen as follows:

1st	May	1996	14	lions at Mandavu Pan
21st	Aug	1996	14	lions at Boabab Pan
26th	Sept.	1996	14	lions at Reedbuck Vlei
27th	Sept.	1996	14	lions at Reedbuck Vlei

These prides of 14 lions could represent two or possibly even three prides of lions. Additional details of where all the large prides of lions were seen are included in Table 26.

As far as all male lion groups are concerned, single males were recorded on 54 occasions, groups of two adult males ten times, groups of three adult males ten times, four adult males on three occasions and on one occasion five adult males were recorded together. Table 25 gives full details of the 628 prides recorded in the 1996 survey. However, the largest pride of lions seen at a waterhole by the Wildlife Society during their September 1996 waterhole count was of 10 animals.

While lions are predominately nocturnal animals, they are, however, often seen very early in the morning or late in the afternoon. Most of the records for the Hwange National Park were for those periods. During the heat of the day they spent many hours sleeping in the shade which often took place close to the main tourist roads in the Park and they made very little effort to move in spite of vehicles within a few metres of them.

In some parts of the Hwange National Park, some prides had become so accustomed to safari and other vehicles that they make no effort to run and hide. On the other hand some prides are still very wary of vehicles and disappeared quickly if a vehicle approached.

Table 26 - Large groups of lion observed (7 or above)

Reference record	Date	No. of lion	Locality	Observations
L1/358	08.01.96	8	Makwa Pan	
L1/360	11.01.96	7	Makwa	Same group as L1/360
L1/6	21.01.96	11	Jambile	Sunning on road
L1/44	22.01.96	9	Manga 1	Moving in low scrub
L1/392	23.01.96	8	Main Camp	-
L1/51	24.01.96	8	Linkwasha	Feeding on wildebeest kill
L1/53	25.01.96	9	Linkwasha	Killed a buffalo
L1/58	31.01.96	8	Linkwasha	In open grassland - drinking
L1/394	31.01.96	8	Sinamatella	Walking, early am, old Robins Road
L1/66	05.02.96	8	Ngweshla	Day two - after kill
L1/67	06.02.96	9	Ngweshla	Still on buffalo kill
L1/68	06.02.96	8	Ngweshla	Open grass area - mating
L1/69	07.02.96	8	Ngweshla	Two of the lionesses in tree
L1/70	08.02.96	8	Ngweshla	In open area - mating
L1/71	09.02.96	8	Ngweshla	At a buffalo kill in open
L1/73	09.02.96	9	Ngweshla	At a buffalo kill in open
L1/74	10.02.96	7	Ngweshla	Walking along Ngweshla/Manga Road
L1/77	11.02.96	8	Kennedy II	Spread out over 500 metres
L1/61	21.02.96	7	Ngweshla	Same group as above?
L1/62	20.02.96	8	Linkwasha	All resting
L1/405	28.02.96	7	Ngweshla	3 cubs playing on anthill with mother/others mating
L1/406	28.02.96	7	Linkwasha	5 cubs with two females
L1/407	29.02.96	7	Ngweshla	Mating pair/females resting, other mother went to collect cubs from pan.
L1/132	13.03.96	7	Ngweshla	
L1/139	21.03.96	9	Linkwasha	Chased by 2 young bull elephant
L1/96	23.03.96	8	Makwa	-
L1/141	24.03.96	10	Ngweshla	Two sets of cubs
L1/144	11.04.96	8	Linkwasha	2 sets of cubs playing
L1/108	14.04.96	10	Masuma	All females
L1/152	19.04.96	11	Ngweshla	Varied activities, mating, resting
L1/153	19.04.06	8	Kennedy	On road
L1/377	24.04.96	10	Deteema	At dam
L1/157	24.04.96	9	Kennedy	On a young zebra kill
L1/121	30.04.96	10	Lukozi River	Stalking buffalo
L1/123	01.05.96	14	Mandavu	
L1/378	04.05.96	7	Beaver Pan	Seen from aircraft V.J.W.
L1/166	08.05.96	7	Linkwasha	Kill in thick bush close by, as crunching was heard
L1/169	14.05.96	7	Linkwasha	Resting on road

Table 26 contd...

Reference record	Date	No. of lion	Locality	Observations
L1/170	14.05.96	7	Samavundhla	Hunting in open grassland
L1/171	20.05.96	8	Linkwasha	Adults stalking & chasing a wildebeest
L1/379	01.06.96	11	Lukozi River	All eating on giraffe carcass
L1/32	13.06.96	7	Bumboosi	
L1/188	20.06.96	15	Dopi	Relaxing in open Acacia savannah
L1/189	20.06.96	11	Dopi	Playing in grassland
L1/195	01.07.96	10	Dom/Dopi	Feeding on giraffe carcass
L1/197	02.7.96	8	Katshana	
L1/206	04.07.96	20	Dopi Pan	On road between Dom & Dopi Pans
L1/203	07.07.96	17	Dopi	Wild dog pack were chasing herd of impala - bumped into pride of lion & were chased
L1/206	22.07.96	8	Livingi	
L1/278	27.07.96	9	Nyamandhlovu	-
L1/279	29.07.96	12	Linkwasha	
L1/281	31.07.96	14	Ngweshla	Resting in long grass at waterhole
L1/210	02.08.96	8	Makwa	
L1/211	02.08.96	7	Makwa	
L1/229	04.08.96	9	Kashawe/ Lukozi	-
L1/213	06.08.96	9	Main Camp	
L1/214	06.08.96	12	Makwa/Dopi	-
L1/215	06.08.96	12	Makwa/Dopi	-
L1/246	08.08.96	9	Balla Balla	-
L1/247	09.08.96	9	Ngweshla	Cubs playing, males young
L1/255	13.08.96	15	Ngweshla	Hunting
L1.282	19.08.96	11	Mandavu	Young male/10 females drinking
L1/283	14.08.96	9	Ngweshla	Drinking
L1/284	15.08.96	9	Ngweshla	-
L1/256	16.08.96	16	Dopi Pan	At buffalo kill
L1/269	17.08.96	14	Dopi Pan	At buffalo kill
L1/257	17.08.96	17	Dopi Pan	At buffalo kill
L1/258	17.08.96	16	Dopi Pan	At buffalo kill
L1/287	21.08.96	14	Baobab	At buffalo kill
L1/339	28.08.96	11	Sinamatella	Resting in Mopane
L1/295	11.09.96	13	Samavundhla	-
L1/310	26/27.09.96	14	Reedbuck Vlei	Killed zebra
L1/335	27.09.96	14	Reedbuck Vlei	Eating on zebra kill
L1/307	27.09.96	8	Guvalala	Seen from platform
L1/316	27.09.96	11	Nyamandhlovu	Attempted to kill buffalo
L1/387	28.09.96	11	Kennedy II	At pan (V.J.W.)
L1/336	28.09.96	8	Masuma	Drank at Dam
L1/346	14.11.96	12	Dopi	Stalking 2 wildebeest

Table 27 - Analysis of lion prey in the Hwange National Park from previous records (Wilson 1975) and during the 1996 survey

Species of prey	Number of records		
	Nat. Parks records up until Dec. 1971 (Wilson 1975)	1969/71 survey (Wilson 1975)	* 1996 survey
Buffalo	144	8	17
Zebra	47	10	8
Wildebeest	37	12	6
Giraffe	40	5	9
Eland	28	5	5
Waterbuck	26	5	3
Elephant	25 (juveniles & calves)	0	0
Warthog	20	8	8
Kudu	23	2	6
Sable	16	0	5
Roan	9	0	2
Impala	6	0	2
Reedbuck	3	0	0
Tsessebe	2	2	0
Baboon	1	0	0
Gemsbok	1	0	1
Antbear	1	0	0
Black rhino	1	0	0
Lion	4 (half grown cub, very old female, yearling male and sub-adult female)	0	0
Hyaena	2	0	0
Ostrich	1	0	2
Duiker	0	1	0

* These represent all records as obtained from visitors sightings, my own personal observations, the survey team and records from carnivora survey forms

The social structure of lions has been well studied by authorities such as Guggisberg (1961), Schaller (1968, 1969), Schaller & Lowther (1969) and Bertram (1978) in several localities in Africa. Unfortunately in spite of the fact that the Hwange National Park has existed since 1928 (now 58 years) no research or detailed study of lion population in the Park has ever been undertaken.

Lions occupy distinct home ranges but this can vary greatly during the year and also depends of the availability of sufficient large prey species. The lionesses form the nucleus of the pride and many adults will spend a greater part of their lives within their home range. However, some females, especially adult and even sub-adult males, will often wander large distances. The pride that moved between Dopi and Ngweshla is just one example. Fresh tracks of lions on some of the Parks roads show that during a single night a male may walk as much as 15 km.

Food

During the 1969/71 mammal survey of the Park, (Wilson 1975) recorded lions feeding on the following prey:

Ngamo/Makolola area: eland 4; wildebeest 8; buffalo 2; zebra 2; warthog 3; duiker 1 and giraffe 2.

Robins/Sinamatella area: waterbuck 5; warthog 3; Tsessebe 2; Zebra 4; wildebeest 1; buffalo 3 and giraffe 1.

Main Camp area: kudu 2; buffalo 3; zebra 4; warthog 2; wildebeest 3; giraffe 2 and eland 1.

In addition to the data collected above by Wilson (1975) there were a number of National Parks records of prey on which lions had been feeding on. These details are given in Table 27 together with details from the present 1996 survey.

From the end of 1971 (end of 1969/71 survey [Wilson 1975]) up until December 1995 there were no records in the Research Staff files at Main Camp of any prey taken by lions or any other species in the Hwange National Park. This does not necessarily mean that no records were kept but during the present 1996 survey I spent some time working through the Research Staff files at Main Camp and no records could be found. B. Russell (pers. comm) has also indicated that during the 6 years that she has worked at Main Camp in the Research Branch no records of any prey of any of the carnivores have been kept.

From the data obtained during the present survey compared with what was published by Wilson (1975), (see Table 27) there is virtually no difference or change in the feeding habits of the lions or their prey items. Their main prey is still giraffe, buffalo, zebra, wildebeest, eland, warthog and kudu. In other words, the large antelopes and warthogs are the main species killed by lions.

Breeding

During the present survey, lions were recorded mating on the following dates: 8th March 1996; 17th July 1996; 10th August 1996 and 20th September 1996. Lionesses were also seen with cubs on no less than 126 occasions over the period of one year (1996). See Table 28.

Now it is very obvious when one examines Table 28 thoroughly that it can be clearly seen that in many instances it is the same female or several females with cubs that are seen time and time again in the same locality.

A very good example is of a single female with three cubs that I personally saw at Ngweshla on 2nd February 1996. The same evening she was seen again, this time with three other females and still with her 3 cubs. Over a period of about 3 weeks, this same female was seen on no less than 27 times with a different number of females with her. She became well known in the area around Ngweshla and her three cubs became quite accustomed to vehicles and people.

Another two females, this time with five cubs, also stayed for some months in the Ngweshla area and a third group of females and 6 cubs were also seen in the Ngweshla area from time to time.

Apart from the adult male lions that occurred in the Ngweshla/ Samavundhla/ Linkwasha area one could safely say the following female prides with cubs also existed in the area:

- 1 - 5 lionesses and 3 cubs (Ngweshla)
- 2 - 3 lionesses and 5 cubs (Ngweshla)
- 3 - lionesses and 5 cubs (Linkwasha)
- 3 - 8 lionesses and 6 cubs (Ngweshla)
- 2 - 4 lionesses and 3 cubs (Samavundhla)

After closer examination of Table 28 it can be seen that at least 30 to 40 different prides of lions were seen with cubs while the total number of different cubs seen was about 103 animals. However, it has been extremely difficult to determine exactly how many lionesses and cubs were really seen during the year and only a detailed study of the lion population after capturing and fitting of radio collars would more accurate results be obtained. In any case a large number of lionesses with cubs were seen during the year from all areas of the Hwange National Park.

Status

In 1973 it was estimated that the lion population in the Hwange National Park was about 500 animals (Wilson 1975) and some 16 years later the same figure of 500 was quoted by Jones (1989). As Jones (1989) was referring to my 1975 publication in his departmental report it is assumed that he was quoting my original estimate of 500 lions.

During the 1994 Wildlife Society annual count at waterholes, they gave a figure of 141 lions that were seen. During the 1995 game count by the same Society, 187 lions were seen and during the September 1996 survey only 63 lions were recorded.

Now it is quite obvious that as a result of more water in the seasonal pans the less likely wildlife would be to visit the main pans to drink. That presumably is exactly what happened in September 1996 when there was an abundance of water still about as a result of the very good 1995/96 rainy season.

Table 25 gives details of 450 prides (or single individuals) of lions recorded on the carnivore survey forms and this gives a total of 1855 lions recorded. Now obviously many of the same individuals and even prides were seen on several different occasions and by different observers. If the figure of 1855 lions seen were halved it would still give a population of 927 lions. Taking into account the dates and localities at which the 1855 lions were recorded it is also postulated that a large number of these were seen on several different occasions.

It is also therefore assumed that a large number of lions were not seen at all during the survey. Also considering the number of lion tracks encountered on the roads in the southern and western part of the Park and along the Botswana border, and the fact that lions were often heard calling at night, also indicated the presence of many more lions. It would, therefore, not been possible to say, with any degree of accuracy, how many lions were present in the prides when they were merely heard roaring at night or from the tracks on the roads.

Taking all these factors into account it is extrapolated that the lion population in the entire Hwange National Park could not be less than 1000 animals. Only very detailed research and survey work over a long period of time will produce more accurate figures for the number of large carnivores in the Hwange National Park. Until such times that this is undertaken the population figures for lions, leopards, wild dogs, cheetah and hyaena should be regarded as educated guesses.

Table 28 - One hundred and twenty six sightings of lionesses with cubs of various sizes in various localities

Reference No.	Date	Number of females in pride	No. of cubs present	Locality (area)	Notes
L1/358	8.1.96	3	4	Makwa)))) Same three adults with 4 cubs, then 3 and finally 2 cubs
L1/360	11.1.96	3	4	"	
L1/14	25.3.96	3	3	"	
L1/368	26.3.96	3	2	"	
L1/35	12.1.96	4	3	Kennedy I)))))))))))))) Possibly the same 3 females with 5 cubs
L1/6	21.1.96	8	3	Jambili	
L1/44	22.1.96	3	6	Manga I	
L1/49	23.1.96	4	3	Samavundhla	
L1/392	23.1.96	3	5	Main Camp	
L1/51	24.1.96	3	5	Linkwasha	
L1/53	25.1.96	3	5	Linkwasha	
L1/58	31.1.96	3	5	Linkwasha	
L1/62	2.2.96	3	5	Linkwasha	
L1/394	31.1.96	3	4	Mandavu	
L1/59	2.2.96	1	3	Ngweshla	
L1/61	2.2.96	4	3	"	
L1/66	5.2.96	5	3	"	
L1/67	6.2.96	5	3	"	
L1/68	6.2.96	4	3	"	
L1/69	7.2.96	4	3	"	
L1/70	8.2.96	4	3	"	
L1/71	9.2.96	5	3	"	
L1/73	9.2.96	5	3	"	
L1/74	10.2.96	3	3	"	
L1/405	28.2.96	3	3	")))))))))))))) These all appear to be the same pride with the number of lionesses recorded as varying between 1 and 5 adults
L1/407	29.2.96	3	3	"	
L1/435	13.3.96	2	3	"	
L1/428	14.3.96	2	3	"	
L1/27	14.3.96	2	3	"	
L1/128	14.3.96	2	3	"	
L1/436	15.3.96	2	3	"	
L1/131	17.3.96	2	3	"	
L1/36	17.3.96	2	3	"	
L1/437	18.3.96	2	3	"	
L1/140	22.3.96	3	3	"	
L1/146	13.4.96	2	3	"	
L1/156	23.4.96	1	3	"	
L1/184	18.6.96	1	3	"	
L1/187	19.6.96	1	3	"	
L1/192	23.6.96	1	3	"	
L1/235	14.7.96	2	3	"	

Table 28 contd....

Reference No.	Date	Number of females in pride	No. of cubs present	Locality (area)	Notes
L1/132	18.3.96	2	5	Ngweshla) These two adults and five cubs were seen on 5 occasions at Ngweshla. On one occasions (i.e. 15.8.96 an additional lioness was with the pride
L1/179	7.6.96	2	5	"	
L1/247	9.8.96	2	5	"	
L1/283	14.8.96	2	5	"	
L1/284	15.8.96	3	5	"	
L1/141	24.3.96	3	6	Ngweshla) Linkwasha/Samavundhla area
L1/152	19.4.96	4	6	"	
L1/255	8.2.96	3	5	Linkwasha) Appeared to be same group of between 2 and 3 females and 5 cubs. Then 2 cubs died
L1/76	10.2.96	2	5	"	
L1/406	28.2.96	2	5	"	
L1/144	11.4.96	3	5	"	
L1/166	8.5.96	2	5	"	
L1/169	14.5.96	3	5	"	
L1/171	20.5.96	3	5	Linkwasha	
L1/176	30.5.96	2	3	"	
L1/77	11.2.96	5	3	Kennedy II	
L1/370	12.4.96	2	2	Mandavu area	
L1/371	13.4.96	1	2	") This pride consisted of two sick lionesses and two small cubs. One lioness died and then one cub died and the group was not seen again
L1/	14.4.96	1	1	"	
L1/93	4.3.96	2	2	Balla Balla) Possibly same females and cubs
L1/308	21.4.96	2	2	Nyamandhlovu	
L1/408	6.3.96	3	4	Samavundhla) Possibly same female with 3 cubs. Number of adults varied between 1 and 4 lionesses
L1/414	10.3.96	2	3	"	
L1/164	7.5.96	2	3	"	
L1/170	14.5.96	4	3	"	
L1/274	15.7.96	2	3	"	
L1/276	16.7.96	1	3	"	
L1/243	28.7.96	1	3	"	
L1/285	15.8.96	2	3	"	
L1/105	12.4.96	1	2	Sinamatella	
L1/111	15.4.96	2	2	Kashawe loop	
L1/17	6.5.96	2	2	") Same lioness with 2 cubs. Again joined by other lionesses.
L1/19	11.5.96	3	2	"	
L1/20	12.5.96	3	2	Sinamatella	
L1/120	28.4.96	1	2	Near Robins) Possibly same female with 2 cubs
L1/162	30.4.96	1	2	Manga 1	
L1/377	24.4.96	7	2	Deteema area	
L1/21	16.5.96	2	2	Lukozi River	
L1/28	23.5.96	1	2	"	
L1/379	1.6.96	6	2	"	

Table 28 contd....

Reference No.	Date	Number of females in pride	No. of cubs present	Locality (area)	Notes
L/422	6.5.96	2	3	Near Makwa Pan/ Railway)
L1/236	15.7.96	1	3	") Possibly same female with young. 2
L1/238	17.7.96	2	1	") young died leaving only 1 cub.
L1/32	13.6.96	4	2	Bumboosi)
L1/189	20.6.96	2	9	Dopi)
L1/256	16.8.96	8	7	")
L1/257	17.8.96	5	10	")
L1/200	4.7.96	4	1	")
L1/195	1.7.96	3	6	Dom)
L1/196	2.7.96	4	5	") Possibly same female
L1/250	9.8.96	2	1	")
L1/263	8.9.96	2	3	Balla Balla)
L1/264	8.9.96	1	3	") Same female
L1/306	16.9.96	1	3	Dom)
L1/299	16.9.96	1	3	")
L1/297	16.9.96	1	3	Balla Balla)
L1/438	16.9.96	1	3	Dom)
L1/298	16.9.96	1	3	Dom)
L1/287	21.8.96	5	8	Baobab)
L1/237	16.7.96	1	2	Tshebe Tshebe)
L1/240	22.7.96	3	2	Livingi)
L1/241	22.7.96	2	3	Sikumi Turnoff)
L1/206	22.7.96	2	3	Livingi Pan)
L1/246	6.8.96	4	3	Balla Balla) Possibly same female with 3 cubs
L1/213	8.8.96	3	3	Main Camp)
L1/212	4.8.96	1	2	Ngwenya)
L1/210	2.8.96	5	3	Makwa)
L1/281	31.7.96	5	8	Ngweshla)
L1/279	29.7.96	4	7	Linkwasha)
L1/295	11.9.96	5	7	Samavundhla) Possibly same females with seven cubs
L1/294	11.9.96	2	3	Mbiza)
L1/278	27.7.96	7	2	Nyamandhlovu)
L1/261	7.9.96	1	2	Main Camp)
L1/266	10.9.96	2	2	" ") Possibly same female with 2 cubs
L1/296	14.9.96	1	2	Balla Balla)
L1/340	6.10.96	1	2	Balla Balla loop)
L1/223	22.7.96	2	1	Chingahobi)
L1/307	27.9.96	5	2	Guvalala)
L1/324	28.9.96	1	1	Roan Pan)
L1.345	13.11.96	5	2	White Hills)
L1/434	23.11.96	1	2	Ngweshla)
L1/351	23.12.96	4	1	Main Camp)
L1/356	24.12.96	1	1	" ") Possibly same female with 1 cub
L1/441	29.12.96	1	2	Kennedy II)

Genus FELIS (Linnaeus 1758)

Caracal

Felis caracal (Schreber 1776)

Felis caracal limpopoensis (Roberts 1926)

Colloquial name

In many reports and even published scientific papers the caracal is unfortunately referred to as the lynx. This is indeed most unfortunate as the European lynx and even the New World lynxes are externally very different to the African caracal.

The Lynxes to the north of us in Europe are spotted and barred and Skinner and Smithers (1990) have indicated that the Turkish name for caracal is "garoh-gulah" or black ear, which they say presumably has become the word caracal in English. In most parts of Africa the species is more commonly known as the caracal and not lynx.

Taxonomic notes

Meester, et. al(1986) recognised only two sub-species for the southern part of Africa with *F.c. damarensis* occurring in Namibia, northern Cape Province, southern Botswana and southern and central Angola and the nominate form *F.c. caracal* from the remainder of the southern African subregion.

Wilson (1975) and Smithers & Wilson (1979) both referred to the sub-species occurring in Zimbabwe as *F.c. limpopoensis* (Roberts 1926). This is now no longer accepted and *F.c. caracal* (Roberts 1926) is the sub-species occurring in Hwange National Park and in Zimbabwe as a whole.

Mass

A large adult male collected at Bumboosi had a mass of 29 lbs (13.2 kg) (Wilson 1975) and is in fact the only weight we have for a caracal from the Hwange area. Smithers & Wilson (1979) give two males with a mass of 13.2 kg and 12.7 kg. However, Skinner & Smithers (1990) give the mass of 6 males from Botswana and Zimbabwe ranging between 11.5 and 17.0 kg with a mean of 13.8 kg. Three females from the same region had a mean mass of 11.9 kg (range 10.9 to 11.5 kg).

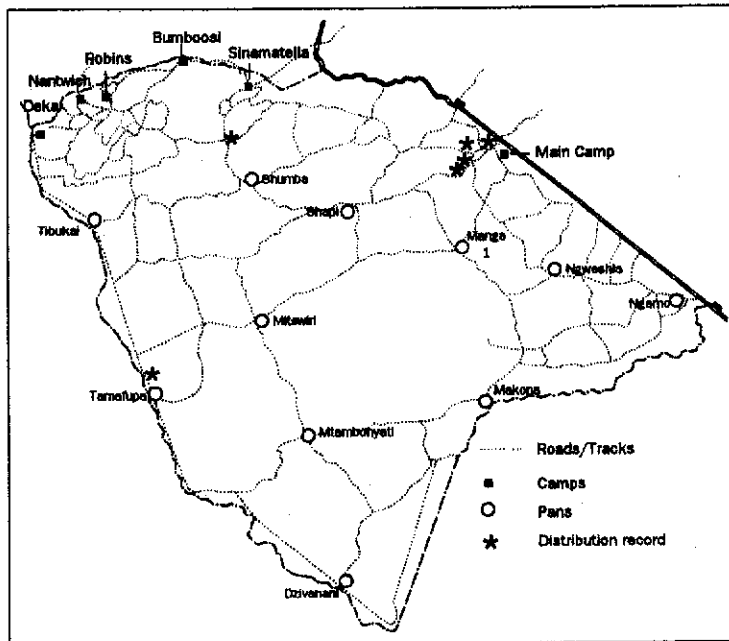
Distribution

Wilson (1975) gave localities of 15 visual and 1 specimen record of the caracal for the 1969/71 survey and indicated that even with the few records it appears as if the species has a wide distribution in the Hwange National Park.

During the present survey, caracal were seen at the following places:

Ref.	CA/1	Single	Balla Balla	24.7.96	5.54pm	Julia Salnicki
"	CA/2	2 together	Nyamandhlovu	17.7.96	5.00pm	Simon Siziba
"	CA/3	Single	Nyamandhlovu	18.9.96	8.00am	Grelet Corinne
"	CA/4	2 together	Dom Pan	13.10.96	6.12pm	African Dawn Safaris
"	CA/5	Single	Upper Lukozi	21.5.96	9.50am	Norma English
"	CA/6	Single	Tamafupa	29.9.96	8.30am	Vivian Wilson

Map 19 shows localities where these 6 records were from. These few records were obtained after covering the Hwange National Park with many survey techniques including night observations from an open vehicle and with a bright spotlight.



Map 19 - Distribution of Caracal as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms and night observations.

Habitat

The six records of caracal mentioned above were from the following habitats:

1. Combretum/Mopani scrub (Veg. type 9)
2. Combretum bushed grassland (Veg. Type 19)
3. Acacia Mundulea bushland (Veg. Type 20)
4. Acacia bushed grassland (Veg. Type 18)

Habits

It is quite possible that the two seen together near Dom Pan are the same two that were seen at Nyamandhlovu. These are only two records of two caracals seen together. The other four records are all for single animals.

Three of the records of sightings were in the early morning and the other three late in the afternoon and early evening. It is, however, interesting to note that in spite of a considerable amount of night work with a spotlight no caracals were seen.

Food

Wilson (1975) mentioned that during the 1969/71 survey a caracal collected at Bumboosi had a *Saccostomys campestris* and one *Praomys natalensis* in its stomach. No new information on the feeding habits of the caracal was obtained during the present survey.

Breeding

Wilson (1975) records a female with two small kittens seen at Sedina Pan on 27th March 1969 while Smithers & Wilson (1979) mentions two young recorded from Lonely Mine near Bulawayo in August. It is of interest to note that there are very few breeding records of this species anywhere in Zimbabwe.

Status

Smithers & Wilson (1979) stated that the caracal is nowhere common in Zimbabwe and because of their shy and secretive nature they are rarely contacted. Wilson (1975) referring to the Hwange National Park only recorded fifteen animals in two full years of

survey and also indicated that the caracal was not common and very rarely seen.

During the present year long survey the caracal was only seen on 6 occasions with a total of 8 animals (4 singles and 2 pairs). It is, therefore, not known how many caracals there are in the Hwange National Park but the few visual records suggest the species to be very rare or at the very least seldom seen.

African wild cat

Felis lybica (Forster 1780)

Felis lybica griselda (Thomas 1826)

Colloquial name

The African wild cat or simply wild cat are the only English names given to this species in southern Africa. This species differs from the European wild cat *Felis silvestris* but there is still some disagreement about the genetic basis for this. (Skinner & Smithers 1990).

Taxonomic notes

Meester et.al (1986) listed two sub-species from southern Africa. These were *Felis l. caffra*, Desmarest 1832, and *F.l. griselda* Thomas 1826. Smithers (1971) gave the distribution of *F.l. caffra* as the southern and eastern parts of South Africa northwards into eastern Zimbabwe and also central and southern Mozambique. The remaining parts of southern Africa and indeed Zimbabwe was occupied by the much paler form *F.l. griselda*. Therefore, the sub-species occurring in the Hwange National Park should be regarded as *griselda*.

Mass

Wilson (1975) gives the mass of 8 males from Hwange National Park as ranging between 9½ and 11¾ lbs (4.3 and 5.3 kg) with a mean of 10 lbs (4.5 kg) while 9 females had a mean of 9 lbs (4.1 kg) with a mass range of 8-12 lbs (3.6 to 5.5 kg).

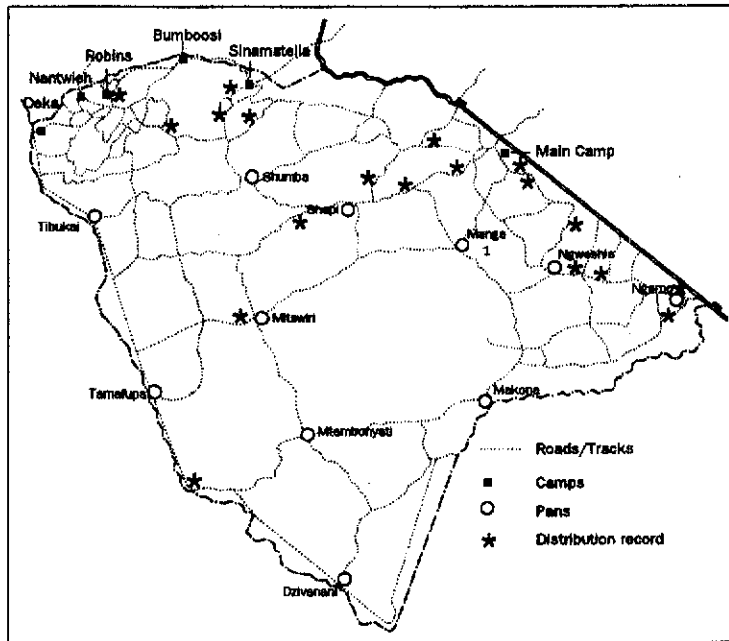
Smithers & Wilson (1979) give a mean mass of 15 wildcats from Zimbabwe as 4.31 kg with a range of 3.97 to 5.05 kg and two females had a mass of 3.52 and 3.32 kg.

Distribution

There are eighteen visual records of the African wild cat from the Hwange National Park and these are shown on Map 20. There are far fewer records from the present 1996 survey in comparison to the 1969/71 survey (Wilson 1975) although it is not clear why this should be the case.

There are two possibilities for fewer records during the present survey. One is that the 1969/71 survey lasted two years and the present survey only one year. Secondly a lot less time was spent out at night with a spotlight during 1996 compared to the 2 year survey of 1969/71. Nevertheless the species still has a wide distribution in the Park as was the case 25 years ago.

Unfortunately a number of domestic cats were observed in several areas during the present survey and this was definitely not the case during the 1969/71 survey. This matter is discussed under Notes below.



Map 20 - Distribution of wild cat as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms and night observations.

Habitat

Wilson (1975) indicated that during the 1969/71 survey the African wild cat was far more common in the drier areas where *Terminalia* and *Baikiaea* occurred on Kalahari sand than in the areas around *Deteema* and *Robins*.

The eighteen visual records obtained during the present survey were from the following habitats:

Combretum bushed grassland	(Veg. type 19)	-	1
<i>Terminalia</i> - <i>Acacia</i> bushland	(Veg. type 24)	-	2
<i>Terminalia</i> - <i>Lonchocarpus</i> bushland	(Veg. type 21)	-	3
Mopane-Combretum wooded bushland	(Veg. type 22)	-	3
<i>Terminalia</i> - <i>Baikiaea</i> bushland	(Veg. type 25)	-	2
Stunted Mopane woodland	(Veg. type 16)	-	2
Mopane wooded bushland	(Veg. type 5)	-	2
<i>Baikiaea</i> - <i>Guibourtia</i> woodland	(Veg. type 27)	-	3

Habits

The African wild cat is very much a nocturnal species and none of the eighteen encountered during the present survey were seen during the hours of daylight. All of the 18 visual observations were of single animals and there are no records from the Hwange National Park of more than one animal together. However, obviously animals will have to come together to mate and females with kittens would also be obvious. While the African wildcat is essentially a terrestrial species Wilson did record a specimen high up in a *Ficus* tree. (Wilson 1975)

Food

One evening at about 8.20pm a single African wild cat was seen in the middle of the road near Sinamatella Camp. It appeared as if the animal was stalking something on the road and then we noticed a large rodent in the road which was blinded by our bright spotlight. The African wild cat took very little notice of our light and in fact took the opportunity to

pounce on the blinded rat before it could run off. With the rodent gripped tightly in the cats jaws it disappeared into the vegetation at the side of the road.

No other data on hunting or the food of the African wild cat was obtained during the present survey. However, Wilson (1975) gave a detailed list of items found in the stomach contents of 13 specimens from the Hwange National Park. These included the following: *Elephantulus* sp; *Steatomys protensis*; *Tater leucogaster*; *Saccostromys campestris*; *Leggada minutoides*; *Aethomys namaquensis*; *Lepus saxatilis*; newly born *Raphicerus* sp; dove; korhaan; quail, *Solifugal*; *Orthoptera*; *Acridudae*; various lizards and even some fruit of *Diospyros mespiliformis*.

Breeding

No new data is available from the present survey. However Wilson mentioned two females showing signs of breeding. A female collected on 24th September 1969 was lactating while another female collected in December was pregnant with three foetuses, each with a crown-rump length of about 20mm. (Wilson 1975).

Status

While it is impossible to give any accurate estimate of the population of African wild cats in the Hwange National Park I believe it would be safe to say that the species is not in any danger and that a good population exists which must number many hundreds of animals. However the situation should be closely watched especially in view of the sightings of domestic cats in the Park.

General

On three occasions domestic cats were recorded in the Hwange National Park. Two of these were seen near Main Camp and a third on the road near Sinamatella Camp. It was difficult to say if these were feral domestic cats but there was very little doubt that they were domestic cats, *Felis catus*.

As the African wild cat freely interbreeds with the domestic cat it is indeed unfortunate that there are domestic cats roaming in the Hwange National Park. Skinner & Smithers (1990) have discussed this issue of hybrids between the African wild cat and the domestic cat and it is a situation that should be closely watched in the Hwange National Park.

Hwange National Park is one of the very few places left in Zimbabwe where a good population of pure bred African wild cats can be found and the more they are allowed to interbreed with domestic cats the worse the situation will become and in the end the true African wild cat will become extinct.

Black-footed cat, Small spotted cat

Felis nigripes (Burchell 1824)

Felis nigripes nigripes (Burchell 1824)

Colloquial name

The name Black-footed cat is indeed well entrenched throughout the region and is the English name normally given to this species.

Only the underparts of the feet of this cat are black while the upper parts are very rarely if ever black. The African wild cat *Felis lybica*, also has black under the feet but one wonders if, in the field, one ever sees the underparts of the feet of these two cats.

Some authors, e.g. Skinner & Smithers (1990) prefer to use the English name Small-spotted cat. However, Smithers (1971; 1973) used the name of Black-footed cat.

At the Chipangali Wildlife Orphanage we have live specimens of both the Black-footed cat and the African wild cat and I believe, even in the wild, it is not difficult to distinguish between the species.

Taxonomic notes

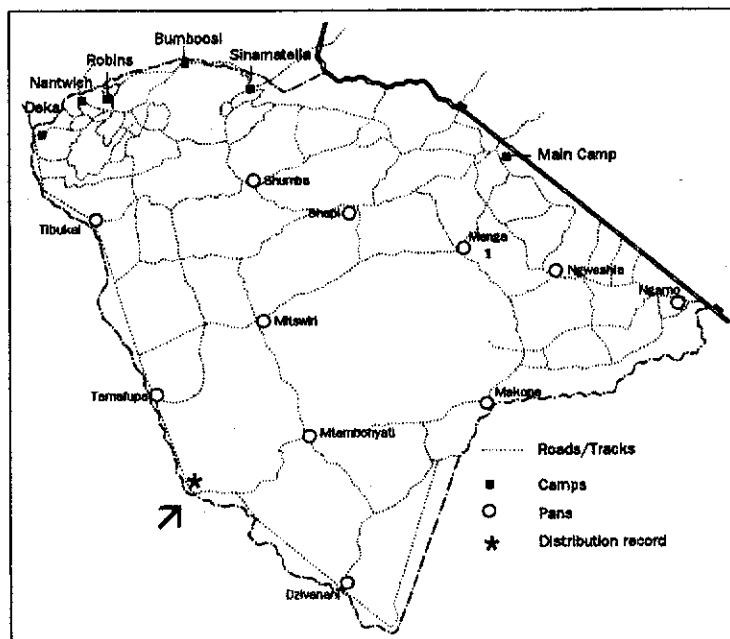
There are two sub-species occurring in southern Africa. These are *Felis nigripes nigripes* (Burchell 1824) from the Kalahari and into eastern Botswana and *F.n. thomasi* (Shortridge 1931) from the south of the species range and into the karoo. It is *Felis nigripes nigripes* (Burchell 1824) that exists in eastern Botswana and now found in western Zimbabwe.

Distribution

In a distribution map of the range of the Black-footed cat, Skinner & Smithers (1990) show the species occurring throughout the eastern section of Botswana and extending into western Zimbabwe (see page 419, Skinner & Smithers 1990). During the 1969/71 survey of the Hwange National Park (Wilson 1975) did not record or even suggest that the Black-footed cat occurred in Zimbabwe.

However, I have always been of the opinion that the species does occur in Zimbabwe as a single animal was seen at night by Dr. Reay Smithers and myself about 15 km west of Tamafupa in 1966 during our mammal survey of Botswana.

During the present survey in August 1996 while working along the western border of the Hwange National Park, Mr. Peter Ngwenya and I very clearly saw a Black-footed cat. It was at an almost dry waterhole only a few kilometres north of Ngwasha Pan where we were camping. There was no doubt whatsoever of its identification as we were both able to study the animal for some time before it casually walked off into some scrub Mopane woodland.



Map 21 - Distribution of Black-footed cat as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms and night observations

While an actual specimen record would be desirable to confirm its occurrence in Zimbabwe I believe that it would be inappropriate to shoot such a rare species merely to confirm its occurrence in the country. In any case I know the species extremely well particularly as I have a live animal at Chipangali Wildlife Orphanage near Bulawayo and I have also seen the species on several occasions in the field in Botswana. (See Map 21 for locality record where the single animal was recorded). No other details of this species are available from Zimbabwe.

Serval

Felis serval (Schreber 1776)

Felis serval serval (Schreber 1776)

Colloquial name

Rosevear (1974) mentions that the Portuguese name for the European lynx as "lobocerval" and from that somehow the English name has been derived. However, Forster (1781) in his description of the serval from the Cape Province of South Africa referred to the species as "Tyger bosch katten" which in Afrikaans would mean "Tierboskat".

Taxonomic notes

Allen (1939) listed 17 sub-species from the African continent of which 3 were for the small spotted form *Felis brachyura* and 14 for *Felis serval*. However, Meester et. al (1986) relegated all the animals from southern Africa to *Felis serval serval*.

Mass

Wilson (1975) gave the mass of a single male serval from Hwange National Park as 19 lbs (8.6 kg) and a large female as 29 lbs (13.2 kg). Smithers & Wilson (1979) indicated that 23 males from Zimbabwe had a mean mass of 11.13 kg with a range of 8.63 to 13.53 kg while 23 females ranged from 8.63 to 11.80 kg with a mean of 9.67 kg.

Distribution

There is no doubt that the distribution of the serval is restricted to a suitable habitat. Therefore, their distribution in the Hwange National Park is determined by the availability of permanent water and adequate cover in the form of tall grass, dense underbush, reedbeds or other areas in which they can hide and find food.

Wilson (1975) mentioned that during the 1969/71 survey the serval was found mainly in the northern and eastern section of the Hwange National Park where water was plentiful and consequently a more suitable habitat.

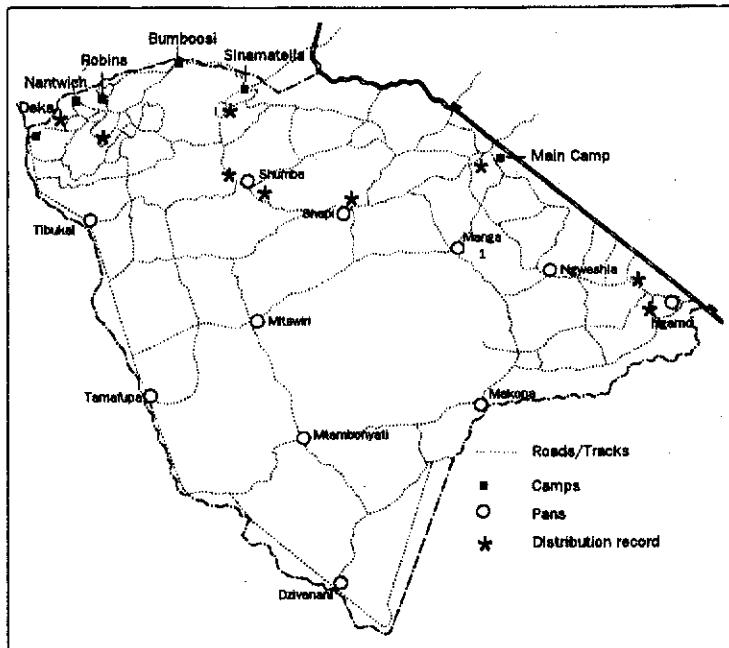
During the present survey there were only nine records of the species from the Park (see Map 22) and all of these were from areas of tall grass and open vleis etc. However, it should be noted that the serval is no doubt a lot more common than the few visual records suggest especially as they are very difficult to see in the habitat in which they live.

Habitat

As already mentioned above, the main habitat requirements for the serval is tall grass, dense vegetation close to streams, vleis, reedbeds and other suitable habitat where permanent water is available.

Habits

The serval is a nocturnal species and is very rarely seen during the hours of daylight. However, in very remote places and where there is little disturbance the species will move



Map 22 - Distribution of serval as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms and night observations

about and feed during the day.

The following visual records of serval from the Park are given below:

SE/1	Single animal	1.7.96	11.30am	Danga/Shapi	H.P. Erwee
SE/2	Single animal	12.7.96	5.55am	Dom	H.A. Peters
SE/3	Single animal	27.9.96	6.40pm	Shumba	T. Abrahamson
SE/4	Single animal	16.8.96	7.15am	Deka area	H.A. Micklesfield
SE/5	Two animals	15.3.96	6.15am	Shumba	H. Watson
SE/6	Single animal	8.5.96	5.10am	Makololo	Touch the Wild
SE/7	Two animals	15.2.96	6.15pm	Ngamo area	Touch the Wild

In some areas where they do occur they often move through the long grass on recognised and well established paths and as a result they are most vulnerable to snaring by people who know of this habit.

Food

It is obvious that the foods eaten by a serval would be found in the habitat in which the species occurs. A serval collected in Hwange National Park during the 1969/71 survey had in its stomach contents two *Leggaria minutoides*, three *Tatera leucogaster* and a single lizard *Mabuza striata*. (Wilson 1975). Another serval collected at Kennedy II contained a large quantity of *Lepus* flesh and hair.

A detailed analysis of 65 serval stomach contents contained the following food items: (Smithers & Wilson (1979).

Food item	No. of occurrence
Muridae	63
Aves	11
Reptilia	7
Misc. Mammalia	7
Insecta	5

Orthoptera	3
Coleoptera	2
Amphibia	1
Milk	3
Green grass	2

Smithers & Wilson (1979) gives a breakdown of the 63 stomachs with Muridae in them represented by the following species:

Species	No. of occurrence
<i>Praomys natalensis</i>	31
<i>Otomys angoniensis</i>	31
<i>Leggada minutoides</i>	3
<i>Rattas rattas</i>	3
<i>Saccostomys campestris</i>	3
<i>Tatera leucogaster</i>	2
<i>Pelomys fallox</i>	2
<i>Aethomys chrysophilus</i>	2
<i>Dasymys incomtus</i>	1
<i>Rhodomys pumilio</i>	1
<i>Dendromys sp.</i>	1
Undetermined	6

While the above analysis does not in any way suggest that the servals in the Hwange National Park feed on all the items mentioned above it does indicate the wide variety of foods eaten by servals.

With the exception of *Rhodomys pumilio* all the other species of Muridae occur in the Hwange National Park (Wilson 1975) and are therefore no doubt preyed on by servals.

Breeding

No data whatsoever is available from the Hwange National Park. Even during the two year survey of 1969/71 no data was obtained (Wilson 1975). However, Smithers & Wilson (1979) suggest that in Zimbabwe as a whole serval young are born from about December to April.

Status

With such a secretive species which is difficult to see and study in its specialised habitat it is extremely difficult to give any indication of its population size. All I am able to say is that it occurs throughout the Park in areas of suitable habitat and maybe a lot more common than the few records show.

Family Canidae

Foxes, wild dog and jackals

The Canidae are represented in the Hwange National Park by two species of jackals, the side-striped *Canis adustus*, the black-backed *Canis mesemolas*, the wild dog, *Lycaon pictus* and the bat-eared fox, *Otocyon megalotis*.

All four species have long slender legs which no doubt is an adaptation to their hunting methods and all have bushy tails.

Genus *Lycaon* (Brookes 1827)

Wild dog, Cape hunting dog

Lycaon pictus (Temminck 1820)

Lycaon pictus pictus (Temminck 1820)

Colloquial name

The wild dog is often referred to as the Cape hunting dog. As the species has a very wide distribution in Africa it is now obvious that the word Cape should no longer be used. However, the words Hunting dog and wild dog are most acceptable and will no doubt be continually used throughout their range. No other English names are recognised.

Taxonomic notes

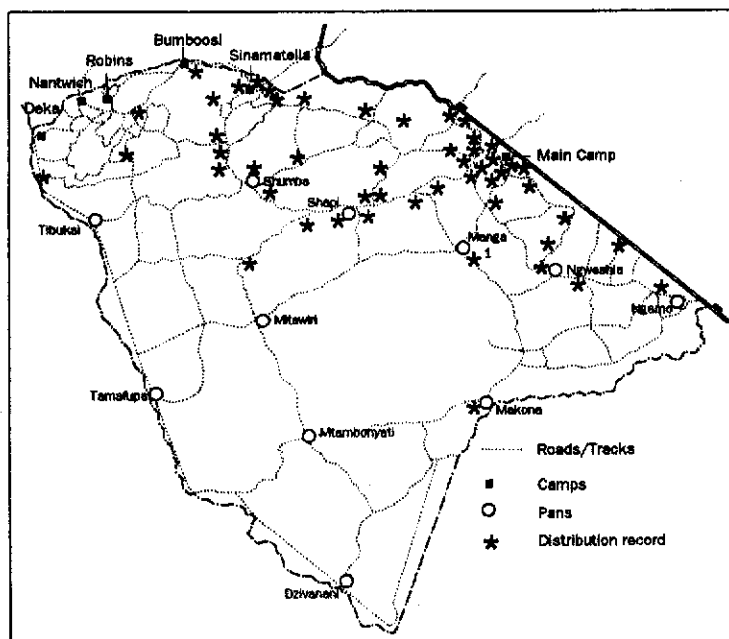
Temminck first described the wild dog from a specimen from coastal Mozambique in 1820 under the name *Hyaena picta*. The specific name *picta* means painted in Latin and this refers to the multi-coloured coat which is blotched with patches of white, yellow and black.

Mass

Smithers & Wilson (1979) give the mass of four captive males (about 24 months old) as 26.80 kg; 26.33 kg; 27.69 kg and 28.60 kg. No other data from Zimbabwe is available.

Distribution

Wilson (1975) mentioned that during the 1969/71 survey of the Hwange National Park the species had a wide distribution and that they were found in most areas. The distribution map for the period 1969/71 showed the species as present in several places along the Botswana border and throughout the southern part of the Park extending all the way to Dzivanini. The wild dog was also at that time recorded throughout the Robins and Sinamatella areas.



Map 23 - Distribution of wild dog as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms and wildlife observation forms

The present survey did not record the presence of the wild dog anywhere south or west of Makona and nowhere along the Botswana border. Even in the Ngamo area there were very few records of the presence of wild dogs and only a few records from the Robins area.

Map 23 gives some idea of the distribution of the 137 groups of wild dogs recorded on the Carnivore Survey sheets during the present survey and while there are many areas where it was not recorded the species no doubt has a wider distribution than the records show, especially as the species has such a very large home range.

Additional details on distribution and status, as submitted to me by the two permanent wild dog research teams based in Hwange, will be discussed under Status below.

Finally, the "road strip counts" recorded four groups of 6 wild dogs and three groups of 7 dogs, while the Wildlife Society of Zimbabwe also saw several groups of wild dogs during their annual game count. Details of these sightings are given in Table 30.

Details of all the sightings of packs of wild dogs are included in Map 23.

Habitat

Within the Hwange National Park the wild dog is found in a very wide range of habitats. These include the broken and hilly country south of Sinamatella and also in the hills north of Sinamatella around Bumboosi. They have been recorded on many occasions in Baikiea woodland, in Mopane country and in comparatively open areas on Kalahari sand around Dom and Nyamandhlovu Pans.

Because wild dogs tend to rely more on sight than smell when hunting they are inclined to spend a great deal of their time in more open woodland and also wooded savanna. They, however, avoid dense thickets and areas of long grass where hunting would be more difficult. However, as Wilson (1975) has pointed out, their distribution is often determined by the availability and abundance of a population of fair to medium sized antelope.

Habits

Wilson (1975) mentioned packs of 18, 16, 15, 14, 14 and 12 wild dog and also indicated that other records included packs of 8, 8, 9, 7, 6, 5, 5, 8, 7, 1, 1 and 3. The mean for the packs of 9 and less being 5 animals whereas the mean for 6 large packs was 15. Taking the entire 18 groups encountered into consideration the mean was 8 animals.

Additional records of 10 wild dog packs from records kept by the Department of National Parks recorded a mean of 7.4 animals per pack with a range of 1-18 animals. The largest pack of wild dogs seen in the Hwange National Park during the 1969/71 survey was 21 animals seen by Mr. John Herbert (Wildlife Ecologist) at Main Camp, on 23rd September 1973 (National Parks Records).

Davies (1993) studied the home range of 5 packs of wild dog in the Main Camp area of Hwange National Park between 1989 and 1993 and she recorded the mean pack size as 9.5 dogs with the range of pack size being 3 - 17 dogs over a 12 month period. She also mentioned that variation in pack size both within packs and between packs was considerable. She also indicated that in a 12 month period a pack of wild dogs could either double in size or halve.

Table 29 - Observations of pack size of Wild dogs

No. in packs	1-5	6-10	11-15	16-20	21-26
No. of observations	75	73	3	0	0

During the present 1 year survey a total of 152 records of packs of wild dogs were analysed and Table 29 gives details of pack sizes of all packs observed.

The average pack size for the 152 records of sighting of wild dogs was therefore 5.2 animals with a range of 1-14 animals. Additional details are given in Table 30.

The largest pack of 14 wild dogs was only seen on one occasion near Main Camp on 16th May 1996 while a month later (22nd June 1996) a pack of 12 wild dogs was seen at Balla Balla. On 23rd July 1996 the same pack was seen again at Main Camp and about half-an-hour earlier the pack was seen on the road near Makwa Pan, running towards Main Camp. It, therefore, appears as if the 4 records of packs between 11 and 14 animals are all for the same pack and all seen in over a period of two months (16th May-25th July 1996).

One well known pack of wild dogs which could very easily be recognised as one of the dogs was marked with a black radio collar and was seen on no less than 56 occasions. The 56 locality records where this group was seen are shown on Map 24.

This pack was first seen at Dom Pan on 13th January 1996 and continued to remain in the area as shown on Map 24 until completion of the survey. The last sighting of the group was on 29th December 1996 at Nyamandhlovu Pan, almost exactly a year after first being seen at Dom Pan in January 1996. This pack was also known to move in and out of the National Park across the railway line into the Forest Reserves.

During the period of the year the pack varied in size of 6-10 animals. The mean size of the pack for the 56 observations was 7 animals which in fact appeared to be the stable number of the pack. These 7 animals were recorded on 21 occasions. On another 17 occasions there were 8 animals in the pack.

Another pack often seen by the safari operators (Touch The Wild) in the Ngweshla area varied between 3 and 5 wild dogs and these were recorded on 8 different occasions. One of the dogs in this group had its left back leg off at the first joint and yet it was able to keep up with the pack.

The wild dog research team of Dr. Bob Robbins and Kim McCreery kindly provided me with data of the wild dogs in the Sinamatella area and their report is as follows:

"Our study area extends from the Chokamella River and White Hills in the east to Crocodile Pools and Manzicheesa in the west, and the Mambane River and Chokamella Camp in the north to Shumba and the Main Road in the south. Within this area there are five packs totalling 24 adults and six pups. The home ranges of two of the packs extends into the Deka, but how far is to date unknown. With the assistance of patrols within the IPZ, coupled with our routinely monitoring radio collared packs, we are confident that this is a reliable estimate with at most perhaps only 6-8 wild dogs unaccounted for, some of which may have been dispersing animals. Another pack of three has been sighted around the Boss Long One/ White Hills/ Mopane Pan area and a pack of four was observed at Inyantue Dam. Currently, not including pups, our average pack size is 4.3 with a range of 2-7 (N-7, see above)."

The Sinamatella wild dog research team mentions a pack of 3 in the Boss Long One area and another pack of 4 in the Inyantue area.

From our "Carnivore Survey" forms we have several records of between 1 and 4 dogs in the Guvalala/ Shapi/ Boss Longone Pan area and also two records of a pack of 6 in the

Table 30 - Number and size of Wild dog groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	0	1	0	12	0	-	13
Two	0	1	0	20	0	-	21
Three	0	1	0	15	0	-	16
Four	0	2	0	13	0	-	15
Five	0	2	0	9	0	-	11
Six	4	0	0	18	0	-	22
Seven	3	0	0	19	1	-	23
Eight	0	0	0	17	0	-	17
Nine	0	0	0	8	0	-	8
Ten	0	0	0	3	0	-	3
Eleven	0	0	0	0	0	-	0
Twelve	0	0	0	2	0	-	2
Thirteen	0	0	0	0	0	-	0
Fourteen	0	0	0	1	0	-	1
Fifteen	0	0	0	0	0	-	0
Sixteen	0	0	0	0	0	-	0
Seventeen	0	0	0	0	0	-	0
Eighteen	0	0	0	0	0	-	0
Nineteen	0	0	0	0	0	-	0
Twenty	0	0	0	0	0	-	0
21-30	0	0	0	0	0	-	0
31-40	0	0	0	0	0	-	0
41-50	0	0	0	0	0	-	0
51-100	0	0	0	0	0	-	0
101 and over	0	0	0	0	0	-	0

Table 31 - Sightings of 137 packs of Wild dogs as determined from "Carnivore Survey" forms

Reference Record	Date	Time	No. of packs	Locality (area)	Observations
WD/17	13.01.96	07.10	7	Dom	Running
WD/18	13.01.96	07.45	7	Dopi Pan	Resting in grass
WD/19	13.01.96	08.45	7	Dopi Pan	Just eaten - covered in blood
WD/1	20.01.96	06.30	1	Caterpillar	Running along road
WD/6	21.01.96	08.00	6	Puff Adder Pan	Chasing impala
WD/20	22.01.96	18.15	6	Balla Balla	One very black dog
WD/21	22.01.96	18.15	6	Balla Balla	
WD/121	24.01.96	06.15	6	Main Camp	Chasing impala
WD/2	24.01.96	08.30	6	Sedina	Drinking at Pan
WD/22	26.01.96	07.10	4	Dopi	
WD/23	26.01.96	07.45	3	Samavundhla	Waiting for a kudu to come out of water
WD/3	31.01.96	06.45	7	Dom	Running
WD/4	31.01.96	06.52	6	Dom	Running
WD/24	13.02.96	17.50	5	Ngweshla	Resting then off hunting
WD/25	13.02.96	18.10	3	Ngweshla	Watching impala herd then running off in answer to a call
WD/5	17.02.96	11.00	7	Nyamandhlovu	
WD/6	19.02.96	06.00	6	Nyamandhlovu	
WD/7	21.02.96	06.30	6	Main Camp	Eating impala kill
WD/8	21.02.96	06.50	8	Puff Adder	Killed young female impala
WD/9	21.02.96	07.30	10	Main Camp (Loop Rd)	At a kill
WD/10	23.02.96	09.45	7	Nyamandhlovu	One young female walking with difficulty
WD/123	24.02.96	17.00	8	Deteema	One dog which was bigger than the others had a collar
WD/124	25.02.96	16.30	6	Main Camp	Made an impala kill
WD/11	25.02.96	17.50	6	Main entrance Main Camp	Eating impala kill
WD/27	05.03.96	07.55	2	Caterpillar	Running fast after something
WD/28	03.03.96	07.55	2	Caterpillar	They were chasing something
WD/29	10.03.96	10.00	4	Dom	In open area
WD/30	12.03.96	AM	8	Caterpillar	
WD/125	15.03.96	07.30	5	Sinamatella	Were walking on road
WD/117	16.03.96	06.18	7	Balla Balla	Eating on kudu carcass. One dog wore black radio collar
WD/83	18.03.96	07.30	2	Shapi Pan	Walking along tarred road
WD/118	18.03.96	17.45	7	Makwa Pan	Seen from helicopter. Radio collar
WD/119	21.03.96	16.30	7	Dom Pan	Drinking at Pan/black collar (one dog)
WD/12	22.03.96	17.15	2	Balla Balla/Ngweshla	Hunting in Acacia/teak forest
WD/31	23.03.96	08.00	3	Nyamandhlovu	Walking along tar road. One dog with black collar
WD/32	06.04.96	16.45	5	T-Junction to Sinamatella	
WD/38	12.04.96	07.00	6	Mabuya Mabema	
WD/39	12.04.96	07.00	6	Balla Balla (Loop end)	Think the Wild dog had made a kill earlier, 8 hyaena very interested. Wild dog were quite aggressive and attacked a hyaena

Table 31 contd...

Reference Record	Date	Time	No. of packs	Locality (area)	Observations
WD/126	16.04.96	16.30	2	Bumboosi River	
WD/33	16.04.96	17.10	2	Bumboosi Spring	Chasing impala - failed
WD/40	20.04.96	06.40	2	Nyamandhlovu	Walking along road
WD/41	20.04.96	08.00	2	Boss Long One/Ngamo	
WD/34	21.04.96	17.45	2	Sinamatella	Two large dogs lying on road for 10 mins.
WD/35	21.04.96	17.45	10	Lukozi River Loop	
WD/36	23.04.96	18.00	5	Caterpillar	Walking along road
WD/42	24.04.96	18.05	5	Main Camp	Trotting single file
WD/84	25.04.96	07.15	2	Ngweshla/towards Main Camp	On the road
WD/43	26.04.96	07.55	4	Railway crossing	Resting
WD/44	29.04.96	18.10	5	Nyamandhlovu	Walking & playing on side of road
WD/45	04.05.96	07.01	7	Makwa Pan	Resting
WD/13	06.05.96	08.00	2	Dopi Vlei	
WD/14	08.05.96	16.00	6	Roan Pan	Adult dogs
WD/127	15.05.96	09.45	3	Guvalala	Resting in the shade
WD/128	16.05.96	18.00	14	Main Camp	
WD/46	17.05.96	07.45	7	Caterpillar	Drinking at Pan
WD/47	20.05.96	09.30	7	Makwa/Kennedy	On road
WD/48	20.05.96	10.30	7	Makwa	Resting, regurgitating. Urinating/defacating
WD/129	03.06.96	19.30	7	Makwa Pan	Walking about
WD/61	09.06.96	07.15	9	Main Camp	A lot of running around - "chittering". Rolling on ground. All adults/all anxious. Seemed worried by presence of 2 Spotted hyaena nearby
WD/130	16.06.96	16.15	5	Main Road	Resting close to road
WD/15	12.06.96	10.30	2	Donga	Running on tarred road
WD/49	13.06.96	16.30	6	3 km from Airport	Had a kill in the morning
WD/62	19.06.96	17.30	8	Balla Balla (turnoff)	Appeared to be hunting
WD/85	21.06.96	18.00	3	Masuma Dam	3 dogs hunting impala
WD/16	22.06.96	07.25	12	Balla Balla	Playing & sunning
WD/63	22.06.96	08.50	9	Livingi	2 packs, one group chased off other
WD/50	24.06.96	17.20	8	Main Camp	Fighting with Spotted hyaena
WD/86	24.06.96	17.30	8	Main Camp	Chased off two hyaena
WD/122	26.06.96	08.45	7	Dom (Loop Road)	Resting and playing on side of road
WD/131	28.06.96	21.30	2	Main Camp	
WD/51	02.07.96	03.30	4	Kanondo Camp	On impala kill
WD/64	02.07.96	08.10	3	Sedina	Came to drink briefly
WD/52	07.07.96	07.00	2	Dopi	
WD/54	08.07.96	17.45	2	Main Camp	Walking near Main Camp
WD/53	11.07.96	08.00	1	Guvalala	Walking
WD/60	12.07.96	08.25	4	White Hills	Active walking on road

Table 31 contd..

Reference Record	Date	Time	No. of packs	Locality (area)	Observations
WD/97	12.07.96	08.26	3	Sinamatella	Walking on Hwange Road
WD/65	15.07.96	17.15	1	Main entrance	"Vividly alive"
WD/66	15.07.96	17.35	1	Dom Pan	
WD/67	21.07.96	07.30	5	Makwa	Probably hunting - running
WD/68	22.07.96	17-18.30	2	Guvulala	On Main Road
WD/55	23.07.96	08.00	8	Main Camp (Loop Rd)	Hunting warthogs on open grassland
WD/56	23.07.96	08.10	8	Main Camp (Loop Rd)	Hunting warthogs
WD/69	23.07.96	18.00	12	Makwa	At Makwa turnoff heading towards tarred road, then again at 18.05 at Main Camp Filling Station
WD/70	23.07.96	17.50	12	Main Camp	Running towards Main Road
WD/71	25.07.96	08.30	6	Makwa	One had radio collar and one had a broken leg
WD/57	02.08.96	07.00	1	Boss Long One	Marking territory in low Mopani scrub
WD/58	03.08.96	07.15	4	Dopi	Hunting
WD/59	04.08.96	18.15	3	Dom	
WD/72	08.08.96	07.20	2	Dopi Pan	On road
WD/73	08.08.96	08.10	7	Dom/Dopi	One licking wounds
WD/74	08.08.96	10.45	1	Shumba/Main Camp	Lying under tree
WD/75	10.08.96	07.30	4	Boss Long One Pan	Seen by a leopard's kill, also leopard, 6 hyaena & 8 vultures
WD/76	12.08.96	18.00	4	Balla Balla	Running on road
WD/93	12.08.96	07.45	7	Main Camp/Dom	2 had blue collars - 1 dog had injured right front leg. 1 dog had missing lower right rear leg. (Both blue collars on)
WD/77	12.08.96	07.20	2	Dopi Pan	Lying calmly along side of road
WD/78	12.08.96	08.40	4	Ingwenya Pan	Hunting
WD/79	13.08.96	07.30	3	Main Camp	Walking along Main Road
WD/80	13.08.96	07.55	2	Platform 2	Just off road going through thick bush
WD/81	16.08.96	08.00	5	Main Camp	1 dog had a blue collar on. Running after group of zebras
WD/82	18.08.96	07.00	1	Main Camp	
WD/87	20.08.96	06.45	8	Ngwenya	1 dog blue collar, also missing underpart right back leg. Other dog limping left foreleg
WD/88	22.08.96	05.35	1	Masuma Dam	Along roadside
WD/89	24.08.96	22.45	6	Inyantue	Two wore brown collars-chased hyaena
WD/108	24.08.96	22.45	6	Inyantue	Wild dogs followed by hyaena. Wild dogs turned & bit 2 hyaenas. 2 dogs wore collars
WD/91	27.08.96	10.45	3	Main Camp	Lying in open clearing
WD/98	27.08.96	19.05	2	Masuma Dam	Arrived from west, drank quickly, returned to west. 1 light coloured
WD/99	28.08.96	00.04	8	Masuma Dam	4 adults came to dam, looked around, walked to tree line joined by 4 pups, drank, walked off
WD/109	29.08.96	07.00	4	Kapula Pump	Crossing from east to west
WD/107	29.08.96	17.50	1	Masuma/Mandavu Dams	
WD/90	18.09.96	10.00	4	Kennedy I	1 dog limping back leg. Waiting while hyaena ate buffalo carcass in the water
WD/92	23.09.96	06.30	3	Makalolo	In grass
WD/94	27.09.96	05.00	1	Samavundhla	In open grass

Table 31 contd...

Reference Record	Date	Time	No. of packs	Locality (area)	Observations
WD/132	27.09.96	23.20	4	Ngweshla	Approached from north, drank, went south. 1 had left back leg off at 1st joint yet friskily running about with other dogs.
WD/95	28.09.96	00.30	7	Makona Pan	Tried to attack 1 sable bull with 2 cows/failed. Bull chased them over Pan
WD/96	28.09.96	01.05	8	Deto Cesspools	Dogs had remains of an unidentified kill. Other 4 dogs killed a guinea fowl
WD/105	10.10.96	07.00	7	Balla Balla	Resting
WD/104	11.10.96	18.00	2	Caterpillar	Walking in long grass
WD/103	12.10.96	06.30	8	Dom	Crossing road/on hunt
WD/106	19.10.96	06.30	9	Balla Balla	Walking
WD/102	19.10.96	06.45	9	Nyamandhlovu	Trotting along road/must have eaten/blood on their necks
WD/101	06.11.96	05.45	2	?	?
WD/113	10.11.96	05.45	9	Dom Pan	Chased warthog/gave up
WD/100	10.11.96	06.15	6	Main Camp gate	Running excitedly to east
WD/110	29.11.96	16.15	2	Kennedy II	Running
WD/111	29.11.96	16.45	2	Kennedy I	Eating on a bone
WD/112	03.12.96	15.00	9	Dom	
WD/115	20.12.96	09.15	3	Guvalala	Resting beside road, 2 had collars, 1 without
WD/114	20.12.96	17.25	3	White Hills	Along road
WD/116	24.12.96	06.15	3	Makwa/Main Camp	Lying beside road/ 1 had a collar
WD/133	25.12.96	17.05	8	Dom Pan	Crossed road/headed east
WD/134	26.12.96	05.30	7	Dopi	Along roadside
WD/135	26.12.96	18.22	8	Dom/Dopi	Walking on road to Dom
WD/136	27.12.96	07.25	8	Balla Balla	Chased impala - unsuccessful. Rested on tarmac
WD/137	27.12.96	07.30	8	Dom Loop	Stomachs very full/bloodstained from kill, moved slowly
WD/138	27.12.96	18.15	3	Boss Long One	Some distance from the road - hunting
WD/139	29.12.96	06.15	8	Nyamandhlovu	Hunting

Inyantue area where the Sinamatella team have recorded four animals. Two of the dogs in the pack of 6 seen at Inyantue area wore brown collars.

While Bob Robbins and Kim McCreery did not mention a pack of 10 wild dogs in the Sinamatella area there is one record of 10 wild dogs on the Lukozi River loop road on 21st April 1996 (Ref: WD/35). See Table 31.

A full and detailed list of all the wild dog sightings recorded as a result of the "Carnivore Survey" forms during the year are given in Table 31.

Food

Wilson (1975) recorded a pack of 15 wild dogs killing and eating five newly born wildbeest calves at Ngamo over a period of 1½ hours. In addition, there are also records of the following prey being killed by wild dogs: 7 kudu; 2 duiker and 7 impala. (Wilson (1975).

Davies (1993) says that twice as many impala (54%) are killed by wild dogs in the Hwange National Park when compared with kudu. She also indicates that while more impala are

Table 32 - Observations of Wild dog hunting prey or at a kill

Reference Record	Date	Time	No. of packs	Locality (area)	Observations
WD/19	13.01.96	08.40	7	Dopi	Just eaten - covered in blood. Regurgitating for pups
WD/20	22.01.96	18.15	6	Balla Balla	Hunting
WD/121	24.01.96	06.15	6	Main Camp gate	
WD/23	26.01.96	07.45	3	Samavundhla	Hunting - kudu in pan
WD/25	13.02.96	18.10	3	Ngweshla	Watching impala herd
WD/7	21.02.96	06.30	6	Loop Rd/Main Camp	On impala kill
WD/8	21.02.96	06.50	8	Puff Adder	On impala kill
WD/26	21.02.96	08.00	6	Puff Adder	Hunting impala & killed
WD/124	25.02.96	16.30	6	Main Camp gate	Hunting impala & killed
WD/11	25.02.96	17.50	6	Main Camp gate	Hunting impala & killed
WD/27	05.03.96	07.55	2	Caterpillar	Hunting??
WD/28	05.03	07.55	2	Caterpillar	Hunting??
WD/117	16.03.96	06.18	7	Balla Ball	Hunted - on kudu kill
WD/12	22.03.96	17.15	2	Balla Balla	Hunting??
WD/33	16.04.96	17.10	2	Bumboosi Spring	Chasing impala - failed
WD/49	13.06.96	16.30	6	Main Airport Road	At their morning kill
WD/85	21.06.96	18.00	3	Masuma Dam	3 hunting impala
WD/51	02.07.96	03.30	4	Kanondo Camp	At an impala female kill
WD/55	23.07.96	08.00	8	Main Camp (Loop Rd)	Hunting warthog
WD/56	23.07.96	08.10	8	Main Camp (Loop Rd)	Hunting warthog
WD/75	10.08.96	07.30	4	Boss Long One	Seen at a leopards kill, also present the leopard, 6 hyaena, 8 vultures
WD/93	12.08.96	07.45	7	Main Camp/Dom	Obviously a carcass near. Blood on all dogs
WD/90	18.09.96	10.00	4	Kennedy I Pan	At carcass of buffalo waiting while hyaena ate carcass in water
WD/95	27.09.96	00.30	7	Makona Pan	Tried to attack 1 sable bull & 2 cows - failed. Bull chased them away
WD/96	28.09.96	01.05	8	Dete Cesspools	4 were eating on unidentified kill - other 4 killed & ate guinea-fowl
WD/113	10.11.96	05.45	9	Dom Pan	Chased warthog - gave up
WD/136	27.12.96	07.25	8	Balla Balla Pan	Chased impala - gave up

killed by wild dogs than kudu when one takes into account biomass rather than numbers of animals, the kudu is considered to represent a greater proportion of the wild dogs diet. Kudu constitutes one and a half times the biomass of impala.

During the present survey it was found that impala were reported to be the main prey of wild dogs, (See Table 32) and this confirms observations by Davies (1993). Of the 26 records of wild dogs hunting or having actually killed any animals, 11 were of impala, 2 were of kudu, 2 records of hunting warthogs, 1 of a guinea-fowl being eaten and even a record of 7 dogs trying their luck with a sable.

In addition to the data presented in Table 32 the pack of 7 wild dogs in the Main Camp area were actually observed killing a steenbok late afternoon in December 1996 and the following morning they were seen killing a baby impala and about half-an-hour later a

duiker.

It is of interest to note that in the last three records only parts of the lower jaw of the small antelopes remained on the ground and if these kills were not actually observed there would have been no record of the species mentioned being killed. It is, therefore, very probable that many more baby antelope of the larger species and mini-antelope such as duiker and steenbok are killed than the few records show.

It is, however, interesting to note that Wilson (1975) mentioned several other species which were killed and eaten by wild dogs. The details cited by Wilson (1975) were from records in the files of the Department of National Parks & Wildlife Management. Details are as follows:

Kudu 28; impala 18; eland 13; tsessebe 4; duiker 2; steenbok 2; reedbuck 3; giraffe (sub adults) 2; waterbuck 1; buffalo 1 and sable 3.

In the Kafue National Park (Zambia) Mitchell et. al. (1965) mentions duiker and reedbuck as the main prey of wild dogs but they also mention kudu 4; impala 2; eland 1; duiker 25; reedbuck 24; waterbuck 2; sable 4; bushbuck 6; lechwe 1; oribi 2; puku 2; wildebeest 4; porcupine 1; lion 2 and hartebeest 15.

The predator-prey relationship of wild dogs is determined not only by the behaviour of the wild dogs but indeed by the behaviour of the prey being hunted. There appears to be a very stereotyped way in which wild dogs hunt and kill their prey. Over a period of several years, especially during the present one years study in the Hwange National Park, I have observed a few successful hunts by packs of wild dogs.

For most of the year wild dogs cover considerable distances each day and they rarely stay for long or for more than a day or two in one area. They usually hunt in packs and seldom alone. The pack varies in size from time to time as already mentioned above under Habits.

In the Hwange National Park wild dogs are strictly hunters of the very early morning and again in the late afternoon for an hour or so until the sun set. During the hours of daylight they spend all their time sleeping and even on very hot days they would all bunch up together in a large pile or very close to each other.

A short time before it starts getting dark, and perhaps usually about an hour before sunset, one of the dogs would get up and after yawning and stretching would walk about, even start playing and nuzzle and greet other sleeping dogs. This activity by one of the dogs would stimulate the others to move and before long the whole pack would be playing and chasing or biting each other. Within a very short time of only about 5 minutes the whole pack would start moving, very often running slowly one behind the other or even spread out over quite a large area. One dog would always lead the others and then there were the second and third dogs following behind while in the rear, some of the dogs just played or chased each other from time to time.

As the dogs progressed they would start a slow trot and with ears directed sideways or even forwards, they would move at a steady pace looking around all the time. In areas where the grass was high some of the dogs would rear up on their hind legs, occasionally to look around. As they trotted along they appeared to take no notice of the wind direction, nor did they show any signs of sniffing the air to detect if any prey was about. They definitely appeared to be watching all the time and sight was the most important aspect of behaviour while hunting.

Sooner or later the leading dog would spot some prey ahead or to the side of it. The

behaviour of the dogs then changed dramatically and with their ears pointed forward and heads held high the wild dogs trotted slowly towards their prey. Occasionally they would stop to look around and when they were about 200-500 metres from the quarry their trotting slowed down and it was also then that they often changed position. The wild dogs would then often walk in a line one behind the other and now the head was held low in line with the body and even the ears were bent backwards as if to try and hide themselves.

On two occasions the prey, in both instances impala, would stand and watch the dogs, then quite suddenly they realised what was about to happen and they would flee as fast as possible. This fleeing obviously also stimulated the dogs to move and the chase was on.

Sometimes it was the dogs running at the prey that made them move or as explained above, the prey would run first with the dogs following. From time to time different dogs would each chase after an animal and then change from one animal to another. More usually the leading dog would go straight after the animal first spotted and would stay with that prey species and not deviate from it. As soon as the leading dog sprinted after its quarry the other dogs would follow and the chase could then last for several kilometres.

Kruuk & Turner (1967) timed sprinting dogs after prey and they felt the dogs could attain a speed of between 60-65 km per hour and that this could last over very long distances. It was not often that the leading dog was overtaken by the dogs that were following behind but obviously if he tired another dog would take over the chase and the remaining dogs would follow behind.

It appeared as if the first and second dogs in the line would do most of the hunting and killing but if the prey animal such as an impala or duiker swerved to one side or zigzagged ahead of the approaching dogs it was then that the dogs following behind would come into action and grab the victim. Kruuk & Turner (1967) have suggested that it may well be this "short cutting" or zigzagging of the prey that has produced the peculiar 'rank-order' in which the dogs hunt.

Of the few records we have of dogs hunting in the Hwange National Park, the prey is usually grabbed by the soft parts of the flank or belly which then causes it to fall and it is then that the dogs immediately bite into the preys belly tearing out their intestines. Even before the balance of the pack arrives, the leading dogs have consumed large quantities of meat which is gulped down in large chunks. None of the dogs would go without food for those that arrived late at a carcass would also be able to obtain some meat by "begging" from other members of the pack and regurgitated meat would be obtained in this way.

One of the main reasons for this rapid gulping down of large chunks of meat would be to prevent Spotted hyaena, which often appeared very quickly on the scene, from stealing their quarry from them. Wild dogs are also well known to feed lame or injured animals by regurgitating meat for them and in this way no dog in a pack would go hungry.

If a small animal such as a steenbok or duiker was killed and was obviously not sufficient for the pack the dogs would continue hunting until something else was found and killed or they would stop hunting if it got too dark and the sun had already set. In the case of early morning hunting they would stop as soon as it became too hot and the sun already high in the sky.

In the Kruger National Park in South Africa, where there are vast numbers of impala, that species formed 87% of the diet of 2,745 wild dog kills (Pienaar 1969) while in the Serengeti area of East Africa, the Thompson's gazelle is represented by 75% of wild dogs

kills between July and December while when the wildebeest were dropping calves the wild dogs concentrated on that species (Estes & Goddard 1967; Schaller 1972).

There is no doubt that kudu, impala and duiker form the bulk of the diet of wild dogs in the Hwange National Park.

Breeding

Wilson (1975) recorded a pack of seven adults and five very small young at Shapi in May 1970 while on 27th May 1970 eleven adults and five pups were seen at Manzimbomvu Pan. Other records cited by Wilson (1975) include pups in June 1971, April 1971 and July 1968. Wilson concludes that during the period 1968-71 young were born during the period April to July.

In a report submitted to me by the Sinamatella Wild dog Research Team (Bob Robbins & Kim McCreery) they say, and I quote them in full:

"Packs usually den around June in abandoned antbear holes or kopjes and have multiple dens during one season. Typically only the alpha female breeds but occasionally there may be two breeding females. Three bitches have been observed in one pack in Hwange but denning was unsuccessful. Pack members provide care for the pups including babysitting and regurgitating meat. Pups are weaned at about 10 weeks.

"It is not until pups are around three weeks old that they appear above ground. The average litter size at this time is 7 with a range of 4-9. The sex ratio is about 50/50. Not all packs denned each year, which contributed to fewer litters. In 1995, only one out of four packs denned. In 1996 three packs denned but two lost their litters.

"Large packs are no longer being reported by scouts and tourists within Hwange" unquote.

Gregory Rasmussen as the other wild dog team operating in the Main Camp area submitted a report on the breeding of wild dogs in Hwange and I quote from his report, as follows:

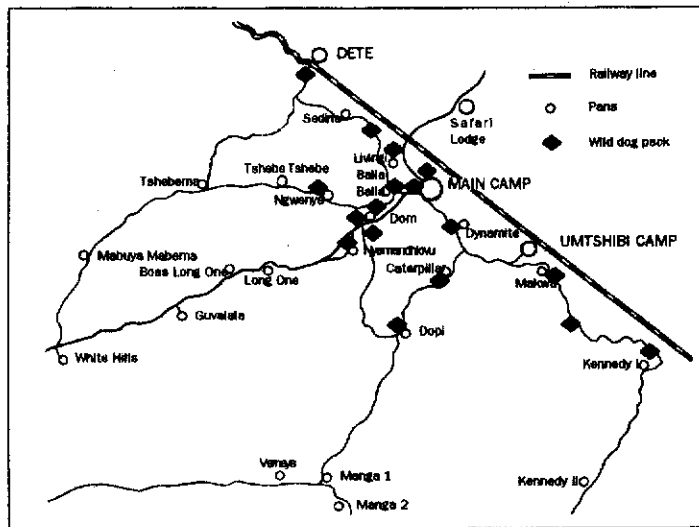
"The breeding patterns of the dogs has varied over the past few years and there have been times of plenty with one particular pack producing 17 puppies in one litter (a Zimbabwean record for one bitch) and a further 14 puppies in 1996. Other packs, especially those only recently formed failed to produce pups in their first year together but hopes are high for the future." unquote.

During the present survey (1996) it was unfortunate that I did not obtain any accurate data on the breeding of wild dogs in the Hwange National Park and none of the records recorded on the "Carnivore Survey forms" produced any good data either. Therefore, the only data on breeding available for 1996 was submitted by the two wild dog research teams. As can be seen above there is considerable differences in the data from the two separate reports. It is, therefore, obvious that additional research is urgently required.

Home range

The home range of the wild dog is very large and varies from about 750 km² in southern Africa up to 1,500 km² in east Africa. Davies (1993) has indicated that in the Hwange National Park wild dogs have average home range areas of 414 km² ranging from as little as 103 to 776 km². Davies (1993) goes on to say that these are similar to wild dog home range areas found in the Kruger National Park in South Africa but significantly smaller than those found in the Serengeti in east Africa.

The only data I was able to obtain on the home range of wild dogs was for the pack of seven (ranged from 6-10) that were found in the Main Camp/ Dopi/ Dom/ Makwa area for most of 1996. (See Map 24). One of the dogs in the pack was found to have a black collar on it and was, therefore, easily identifiable.



Map 24 - Localities where resident pack of wild dogs were seen during 1996. The size of this pack varied from 6 to 10 animals

Status

In a report submitted to me by Rasmussen for inclusion in this report he indicated the following "from the projects work it has been possible to estimate that there are only approximately 150 Painted dogs remaining in Hwange National Park." Rasmussen (pers. comm.).

On the other hand, Robbins & McCreery (pers. comm.) in their report for the Robins/Sinamatella area of the Hwange National Park felt that in their area of research there were five packs of wild dogs totalling 24 adults and 6 pups. They felt there could be about 6-8 wild dogs unaccounted for. They also mentioned a pack of three that occurred in the Boss Longone Pan area and another pack of four near Inyantue Dam. In all they mention a population of approximately 37-39 animals.

After a careful analysis of the data presented in Table 31 of this report I believe the following packs of wild dogs could possibly exist in the Park.

- 6-10 in the Dom/Dopi/Nyamandhlovu/Makwa area
- 8-10 in the Deteema/Lukozi River area
- 10-14 in the Main Camp/Forest Reserve area
- 4-6 in the Inyantue area
- 24 in the Sinamatella area (Robbins & McCreery)
- 3-5 in the Makalolo/Samavundhla area
- 2-6 in the Kennedy/Makwa/Ngweshla area

The above would suggest a population of between 57 and 75 wild dogs. However, because of the constant changing in the size of packs and the fact that their home range areas are so extremely large and variable it is impossible to give an accurate picture of the status of the wild dogs in the Hwange National Park at the present time.

I believe that after the one years survey of the Park I would doubt if there were even 80 different wild dogs at the present time.

In a very recent report (February 1997) submitted to the Department of National Parks & Wildlife Management by Rasmussen, he states the following and I quote him in full:

"Hwange Region

Using densities for HNP as an example, the mean pack size of 7.4, (Wilson 1975) compares favourably with the current figure of 7.0 computed for the same area in 1995. Childs (1985) estimated a mean of 7.6 dogs/pack in 1975. Also significant is the low density of dogs in Hwange National Park in comparison to other areas. This figure has now been consistently low for the last twenty years thus indicating the strong influence that habitat has in shaping Painted Hunting Dog densities. It also clearly indicates that HNP is currently at capacity ± 1.0 from the mean as determined by confidence limits.

Population estimate for Hwange National Park

Mean	Stdev	Std error	95% Upper	95% Lower	Mean Pack size
146.6	2.5	.55	169.4	123.8	7.0

Unquote.

I, however, believe that the mean pack size given by Wilson (1975) and even Childs (1985) now no longer applies. More than 10 years have passed since Childs (1985) data was published and over 25 years since Wilsons (1975) data. I have shown that the mean pack size recorded during the 1996 survey for over 100 observations is 5.2 wild dogs while Robbins & McCreery working in the Sinamatella area give a mean pack size of only 4.3 animals.

I am also of the opinion that it is not habitat that is shaping the numbers and distribution of wild dogs in the Hwange National Park but the presence of large numbers of lions and hyaena. Neither of these two species occurred in such very large numbers 25 years ago.

Once again, I would like to point out that the relationship of the large carnivores to each other is very sadly lacking.

A very detailed survey and research programme is now essential and until such times that this is undertaken most of what has been said is mere guess work. On the other hand it is important to note that the wild dog project in the Hwange National Park commenced in March 1982 (Masulani 1996), and now some 14 years later we still have almost no published data on the distribution and status of the wild dogs of the Hwange National Park.

Genus *Otocyon* (Muller 1836)

Bat-eared fox

Otocyon megalotis (Desmarest 1822)

Otocyon megalotis megalotis (Desmarest 1822)

Colloquial name

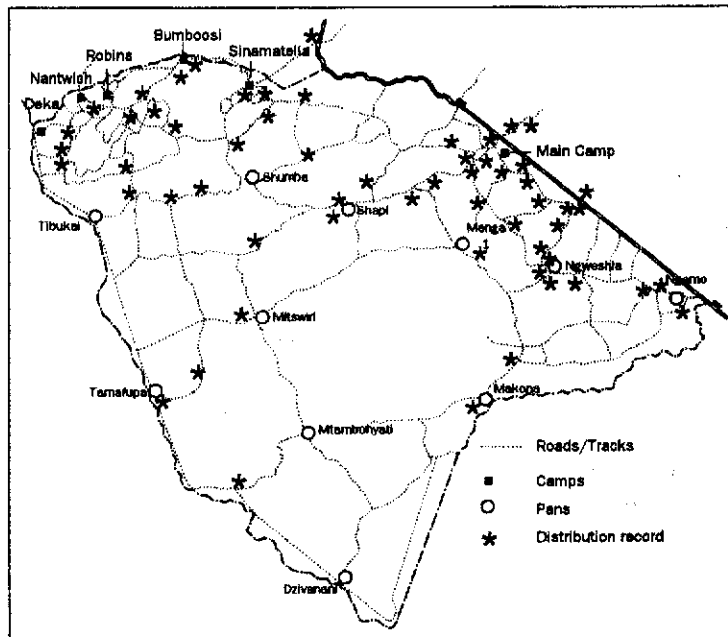
The colloquial name is indeed most appropriate. The Bat-eared fox does have very large ears so is similar to the Egyptian siit-faced bat, *Nycteris thebaica*. (Skinner & Smithers 1990).

Taxonomic notes

Desmarest first described the Bat-eared fox from a specimen from the "Cape of Good Hope" in 1822. It was first called *Canis megalotis* no doubt as a result of the close resemblance to the jackals. However, as a result of the huge ears of the species and the fact that the dental formula is different the species was placed in a genus of its own.

Distribution

Wilson (1975) mentioned that during the 1969/71 survey the Bat-eared fox had a very wide distribution in the Park and that they were particularly common around Deteema dam, Shumba and Nyamandhlovu Pan.



Map 25 - Distribution of Bat-eared fox as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms and night observations.

During the present survey it was confirmed that the Bat-eared fox still had a very wide distribution in the Hwange National Park and they were recorded in a wide range of habitats and in most areas of the Park. Map 25 gives details of 53 groups of Bat-eared foxes recorded during the present survey.

Habitats

During the 1969/71 survey Bat-eared foxes were recorded on basalt soils where an association of Mopane-Combretum occurred and also in the ecotones of Acacia/Combretum. They were also common on the basalt areas south of Sinamatella below the camp hill and common on the short grass areas on Kalahari sand around Shumba (Wilson 1975).

Estes (1991) mentions open grassland, light Acacia woodland and overgrazed rangeland as the preferred habitat of Bat-eared foxes. Estes goes on to say that the species also preferred bare ground like that occurring on volcanic-ash and calcareous soils with an underlying hardpan and sandy soils.

Skinner & Smithers (1990) mention that in southern Africa the species is associated with open country and preferred areas of short grass or grassland with a lot of bare ground.

During the present survey I was fortunate to have seen Bat-eared foxes in a wide variety

of habitats, as follows:

- * Open bare ground and well grazed grassland around Nyamandhlovu Pan.
- * Acacia woodland with short grass near Main Camp.
- * Tall *Baikiaea* woodland on Kalahari sand between Main Camp and Umtshibi Camp.
- * Open dry and bare ground with Mopane woodland near Sinamatella.
- * Very rocky and broken hilly country on the Kashawe Loop road near Sinamatella.
- * Calcrete soils and very short grass around Kennedy I, Makwa, Dom Pan, Balla Balla, Ngweshla and several other pan areas.
- * Short grassland with no bare ground on the Shumba plains.

Habits

Wilson (1975) mentions a group of 12 together at Nyamandhlovu and also nine together near Shumba Pan. He also mentions eight sightings of five together.

Skinner & Smithers (1990) indicate that different groups of Bat-eared foxes intermingled freely when feeding and that up to 15 individuals from four separate groups were found together in an area of less than 0.5km². However, while these temporary associations are not uncommon, the most common group size recorded in the Kalahari Gemsbok National Park was 2.72 animals (range 1-10) (Nel, Wills & Van Aarde 1984).

This was confirmed during the present survey in the Hwange National Park where the most frequently seen group was of two animals followed by groups of three. Table 33 gives the composition of 53 groups of Bat-eared foxes encountered during the present survey.

Table 33 - Number and size of Bat-eared fox groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	0	3	0	3	-	7	13
Two	1	0	0	3	-	14	18
Three	1	0	0	5	-	8	14
Four	0	0	0	1	-	2	3
Five	0	1	0	1	-	2	4
Six	0	0	0	0	-	0	0
Seven	0	0	0	0	-	1	1
Eight	0	0	0	0	-	0	0

The group of seven was seen near Dom Pan at 8.30 pm and on being disturbed they split into two separate groups of four and three and each group ran off in a different direction. The members of the two groups scattered and ran in all directions twisting and turning as they disappeared into the Acacia thickets near the Pan.

In the Hwange National Park during the present survey Bat-eared foxes were found to be almost entirely nocturnal. Of the 53 records of the species none of them were seen during

the hours of daylight and 45 of the 53 groups encountered were seen after 7.30 pm. However, several groups (or individuals) were seen just as the sun was setting or very early in the morning when it was still dark.

Wilson (1975) mentioned that during the 1969/71 survey some animals were already active by 6.00 pm and that even at that time some specimens already had full stomachs. It is of interest to note that Skinner & Smithers (1990) say that in most areas the activity of the Bat-eared fox shifts gradually from diurnal in winter to nocturnal in summer. This was definitely not the case during the present survey in the Hwange National Park where the species was almost entirely nocturnal throughout the year and the same habit applied during the 1969/71 survey (Wilson 1975).

During the heat of the day the species would lie up in shady areas such as clumps of small Acacia or other trees or they would seek shelter in disused antbear (*Orycteropus afer*) holes in the ground.

Food

In a sample of 10 stomachs of Bat-eared foxes from the Hwange National Park, Wilson (1975) recorded the following:

<i>Hodotermus mossambicus</i>	- 10 times
<i>Coleoptera (Scarabaeidae)</i>	- 3 times
<i>Coleoptera (Tenebrionidae)</i>	- 2 records
<i>Muridae (Leggata minutoides)</i>	- 2 records

In addition *Hodotermus mossambicus* constituted the entire contents of five stomachs examined. In Botswana 72 Bat-eared fox stomachs were examined and the following food items were recorded (Skinner & Smithers 1990).

Food item	Percentage occurrence
<i>Insecta</i>	88
<i>Scorpiones</i>	22
<i>Muridae</i>	17
<i>Reptilia</i>	14
Wild fruits	14
<i>Solifingae</i>	11
<i>Myriapoda</i>	7

There is no doubt that Bat-eared foxes rely a great deal on their ears and noses and perhaps only rarely use their eyesight to locate food (Smithers 1983). Harvester termites (*Hodotermus mossambicus*) is one of their most important food items and Bat-eared foxes have been seen with their heads close to the ground actually licking up these insects.

On one occasion I watched a Bat-eared fox leaping about in the short grass capturing insects such as grasshoppers and even trying to capture rodents and lizards. The ears of the Bat-eared fox are so well developed and its sense of hearing so acute that it can actually detect the presence of insects below ground or amongst leaf and grass litter.

Breeding

Wilson (1975) mentions a pregnant female Bat-eared fox collected at Shakwanki on 26th September 1969 which had three foetuses in its oviducts. Each foetus had a crown-rump length of 55 mm. Two of the foetuses were males and the third a female. Wilson also recorded very small young during October and November in the Hwange National Park and on both occasions there were three young with each female.

During the present survey I recorded a pair of Bat-eared foxes with three babies on 8th January 1996. The group were seen on the main road between Main Camp and the Umtshibi turn-off at 9.30 pm where they were playing on the road at the time. I estimated the babies to be between 1 month and 6 weeks old. This was the only record of baby Bat-eared foxes during the 1996 survey.

Status

The Bat-eared fox is certainly not uncommon in the Hwange National Park. There is a good population in the Balla Balla, Dom, Nyamandhlovu Pans area and they are very often seen with a spotlight at night.

While it would be impossible to give any meaningful estimate of the total population in the Park I would guess that there must be several thousand scattered throughout the area.

Genus *Canis* (Linnaeus 1758)

Side-striped jackal

Canis adustus (Sundevall 1846)

Canis adustus adustus (Sundevall 1846)

Colloquial name

The name jackal is derived from the Persian, *Sagal*, which according to Skinner & Smithers (1990) was possibly applied to the golden jackal, *Canis aureus*. The name side-striped no doubt refers to the light coloured longitudinal bands on the flanks and sides of the animal.

Taxonomic notes

Seven sub-species have been listed from Africa of which only one, *Canis adustus adustus* (Sundevall 1846) is found in southern Africa and therefore the Hwange National Park. This sub-species was described from a specimen from "*Caffraria Interiore*". Roberts (1951) fixed the type locally as the Magliesberg, west of Pretoria.

Distribution

Wilson (1975) when referring to the 1969/71 survey of the Hwange National Park stated that the distribution of the Side-striped jackal was confined to the northern and eastern sections of the Park. At that time (1969/71) the species was widely distributed north of 19°S and there was only one visual record of it south of that latitude.

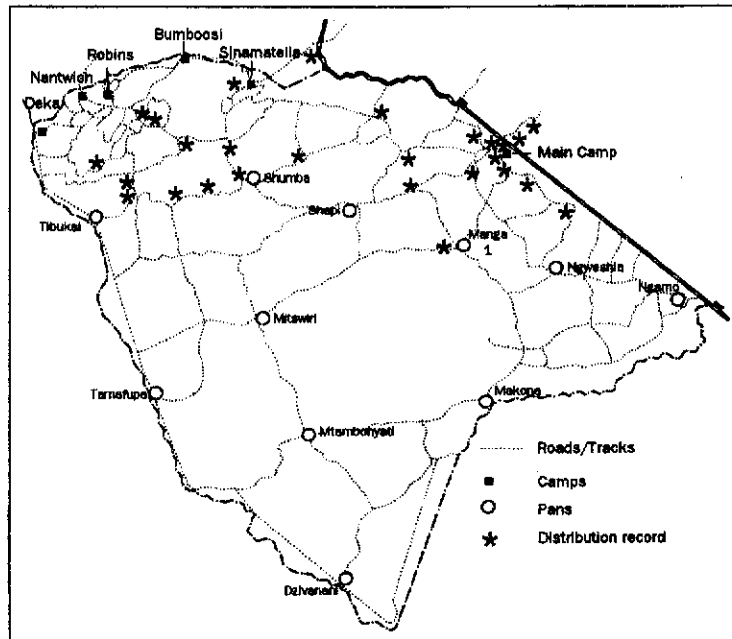
The same applies in Botswana where Smithers (1971) only recorded the Side-striped jackal in the northern part of the country, north of 19°S. The exact situation was found to apply during the 1996 survey where there are no visual records of the Side-striped jackal south of 19°S.

However, one evening at about 6.50 pm in February 1996 I saw a jackal a few kilometres south of Ngweshla Pan which I thought was a Side-striped jackal. This specimen had the distinct light coloured band on the flank and sides but there was no white tip to the tail. On other occasions I have seen Side-striped jackals with no white tipped tails so the visual record will remain one of uncertainty.

If the Side-striped jackal does occur south of 19°S in the Hwange National Park it is not

very common and there are no definite records of its occurrence in that region.

Map 26 shows the distribution of the Side-striped jackal in the Hwange National Park as determined from various survey techniques.



Map 26 - Distribution of Side-striped Jackal as determined from marked transects (road strip counts), Wildlife Society game count, carnivora survey forms, wildlife observation forms and night observations.

Habitat

The Side-striped jackal appears to be more common in areas where there is permanent water and especially in the Robins area and around Main Camp and Nyamandhlovu Pan.

Wilson (1975) mentioned that the Side-striped jackal was seen in fair numbers along the Lukozi River during the 1969/71 survey. However, during the present survey it was not seen at all along the Lukozi or even south of Sinamatella Camp or on the Kashawe Loop road. The species does, however, still occur in the Sinamatella areas as I personally saw one near Sinamatella Camp in April 1996.

There are numerous records of the Side-striped jackal in open dry Mopane woodland south of Robins Camp and also in the lush grasslands west of Shumba Pans. A pair with three babies was also seen on numerous occasions in Acacia woodland and thickets within half a kilometre of Main Camp. I believe the Side-striped jackal prefers a habitat which is more closed and with lots of cover as opposed to the more open grassland.

Habits

Of 61 visual records of the Side-striped jackal 38 were of single individuals, 10 of pairs together and four of three adults together. In addition, there were nine records of five together and in every instance it was the same adult pair with three babies which lived in some Acacia thickets at Main Camp. (See Table 34).

Wilson (1975) mentions that during the 1969/71 survey at no time were more than two Side-striped jackals ever seen together. On several occasions a single Side-striped jackal was seen near the Main Camp offices at night while the same animal was also seen

Table 34 - Number and size of Side-striped jackal groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	2	18	0	8	0	10	38
Two	2	1	0	2	0	5	10
Three	0	0	0	2	0	2	4
Four	0	0	0	0	0	0	0
Five	3	0	0	0	0	6	9
Six	0	0	0	0	0	0	0

wandering around the staff houses at night. On one occasion it was even seen very close to the restaurant at Main Camp and had become very tame and unafraid of people.

While the Side-striped jackal is usually regarded as a strictly nocturnal species the adult pair and their three babies were often seen on the road near Main Camp early in the morning and late in the afternoon. This group of five were unafraid of vehicles and when a vehicle approached they would slowly move off the road and stop only a few metres into the vegetation.

On one occasion I was following the "marked" known pack of 7 wild dogs as they trotted up the gravel road between Dynamite Pan and Main Camp. When I reached the place where the group of five Side-striped jackals lived I saw the jackals on the road just ahead of the dogs. As the wild dogs approached, the jackals made no effort to run away or even move off the road. One of the dogs stopped where the jackals were and approached one of the baby Side-striped jackals. Both species were unafraid of the other and after they sniffed at each other and literally touched noses, the dog ran off to follow the other dogs ahead of it.

This species has not been studied in any great detail and while we may know a great deal concerning the behaviour of the Black-backed jackal the habits and behaviour of the Side-striped jackal is unknown.

Food

The stomach contents of two specimens were examined by Wilson during the 1969/71 survey. One stomach contained an adult *Typhlops scheleglii mucroso*, some beetles and a large grasshopper. The second specimen contained some impala meat (from a bait animal) and two rodents, *Praomys natalensis* (Wilson 1975).

Out of a sample of 71 Side-striped jackal stomachs from Zimbabwe, Smithers & Wilson (1979) recorded the following food items:

Food item	No. of occurrences
Wild fruits	51
Mammalia	25

Insecta	16
Isoptera	2
Formicidae	2
Carrion	9
Aves	9
Reptilia	1
Grass	27

Wild fruits and the seeds of agricultural crops appeared to be the commonest item of food. Smithers & Wilson (1979) give the following details:

Food item	No. of occurrences
Wildfruits, etc. <i>Ficus</i> sp.	11
<i>Parinari curatellifolia</i>	7
Peanuts	7
Mealies	5
<i>Uapaca</i> sp.	3
Beans	2
Sunflower	2
<i>Grewia</i> sp	1
<i>Solanium</i> sp	1
<i>Uapaca kirkiana</i>	1
<i>Diospyros mespiliformis</i>	1

Mammals ranked next after wild fruits and occurred in 25 of the 71 stomachs examined. Some of the items included: Scrub hare, mole rat, Multimammate mouse, Angoni vlei rat and several other species of *Muridae*. Insects were also an important food item. It should be noted that all the specimens were collected in the Mashonaland area (Smithers & Wilson 1979).

Breeding

Apart from the adult pair of Side-striped jackals with their three young first seen on 18th February 1996 when the babies were about 1 month old there were no other records of breeding during the present survey. It is of interest to note that the same group were seen on many occasions over a period of 6 months and always within about 100 metres of where they were first seen in February 1996.

Status

The Side-striped jackal is not anywhere as common as the Black-backed jackal and from several survey techniques they were only seen on 61 occasions many of which were no doubt repeat sightings. However, the species is not uncommon and the population is not in any way endangered.

Black-backed jackal

Canis mesomelas (Schreber 1775)

Canis mesomelas mesomelas (Schreber 1775)

Colloquial name

The Black-backed jackal has a very distinct and beautiful broad dark saddle on the upper parts of its body and this very easily distinguishes it from the Side-striped jackal. In some

places the species is also referred to as the Silver-backed jackal.

Taxonomic notes

Meester et. al. (1986) relegated all Black-backed jackals from the southern African sub-region to *Canis mesomelas mesomelas*. However, for those interested in the taxonomy of the Black-backed jackal I would refer them to Smithers (1971) where a detailed discussion on the differences between *C.m. arenarum* (Thomas 1926) and the nominate form *C.m. mesomelas* is given.

Distribution

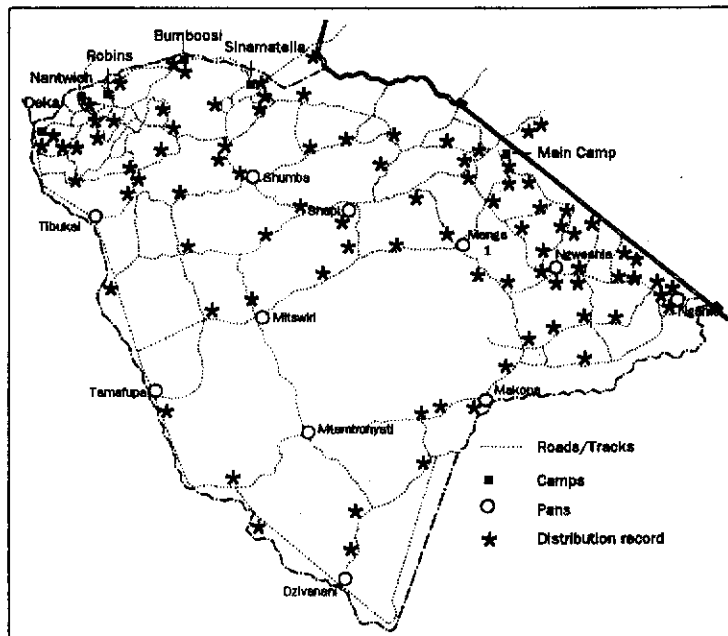
During the 1969/71 survey of the Hwange National Park the Black-backed jackal was not found to be common in the northern part of the Park around Robins and Shumba areas (Wilson 1975). At that time, now some 25 years ago, the species was much more common in the Ngamo/Makalolo area and on Kalahari sand.

Therefore, in 1969/71, it was felt that the Black-backed jackal was replaced by the Side-striped jackal in the northern areas of the Park although there was still considerable overlap of the two species (Wilson 1975).

During the present 1996 survey the distribution of the Black-backed jackal was found to be considerably different to what it was 25 years ago. This jackal is now very common in the Robins and Shumba areas and also many were seen around Sinamatella and other areas in the north. In addition, it is most common around Ngweshla, Ngamo and Makwa Pan and there are also records from Dzivanini.

The Black-backed jackal now has a very wide distribution in the Park and was recorded throughout and in all habitat types. Additional details are given under habitat below.

Map 27 gives the distribution of the Black-backed jackal as found during the 1996 survey.



Map 27 - Distribution of Black-backed jackal as determined from marked transects (road strip counts), Wildlife society game count, carnivora survey forms, wildlife observation forms and night observations.

Habitat

Wilson (1975) mentions that the Black-backed jackal preferred areas of Kalahari sand particularly if open country was close by. He goes on to say that this jackal is not common in Mopane woodland in the north of the Park or even in the Leasha/Dzivani area.

Smithers (1971) states that the species has a very clear habitat preference for open areas in Botswana. Skinner & Smithers (1990) say that the Black-backed jackal has a tendency to be associated with open terrain.

One important observation noted during the present 1996 survey is that the Black-backed jackal has now spread out considerably over the past 25 years and is now very common in areas where it was previously uncommon or very seldom seen. This is particularly apparent in the Robins/Sinamatella area where the Black-backed jackal is now often seen.

One of the possible reasons for this expansion of their range to the north of the Kalahari country is that the Mopane woodland around Robins and Sinamatella is much more open today than it was 25 years ago. The habitat has changed dramatically and in many places in the Robins/Sinamatella area one can now find a great deal of open Mopane woodland which previously was more closed and with better grass cover.

As the Black-backed jackal prefers a more open and dry habitat as mentioned above, the area around Robins and Sinamatella is now a more suitable habitat for the species than it was 25 years ago.

Habits

Black-backed jackals were very often seen about during the hours of daylight but as it became hotter during the day so they would retire to a shady tree where they would lie in the shade.

Single and occasionally two or three jackals together were often seen on the Kennedy vlei and on the open grasslands at Ngweshla. The most common grouping of the species was of single animals. During the 1996 survey there were 128 records of single animals, 58 visual records of two together and 12 records of three together. See Table 35 for full details

Table 35 - Number and size of Black-backed jackal groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	21	77	0	18	1	11	128
Two	25	16	0	10	0	7	58
Three	5	1	0	2	0	4	12
Four	4	2	0	1	0	1	8
Five	1	0	0	2	0	0	3
Six	0	0	0	0	0	1	1

of 210 groups encountered.

In some areas of its distribution in the Hwange National Park the Black-backed jackal is rarely seen during the hours of daylight and because of disturbance remained strictly nocturnal in habits. In other areas, such as at Ngweshla, it was very accustomed to vehicles and humans and made no effort to run away if a vehicle approached. Ngweshla would in fact be a very suitable area where the Black-backed jackal could be studied as those that occurred in the area were already habituated to humans.

Foods

Wilson (1975) recorded pieces of giraffe skin and flesh in a specimen collected at Ngamo and another animal had the remains of a springhare in its stomach. Flesh and skin of a *Lepus saxatilis* were found in the stomach of a Black-backed jackal collected at Makololo and some specimens have also been recorded feeding on beetles and harvester termites.

No new information on the feeding habits of the Black-backed jackal was obtained during the present survey other than the fact that they were often seen near lion carcasses waiting for the lions to retreat.

Breeding

On 14th January 1996 an adult pair of Black-backed jackals and three young were seen at Ngweshla Pan at 6.20 am. Two hours later a second pair with three babies were also seen at Ngweshla but about 2 km away. Therefore, at least two adult pairs each with three babies occurred on the Ngweshla Plain. Both groups of pups were of the same age and perhaps about 1 month old. The babies were obviously born in December 1995.

Both Smithers (1971) and Shortridge (1934) mention that babies are born towards the end of the year around November and December. Wilson (1975) mentioned two puppies (± 5 weeks old) with an adult at Dom Pan on 17th January 1968, again suggesting a December birth.

Status

The Black-backed jackal is very common in the Hwange National Park and they have been recorded from many areas. While it is not known with any degree of accuracy what the population is in the Park it is suggested that many thousands are present and it is now very common throughout the Park.

Family MUSTELIDAE

Otters, polecats, weasels and honeybadgers

The following species of this Family were recorded by Wilson (1975) and again during the present survey:

Genus	<i>Aonyx</i> (Lesson 1827)	
Species	<i>Aonyx capensis</i> (Schinz) 1821	Cape Clawless otter
Genus	<i>Mellivora</i> (Storr 1780)	
Species	<i>Mellivora capensis</i> (Schreber 1776)	Honeybadger; Ratel
Genus	<i>Poecilogale</i> (Thomas 1833)	
Species	<i>Poecilogale albinucha</i> (Gray 1864)	African weasel
Genus	<i>Ictonyx</i> (Kamp 1835)	
Species	<i>Ictonyx striatus</i> (Perry 1810)	Striped polecat

Family **VIVERRIDAE**

Mongoose, civets, genets

The following species of this Family were recorded by Wilson (1975), and again during the present survey.

Genus	<i>Civettictis</i> (Pocock 1915)	
Species	<i>Civettictis civetta</i> (Schreber 1776)	African civet
	This species was referred to by Wilson (1975) as <i>Viverra civetta</i> (Schreber 1776)	
Genus	<i>Genetta</i> (G. Cuvier 1816)	
Species	<i>Genetta genetta</i> (Linnaeus 1758)	Small-spotted genet
	<i>Genetta tigrina</i> (Schreber 1776)	Large-spotted genet
Genus	<i>Paracynictis</i> (Pocock 1916)	
Species	<i>Paracynictis selousi</i> (De Winton 1896)	Selous' mongoose
Genus	<i>Cynictis</i> (Ogilby 1833)	
Species	<i>Cynictis penicillata</i> (G. Cuvier 1829)	Yellow mongoose
Genus	<i>Herpestes</i> (Illiger 1811)	
Species	<i>Herpestes ichneumon</i> (Linnaeus 1758)	Large grey mongoose
Genus	<i>Galerella</i> (Gray 1865)	
Species	<i>Galerella sanguinea</i> (Ruppell 1836)	Slender mongoose
	This species was referred to by Wilson (1975) as <i>Herpestes sanguineus</i> (Ruppell 1836)	
Genus	<i>Ichneumia</i> (L. Geoffroy 1837)	
Species	<i>Ichneumia albicauda</i> (G. Cuvier 1829)	White-tailed mongoose
Genus	<i>Atilax</i> (F. Cuvier 1826)	
Species	<i>Atilax paludinosus</i> (G. Cuvier 1829)	Water mongoose
Genus	<i>Mungos</i> (E. Geoffrey and G. Cuvier 1795)	
Species	<i>Mungos mungo</i> (Gmelin) 1788)	Banded mongoose
Genus	<i>Helogole</i> (Gray 1862)	
Species	<i>Helogole parvula</i> (Sundevall 1846)	Dwarf mongoose

During the short period of the present one year survey it was not possible to concentrate on a detailed survey of the small carnivores of the Hwange National Park in addition to attempting to obtain an accurate picture of the distribution and status of the large and economically important antelopes, zebra, giraffe and elephant at the same time.

In order to obtain accurate data on the small carnivores of the Hwange National Park it is necessary, if not essential, to do a considerable amount of night work with a spotlight and from an open vehicle. However, while some night work was carried out during 1996 and a determined effort was made to obtain data on the small carnivores, there was not enough time to get as much data as we would have liked. Therefore, because of the limited amount of information on the small carnivores of the Park, I have changed the way in which the data is presented in this report.

For example, no distribution maps of sightings of the small carnivores have been included in this report but a detailed table giving date, time and locality of all visual records of all small carnivores has been included. (See Table 36 below).

As far as the locality data is concerned I have included in Table 36 the name of the nearest pan or other well known waterpoint or camp where the animal in question was seen. This

will at least give some indication where the species of small carnivore was seen.

The reader of this report is referred to Map 5 (page 26) of this report for location of the various pans etc. Additional data concerning the various small carnivores, as limited as it is, is given in the book on the Mammals of Wankie National Park, Rhodesia (Wilson 1975) which was the result of the 1969/71 survey.

As I have already mentioned on several occasions when discussing the large carnivores of the Hwange National Park, a much more detailed survey of the carnivores of the Park is long overdue.

Table 36 gives full details of all visual records of the carnivores sighted in the Hwange National Park during 1996.

Table 36 - Details of all visual records of Mustelidae and Viverridae during the 1996 survey of Hwange National Park.

Species	Locality (nearest pan)	Date	Time	Number together	Notes
MUSTELIDAE					
<i>Aonyx capensis</i> (Clawless otter)	Robins area	15.01.96	06.30	2	In Deka River
	Robins area	21.05.96	05.50	1	In small pool
	Deka Camp	19.07.96	05.50	2	Playing on sand bank
<i>Mellivora capensis</i> (Honeybadger)	Sinamatella Camp	Jan-May '96	late pm	1	Tame animal often seen at Camp
	Ngweshla	28.09.96	02.45	2	Wildlife Society count
	Umkhawazane	28.09.96	23.05	1	" " "
	Jozivanini	28.09.96	09.01	1	" " "
	Red Pan	28.09.96	00.25	1	" " "
	Dynamite	27.09.96	19.40	1	" " "
	The Hide	27.09.96	19.35	1	" " "
	Secheche	27.09.96	18.35	2	" " "
	Makololo 1	28.09.96	23.20	1	" " "
	Makololo 1	27.09.96	23.20	1	Carnivore survey
	Kennedy Vlei	27.09.96	19.35	1	" "
	Dynamite	27.09.96	19.40	1	" "
	Secheche	27.09.96	18.35	2	" "
	Red Pan/Ivory Lodge	27.09.96	00.25	1	" "
	Sinamatella	21.09.96	19.20	1	" "
	Robins Camp	12.04.96	11.97	1	Aerial survey
	Main Camp	18.09.96	08.15	1	" "
	Near Ngwenya	14.06.96	09.07	1	Road strip count
	Chingahobe Drive	17.08.96	12.23	1	" " "
	<i>Poecilogale albinucha</i> (Striped weasel)	Sedina Pan	16.03.96	08.15	1

Table 36 contd...

Species	Locality (nearest pan)	Date	Time	Number together	Notes
<i>Ictonyx striatus</i> (Striped polecat)	Farm 41 Kennedy	04.08.96	21.00	1	Wildlife form
	Farm 41 Kennedy	05.08.96	21.30	1	" "
	Bomani	28.08.96	01.10	1	Wildlife Society
<i>Civettictus civetta</i> (African civet)	Kennedy I	27.09.96	04.00	1	" "
	Kennedy I	28.09.96	02.30	1	" "
	Kennedy I	28.09.96	02.00	1	" "
	The Hide (Kennedy)	28.09.96	00.25	1	" "
	Red Pan	28.09.96	00.50	1	" "
	Red Pan	28.09.96	01.45	1	" "
	Red Pan	27.09.96	23.10	1	" "
	Inyantue	28.09.96	01.26	1	" "
	Masuma Dam	28.09.96	03.10	1	" "
	Kanondo Pan	06.08.96	22.00	1	Wildlife form
	Sinamatella gate	21.09.96	04.57	1	" "
	The Hide Kennedy	28.09.96	00.25	1	" "
<i>Genetta tigrina & G. genetta</i> (Small spotted and large spotted genet)	Sinamatella	21.08.96	18.57	1	Wildlife Form
	Sinamatella Camp	15.03.96	19.50	1	Night observation
	Kashawe loop	17.03.96	20.20	1	" "
	Sinamatella Hill	04.04.96	20.14	1	" "
	Lukozi River	18.04.96	20.30	1	" "
	Umtshibi Camp	12.02.96	19.50	1	" "
	Makwa Pan	19.02.96	18.30	1	" "
	Ngweshla Pan	20.03.96	21.20	1	" "
	Ngweshla Pan	26.03.96	20.45	1	" "
<i>Paraynictis selousi</i> (Selous mongoose)	Nyamandhlovu area	15.07.96	10.30?	1	Wildlife form
	Makwa Pan	18.01.96	19.20	1	Night observation
<i>Cynictus penicillata</i> (Yellow mongoose)	Tamasanka	31.07.96	13.05	1	Road strip count
	Danga Pan	19.03.96	10.15	1	Ref. Peter Ngwenya
	Secheche Pan	12.07.96	15.15	2	Touch the Wild Safari
<i>Herpestes ichneuman</i> (Large grey mongoose)	Tsamhole	27.09.96	22.30	1	Wildlife Society
<i>Galerella sanguinea</i> (Slender mongoose)	Makwa	27.01.94	07.45		Road strip count
	Kennedy	07.03.96	09.15	1	" " "
	Dopi	15.09.96	10.25	1	" " "
	Lukozi River	03.05.96	16.39	1	" " "
	Chingahobi Drive	19.04.96	16.15	1	" " "
	Tshompani	20.04.96	12.00	1	" " "

Table 36 contd...

Species	Locality (nearest pan)	Date	Time	Number together	Notes
	Dwarf Goose Pan	26.05.96	07.47	1	Road strip count
	Leasha Dam	30.07.96	15.00	1	" " "
	Tamboyentendhla Pan	01.08.96	15.06	1	" " "
	Deteema/Sibuya			1	" " "
	Samavundhla			1	" " "
	Kapani			1	" " "
	Little Toms	27.09.96	14.50	1	Wildlife Society
	Croc. Pools Hide	28.09.96	06.25	1	" "
	Shakwanki	27.09.96	15.20	1	" "
	Josayanini	27.09.96	15.47	1	" "
	Masuma Dam	27.09.96	18.09	1	" "
	Mtoa	27.09.96	16.59	1	" "
	Mtoa	28.09.96	08.12	1	" "
	Roan Pan	27.09.96	14.15	1	" "
	Croc. Pools Hide	27.09.96	13.56	1	" "
	Croc. Pools Hide	27.09.96	15.06	1	" "
	Croc. Pools Hide	27.09.96	16.30	1	" "
	Ngwenya Pan	05.06.96	14.00	1	Carnivore survey
<i>Ichneumia albicauda</i> (White tailed mongoose)	Umtshibi	27.09.96	03.35	1	Wildlife Society
	Ngweshla	27.09.96	22.20	1	" "
	Ngweshla	27.09.96	22.51	1	" "
	Ngweshla	28.09.96	03.05	1	" "
	Ngamo II	27.09.96	21.00	1	" "
	Mbiza	27.09.96	22.00	1	" "
	Manga II	28.09.96	05.36	1	" "
	Dynamite	28.09.96	02.33	1	" "
	Dynamite Pan	28.09.96	02.33	1	Carnivore survey
	Ngwenya	27.09.96	22.00	1	" "
	Sinamatella	09.05.96	20.45	1	" "
<i>Atalix paludinosus</i> (Water mongoose)	Deka River	25.04.96	18.15	1	Warden, Robins
	Shumba Pan	19.07.96	16.50	1	I. Carter
<i>Mungos mungo</i> (Banded mongoose)	Makwa	04.08.96	08.55	1	Road strip count
	Safari Lodge	27.09.96	15.39	17	Wildlife Society
	Red Pan	27.09.96	15.05	26	" "
	Umtshibi	27.09.96	12.12	3	" "
	Umtshibi	28.09.96	09.10	3	" "
	Ngweshla	06.03.96	09.00	7	Road strip count
	Caterpillar	15.09.96	09.27	8	" " "
	Umtshibi	28.09.96	12.00	9	Wildlife Society

Table 36 contd...

Species	Locality (nearest pan)	Date	Time	Number together	Notes
	Shumba/Dandari	18.9.96	11.20	10	Road strip count
	Tshakabika	27.09.96	12.50	10	Wildlife Society
	Dynamite	27.01.96	06.45	11	Road strip count
	Makwa	26.02.96	08.30	11	" " "
	Mandavu (North)	28.09.96	09.12	1	Wildlife Society
	Tshakabika	27.09.96	12.49	1	" "
	Deteema	28.09.96	06.45	25	" "
	Shapi/Tendele	15.7.96	11.15	13	Road strip count
	Ngweshla	27.07.96	17.15	14	" " "
	Samavundhla	19.8.96	12.30	14	" " "
	Dopi	18.04.96	08.30	15	" " "
	Tamafupa/Jolleys	15.8.96	10.15	17	" " "
	Livingi	27.09.96	16.02	12	Wildlife Society
	Makwa	27.09.96	17.50	17	" "
	Manzichisa	27.09.96	13.30	13	" "
	Kennedy I	27.09.96	18.20	21-30	" "
	Deteema	21.08.96	08.35	21-30	Wildlife form
<i>Helogole parvula</i> (Dwarf mongoose)	Lukozi River Drive	17.04.96	08.30	1	Road strip count
	Lukozi River Drive	19.04.96	10.30	1	" " "
	Lukozi River Drive	19.04.96	09.14	1	" " "
	Chingahobe Loop	25.05.96	17.22	1	" " "
	Chingahobe Loop	17.08.96	09.17	1	" " "
	Tamafupa/Mitwiri	01.08.96	15.03	1	" " "
	Mandavu (North)	27.09.96	16.15	1	Wildlife Society
	Ngweshla	15.03.96	04.12	1	Wildlife form
	Kashawe Loop	13.04.96	07.25	2	Road strip count
	Deteema	27.09.96	17.19	2	Wildlife Society
	Mandavu (North)	27.09.96	16.22	3	" "
	Kennedy vlei	27.01.96	08.15	4	" " "
	Kashawe Loop	13.06.96	15.40	4	" " "
	Lukozi River Drive	12.08.96	08.59	4	" " "
	Samavundhla	15.3.96	09.50	4	" " "
	Shumba/Dandari	17.6.96	11.10	4	" " "
	Tshabema	28.09.96	10.02	4	Wildlife Society
	Masuma/Shumba	20.05.96	08.20	6	Road strip count
	Deteema/Sibuya	14.7.96	16.20	6	Road strip count
	Masuma Dam	20.05.96	08.06	10	" " "
	Balla Balla Pan	10.01.96	08.20	13	Wildlife form
	Deteema	21.08.96	09.35	4	Wildlife slips

Order **PROBOSCIDEA**

Family **ELEPHANTIDAE**

Elephant

Genus **LOXODONTA** (Anonymous 1827)

African elephant

Loxodonta africana (Blumenbach 1797)

Loxodonta africana africana (Blumenbach 1797)

Colloquial name

The name is derived from the Greek for elephant, *elephas*, in Latin *elephantus*. The name "*pachyderms*" is often applied to elephants and refers to their thick skin (Skinner & Smithers 1990).

Taxonomic notes

The only sub-species recognised from southern Africa is *Loxodonta africana africana* (Blumenbach 1797) while the forest elephant *L.a. cyclotis* (Matschie 1900) occurs in the rainforest areas of west and central Africa.

Distribution

The elephant is the most common and widespread mammal species in the Hwange National Park and there are visual records from almost every part of the Park. These visual records were obtained from "road strip counts" and from aerial surveys by fixed wing aircraft and helicopter and various other survey methods. (See Map 28).

Map 28 includes visual records from all months of the year but has not taken into account the wet and dry season distribution which obviously would be very different depending on the availability of surface water in the Park.

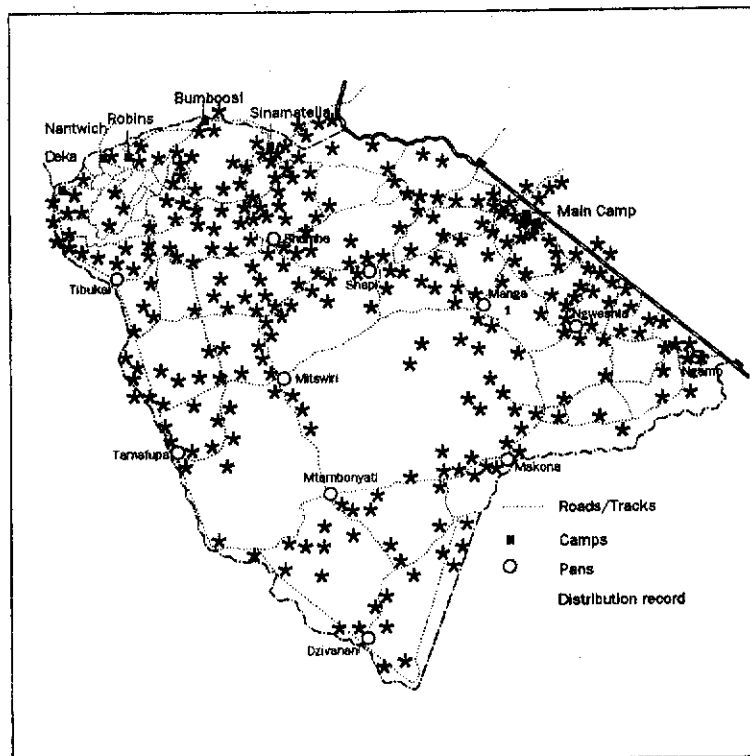
Habitat

Elephant in the Hwange National Park have been recorded in every possible habitat type. These include habitats throughout the Kalahari sand country, in the rocky and broken country south of Sinamatella and east of Shumba, in riverine vegetation, Mopane woodland and especially around the pans and other waterpoints throughout the Park.

Habits

Wilson (1975) stated that sightings of 380 herds of elephants over a period of two years in the Hwange National Park indicated that the average herd size appeared to be 13 animals with the most common size being from 9-17 elephants.

It can be seen from Table 37 that 1 167 single elephants were seen, 381 groups of two, 194 groups of three, 168 groups of four and 114 groups of five together. In nearly every case these small groups were all bull herds.



Map 28 - Distribution of elephant in the Hwange National Park as determined by road strip counts, aerial surveys by helicopter and fixed wing aircraft and Wildlife Society annual game count.

In comparison to what was found by Wilson (1975) the present 1996 survey revealed the presence of a large number of large herds of elephants. For example, 138 herds of elephants in the size range of 21-30 elephants were seen and herds of from 31-40 were encountered on 38 occasions. On twelve occasions herds of over 50 elephants were seen and 5 herds of over 100 animals.

Table 37 gives a detailed picture of all herds of elephants seen during the year. This data was obtained from aerial surveys (fixed wing and helicopter) from the Wildlife Society annual game count at waterholes and from "road strip counts".

The distribution of the elephant in the Hwange National Park, which is the largest protected area in Zimbabwe, is very clearly linked to the availability of water. When the area was first proclaimed a Game Reserve in 1928 it was generally uninhabited and there was very little permanent water during the dry season. Consequently the elephant densities were very low at that time. (Davison 1967). In fact it was estimated that in 1930 there were most probably not more than about 2 000 elephants in the Park which at that time did not have more than 15 perennial waterpoints. (Cumming 1981).

Davison (1967) stated that in those early days of the Park, the elephants moved out of the Park during the dry season in order to find water and it was into the unprotected areas that they moved where they were consequently hunted.

As a result of the hunting of elephant outside the Park it was decided to develop the waterpoints in the Hwange National Park and also to deepen many of the Pans to improve their capacity. At the same time, many more boreholes were drilled and some dam building took place. (Davison 1967). Full details of when the boreholes were drilled is given in Table 6 of this report. The first borehole was drilled at Ngweshla in 1935 and the programme of borehole drilling continued until 1973. However, some boreholes were drilled after 1973.

Table 37 - Number and size of Elephant (cows/bulls/mixed) herds as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	186	629	28	-	324	-	1167
Two	72	183	11	-	115	-	381
Three	44	90	5	-	55	-	194
Four	45	68	3	-	52	-	168
Five	16	51	1	-	46	-	114
Six	15	28	3	-	39	-	85
Seven	9	31	0	-	22	-	62
Eight	9	32	1	-	22	-	64
Nine	6	34	4	-	16	-	60
Ten	5	26	4	-	26	-	61
Eleven	10	26	0	-	15	-	51
Twelve	5	32	0	-	21	-	58
Thirteen	1	17	1	-	16	-	35
Fourteen	7	28	1	-	8	-	44
Fifteen	2	16	0	-	18	-	36
Sixteen	5	8	1	-	6	-	20
Seventeen	19	10	1	-	8	-	38
Eighteen	1	9	0	-	6	-	16
Nineteen	5	14	1	-	5	-	25
Twenty	4	5	2	-	14	-	25
21-30	12	80	8	-	38	-	138
31-40	9	21	2	-	6	-	38
41-50	4	7	2	-	0	-	13
51-100	3	7	2	-	0	-	12
101 and over	0	1	3	-	1	-	5

As a direct result of the provision of more permanent water in the Hwange National Park and the absence of hunting of the species in addition to some immigration into the Park, the elephant population increased dramatically. Cumming (1981) estimated that by 1980 the elephant population in the Hwange National Park had increased to around 11 000 elephants and by then there were also no less than 25 boreholes supplying water to the pans.

It was also in the 1960's that serious damage to the vegetation, particularly on the shallow soils in the northern part of the Park, was apparent and in 1964 it was decided to reduce the elephant population. (Cumming 1983).

Even though the culling of elephant continued at various levels for some years the elephant population continued to increase and by 1979 it was estimated that there were at least 16 000 elephants in the Park and by 1981 as many as 20 000 elephants (Cumming 1981). By 1981 there were at least 70 perennial waterpoints in the Hwange National Park.

Cumming (1983) reported that on the basis of dead trees which were counted during the 1980 and 1981 aerial surveys it was concluded that the elephants were having a considerable negative effect on the vegetation and this was even taking place in the Kalahari sand area. This was in spite of what Williamson (1975) said when he indicated that the carrying capacity of Kalahari sand area could carry large numbers of elephant because of the variety and quality of the available browse.

As a result of the damage to the vegetation it was decided to reduce the elephant population to 12 000 animals over a period of three to four years. (Cumming 1983). By 1985 the population of elephant was then estimated to be about 15 000 and from then on very few animals were removed. By 1990 the elephant population had again increased considerably and had reached a staggering maximum of 29 000 animals. (Unpublished National Parks Reports).

When I commenced my survey of the mammals of Hwange National Park in January 1996 there was a considerable amount of surface water everywhere. Every pan encountered had water in it with every pan literally being full and overflowing. Each little depression in the ground contained water and in places even the roads were flooded. This was as a result of the very good rainy season which commenced in November 1995 and continued until March 1996.

As a result of these very good rains and water everywhere the elephant had dispersed throughout the Park and very few elephant were seen near the main pumped pans along the tourist routes throughout the Park. Aerial surveys by helicopter and fixed wing aircraft showed that elephants were present in large numbers in the central parts of the Park which was normally a very dry area, and along the Botswana border.

As the dry season approached and water supplies dried up in the central part of the Park there was a definite movement of elephants to areas where surface water still existed. Many of these waterpoints were at some of the larger pans which did not have pumped water while others were at pumped pans.

The density of elephant in the Park was definitely related to the rainfall of the previous season and obviously the higher the rainfall the more surface water. As a result, the elephant were not in any way dependent on the artificial water supplies until much later in the dry season.

As the water dried up in the small seasonal pans so the movement of elephant to other waterpoints increased. This was very noticeable especially from the numerous helicopter flights over the Kalahari sand areas. The less water there was so the density of elephants

increased around the pans that still had water in them or at the pumped pans.

The elephants obviously ranged over a large area during the rainy season and restricted their dry season range to the vicinity of water supplies. It was of interest to note that during the helicopter flights the greatest concentration of elephants during the dry season was within 1 km to 2 km from the pans with water. The further away from the pans with water we flew the lower the density of elephant was. During the height of the dry season very few elephant were ever seen more than 5-6 km from water.

It was also not necessary for elephants to drink every day. Conybeare (1991) mentions one elephant which visited a waterpoint three times within 4 days with an interval of 30 hours in each case. He indicated that visits to water was not a daily occurrence and that it was common for the interval to be about 36 hours.

Conybeare (1991) found that elephants in the Kalahari sand area of the Hwange National Park have very large home ranges within which the seasonal movement was related to the availability of water. Conybeare gave the home range of females and calves as 1 038 sq. km to as much as 2 544 sq. km while males had a larger home range from 1 300 sq. km to 2 891 sq. km. The greatest range length was recorded as 91 km for a female and 102 for a male.

During the dry season the home range of females was reduced considerably which was from 360 sq. km to 878 sq. km and for males from 139 sq. km to 988 sq. km. (Conybeare 1991). The difference in the size of home ranges during the wet season and dry season was obviously directly related to the availability of surface water. Conybeare (1991) found that the mean home range of 7 females and 5 males was 1 965 sq. km and that during the dry season the mean home range of the same animals was only 588 sq. km when the elephants were restricted to the vicinity of artificial water supplies

In years of good rainfall the seasonal pans retained water a lot longer and it was then that elephants were less dependent on the artificial water supplies where diesel engines were fitted.

This seasonal local migration of elephant which as mentioned above is linked to the availability of water has also been recorded elsewhere in Africa as recorded by Pouche (1974) in southern Niger in west Africa. Similar patterns have also been noted in Tsavo National Park in Kenya (Leuthold 1977), in Amboselli also in Kenya (Western & Lindsay 1984) in the Zambezi Valley in Zimbabwe (Dunham 1986) and in Namibia by Viljoen (1989).

It was also noted during the dry season of 1996 and during the present survey that elephants moved from one water supply to another within a very short period of time. For example a very large bull elephant with an unbelievably large scar on his left side was seen drinking at Sinanga Pan at 8.05 am on 27th June 1996. Two days later the same bull was found feeding on the open grassland within 100 metres of Makwa Pan, and a week later was seen at Kennedy I Pan. Two weeks later the same bull was seen at Sinanga again in the early morning.

While the distances between the pans mentioned above are not all that great it does however show that elephants move from pan to pan with surface water within a few days. Obviously all these pans mentioned above fell within the home range of that naturally marked bull elephant.

During the present 1996 survey of the Hwange National Park, elephants were found drinking at pans at all hours of the day and during the heat of the day they were very often

seen wallowing in the mud at the side of the pan. They were even swimming in some of the larger and deeper pans. For example, as long as water remained in Roan Pan it was always possible to see elephants there during the middle of the day.

However, while elephants did visit pans throughout the day the main drinking period was in the evening and for the first three to four hours of darkness. This pattern was also reported to be the case by Weir and Davison (1966).

Food

Wilson (1975) mentioned that a great deal of work has already been done on the food and feeding habits of elephant and he produced several lists of plants fed on by elephants in the Hwange National Park. The reader of this report is referred to the book on "The Mammals of Wankie National Park."

During that 1969/71 survey, (Wilson 1975) mentioned elephants feeding on 164 plant species of which 87 were trees and shrubs, 35 herbs and 42 grasses. He also mentioned that mineral salts were much sought after by elephants and in several areas within the Kalahari sand country large holes were often dug by elephants where soil high in calcium was eaten.

By virtue of the fact that elephants concentrate around artificial water supplies during the dry months of the year, one would expect a considerable amount of damage to the vegetation close to the pans. In the case of pans where water has been pumped into them for 30 or more years, most tree species close to the pans have been eliminated and the surrounding areas turned into grassland or wooded grassland and further from the pan into bushland.

While frost in some areas may cause major changes in vegetation it is suggested that the overpopulation of elephants is the main cause of vegetation loss or change but with the present high elephant population and densities around artificial water the state of decline of the tree density will continue. In many areas the vegetation change is reversible if the elephant numbers are reduced.

The elephants feeding habits are such that it is not uncommon for them to push over large trees which are found broken at the main stems or even by ringbarking. This overutilisation in the Hwange National Park has already caused woodland, and even riverine vegetation, to change towards bushland and even grassland. These changes in habitat have been seen to affect other large mammals and one typical example is the destruction of the riverine vegetation along the Lukozi River in the Sinamatella area.

Twenty five years ago both bushbuck and Sharpe's grysbok were often seen in the riverine vegetation along the Lukozi River. At that time (1969/71) the vegetation was so dense that it was almost impossible to see the river and I had to force myself through the dense undergrowth to get to the actual river bed. Now some 25 years later the river could be clearly seen in a large number of places from the actual road (Lukozi River Drive) which was not possible before. This opening up of the riverine vegetation was entirely due to elephant pressure and their feeding on the lush vegetation along the banks of the Lukozi River.

In addition to the riverine vegetation along the Lukozi River the entire Mopane woodland and Acacia thickets along the Sinamatella River area below the Sinamatella Camp, are also now far more open than they were previously. In fact, many areas around Sinamatella resembled a lunar landscape and even during the height of the heavy rains the vegetation had not recovered. Large numbers of broken and badly damaged Mopane trees were seen

everywhere and elephants were even entering the tourist camp at Sinamatella at night, destroying large Mopane trees within 10 metres of the lodges and the restaurant.

This problem of the destruction of the vegetation was as a result of just too many elephants which again is a man made problem. This problem has arisen as a result of increasing human population outside the Park and not enough management of the elephant population within the Hwange National Park.

Originally in the early 1980's it was not only the elephant problem that had caused the destruction of the vegetation in the Kalahari sand areas. Childs & Walker (1987) investigated the dynamics of the woody vegetation in the areas of Kalahari sand west of Main Camp and at that time they considered edaphic factors were also the primary determinants of the vegetation structure together with fires and frost and that elephants at that time had only a minor effect on the vegetation. While fires and frost still caused considerable damage to the vegetation these two factors, now combined with the overpopulation of elephants, has increased tremendously the damage to the habitat.

Successive years of good rainfall would no doubt help the vegetation to recover in many areas as increased rainfall influences the state of the vegetation which increases the tree recruitment rate and growth. Under those circumstances elephant populations and densities would be more widely scattered throughout the Park and because of the vast size of the Hwange National Park, home ranges would also be a great deal larger. At the same time, elephant herds would not be dependent on the artificial water supplies. However, the Hwange National Park and Matabeleland in particular have received very erratic rains over a long period of time and this, no doubt, will continue for the foreseeable future.

The outcome of the overpopulation of elephant in the Hwange National Park could possibly be the natural dying of large numbers of elephants. This was demonstrated in the Tsavo National Park in Kenya when a similar build-up of elephants occurred. This brought about extensive vegetation changes in the Park. (Glover 1963).

As is the case in the Hwange National Park at present there were several years of low rainfall and during 1970 and 1971 low rainfall in Tsavo and the lack of vegetation caused the elephant population to crash. During that period it was estimated that at least 6 000 elephants died and possibly even as many as 9 000 died due to starvation. (Corfield 1973; Parks 1983).

Breeding

Several writers considered that elephants, because of their long gestation period of 22 months, bred throughout the year, Ansell (1969) and Smithers (1970). However, Hanks (1969) working in the Luangwa Valley in Zambia found a distinct peak in calving during the period September to February.

During the present study I recorded all newly born or very small baby elephants seen. It was not in any way easy to determine the age of baby elephants but ones that were obviously a "pink" colour were recorded as newly born while those that could easily walk under the belly of the mother and also very wobbly on its feet, were considered to be about one month old. While this is not in any way highly accurate it does give some indication of the age of the baby.

During the present survey of the Park I recorded 71 newly born or very young calves, details of which are included in Figure 1. From this it is clear that there was a distinct peak in calving during the September-November period. Even if the ages of the babies recorded

in October were a month or more older than originally thought it would still give a peak in calving in August to November.

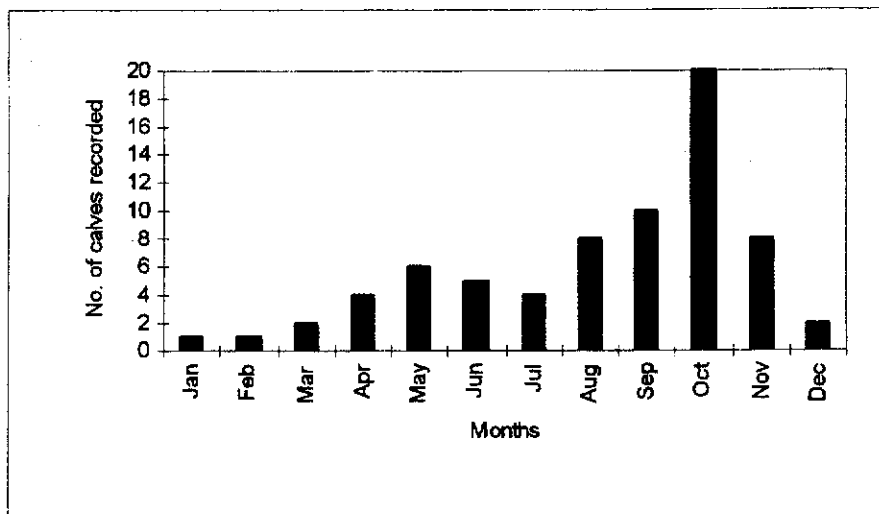


Figure 1 - Frequency of 71 newly born or very young elephant calves recorded from Hwange National Park during 1996

Status

Davies (1996) estimated that elephant in the Hwange National Park during August/September 1996 occurred at a density of 1.83 elephants per km² and that these ranged from 0.77 elephant per km² in the central area of the Park to 3.11 per km² in the Robins area. It was estimated that 27 907 ($\pm 23.8\%$) elephants occurred in the Park. During the 1995 aerial survey of the Hwange National Park the estimate was 22 762 ($\pm 17.8\%$) (Davies 1995).

Confidence limits for the 1996 annual aerial survey were high compared with the previous years survey which was most probably due to the fairly large scale changes in the distribution of elephants during 1996 and this was no doubt as a result of the much higher rainfall experienced during the 1995/96 season.

Table 38 gives full details of all elephants seen by the aerial survey team during September 1996 together with an estimate of the population size. For details of areas covered, see Map 9.

At the same time that the National Parks annual aerial survey was being conducted in September 1996 our survey team was also operating on the ground, and also from a helicopter which was at our disposal.

The area of greatest 95% C.L. range as determined from the aerial survey was the Shakwanki stratum with a minimum count of 130 elephants and a maximum of 9 721 animals. As a result of our ground work at the same time I believe the figure of 130 elephants in the area would have been closer to the true population at that particular time and the same applied to the Central B stratum where a 95% C.L. range was from 1407-3618 elephant.

Taking these two areas into account I am of the opinion that the figure of 21 270 elephants which lies at the bottom of the 95% C.L. range would be a more realistic figure for the population of elephants in the Hwange National Park during September 1996.

However, it is of interest to note that a very large concentration of elephant was seen during a transect by fixed wing aircraft on 4th May 1996 at about 4.45 am just north of Mitswiri Pan. Within a period of only about 10 minutes the following elephants were seen: 2 elephant bulls, 1 elephant bull, 1 elephant bull, 25 cows and calves, 30 cows and calves,

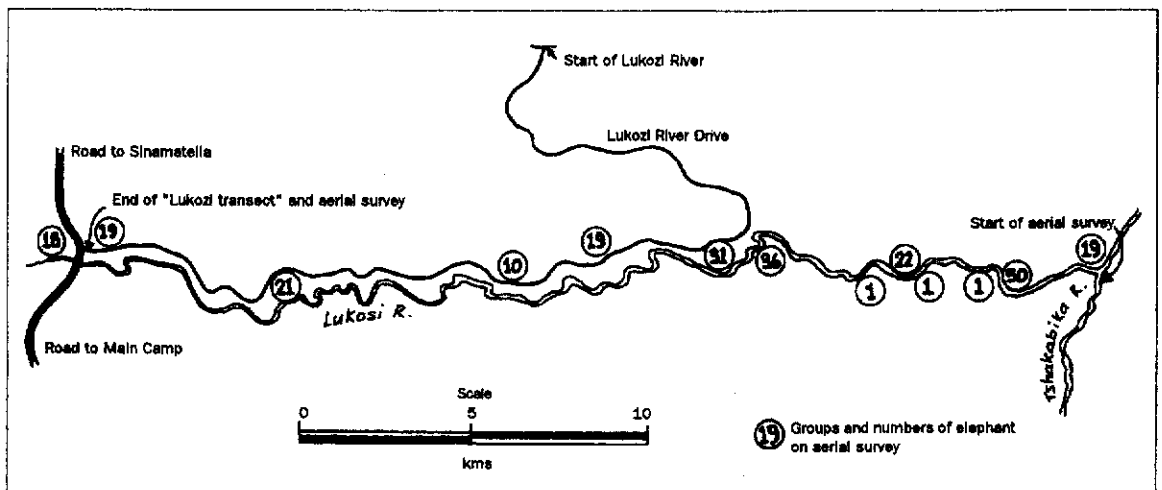
Table 38 - Numbers of elephants seen during 1996 aerial survey and estimated population for the Hwange National Park (after Davies 1996)

Stratum (area)	No. seen	No. estimated	Variance	95% C.L. (Range)	95% C.L. (%)
Robins	329	3201	595798	1519-4883	52.5
Dandari	250	2871	782083	1020-4721	64.5
Shakwanki	130	3904	5651892	130-9721	149.0
Dzivanini	178	2317	770797	434-4200	81.3
Sinamatella	251	3353	1129395	1074-5633	68.0
Mtoa	190	1854	162078	1004-2703	45.8
Main Camp	248	2406	495393	914-3898	62.0
Shapi	256	2513	276956	1407-3618	44.0
Central B	69	1335	566585	69-3177	138.0
Central A	151	1493	282167	353-2632	76.3
Ngamo	248	2661	299050	1502-3821	43.6
Total	2300	27907	11012187	21270-34544	23.8

50 cows and calves, 35 cows and calves, 8 bulls, 20 cows and calves. This gave a figure of at least 172 elephant in a very small area.

On 27th March 1996 a helicopter flight over the Balla Balla/ Tshebema/ Boss Longone area gave a very accurate count of 328 elephants in 16 groups. A very short flight up the Lukosi River by helicopter from the junction of the Lukosi and Tshakabika Rivers up the Lukosi River to the main Shumba road gave a count of 248 elephants in 13 groups. This flight lasted less than ½ hour and the following groups made up the 248 elephants seen: 19, 50, 22, 31, 19, 10, 21, 19, 18, 36, 1, 1, 1.

It was possible, during this short flight, to accurately count every elephant in each group encountered. This is the same area referred to earlier in this report where tremendous damage to the riverine vegetation along the Lukosi River had been noted. Map 29 shows the locality at which each herd of elephant was seen near the Lukosi River.



Map 29 - Locality at which each herd of elephant was seen near the Lukosi River

Another flight by fixed wing aircraft on 4th May 1996 at 4.55 pm along the Botswana border recorded the following elephants:

Stoffels Pan	100+	cows & calves	6	cows & calves
	1	bull	4	bulls
	1	bull		
Cement Pan	5	bulls	2	bulls
	2	bulls	4	bulls
	1	bull	2	bulls
	3	bulls	18	cows & calves
	18	cows & calves		
Tamafupa	30+	cows & calves		

All the elephants mentioned above were recorded from the Zimbabwe side of the border and all close to the pans which were actually on the border. From where we were flying along the border road we could also see many large herds of elephant on the Botswana side of the border. There were several hundred elephant which were not counted. Therefore, the movement of elephant across the Botswana/Zimbabwe border must be considerable.

Finally, it would be inappropriate to consider Hwange National Park as an island in north-western Zimbabwe. Elephant movement to and from the Park into Botswana, the Matetsi safari area, the forest reserves and private land east of the railway line takes place all the time.

Many thousands of elephant also occur in the areas just mentioned above and as a result the population of elephants in the Hwange National Park would vary considerably from one time of the year to another.

A much more detailed and long term study of elephant movement and status in this vast area is long overdue. Considering the vast economic value of the elephant and the fact that the population is expanding all the time, international funding should be sought for a long term study of this important species.

At the time of writing and during the whole of 1996 no detailed research work was being carried out on the elephants of the Hwange National Park.

Order **PERISSODACTYLA**

Family **RHINOCEROTIDAE**

Rhinoceros

Genus **CERATHOTHERIUM** (Gray 1868)

White rhinoceros or Square-lipped rhinoceros

Ceratotherium simum (Burchell 1817)

Ceratotherium simum simum (Burchell 1817)

Colloquial name

The colloquial name White rhinoceros is so well entrenched that it would be difficult to try and call the species anything else. However, the species is also very often referred to as the Square-lipped rhinoceros.

The name White rhinoceros originates from the Dutch name "witte" renoster or the Afrikaans witrenoster which was used in the early days to distinguish this species from the Black rhinoceros. As Skinner & Smithers (1990) mention, the name Wit or White has been used for nearly 200 years.

Taxonomic notes

Burchell (1817) originally described the White rhinoceros from a specimen from "the interior of South Africa". The type locality was later fixed by Shortridge (1934) as near Kurnman, Cape Province.

Only one sub-species is recognised for southern Africa, *Ceratotherium simum simum* (Burchell 1817).

Past distribution and history in Hwange National Park

Herbert and Austen (1972) suggested that probably the last White rhinoceros to occur naturally in the vicinity of the Hwange National Park was in the Dett Vlei about 10 km north-east of the Park's eastern boundary. It was the famous hunter Selous who made this observation in 1873. (Selous 1908).

Over the period 13th November 1966 to 12th March 1967 a total of 35 White rhinoceros (16 males and 19 females) were received from the Umfolozi Game Reserve in Natal, South Africa for introduction into the Hwange National Park. (Hatton 1968).

They were at first held in holding pens some 15 km south-east of Main Camp and later moved into paddocks. The Manga Vlei where the pens and paddocks were built was considered to be the most suitable location for their introduction into the Park.

On 7th December 1966 one of the rhino broke out of the paddock and ten hours later it was seen 25 miles (15 km) from where it escaped. It was believed to have taken up residence in the Shumba area of the Park (Herbert and Austen 1972). Then from 8th December 1966 to 21st April 1967 the remaining animals were either released or broke out of the paddocks.

Some of the animals travelled considerable distances and at least six were known to have moved into Botswana with two of them dying of thirst in July 1968 at Odiakwe in Botswana. This was at least 140 miles from the release site. The other four were later reported to be seen in eastern Botswana by safari hunters. (Herbert & Austen 1972). Another nine White rhino crossed the eastern boundary of the Park where one female was shot by a farmer on Dahlia Ranch on 27th October 1967 and it was thought that the remaining eight animals returned to the Park. (Herbert and Austen 1972).

In March 1968 an attempt was made to capture two White rhino in the Matetzi area to the north of the Hwange National Park. However, it was not known where these two animals had come from as four White rhino were also released into the Victoria Falls National Park. One died as a result of the dart hitting the animal in a vein while the other, a female, was successfully darted and moved to the Linkwasha (Inkwazi) Vlei in the Hwange National Park. Since August 1967 to February 1972 another six White rhino deaths were recorded in the Park and surrounding area (Herbert and Austen 1972). It is interesting to note that of the nine dead White rhino, six were adult females, one was an adult bull and two were calves. Therefore, of the 35 White rhino released in the Hwange National Park, 26 of them were still alive in March 1972 (Herbert & Austen 1972).

By September 1971 the last census that was done before the publication of Herbert and Austen's paper there were four White rhino in the Robin- Deteema area, four just outside the Park in the Hwange Controlled Hunting Area, two in the Sinamatella area, two in Shumba and 20+ in the Kennedy- Madundumela- Linkwasha (Inkwazi) vlei system, a total of 32 animals.

By September 1971 numerous calves and sub-adults were seen in the Hwange National Park suggesting that a viable breeding population had been established. (Herbert & Austen 1972). By November 1973 it was estimated that the population of White rhino in the Hwange National Park had increased to at least 40 animals. (Wilson 1975). By May 1989 when the Management Plan for the Hwange National Park was written, it was estimated that the White rhino population stood at 100 animals. (Jones 1989). Then during the late 1980's and 1990's poaching really started taking a toll of the rhinos in Zimbabwe.

Michael Kock working in National Parks on the rhino programme indicated that between 1984 and 1991 at least 959 Black rhino and White rhino were killed by poachers in Zimbabwe. This was happening in spite of the major anti-poaching efforts by the Department of National Parks & Wildlife. (Kock 1991). Kock goes on to say that in 1991 nearly 100 rhino were killed and in 1990 several White rhino were poached in Hwange National Park and some even very close to the main tourist routes.

A dehorning programme was, therefore, initiated and during 1991 a total of 71 White rhino were captured of which 59 were dehorned. Most of these rhino were found in the south-east of the Park. Kock goes on to say that approximately 30 more White rhino remained with their horns still present in the Hwange National Park. (Kock 1991).

Environment 2000's Newsletter of January 1994 says that when patrols were recommended in June 1993 at least 70 of the dehorned White rhino in Zimbabwe's biggest stronghold, the Hwange National Park, had been lost to poachers.

By the time that I commenced my 1996 survey of the Hwange National Park in January 1996 it was felt that almost the entire White rhino population had disappeared as a result of poaching and only a few remained. Perhaps not more than half a dozen from the original figure of 100 were left.

1996 survey and present status

During 1996 when the present year long large mammal survey of the Hwange National Park was carried out and after covering all areas of the Park, only two white rhino were located. These two rhino were seen on several occasions by a number of people. They remained in the same definite home range and were never seen outside that area. In addition there is also the possibility of another 4 or 5 White rhino in the Robins/ Sinamatella area.

Therefore, it is assumed that the total White rhino population of the Hwange National Park is now about 6-7 animals. There is a slight possibility that there may well be another one or perhaps even two White rhino in the Park but accurate details are still lacking. In any case the population of White rhino in the Park is now not more than 6-7 animals.

The population had therefore dropped from 100 animals in 1989 to 6-7 animals in 1996, a loss of about 90 White rhino in 7 years. For security reasons no Distribution Map of this species has been given or any other details regarding the location of the remaining rhino.

Genus *DICEROS* (Gray 1821)

Black rhinoceros, Hook-lipped rhinoceros

Diceros bicornis (Linnaeus 1768)

Diceros bicornis minor

Colloquial name

More commonly known as the Black rhinoceros, the species is sometimes referred to as the Hook-lipped rhinoceros.

Taxonomic notes

du Toit (1987) has assigned the southern African population of Black rhino to the sub-specific name of *Diceros bicornis minor*. This sub-species supposedly occurs throughout the area from Natal and Zululand through Zimbabwe, Zambia, Malawi and into southern Tanzania.

Distribution and history in Hwange National Park

The first reference to Black rhino in the Hwange area was by Selous (1908). Long before the establishment of the Wankie Game Reserve in 1928 Selous mentioned seeing both Black and also White rhino in the Dett Vlei in October 1873.

Oates (1881) also reported rhino (species not stated) along the Botswana border between Dzivanini and Tamasanka in November 1874 and Kelly Edwards (Conservator of Forests) also saw rhino (species not stated) in 1912 at old Ngamo just north of Ngamo siding. There is also a record of a farmer at Sinamatella Ranch, which is now part of the Hwange National Park, who possessed a rhino horn which was found in 1926.

Herbert & Austen (1972) mention a pair of Black rhino in the vicinity of the Deka River near Robins Camp which were sighted in the area on many occasions from 1942 to 1946. Apparently they wandered to the south-east of Hwange National Park onto Sunnyside Farm now called Mbisa. This farm lies between Ngamo and Ingwe sidings and the male was mistaken for an eland and shot. It is reported that the other animal roamed extensively in the Park where its spoor was last seen in the vicinity of Ngamo in 1956. It is believed that this animal was finally poached as a piece of rhino skin was found in a bushman's camp near the Nata River. (Herbert & Austen 1972).

Wilson (1975) mentions that in October 1962 six male and two female Black rhino were released in the Mandavu Dam area and in March 1963 another three females and a male were also released. In October 1965 another 40 Black rhino were introduced into the Mandavu Dam area. (Wilson 1975). Of the 52 rhino introduced several died from various causes but a number of calves were also born.

All the above mentioned animals were from the Kariba area and they were first held in paddocks near Mandavu Dam before being set free into the Park. The Mandavu/Sinamatella area was chosen as the release site as it had a habitat similar to that of the Kariba area which consisted of hilly country and thick bush. (Herbert & Austen 1972). As a result of a few deaths the total number of Black rhino remaining in the Hwange National Park in 1965 was 48 animals.

Between 25th and 27th August 1971 using a helicopter and flying at an average height above the ground of 100 m a thorough search was made for the Black rhino. Transects 100 m apart were flown in the Sinamatella and Robins areas as well as towards Dandari and a total of 6 hours flying time was made. A total of only seven Black rhino were seen which consisted of six adults and one calf. (Herbert & Austen 1972).

Herbert and Austen go on to say that in May 1971 the rhino population in the entire area was as follows:

- Seven in the Robins-Deteema area
- Three in the Sinamatella area
- Eleven* in the Wankie Controlled Hunting Area
- One in the Mtoa area and
- One at Giraffe Springs (6 miles south-west of Shapi).

This gave a total of 23 Black rhino left in the Park but they were unable to say what had happened to the remaining animals.

By November 1973 the population of Black rhino in the Park was estimated to be about 30 animals. (Wilson 1975). By May 1989 some 16 years later it was estimated that the Black rhino population in the Hwange National Park was 175 animals. (Jones 1989).

As with the White rhino the poachers moved into the Hwange area and a large number of Black rhino were also killed. I have been unable to find records of just how many Black rhino were poached in the Hwange National Park and Beatrice Russell, who helped with the present survey of Hwange National Park, indicated that she could not find any records whatsoever of the number of rhino that died and that there were no records at Main Camp.

1996 survey and present status

By January 1996 when I commenced my survey I investigated the Black rhino situation in the Hwange National Park thoroughly and a fair population still exists there.

Mr. Stewart Towindo, Ecologist of the Department of National Parks & Wildlife based at Sinamatella Camp was requested to submit a brief report on the Sinamatella Intensive Protection Zone (IPZ) for rhinos. His report is as follows:

Sinamatella IPZ Rhinos

"Present Status

The history of rhino poaching is a long one for Zimbabwe starting of in the early 80s in the Zambezi valley and spreading through the Sebungwe region into the Hwange, Matetsi area Poaching started in Hwange National Park in 1987 and reaching a peak in 1992. In view of this crisis country wide a black rhino emergency conservation plan of 1993 was adopted

by the department and this led to the formation of four IPZs for black rhinos in the country namely Sinamatella, Matusadona, Matopos and Chipinge. The Sinamatella IPZ is the largest of the four with an area of 1400 km². Further black rhino introductions were made into the area in 1993 from Chizarira and Sikumi forestry area and 5 rhinos were introduced into the area.

Monitoring Programme

One of the main objectives of the IPZ was to maintain a population of individually monitored black rhino through radio collaring. Collaring was done for law enforcement purposes to allow for effective deployment of scouts into areas with rhino. It has also allowed to maintain a population register of most of the animals in the IPZ through ear notching, transponder chip insertion to identify the animals and the horns. It has also allowed us to look into the biology of our rhino population. There is however a need for a better collar design that stays on the animal for at least two years. There is an urgent need to collar all our peripheral rhino so that they can be monitored for security reasons. There are other monitoring techniques that can be used to monitor the rhino population in the area. We are currently exploring the use of rhino spoor photography as a way of identifying individual rhinos. This method has proved to quite reliable and cost effective means of censuring rhinos and is being refined to identify individuals.

Population Performance

Our rhino population has been growing at a rate of 11% over the period 1992 to 1995. This is very high when compared to other areas in Africa it implies that our rhinos have the potential to recover fast. About 27% of our female rhino population is giving birth each year. Our intercalving interval is about 42 months. Gestation period for rhino is between 15 to 17 months.

Dehorning

Dehorning was done to reduce the incentive to poach as there will a greater risk for a small benefit. This has served us well during the poaching crisis and works well with good law enforcement effort. Of the 23 calves known to have been born to dehorned cows from 1992-95, only three calves were lost, suggesting that dehorning had no significant effect on calf survival. This implies that dehorning is not having a negative impact onto our rhino population.

Home Ranges

The mean home range size for a male rhino in the IPZ was observed to be 96.24km² and that for a female rhino was 87.42km². There was no significant difference in home range size between males and females. In general wet season ranges for both males and females were smaller than dry season ranges. Home range sizes were variable between animals with some animals having ranges as small as 30km² and as large as 300km².

Rhino Conservation

A major focus of our IPZ functions is on protecting the current population from poaching and in maximising breeding rate of the population. To achieve these goals the man power levels of the IPZ have been boosted to reasonable levels. We are also working together with the army and the police in our anti poaching operations under a presidential directive of Operation Heritage. To achieve the maximum breeding rate the rhinos have been placed in areas of suitable habitat within the IPZs and private conservancies. These population have been further consolidated into large breeding groups through capture and translocation. This strategy to date has shown some positive results as our rhino populations are now recovering." End of report from Mr. S. Towindo.

While I have a very good idea of the distribution and status of the Black rhino in the Hwange National Park this data is not being included in this report for security reasons. Nor is the map of the distribution of the rhino included.

Family EQUIDAE

Zebra

Genus EQUUS (Linnaeus 1758)

Burchell's zebra

Equus burchelli (Gray 1824)

Equus burchelli chapmani (Layard 1865)

Colloquial name

This zebra was named after the very well known traveller and naturalist W.J. Burchell who collected the original specimen from South Africa and presented it to the British Museum (Natural History). Skinner & Smithers 1990.

Taxonomic notes

Ansell (1974) listed seven sub-species from Africa of which three were from the southern African sub region. The sub-species *E.b. burchelli* is now extinct and *E.b. antiquorum* (H. Smith 1841) occupies the area from southern Angola across to northern Namibia, northern Botswana and the Transvaal and natal. *E.b. chapmani* occurs in northern eastern Botswana, Zimbabwe and southern Mozambique. Therefore, it is *E.b. chapmani* which occurs in the Hwange National Park.

Wilson (1975), Skinner & Smithers (1990) and Smithers (1971) suggest that the two sub-species *antiquorum* and *chapmani* integrate in the Hwange National Park where some animals have stripes all the way down the legs to the hooves while in others the legs are never wholly striped. (Wilson (1975).

Distribution

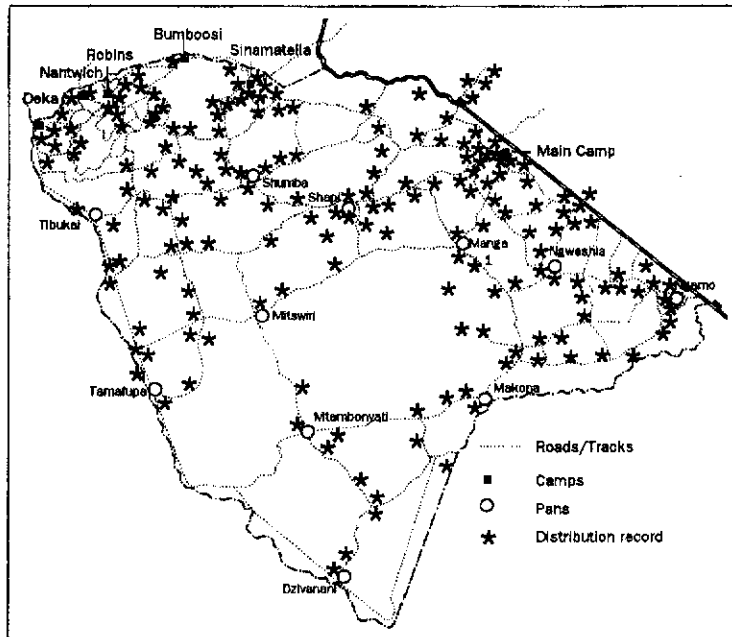
Davison (1967) says that zebra were rather rare animals when the Wankie Game Reserve was first proclaimed, being purely a dry season visitor to the eastern and northern parts of the reserve. It was only in the north-west that zebra were seen during the rainy season. Davison goes on to say that the "trek" into the reserve to the east began each year about June when small groups came in from the west. Davison said that as zebra were considered as "plains game" the Wankie Game Reserve was not that type of country. He goes on to say that the species was not known at Ngamo and Kennedy and were very rarely seen around Main Camp before 1950.

Even when Davison wrote his book "Wankie. The Story of a Great Game Reserve" in 1967 he said that zebra were not common and one very seldom saw more than ten or twelve together and that they were still absent from the southern end of the Park. He also felt that any migration into the Park from Botswana was into the Deka River basin and none at all in the Nata area.

By 1969/71 when I carried out my mammal survey of the Hwange National Park zebra were by then common and they also had a very wide distribution. They occurred throughout the

Park during 1969/71 including the Dzibinini area and were plentiful around Nehimba and Shakwanki where over 250 were seen over a distance of 12 miles in November 1970. Wilson (1975) goes on to say that the largest concentration of zebra were found in the Deka area where about 400 were seen in October 1973. Large groups were also seen on the Kennedy vlei and at Ngamo in 1973.

The 1996 survey again indicated a very wide distribution of zebra in the Hwange National Park while Map 30 shows localities where the species was seen. These visual records were obtained from aerial surveys by fixed wing aircraft and helicopter, from marked transects (road strip counts) from Wildlife Society records of animals seen at waterholes and from records on wildlife report forms.



Map 30 - Distribution of Burchells zebra in the Hwange National Park as determined from marked transects ("road strip counts"), aerial surveys, Wildlife Society game count and wildlife forms

Habitat

Although zebra prefer open grasslands and were found to be very common in all areas where this habitat existed they were also found in other habitats as well. For example, two small groups were known to be permanent residents in tall *Baikiaea* woodland between Main Camp and Umtshibi while many other groups also inhabited broken country around Sinamatella and east of Shumba. They were also very often seen in Mopane woodland around Mandavu Dam, on the Kashawe Loop road near Sinamatella and also in the Robins area.

Habits

The zebra is very much a gregarious species and large concentrations were often encountered especially in places like the Shumba Plains, the Kennedy Vlei and around Shapi and Shakwanki. However, single individuals were recorded in no less than 56 occasions and groups of two on 72 occasions. The most common herd size was four animals of which there are 113 records followed by herds of five seen on 93 occasions.

There are also records of every possible herd (see Table 39) and also one group of from 51-100 animals. In fact this record was of 72 animals seen on the Kennedy Vlei. Table 39 gives details of all herds or groups encountered during the survey.

Table 39 - Number and size of Burchell's zebra groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	22	17	5	-	12	-	56
Two	32	30	2	-	8	-	72
Three	32	35	5	-	122	-	194
Four	45	38	9	-	21	-	113
Five	39	31	9	-	14	-	93
Six	30	20	7	-	4	-	61
Seven	24	9	5	-	2	-	40
Eight	23	13	3	-	2	-	41
Nine	19	7	1	-	0	-	27
Ten	9	13	3	-	1	-	26
Eleven	31	2	1	-	1	-	35
Twelve	17	3	1	-	0	-	21
Thirteen	7	3	1	-	0	-	11
Fourteen	12	2	0	-	0	-	14
Fifteen	6	3	1	-	0	-	10
Sixteen	2	2	1	-	0	-	5
Seventeen	13	1	0	-	0	-	14
Eighteen	9	0	0	-	0	-	9
Nineteen	0	3	0	-	0	-	3
Twenty	1	0	1	-	0	-	2
21-30	7	2	2	-	0	-	11
31-40	4	1	0	-	0	-	5
41-50	0	1	0	-	0	-	1
51-100	0	0	1	-	0	-	1
101 and over	0	0	0	-	0	-	0

Food

Burchell's zebras are predominately grazers but in the Hwange National Park they were observed browsing on several occasions on the leaves of recently flushed *Baikiaea* leaves. They were also seen feeding on sedges at Dynamite Pan and also digging with their front hooves and eating rhizomes of some grasses.

Some of the grasses which were found to be eaten by zebra during the present survey included *Cynodon dactylon*, *Digitaria milanijana*, *Eragrostis pallens*, *Panicum maximum* and *Chloris gayana*. They are particularly fond of *Cynodon dactylon*.

Breeding

There are a large number of records of newly born zebra and the species appeared to have a peak in foaling during the cold months of the year. The following records of newly born young were recorded during the year: February 4; March 11; April 9; May 13; June 21; July 17; August 9; September 4; October 3; November 1 and December 3.

From the above data it appears as if the species breeds throughout the year but with a distinct peak in foaling during May to July.

Status

Wilson (1975) gave a figure of about 4 000 zebra in the Hwange National Park which was for 1973. Some 16 years later (1989), Jones (1989) estimated the population to be about 3 500 zebra. From aerial surveys carried out in 1994 it was estimated that the population was about 3 086 with a 95% C.L. range of from 1 898 to 4 274. (Davies 1994).

The similar aerial survey of the Park in 1995 gave an estimated population of 3 043 with a 95% C.L. range of between 2 116 and 3 970. The 1996 aerial survey gave an estimated population of 2 393. (See Table 40).

Table 40 - Numbers of zebra in the Hwange National Park

Year	No. seen	No. estimated	95% C.L. (Range)	95% C.L. (%)	Author
1973	-	4000	-	-	Wilson (1975)
1989	-	3500	-	-	Jones (1989)
1994	322	3086	1898-4274	38.5	Davies (1994)
1995	314	3043	2116-3970	30.5	Davies (1995)
1996	210	2393	1539-3246	35.7	Davies (1996)

Taking into account the present survey especially the "road strip counts" and from the data presented above, it is estimated that the zebra population in the entire Hwange National Park lies between 3 000 and 4 000 animals.

Order **ARTIODACTYLA**

Even-toed ungulates

Family **SUIDAE**

Pigs

Genus *POTAMOCHOERUS* (Gray 1854)

Bushpig

Potamochoerus porcus (Linnaeus 1758)

Potamochoerus porcus nyasae (Forsyth Major 1897)

Colloquial name

The name bushpig is most appropriate as this species is very much associated with dense bush, long grass and thickets.

Taxonomic notes

Two sub-species supposedly occur in southern Africa. *P.p. nyasae* occurs throughout Zimbabwe, north eastern Botswana and parts of Mozambique while *P.p. koiropotomus* (Desmoulins 1831) occurs throughout the remainder of southern Africa. (Skinner & Smithers 1990).

Distribution

Wilson (1975) pointed out that during the 1969/71 survey there were very few visual records of bushpig in the Hwange National Park and gave details of 12 sightings. During the present survey (1996) the only record of bushpig was of two seen by the Wildlife Society members during their 24 hour game count but these were outside the Park at the Hwange Safari Lodge on the Dett Vlei.

However, it should be remembered that even in places where the bushpig is very common it is still rarely seen. The species is strictly nocturnal and very secretive. As a result of the various visual records of the species by Wilson (1975) it is assumed that the species does still occur in the Park and that it is, no doubt, a lot more common than the records show.

Genus *PHACOCHOERUS* (F. Cuvier 1817)

Warthog

Phacochoerus aethiopicus (Pallas 1766)

Phacochoerus aethiopicus sundevalli (Lonnberg 1908)

Colloquial name

The English name no doubt refers to the large conspicuous facial "warts" on the face of the species.

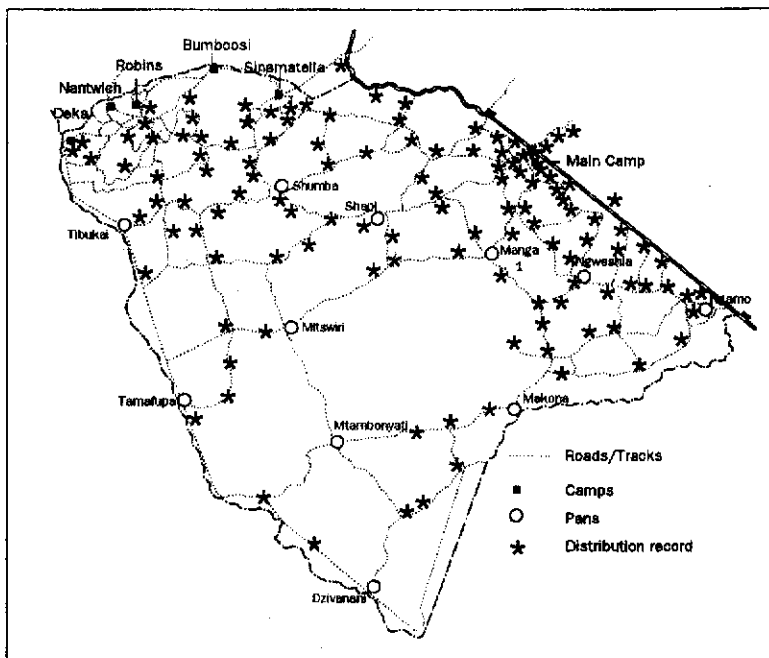
Taxonomic notes

Three sub-species occur in the southern African sub region. They are as follows:

P.a. aethiopicus which now survives only in the northern Cape Province,
P.a. sundevalli from Natal northwards to the Transvaal, Mozambique and Zimbabwe, and
P.A. shortridgei from Namibia and Botswana.

Distribution

The warthog has a wide distribution in the Hwange National Park and has been recorded from most areas even in the central parts around Tendele and Tindergrass Pans. However, it is much more common where there is an abundance of water, especially around the pans that retain water throughout the year. These include Dom, Dopi, Nyamandhlovu, Ngweshla and all the pans as far as Ngamo and in many other areas. They have also been recorded all along the Botswana border and in the Mopane country in the Dzivanini/ Leasha area, all over in the Robins and Sinamatella areas and are also common on the grassland around Shumba. (See Map 30 for distribution of warthog).



Map 30 - Distribution of warthog as determined from marked transects ("road strip counts"), Wildlife Society annual game count, wildlife forms and from aerial surveys

Habitat

Found in a large variety of habitats and especially where there is an abundance of permanent water. They have also been recorded on numerous occasions in *Baikiaea* woodland and are common in Mopane woodland. They are particularly associated with open ground flood plains and vleis and in the Hwange National Park around pans and other waterpoints.

Habits

While the species is essentially diurnal in habits it was often seen out feeding during full moon but those that do venture out at night are usually found on very open ground where visibility is good.

The warthog is normally found in small family groups consisting of a male, a female or two and young of the year. However, during the present survey single animals were recorded on 102 occasions and groups of 12 were seen on two different occasions in two different

areas. On both occasions these large groups split into two or more smaller groups when disturbed and ran off in different directions. Table 41 gives details of all groups encountered during the present survey.

Table 41 - Number and size of warthog groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, carnivore survey forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	25	51	14	-	12	-	102
Two	25	36	14	-	6	-	81
Three	19	26	5	-	3	-	53
Four	16	19	3	-	1	-	39
Five	11	14	6	-	0	-	31
Six	13	0	7	-	1	-	21
Seven	11	1	0	-	0	-	12
Eight	6	1	1	-	0	-	8
Nine	2	0	2	-	0	-	4
Ten	2	0	0	-	0	-	2
Eleven	1	0	0	-	0	-	1
Twelve	2	0	0	-	0	-	2

Food

On numerous occasions warthogs were seen digging in areas where seasonal pans existed. While there was still some water in the pans, and long before they had completely dried up warthogs were found actually standing in water and feeding on the roots or on other parts of reeds and sedges growing in the water. As the dry season progressed so warthogs continued to make use of the almost dry pans and then they were observed actually digging in the moist soils. Even when the seasonal pans were completely dry, warthogs continued to frequent the dry areas and were often seen digging in the dry soil.

One of the most interesting aspects of these digging sessions in the pans was the direct association of Crested cranes with the warthogs. On many occasions, Crested cranes were found very close to the warthogs feeding on insects and perhaps even amphibians disturbed by the warthogs.

Warthogs are great diggers and rooting for rhizomes and tubers was a common sight in the Hwange National Park. Wilson (1975) recorded warthogs feeding on the following grasses: *Aristida adscensionis*, *Cynodon dactylon*, *Digetaria milanijana*, *D. setivalva*, *Echinochloa stagnina*, *Panicum maximum* and several other species.

Wilson (1975) also recorded warthogs feeding on the flesh and intestines of impala and also feeding on an ostrich carcass. On another occasion chasing three cheetah off an impala carcass.

Breeding

Warthogs are strictly seasonal breeders and when I arrived in the Hwange National Park to commence my survey in January 1996 most, if not all, of the females had already produced young. Young warthogs were seen all over the Park with the numbers of young varying from two to six. Towards the end of 1996 the first young of the season were seen on 18th October 1996 and from then on young were seen with old adult females on dozens of occasions.

By the middle of November 1996 most of the females that were going to produce young had already done so but odd females with tiny babies were still seen in November and early December 1996. The most common litter size was 4 piglets and of 55 records for the period October to December 1996, the average litter size was 3.2 young. See Figure 2 for size of litters of warthogs recorded from 55 females with young.

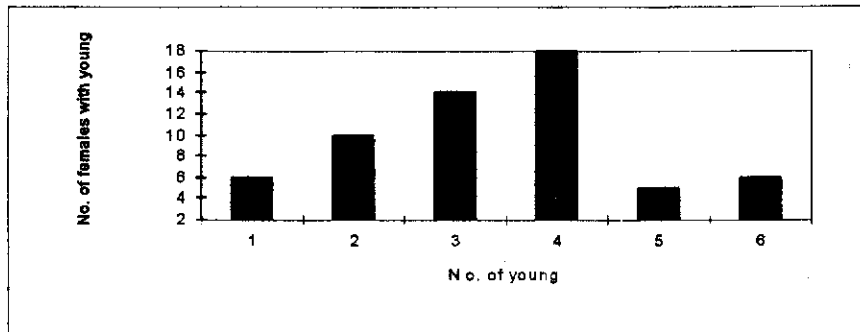


Fig. 2 - Size of litters of warthogs

Status

Wilson (1975) gave an estimate of the warthog population in the Hwange National Park for 1973 as around 3 000 animals. On the other hand Jones (1989) felt there were 7 000 warthogs in the Park. Davies (1996), from aerial surveys, estimated the population to be 423 with a 95% C.L. range of from 185-660. Now it is fairly certain that large numbers of warthogs were missed from the air so it is obvious that even the maximum figure of 660 as given by Davies (1996) must be an underestimate of the warthog population in the Park.

During the 1996 Wildlife Society game count at waterholes in September, only 382 warthogs were seen. This again is an underestimate as vast amounts of surface water was still lying in seasonal pans as a result of the very good rains in the 1995/96 rainy season. Therefore very few of the warthogs would have found it necessary to visit the artificial pans where water was being pumped, as they had plenty of pans with water all over the Park.

In 1995 the Wildlife Society count of warthogs was 589 and the 1994 count 685 animals. (See also Table 9 of this report).

Warthogs were impossible to locate during the rains and for several months after the rainy season when the grass was still long and visibility poor. During those months of the year warthogs were not often seen and it was only during the dry season that they were reported in large numbers.

In spite of the low numbers of warthogs recorded during the Wildlife Society game counts and from aerial surveys (where they were impossible to see) I believe the population is

several times larger than the records indicate. While I appreciate that it would be impossible to give an accurate figure of the number of warthogs in such a vast area as the Hwange National Park, I believe there could not be less than 4 000 animals and perhaps as Jones (1989) has indicated, as many as 7 000.

Family **HIPPOPOTAMIDAE**

Hippopotamus

Genus HIPPOPOTAMUS

Hippopotamus

Hippopotamus amphibius (Linnaeus 1758)

Hippopotamus amphibius capensis (Desmoulins 1825)

Colloquial name

The English colloquial name is derived from the Greek which means "water or river horse". (Skinner & Smithers 1990).

Taxonomic notes

The sub-species occurring in the Hwange National Park is possibly *H.a. capensis*. This sub-species was originally described by Desmoulins in 1825 from the lower reaches of the Berg River in the Cape Province of South Africa.

Distribution

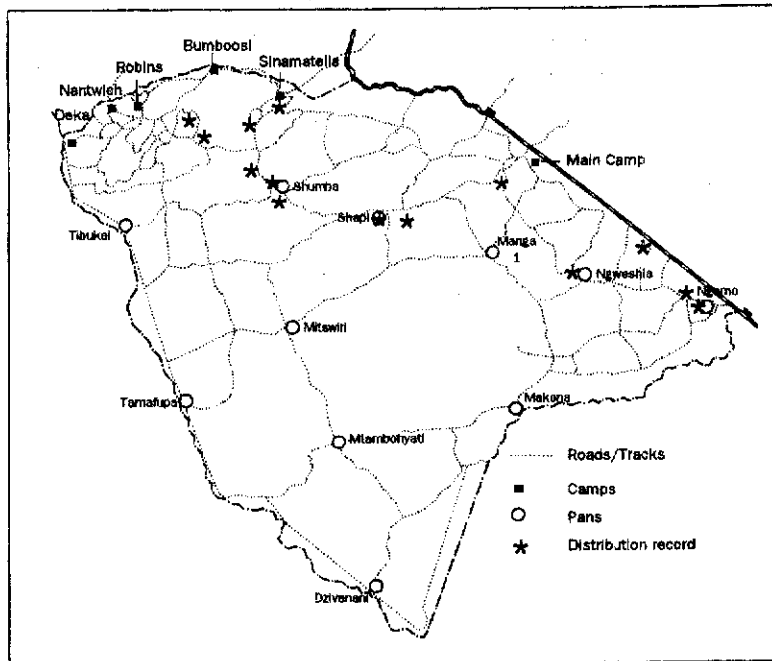
Davison (1967) said "one noticeable absentee at the Hwange National Park was the hippopotamus." He goes on to say "that until Mandavu Dam was built there were no stretches of water big enough or permanent enough to accommodate such a large aquatic animal." As soon as the Mandavu Dam was completed a hippo was recorded in it but Davison said it was not known where the hippo came from or how it found its way to the Dam. That was in 1953. After about 6 months at Mandavu, a calf appeared which no doubt was born there. After that the two hippos were joined by a third animal.

By the time I carried out my 1969/71 survey there were still three hippo in the Mandavu Dam and a single hippo was occasionally seen in the Sinamatella area and also in the Lukozi River. (Wilson 1975).

In 1968 a single hippo was recorded as far south west as the Limpande Dam and there was so little water in the Dam that the hippo could not even submerge. A second hippo was seen in the Limpande Dam in 1971 and there was a report of another hippo in the small dam on the Deka River near Robins Camp in 1972/73.

From the data given by Wilson (1975) it appears as if there were only about 7 hippo in the Hwange National Park in the early 1970's.

During the present survey in 1996 hippo were recorded in many parts of the Park. There are records of the species at Ngamo, Ngweshla, Shapi, White Hills Pan, Nyamandhlovu, Dom, Shumba Pans, Sinamatella, Mandavu, Deteema Dam, Makololo, Mandavu North, Masuma and Mbiza. (See Map 31).



Map 31 - Distribution of hippopotamus in the Hwange National Park as determined from marked transects ("road strip counts"), aerial surveys, Wildlife Society annual game count and from wildlife report forms.

As the hippo move about a great deal from one pan to the next it was difficult to ascertain exactly how many hippo there were in the Hwange National Park but we can say for certain that there were no less than 57 animals during 1996.

On 3rd May 1996, during an aerial survey, 9 hippo were seen in one of the Shumba Pans and another 16 also in another of the Shumba Pans. This gave a total of 25 hippo in the Shumba area alone. On 4th May, 2 adults and 1 tiny baby hippo were seen in Deteema Dam. In July 1996 there were at least 3 hippo at Ngamo, 1 at Mbiza, 1 at Ngweshla, two at Nyamandhlovu, 2 at White Hills Pan and 2 at Shapi. There were also 7 at Mandavu Dam at the same time.

Taking all the records into account and also considering the fact that the hippo move about a great deal from one pan to the next, I believe the population in the Hwange National Park in 1996 would be at least 60+ hippo.

The Wildlife Society counted 57 hippo at various pans during their 24 hour game count in September 1996, as follows:

Deteema Dam	4	Mbiza	1
Makololo	6	Ngamo	5
Mandavu	17	Shapi	1
Masuma	14	Shumba	6
White Hills	2		

Jones (1989) estimated the population in the Hwange National Park to be 20 animals. Table 42 gives details of all sightings of hippo. It should, however, be remembered that many of the visual records are of repeat sighting. There was no record during 1996 of the presence of hippo in the Dzivanini/ Leasha area of the Park as was the case in 1969/ 71.

Table 42 - Number and size of hippopotamus groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all survey forms.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	5	4	1	-	0	-	10
Two	3	5	3	-	0	-	11
Three	7	1	0	-	0	-	8
Four	2	3	3	-	0	-	8
Five	0	0	0	-	1	-	1
Six	1	3	0	-	0	-	4
Seven	1	1	0	-	1	-	3
Eight	2	0	0	-	0	-	2
Nine	0	0	0	-	1	-	1
Ten	0	1	0	-	0	-	1
Eleven	0	0	0	-	0	-	0
Twelve	0	0	0	-	0	-	0
Thirteen	0	0	1	-	0	-	1
Fourteen	0	1	0	-	0	-	1
Fifteen	0	0	0	-	0	-	0
Sixteen	0	0	0	-	1	-	1
Seventeen	0	1	0	-	0	-	1
Eighteen	0	0	0	-	0	-	0



Family GIRAFFIDAE

Genus *giraffa* (Brisson 1762)

Giraffe

Giraffa camelopardalis (Linnaeus 1758)

Giraffa camelopardalis angolensis (Lydekker 1903)

Colloquial name

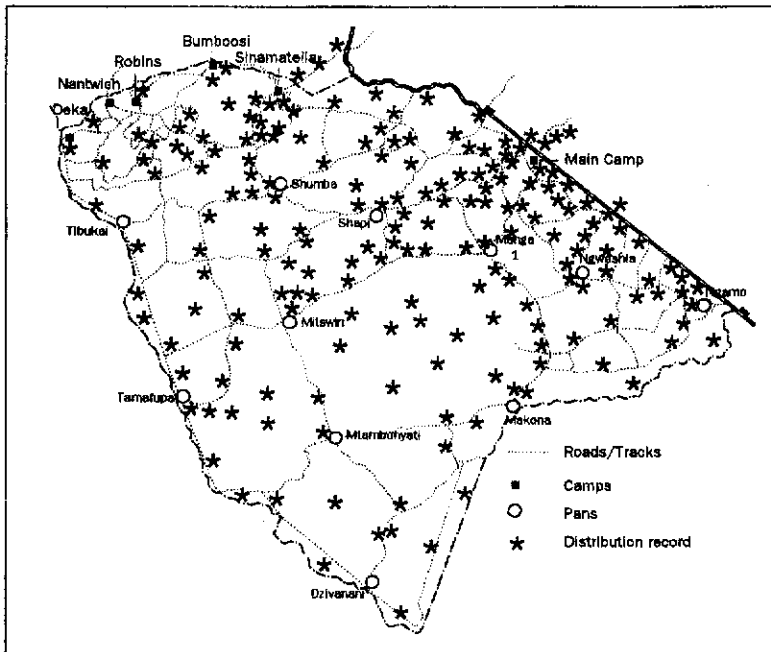
Skinner & Smithers (1990) feel that the name giraffe appears to have originated from the Arab word Xirapha (one which walks swiftly). However, the specific name *camelopardalis* no doubt appears to come from the size and markings of the animal. In other words "big as a camel" and "spotted like a leopard."

Taxonomic notes

At one time a number of different species of giraffe were recognised but at the present time modern taxonomists regard all giraffe as sub-species of *G. camelopardalis*. The sub-species *G.c. angolensis* is the one occurring in north western Zimbabwe and therefore the Hwange National Park.

Distribution

The giraffe is one of the most widespread of large mammals in the Hwange National Park and Wilson (1975) recorded it throughout with the exception of the very centre of the Park south of Tendele Pan. The lack of visual records from that area during the 1969/71 survey was no doubt due to the fact that there were no roads or even bush tracks in the area and secondly no aircraft, either fixed wing or helicopter, were available at that time.



Map 32 - Distribution of giraffe in the Hwange National Park as determined from marked transects ("road strip counts"), aerial surveys, Wildlife Society game counts and from wildlife forms

During the present survey giraffe were found to occur throughout the Hwange National Park and helicopter and fixed wing aircraft enabled us to examine areas that were generally

most inaccessible and where giraffe were recorded. Map 32 shows the distribution of giraffe in the Hwange National Park and from this map it is clear how wide their distribution was found to be.

Habitat

The species was found in every possible habitat in the Hwange National Park. They were recorded near pans in Baikiaea and Terminalia woodland, in Acacia woodland, Mopane country and even in very broken country both north and south of Sinamatella Camp.

Giraffe was one of the few species seen many kilometres from water in the central areas of the Park and especially south of Tendele Pan and west of Tindergrass Pan. The giraffe is also capable of going without drinking for long periods at a time and as a result, they are also found in very dry areas.

Habits

Groups of up to 30 animals were recorded by Wilson (1975) and during the present survey this was again the case. The Wildlife Society recorded one large group and there is also a record of 27 together near Ngamo Pan. There are 19 records of groups of sixteen and fifteen records of groups of 14 animals together. However, single animals were recorded on 300 occasions and two together 107 times.

Table 43 gives full details of all groups encountered during the present survey.

Giraffe are predominately diurnal animals and during the night when we were operating from a vehicle with a spotlight we usually found giraffe lying down with their necks erect.

Foods

Wilson (1975) gives a detailed list of plants eaten by giraffe so there would be no point in giving a similar list in this report. However, it is of interest to note that on 18 different occasions, giraffe were recorded feeding on *Gardenia spatulifolia* trees and distinct browse lines on the trees in the Nyamandhlovu area were noticeable.

Breeding

Newly born young were recorded for all months of the year. Figure 3 gives frequency of 104 newly born young. However, Fig. 3 does suggest a peak in calving during December/January but only additional research will confirm if this is true.

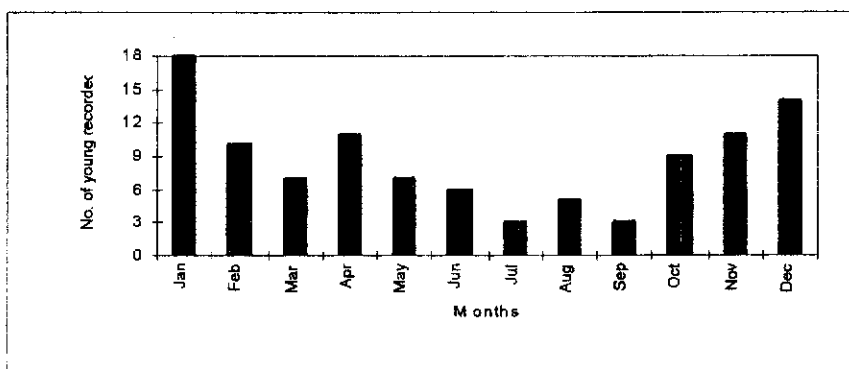


Fig 3 - Breeding data for giraffe

Status

Davison (1967) mentioned that giraffe being a semi-desert animal has done well in the Hwange National Park and that they were more plentiful in the Kalahari sand veld than in the more stony country in the north of the Park.

Table 43 - Number and size of giraffe groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	85	122	11	-	82	-	300
Two	50	26	6	-	25	-	107
Three	35	22	5	-	10	-	72
Four	39	5	3	-	16	-	63
Five	22	14	3	-	5	-	44
Six	16	5	1	-	4	-	26
Seven	23	3	1	-	1	-	28
Eight	14	2	0	-	0	-	16
Nine	5	2	3	-	0	-	10
Ten	3	2	1	-	1	-	7
Eleven	14	0	1	-	0	-	15
Twelve	5	1	0	-	0	-	6
Thirteen	4	0	0	-	0	-	4
Fourteen	3	2	0	-	0	-	5
Fifteen	3	0	1	-	0	-	4
Sixteen	18	1	0	-	0	-	19
Seventeen	2	0	0	-	0	-	2
Eighteen	2	0	0	-	0	-	2
Nineteen	1	0	0	-	0	-	1
Twenty	0	0	0	-	0	-	0
21-30	0	1	1	-	0	-	2
31-40	0	0	0	-	0	-	0
41-50	0	0	0	-	0	-	0
51-100	0	0	0	-	0	-	0
101 and over	0	0	0	-	0	-	0

Jones (1989) gave a population of about 2 500 giraffe in the Hwange National Park while the most recent data available is by Davies (1996) which estimated the population to be about 2 536 animals.

Table 44 gives details of various estimates of giraffe population over the past 7 years. The population of giraffe in the Hwange National Park would certainly not be less than 2500 animals and possibly more likely to be in the region of 3000 animals.

Table 44 - Numbers of giraffe in the Hwange National Park

Year	No. seen	No. estimated	95% C.L. (Range)	95% C.L. (%)	Author
1989	-	2500			Jones 1989
1994	202	2230	1669-2791	25.2	Davies 1994
1995	183	2036	1388-2684	31.8	Davies 1995
1996	214	2536	1706-3366	32.7	Davies 1996

Family **BOVIDAE**

The antelope and buffalo

This family is represented in the Hwange National Park by an assemblage of 17 species, namely: Common duiker (*Sylvicapra grimmia*); steenbok (*Raphicerus campestris*); Sharpe's grysbok (*R. sharpei*); klipspringer (*Oreotragus oreotragus*); reedbuck (*Redunca arundinum*); waterbuck (*Kobus ellipsiprymus*); impala (*Aepyceros melampus*); gemsbok (*Oryx gazella*); roan (*Hippotragus equinus*); sable (*H. niger*); tsessebe (*Damaliscus lunatus*); Blue wildebeest (*Connochaetus taurinus*); kudu (*Tragelaphus strepsiceros*); bushbuck (*T. scriptus*); eland (*Taurotragus oryx*) and buffalo (*Synceros caffer*).

A new species of antelope now found in the Hwange National Park is the oribi (*Ourebia ourebi*) while the Cape red hartbeest (*Alcelaphus buselaphus*) possibly no longer exists in the Hwange National Park.

Each of the 18 species mentioned above will now be dealt with separately.

Genus **CONNOCHAETUS**

Blue wildebeest

Connochaetus taurinus (Burchell 1823)

Connochaetes taurinus taurinus (Burchell 1823)

Colloquial name

This species has in the past often been referred to as the brindled gnu, a name very seldom used these days. The name Blue wildebeest no doubt refers to the blueish-grey colour which often becomes prominent in different light conditions.

Taxonomic notes

Only one sub-species occurs in southern Africa, namely *Connochaetes taurinus taurinus* (Burchell 1823).

Distribution

Davison (1967) mentions that up until 1935 there were no wildebeest at all in the Ngamo, Kennedy or Main Camp areas with the last of the animals being shot near Kennedy in 1926.

Davison says that during the drought of 1934 large numbers of wildebeest concentrated at Dzivanini and when the water gave out many of them moved up the Sekumi and Kennedy valleys and a few even reached Ngamo and Kennedy where they survived.

Davison mentioned that following the drought when he was on patrol in the Dzivanini area he found many heaps of bones of the animals that did not make it up to Ngamo and Kennedy. He mentioned that those that survived the long journey to Ngamo and Kennedy were only about 25 animals with some calves and that they have remained in those areas ever since.

Davison said the population had increased to over 3 000 animals from the original 25+ by 1967. By 1967 there was also a small herd of wildebeest in the Robins area and another at Sinamatella. (Davison 1967).

By 1969/71 when I carried out my 2 year survey of the Hwange National Park, wildebeest were widespread in the Park with the main concentration occurring in the Ngamo/Makololo area and around Main Camp. They were also recorded at that time in the Dzivanini/Leasha/ Limpande area and at several places in the Robins area. While a group of 4 did occur in the Sinamatella area in 1969/71 the species was very seldom seen there. A small herd also occurred near Shumba and even occasionally at Shapi. (Wilson 1975).

During the present survey the main concentration of wildebeest was found to occur in the Ngamo/ Makololo/ Ngweshla/ Kennedy areas and then another large concentration around Main Camp/ Dom/ Nyamandhlovu. A small concentration exists around Shumba, a few in the Robins area and a very small herd at Sinamatella. Odd pockets of wildebeest also occur around Shapi and Guvalala.

It is of interest to note that during the 1996 survey no wildebeest or in fact any sign of them were recorded along the Botswana border or in the areas around Mitswiri, Matambonyati, Makona or Dzivanini. With the exception of Main Camp and concentrations of wildebeest around Kennedy/ Ngweshla/ Makololo and Ngamo there has been a distinct reduction in the range of the species since the 1969/71 survey.

The 1996 aerial survey of the entire Park (Davies 1996) did not record any wildebeest in the north and west of the Park. The same position applied in 1995 (but 2 were seen at Sinamatella). (Davies 1995). During the 1994 aerial survey 2 wildebeest were seen at Sinamatella. (Davies 1994).

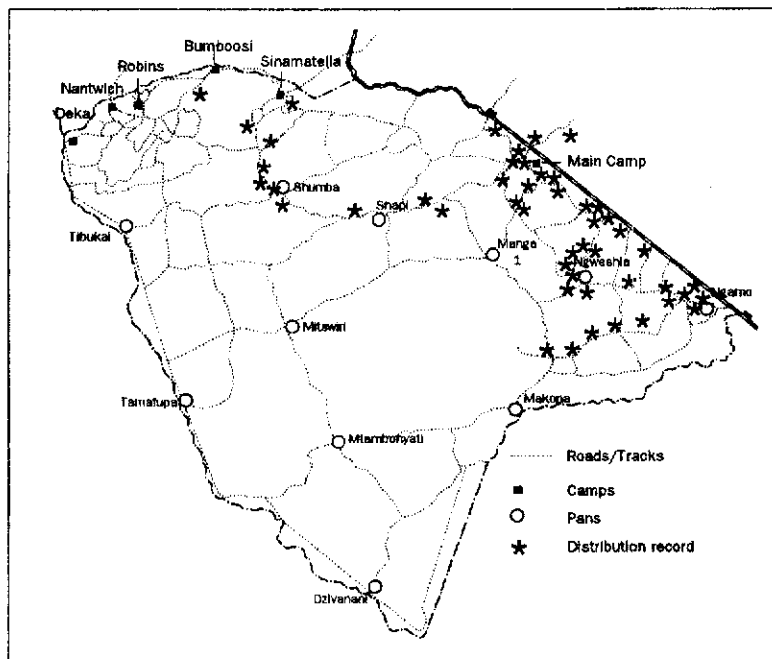
During the present survey I noted that a very good strong double game/cattle fence exists along the Botswana border in the Nata/ Dzivanini area. As Davison (1967) pointed out and which I also saw in 1969/71 the Dzivanini area was one of the main migration routes of wildebeest from Botswana to Hwange National Park. The erection of the double fence definitely prevents any movement of wildebeest into the south western section of the Hwange National Park.

On 3rd May 1996 after flying backwards and forwards along fixed transects for 3½ hours in the Robins area no wildebeest were seen and it was also in this area that no wildebeest

were seen during the 1994 (Davies 1994), 1995 (Davies (1995) and 1996 (Davies 1996) aerial surveys.

On 3rd May 1996 a similar flight over the Sinamatella area again revealed no wildebeest. However, on the ground during "road strip counts: 6 wildebeest were seen near the Lukozi River and the Wildlife Society also recorded two wildebeest at Mandavu Dam. The marked transects ("road strip counts") in the Robins and Sinamatella areas also confirmed that there were very few wildebeest left in the northern parts of the Park. For additional details of results of road strip counts see Table 45 for transect numbers.

One possible reason for the reduction in the wildebeest population in the Robins area could be the drying out of the Mopani woodland and the vleis in the area over the past few years of drought (other than 1995/1996). The entire area is distinctly a lot drier than it was 25 years ago and this may have affected the distribution of wildebeest in the area. Map 32 gives the distribution of wildebeest as determined from the present 1996 survey.



Map 32 - Distribution of wildebeest in the Hwange National Park as determined by marked transects (road strip counts), Wildlife Society game count, wildlife forms and all aerial surveys

Habitat

The Blue wildebeest usually occurs on open grasslands around pans, especially around Kennedy, Main Camp, Ngamo and Makololo. However, they have also been recorded in open Mopane woodland in the Robins and Sinamatella area and near the Lukozi River they have been seen in hilly and broken country. This type of habitat is certainly not one favoured by the species.

It appears as if shade and certainly drinking water is an essential requirement. They were also recorded moving to short grass areas during the dry season in the Hwange National Park but these are all short distance seasonal movements.

Habits

Blue wildebeest are essentially gregarious animals and herds of almost every possible size has been recorded in the Hwange National Park. (See Table 45). However, while single individuals which are usually bulls were recorded on 77 occasions the most common actual herd size was between 21 and 30 animals and this size group was recorded on 31

Table 45 - Number and size of wildebeest groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	37	22	13	-	5	-	77
Two	13	7	2	-	1	-	23
Three	8	3	0	-	4	-	15
Four	8	4	1	-	0	-	13
Five	1	5	0	-	0	-	6
Six	4	2	1	-	0	-	7
Seven	5	3	2	-	0	-	10
Eight	4	2	1	-	1	-	8
Nine	2	0	0	-	0	-	2
Ten	5	1	2	-	0	-	8
Eleven	7	1	0	-	0	-	8
Twelve	5	0	0	-	1	-	6
Thirteen	6	1	1	-	0	-	8
Fourteen	7	1	0	-	0	-	8
Fifteen	8	2	0	-	0	-	10
Sixteen	3	0	0	-	0	-	3
Seventeen	2	2	0	-	0	-	4
Eighteen	5	0	0	-	0	-	5
Nineteen	1	1	0	-	0	-	2
Twenty	2	2	0	-	0	-	4
21-30	21	7	1	-	2	-	31
31-40	14	3	3	-	1	-	21
41-50	10	3	0	-	1	-	14
51-100	11	3	0	-	0	-	14
101 and over	4	1	0	-	0	-	5

occasions. Large herds of 41-50 were seen on 14 occasions and groups of over 100 were recorded on no less than 5 occasions.

Herds of thousands have not been seen in the Hwange National Park but Wilson (1975) mentioned a concentration of 213 at Ngamo in January 1968. On a helicopter flight on 26th March 1996 from Umtshibi Camp to Ngamo the following herds and concentrations of wildebeest were seen: Kennedy 37; Mbiza 109; Ngamo 560+; Makololo 49 and Samavundhla 41. This represented a total of 796 wildebeest in 5 groups.

Food

Grasses eaten by wildebeest in the Hwange National Park include the following: *Brachiaria xanthalenca*, *Chloris virgata*, *Dactyloctenium aegyptium*, *Digitaria pentzii* and *Urochloa brachyura*, *Cynodon dactylon* is one of the main grass species throughout their range in the Hwange National Park.

Breeding

When I arrived in the Hwange National Park to commence my one year survey in early January 1996 most of the wildebeest females had already calved. However, during January 1996 I did see another 18 females with newly born calves and several that could not have been more than a day or two old. In all cases the umbilical cord was still present so the young calves could not have been more than a week old.

On one occasion, close to our camp at Umtshibi, we came across a female that had just calved. It was at 7.15 am on 18th January 1996 and the calf had just risen onto its feet with the afterbirth still hanging from the vulva of the female.

On another occasion on 21st November 1996 at Kennedy II Pan area a group of 27 wildebeest were seen. Sixteen of the females had calved down within a day or two and some females were still about to produce their young. Amidst this herd of wildebeest were 6 Black-backed jackals and they remained very close to the wildebeest. As the wildebeest moved so the jackals moved with them. The scavengers were no doubt feeding on the afterbirth of the females.

The calving season in the Hwange National Park appears to be from the middle of November to the end of December with some females still dropping calves in early January.

Status

As mentioned above, Davison (1967) mentioned that in 1935 there were no wildebeest in the Ngamo/ Kennedy/ Main Camp area and they appeared to have moved into the Dzivanini area in 1934 and thereafter some moved up towards Kennedy and Ngamo. By 1967 Davison thought there were as many as 3 000 wildebeest in the area.

Wilson (1975) mentions that a great deal of culling of wildebeest had taken place in the area and by the time that the 1969/71 survey had taken place there were no longer the large herds of wildebeest that could be seen in 1967/68.

The Department of National Parks & Wildlife Management 1964 annual report mentioned a concentration of 8 000 wildebeest in the vicinity of one pan in the southern section of the Park. Unfortunately the report did not say at what pan these animals were seen. Anyway by November 1973 the population of wildebeest in the Hwange National Park was estimated to be about 1 800 animals (Wilson 1975) and Jones (1989) felt the population to be as few as 1 300 animals.

Aerial surveys carried out in 1994 gave a population of 1 053 animals (Davies 1994) and in 1995 as only 638 wildebeest (Davies 1995). The most recent aerial survey in

September 1996 gave a figure of 665 (Davies 1996). Table 46 gives details of the various estimates of wildebeest in the Hwange National Park.

Table 46 - Estimates of wildebeest population in Hwange National Park

Year	No. seen	No. estimated	95% C.L. (Range)	95% C.L. (%)	Author
1973		1800	-	-	Wilson (1975)
1989		1300	-	-	Jones (1989)
1994	160	1230	313-2147	74.6	Davies (1994)
1995	68	638	68-1529	139.6	Davies (1995)
1995	62	665	62-1390	108.9	Davies (1996)

Taking all the above factors into account and the fact that on 26th March 1996 on a helicopter flight from Umtshibi to Ngamo a total of 796 different wildebeest were counted but one can quite safely say that all the wildebeest in the Park were not seen on that flight. Several hundred wildebeest also exist on the Kennedy Vlei, around Main Camp and especially around Dom and Nyamandhlovu. I would, therefore, be inclined to give an estimate of between 1 500 and 2 000 wildebeest in the Hwange National Park during 1996.

Genus *ALCELAPHUS* (Blainville 1816)

Red hartebeest

Alcelaphus buselaphus (Pallas 1766)

Alcelaphus buselaphus caama (G. Cuvier 1804)

Colloquial name

This species is often referred to as the Cape hartebeest but the name is really not appropriate as this hartebeest is not confined to the Cape but occurs in many areas in Namibia and Botswana.

Taxonomic notes

Ansell (1972) recognised 12 sub-species from the continent of Africa of which only one, *Alcelaphus buselaphus caama* occurs in Southern Africa and therefore eastern Botswana and Hwange National Park.

Distribution and status

Davison (1967) says "the Cape hartebeest is perhaps the rarest animal in the Park. When I did my first patrols I found a small troop of twelve near Sibaninni and a skull in one of the Bushman camps. At that time they had not been recorded in Rhodesia and did not appear on the game list. Since those early days one or two small herds in the Sibaninni area are all that we have recorded, with the exception of two animals which appeared at Kennedy."

Davison (1967) goes on to say that one of the two seen at Kennedy was killed by lions while the other one appeared to have moved to Ngamo. He also mentioned that there were

reports of a single animal seen at Robins on only one occasion.

Wilson (1975) in addition to the details already given by Davison (1967) mentions that Smithers (1971) states that the Cape hartebeest is found in the north east of Botswana through to the Rhodesian border. Wilson (1975) also says that on 28th July 1973 four Cape hartebeest were released at Waterloop (Makwa area) and that these animals were captured in the Plumtree area.

As the species has not been seen in the Hwange National Park for many years now it is assumed that the last remaining animals have died or disappeared and that they no longer occur in the Hwange National Park.

Genus *DAMALISCUS* (Sclater & Thomas 1894)

Tsessebe

Damaliscus lunatus (Burchell 1832)

Damaliscus lunatus lunatus (Burchell 1832)

Colloquial name

The name tsessebe comes from the Tswana name for the species which is Tshêsebe.

Taxonomic notes

Only one sub-species is recognised in southern Africa, namely *D.l. lunatus*.

Distribution and status

Wilson (1975) mentioned that the tsessebe was one of the rarest antelope in the Park and that during the 1969/71 survey there were unlikely to be more than 100 animals present in the Hwange National Park. The bulk of the population at that time (1969/71) occurred in the Robins area where the species was seen on the Tshowe Drive, Chingahobi, Dandari, Dolilo, near Robins Camp and also on Deka Farm.

Further south tsessebe were seen at Nehimba and there were several at Shumba. Two were seen at Main Camp and these were often seen in the Guvalala/ Nyamandhlovu area.

Jones (1989) mentions a population of 100 in the Hwange National Park but from reading through his report it appears as if he was merely quoting the figure of 100 that I gave in 1975. (Wilson 1975).

The tsessebe population in the Hwange National Park is now considerably different to what it was in 1969/71 when there were perhaps as many as 100 animals. Even Davison (1967) remarks that the tsessebe has not increased and I quote him in full:

"Tsessebe, too, have not increased. They occur in small troops in the Robins area and there is a troop near Shumba but, apart from these small numbers, they are not present elsewhere in the reserve. They calve regularly in September each year but the young seem to be mopped up by wild dogs. Like the hartebeest, they are one of the failures under protection as far as Wankie is concerned." unquote.

In 1994 the aerial survey recorded 5 tsessebe in the Park and from that Davies (1994) calculated the population to be about 45 animals with a 95% C.L. range of from 5-126 animals.

Davies (1995) did not record any tsessebe during the 1995 annual aerial survey and nor were any seen during the 1996 aerial survey of Hwange National Park. (Davies 1996). After covering vast areas of the Park on the ground and also after flying by helicopter and fixed wing aircraft, I did not see even one tsessebe over the period of a full year.

However, in September 1996 during the Wildlife Society's annual game count at waterholes in the Park a group of 12 tsessebe were seen at the Deka Home Vlei. This is on the extreme northern boundary of the Hwange National Park and I believe other tsessebe occur in the Kasuma Pan National Park. A group of about 8 tsessebe were also seen in the Dett Vlei during the year.

Therefore the population of tsessebe in the Hwange National Park was found to be very low and it appears unlikely of there being even 20 left in the National Park.

Genus *SYLVICAPRA* (Ogilby 1837)

Common or Grey duiker

Sylvicapra grimmia (Linnaeus 1758)

Sylvicapra grimmia splendidula (Gray 1871)

Colloquial name

The duiker was named after its characteristic habit of diving at high speed through the bush in a series of jumps. The Afrikaans word for dive is duik and from this the name duiker was derived.

As the species is one of the most common antelope in South Africa it is not surprising that the name Common duiker was given to it. In some areas of its distribution this duiker is a greyish colour and that no doubt is why it also referred to as the Grey duiker.

Taxonomic notes

The sub-species occurring in north western Zimbabwe and northern Botswana is *S.g. splendidula*.

Distribution

Wilson (1975) found the species to be common in the area south of Main Camp and south eastwards towards Ngamo. They were also recorded from the Dzivanini area and along the Botswana border. Wilson (1975) also indicated that the species was rare or absent in some places in the Robins/ Sinamatella area.

During the present survey the Common duiker was seen on numerous occasions in the area south and south east of Main Camp and also along the Manga Vlei. They were definitely more common in the Baikiaea/ Acacia/ Terminalia vegetation than in Mopane woodland where they were found to be rare or even absent.

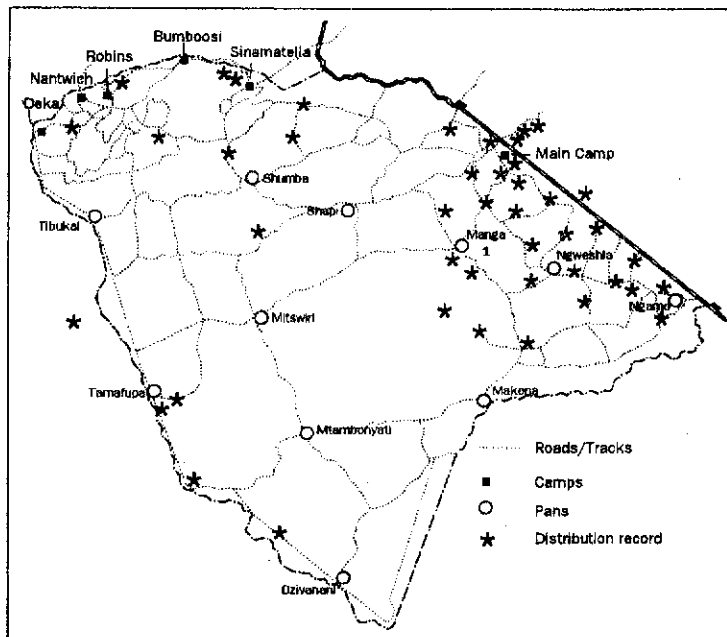
After three full months in the Sinamatella area and after covering every road in the area and even working at night with a spotlight, only five Common duiker were seen. There were many reports of Common duiker in the Sinamatella area but the species is easily confused with steenbok by people unfamiliar with both species. Therefore, most of the records of Common duiker south of Sinamatella and in the Mopani woodland has been discarded.

However, the species does occur in the broken country north of Sinamatella and I personally saw a pair on the airstrip at Sinamatella late one night. I also saw a single duiker

in the riverine Acacia belt along the Sinamatella River.

While no Common duiker were seen in the Mopane country in the Leasha/ Dzivanini area during the preset survey they were however seen at night along the Botswana border and at Tamafupa early in the morning.

Map 33 shows the distribution of the Common duiker as determined by the 1996 survey.



Map 33 - Distribution of Common duiker in the Hwange National Park as determined from marked transects ("road strip counts"), Wildlife Society game counts and from night observations

Habitat

The Common duiker prefers the Kalahari sand country as long as some cover is available. However, while it does not exist in open dry Mopane woodland in the north of the Park it was found to be very localised in riverine vegetation or in thickets within the Mopane woodland. In the Baikiaea woodland south of Main Camp and in the Acacia thickets surrounding the Ngamo plains the duiker was common and often seen at night.

It was also found in the Terminalia scrub thickets and woodland along the Botswana border and in the broken and hilly country east of Shumba and south of Sinamatella.

Habits

The Common duiker is essentially a nocturnal and in some places a crepuscular species. It was rarely seen about during the day but on very wet and overcast days it was often seen on the side of the road between Main Camp and Umtshibi.

The species is solitary in habit but a female in oestrus will often be accompanied by a male. When two animals are seen together it is generally a female with her young or a female with a courting male. See Table 47 for details of groups encountered during the survey.

Food

No new food items were added to the list of plants eaten in the Hwange National Park as given by Wilson (1975). The reader is therefore referred to Wilson (1975) for details of plants eaten.

Table 47 - Number and size of Common duiker groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	8	3	2	-	38	7	58
Two	1	1	0	-	1	2	5
Three	0	0	0	-	0	1	1
Four	0	0	0	-	0	0	0
Five	0	0	0	-	0	0	0
Six	0	0	0	-	0	0	0
Seven	0	0	0	-	0	0	0
Eight	0	0	0	-	0	0	0
Nine	0	0	0	-	0	0	0
Ten	0	0	0	-	0	0	0
Eleven	0	0	0	-	0	0	0
Twelve	0	0	0	-	0	0	0



Status

The Common duiker is one of those species that it would be almost impossible to estimate the size of a population in any given area. Even in very small areas of only about 100 hectares it is very difficult to say how many duiker are present. Wilson (1975) and Jones (1989) both avoided giving even a rough estimate of the number of duiker in the Hwange National Park.

I have been studying the Common duiker for over 20 years in a large number of habitats in many countries in Africa and all I am able to say about the Hwange population is that it is healthy and there must be several thousand animals in the Park.

Genus *OREOTRAGUS* (A. Smith 1834)

Klipspringer

Oreotragus oreotragus (Zimmermann 1783)

Oreotragus oreotragus stevensoni

Colloquial name

The English name is the same as the Afrikaans and is fully descriptive. It relates to the animal jumping from one rock to another.

Taxonomic notes

Four sub-species occur in the southern African Subregion namely *O.o. oreotragus* from the Cape to the Orange River; *O.o. transvaalensis* from the Transvaal to Natal and possibly southern Mozambique; *O.o. tyleri* in Angola and Namibia and finally *O.o. stevensoni* in Zimbabwe and Botswana.

Distribution and Status

The klipspringer was found to be confined to the broken country and rocky outcrops of the north eastern section of the Hwange National Park and did not occur anywhere else in the Park (Wilson 1975).

During the present survey there was no difference in the distribution and status of the species in the Hwange National Park compared to 25 years ago. There were visual records from north of Shumba on the granite outcrops, three records of two animals from Bumboosi, a record of a large adult male from the Kashawe Loop Road and three separate records of the klipspringer in the broken country about 20 km south of Sinamatella Camp.

From the few records available it was not possible to give any indication of the status of the species especially as it lives in such very broken and inaccessible country and was hardly ever seen. However, I believe the species is a lot more common than the few visual records show. Additional details on food and feeding habits, habitat requirements, predation and breeding can be found in the book on the Mammals of Hwange National Park (Wilson 1975).

No distribution map for this species has been included in this report.

Genus *OUREBIA* (Laurillard 1841)

Oribi

Ourebia ourebi (Zimmerman 1783)

Ourebia ourebi rutila (Blaine 1922)

Colloquial name

Skinner & Smithers (1990) believe the name oribi is derived from the Khoikhoi name orabi.

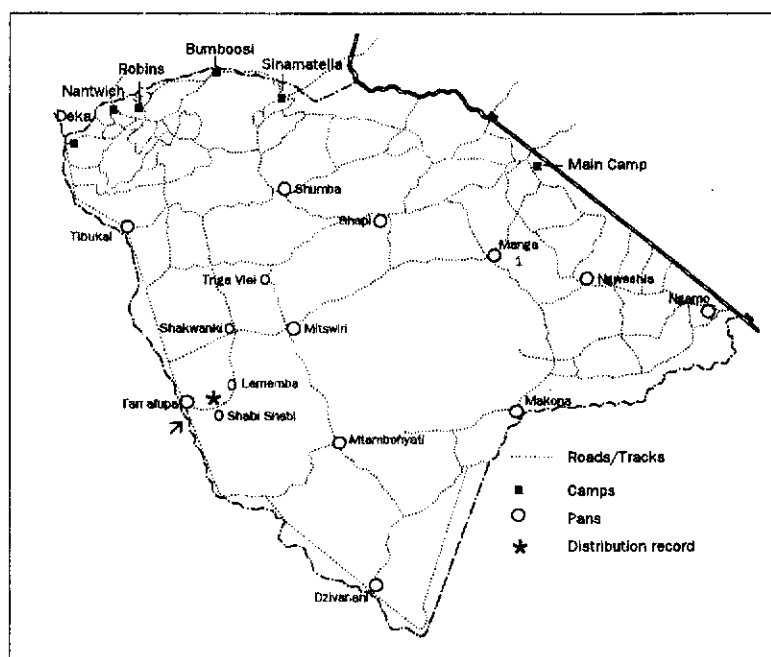
Taxonomic notes

Ourebia owebu nastata (Peters 1852) is the sub-species occurring in eastern and south eastern Zimbabwe and also northern Mozambique while *O.o. rutila* (Blaine 1922) supposedly occurs in north western Zimbabwe, north eastern Botswana and north eastern Namibia.

Distribution

During the 1969/71 survey of the Hwange National Park I believed that we saw an oribi in the Shumba Pan area but as the species was not known from Hwange National Park the record was discarded. However, I did mention in my book on "Mammals of Wankie National Park", page 142 that there were several areas of suitable habitat for oribi in the Hwange National Park and those included Madundumela, Shumba and Danderi Vleis. (Wilson 1975).

Oribi are well known from just north of the Hwange National Park in the Kazuma Pan Depression and at one time a population of at least 20 occurred in that area. (Wilson 1975; Smithers & Wilson 1979). I could, therefore, see no reason why the species should not occur in the Hwange National Park especially as there were several areas of very suitable habitat and also as Mr. Peter Ngwenya of the Research Branch at Main Camp had also previously reported the sighting of an oribi near Shakwanki.



Map 34 - Single locality at which oribi were recorded in the Hwange National Park

On the morning of 1st August 1996 while travelling from Tamafupa to Mitswiri, Peter Ngwenya and I very clearly and at close range saw 2 oribi, a male and a female, about 1 kilometre from Shabi Shabi seeps (which were dry). The animals ran across the road in front of our vehicle and after only about 100 metres they stopped and watched us.

This visual sighting is, therefore, the first positive record of the species for the Hwange National Park and the small pan which contained water close to the road and where the oribi were seen was named Oribi Pan. Therefore, it can be assumed that a small population of oribi exist in the Triga Vlei stretching from Shabi Shabi up towards Lememba and Shakwanki. (See Map 34).

Genus *RAPHICERUS* (H. Smith 1827)

Steenbok

Raphicerus campestris (Thunberg 1811)

Colloquial name

Skinner & Smithers (1990) state the name is derived from the Afrikaans word steen, which is a red brick. This, therefore, means a "red brick bok" or steenbok.

From time to time the word steinbok has been used which, as Skinner & Smithers (1990) pointed out, is unfortunate as it is the German name for the ibex, *Capra ibex*.

Taxonomic notes

Wilson (1975) referred to the sub-species occurring in the Hwange National Park as *Raphicerus campestris steinhardtii* but did say that a revision of the sub-species was long overdue. Both dark red and light coloured animals were recorded in the Hwange National Park.

Distribution

Wilson (1975) very clearly indicated that the steenbok during the 1969/71 survey only occurred in the area south of Shumba and that there were no visual records from the Mopane country around Robins/ Deteema/ Mandavu and Sinamatella. Wilson goes on to say that north of Shumba the steenbok is replaced by the Sharpe's grysbok .

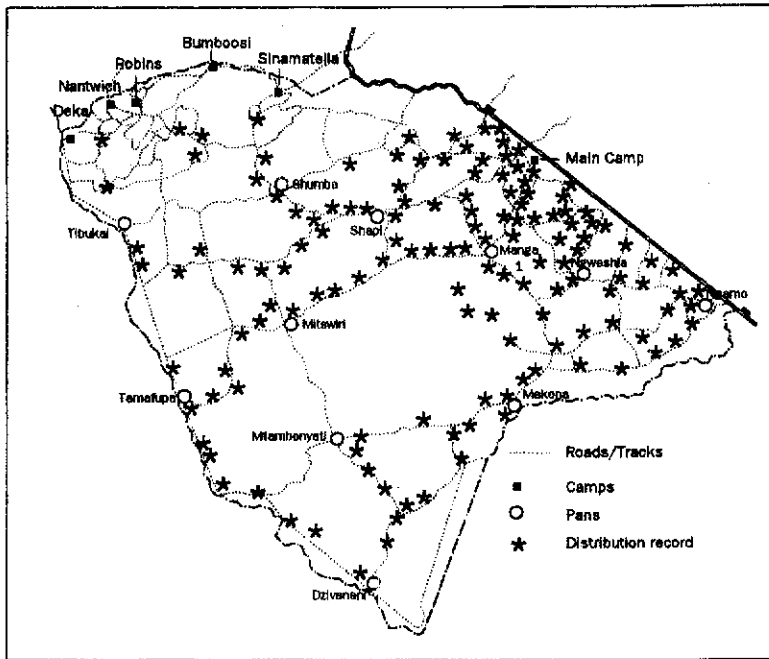
However, during the present survey steenbok were recorded on several occasions in the Robins, Sinamatella, Deteema and Mandavu areas and this was found to be completely different to what it was 25 years ago. This is difficult to explain but may well be as a result of the decrease of the number of Sharpe's grysbok in that area and the possible drying out of the northern part of the Park. (See also remarks under Sharpe's grysbok below).

Map 35 gives the distribution of steenbok during 1996 as determined by "road strip counts", night observations, Wildlife Society game counts and aerial surveys (by helicopter).

Habitat

The steenbok occurs in a wide variety of habitats but prefers the dry Kalahari sand country where it is more open and where there is short grass. They are also common in light woodland especially if *Acacia* and *Terminalia* trees are present.

During the present survey the species was found to occur very occasionally in open Mopane woodland and even in a hilly area west of Sinamatella Camp. Both the last two mentioned habitats are unusual for the steenbok.



Map 35 - Distribution of steenbok in the Hwange National Park as determined from marked transects ("road strip counts"), Wildlife Society annual game count, wildlife forms, night observations and by aerial surveys with the helicopter

Habits

The steenbok was generally found as a solitary animal although pairs were seen on 23 occasions. (See Table 48). They were very often seen close to the main tourist roads where they became so accustomed to vehicles that they made no effort to run off.

Table 48 - Number and size of steenbok groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, all aerial surveys and night observations

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	122	4	16	-	0	0	142
Two	21	0	2	-	0	0	23
Three	0	0	0	-	0	0	0

A steenbok female with a broken right front leg was seen within 5 metres from the road near White Hills Pan on no less than 6 occasions and each time she was seen she limped along with the leg dangling. She appeared in otherwise good condition and fed happily close to the road.

After a very severe fire had swept through the area between Guvalala and Nyamandhlovu and the entire area completely burnt out with not a patch of grass remaining, the steenbok was the only species seen in the area close to the road. On three occasions adult steenbok were seen lying in the open on burnt ground within an hour of the fire passing through the area. Some dead trees were still smouldering and yet the steenbok were present.

Foods

A detailed list of plants eaten by steenbok is given by Wilson (1975) so there is no need

to repeat the details here. No new and additional data was obtained during the present survey.

Status

While no accurate details of the size of the population of steenbok is available for the Hwange National Park it is fairly certain that many thousand occur throughout the southern and eastern parts of the Park. In the northern area they are present but not common.

Sharpe's grysbok

Raphicerus sharpei (Thomas 1897)

Raphicerus sharpei colonicus (Thomas & Schwann 1906)

Colloquial name

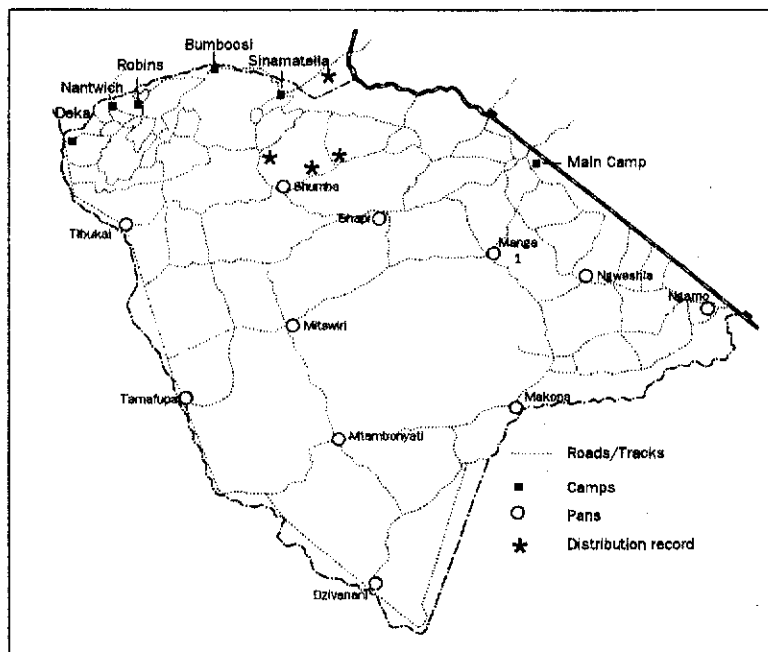
This grysbok was named after Sir Arthur Sharpe who first collected the specimen in southern Angoniland in Malawi from which the species was described. (Skinner & Smithers 1990).

Taxonomic notes

There still remains the question as to whether *R.s. colonicus* is a synonym of *R.s. sharpei* (Meester et.al. 1964); Wilson (1975).

Distribution

Wilson (1975) referring to the 1969/71 survey of the Hwange National Park indicated that the Sharpe's grysbok was confined to the northern part of the Park and that it was not recorded south of the Shumba/ Dandari Road. At that time it was replaced south of Shumba by the steenbok although the two species did occur marginally on the same ground in the Shumba area.



Map 36 - Distribution of Sharpe's grysbok in the Hwange National Park as determined from marked transects ("road strip counts"), Wildlife Society game count, wildlife forms and aerial surveys.

In 1969/71 the species was recorded at Tshompani, Tshakabika, Mtoa River and north to Bumboosi and along the Lukozi River in addition to Robins Camp and the Robins area. (Wilson 1975). During the present survey there are only three records of a Sharpe's grysbok for the entire area and that was near Masuma Dam where my wife, Paddy Wilson saw a grysbok in June 1996. In addition there are two other records near Shumba.

During the National Parks 1996 annual aerial survey of north western Matabeleland a single Sharpe's grysbok was seen on Transect HK08 on the Dzivanini Stratum on 14th September 1996. (Davies 1996). I personally doubt this record for three reasons. First it is almost impossible to see grysbok from the air especially from a fixed wing aircraft. Secondly, the Dzivanini habitat is quite unsuitable for grysbok and finally the record is well out of the normal range of grysbok in the Hwange National Park.

There is also another positive record of grysbok from the vicinity of Hwange National Park and that was from Mbala Lodge just outside the Park where one of the National Parks Game Scouts saw a Sharpe's grysbok near Red Pan on May 1996. (See Map 36).

Status

During the 1969/71 survey of the Hwange National Park, Wilson (1975) when referring to grysbok, states "even though they occur in the Robins area and around Robins Camp they are not common there. In fact the only part of the Park where the species is common is along the Lukozi River. Over a distance of 10 miles, 19 grysbok were seen on the evening of 9th October 1969." During the present 1996 survey the Lukozi River marked transect was covered on no less than 18 occasions by several different teams and at different times of the day throughout the year and not one Sharpe's grysbok was seen.

I have mentioned previously (under the elephant profile of this report) that 25 years ago the riverine vegetation along the Lukozi River was very dense indeed and that was when grysbok were found there. Today (1996) the vegetation has thinned out considerably as a result of elephant destruction and grysbok no longer occur along the Lukozi River Drive where 25 years ago they were common. However, their distribution may well have shifted southwards into the broken country south of the Lukozi and east of Shumba.

Genus AEPYCEROS (Sundevall 1847)

Impala

Aepyceros melampus

Aepyceros melampus melampus (Lichtenstein 1812)

Colloquial name

The Zulu name for the species is impala while the Tswana name is phala. It is quite possible that either of these two names we used and anglicised to become impala.

Taxonomic notes

Two sub-species of impala occur in the southern African Subregion. The Black-faced impala, *A.m. petersi* (Bocage 1879) is found in northern Namibia and south western Angola while the other sub-species *A.m. lichtenstein* occurs throughout the remainder of southern Africa.

Distribution

Davison (1967) mentions that in the early days of the Hwange National Park the impala was another species that occurred only in the Deka and Lukozi River basins while the

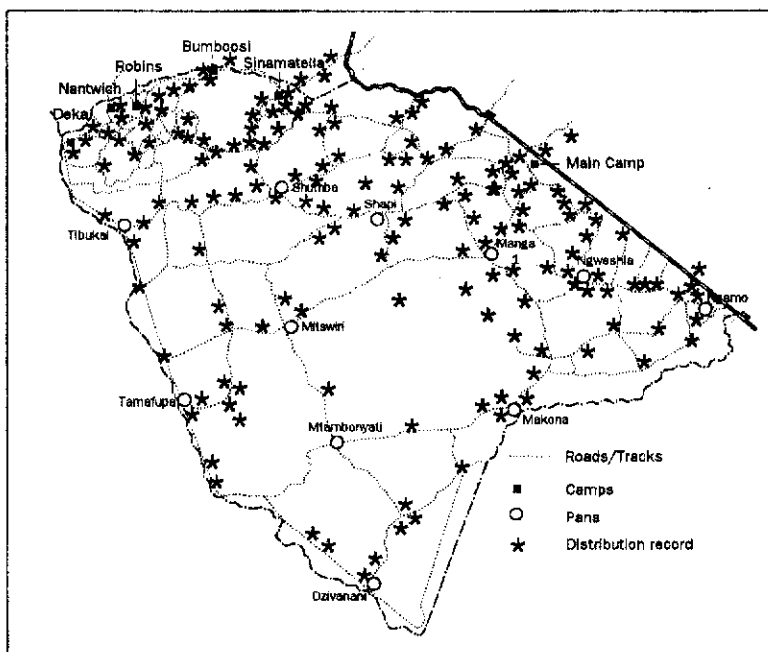
Kalahari sand country was totally unsuited to them. However, one or two small pockets did at that time occur south of the Lukozi and Deka areas and one was between Shapi and Mtoa.

Davison goes on to say that by the time he published his book in 1967 the impala in the Shapi/ Mtoa area had not increased beyond 'normal' considering the protection they were given. He goes on to say that small troops have appeared at Tschebema and Nyamandhlovu but these are out of their natural habitat and also that impala did not occur in the Mopane country in the Dzivanini area. He also mentioned one small troop of 10 on the Nata River in Botswana about 20 miles west of the border.

Wilson (1975) felt that the main area of distribution of impala was in the north of the Hwange National Park lying north of 19°S but that the species was extending its range all the time and was also found at Ngamo, Shakwanki and near Hendricks Pan on the Botswana border. During 1969/71 there were very few impala in the Main Camp area and only very occasionally were four or five seen on the "Ten Mile Drive". By 1973 there were already no less than 100 impala in the "Ten Mile Drive" and another 40 in the Guvalala area. (Wilson 1975).

Wilson goes on to say that the spread of impala to the Main Camp area and their increase in numbers may well have been as a result of the over population which led to the culling of the species in the Robins/ Sinamatella area in 1969 and 1970. (Wilson 1975). A National Parks report dated 24th February 1969 indicated that there were four main concentrations of impala in the north of the Park, these being at Masuma (500 animals), Mandavu (1 500 animals), Deteema (2 000 animals) and Dolilo (2 000 animals).

Since 1969/71 (Wilson 1975) the situation regarding the distribution of impala has changed dramatically. Over the last 20 years impala have spread throughout the Park. By the time the 1996 survey was done impala were found to occur almost everywhere in the Park and they were recorded all along the Botswana border and throughout the central parts of the Park even though their numbers were very low in some places such as Tindergrass, Tendele and Mitswiri.



Map 37 - Distribution of impala as determined from marked transects ("road strip counts"), aerial surveys, Wildlife Society game counts and wildlife forms

However, vast concentrations were found at Nyamandhlovu, Dom, Dopi, Manga, Kennedy and good numbers all the way to Ngweshla and down to Ngamo. See Map 37 for distribution of impala during 1996.

Habitat

Wilson (1975) mentions that at one time the impala was confined to the Mopane on basalt soils in the north of the Park but that by 1975 they occurred in a wide variety of habitat types. Even Davison (1967) said that the impala was confined to the north of the Park and that the Kalahari sand country was totally unsuited to them.

The situation has changed unbelievably since Wilson wrote his report in 1975 and Davison in 1967. The largest herds of impala now occur on Kalahari sand in the south and east of the Park and the size of the herds and indeed the population in the north of the Park in Mopane woodland is now smaller than those of the south. The Kalahari sand vegetation now appears to be a more favourable habitat than the Mopane woodland. This is all very difficult to explain and much more research is needed.

Habits

Table 49 gives the sizes of the various groups of impala seen during the 1996 survey. From this it is clear that every possible size of impala herd was seen in addition to over 18 herds of over 100 impala in a herd. There were also 30 records of impala herds numbering between 51 and 100 and 45 records of impala herds of between 21 and 30 animals. The largest herds of impala were seen from November until about April/May when there were very large numbers of young with the herds.

Food

A detailed list of grasses and tree species fed on by impala is given in Wilson (1975) so there is no need to repeat it here.

Breeding

The impala in the Hwange National Park have a well defined breeding season and young are dropped from the middle of November to the end of December. However, some females were still noted producing young in the middle of January but these were definitely later as the peak is end of November and the first two weeks of December.

Status

Wilson (1975) mentioned that in November 1973 it was estimated that there were at least 8 000 impala in the Hwange National Park and that was after 6 400 impala were culled during the period 1969/70. Before the 1969/70 cull there must have been at least 15 000 impala in the Park of which at least 10 000 occurred in the Masuma/ Mandavu/ Deteema/ Dolilo areas (Wilson 1975). After the major 1969/70 cull the impala began to spread out and it was in the years that followed that their numbers increased in the Main Camp/ Kennedy area.

By 1989 it was estimated that there were about 30 000 impala in the Park (Jones 1989) although Davies (1994) as a result of an aerial survey estimated the population to be only 2 115 with a 95% C.L. range of from 805 to 3 425 impala. Davies (1995) estimated the population to be about 2 957 impala and in 1996 Davies (1996) estimated the population to be 4 312 with a 95% C.L. range of from 2 560 and 6 065 animals.

From my own personal observation it was apparent that even with a helicopter and after flying slowly over an area where I knew over 500 impala occurred very few animals were seen. Therefore, the task of counting impala from a fixed wing aircraft was a lot more difficult and many thousands were no doubt missed. I believe the aerial survey results of impala for the period 1994 to 1996 (Davies 1994, 1995 and 1996) were greatly underestimated.

Table 49 - Number and size of impala groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	66	33	11	-	6	-	116
Two	45	25	10	-	2	-	82
Three	31	22	7	-	4	-	64
Four	27	19	3	-	5	-	54
Five	20	17	6	-	2	-	45
Six	27	17	2	-	4	-	50
Seven	19	15	2	-	6	-	42
Eight	16	12	5	-	3	-	36
Nine	12	5	2	-	1	-	20
Ten	15	8	8	-	6	-	37
Eleven	8	9	2	-	1	-	20
Twelve	12	12	5	-	2	-	31
Thirteen	2	9	3	-	0	-	14
Fourteen	18	6	0	-	1	-	25
Fifteen	9	6	1	-	2	-	18
Sixteen	8	1	1	-	0	-	10
Seventeen	7	7	0	-	1	-	15
Eighteen	6	4	0	-	1	-	11
Nineteen	3	3	0	-	1	-	7
Twenty	10	3	0	-	0	-	13
21-30	26	19	0	-	0	-	45
31-40	38	12	0	-	0	-	50
41-50	16	4	0	-	0	-	20
51-100	24	6	0	-	0	-	30
101 and over	18	0	0	-	0	-	18

The Wildlife Society's annual game count at waterholes in the Park for 1996 gave a figure of 2 741 impala seen at 39 waterholes. A summary of some of the estimates for the Hwange impala population is given in Table 50.

Table 50 - Estimate of the numbers of impala in the Hwange National Park

Year	No. seen	No. estimated	95% C.L. (Range)	95% C.L. (%)	Author
1969/70		15000			Wilson (1975)
1973		8000			Wilson (1975)
1989		30000			Jones (1989)
1994	207	2115	805-3425	61.9%	Davies (1994)
1995	273	2957	1734-4180	41.4	Davies (1995)
1996	369	4312	2560-6065	40.6	Davies (1996)

The last four estimates of the impala population (Table 50) varies from 2 115 to 30 000 impala. I believe the figure of 2 115 is extremely low for the reasons already mentioned above and I would guess that the 30 000 is excessively high. I know for a fact that in the Main Camp/ Makwa/ Dopi/ Kennedy/ Makololo and Ngamo area there were at least 14 herds of over 100 impala and dozens of smaller herds of from 30 to 70 animals. It is postulated and after an educated guess that the impala population in the Hwange National Park could not possibly be less than 15 000 animals and perhaps even as many as 20 000.

The time allocated for the survey of only one year was not anywhere enough to calculate accurately the size of the population of species such as impala.

Genus *HIPPOTRAGUS* (Sundevall 1846)

Roan

Hippotragus equinus (Desmarest 1804)

Hippotragus equinus cottoni (Dollmans & Burlace 1828)

Colloquial name

The word roan refers to the general colour of the species which in certain lighting conditions has a slight strawberry tinge (Skinner & Smithers 1990).

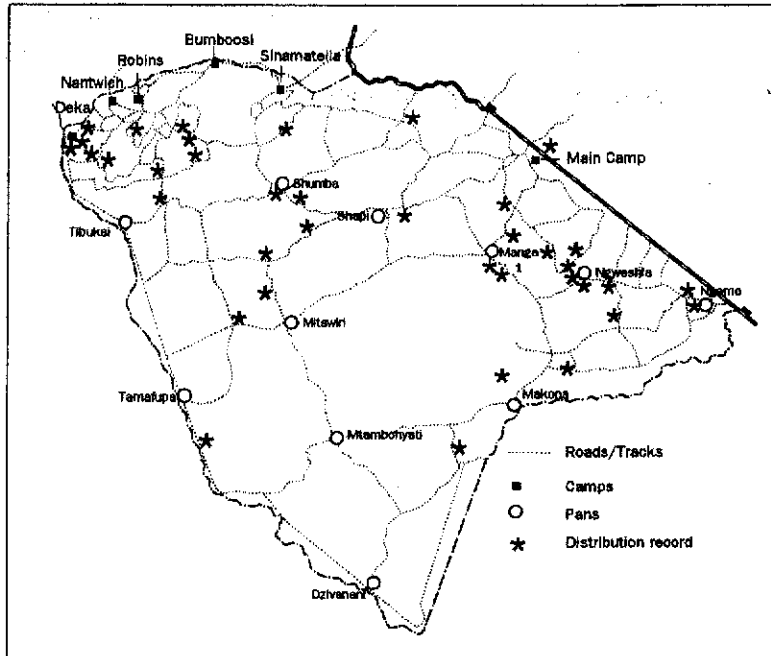
Taxonomic notes

Two sub-species supposedly occur in southern Africa, these being *H.e. cottoni* from Western Zimbabwe, Botswana and north eastern Namibia, Angola and other areas in the west of southern Africa. *H.e. equinus* occurs in the east and up to Malawi.

The sub-species found in the Hwange National Park is regarded as *H.e. cottoni* (Wilson 1975; Smithers & Wilson 1979).

Distribution

Best, Palmer, Shephard and Wilson (1970) presented a map of the distribution of roan in Zimbabwe and they included the Hwange National Park in their survey. They mentioned that the roan was common in the north west of Zimbabwe and numerous in the Hwange National Park.



Map 38 - Distribution of roan in the Hwange National Park as determined from marked transects ("road strip counts"), aerial surveys, wildlife forms and Wildlife Society game count

Wilson (1975) felt that as a result of the 1969/71 survey of the Park roan were found to have a wide distribution and with the exception of some dry areas around Tendele the species occurred throughout. At that time (1969/71) the greatest concentration of roan occurred in the Shumba/ Shapi/ Robins area. (Wilson 1975).

During the present survey, roan were seen in many areas throughout the Park in a very scattered distribution. Map 38 gives distribution of roan in the Hwange National Park.

Habitats

Roan occur in a large variety of habitats in the Hwange National Park but their preferred habitat is in more open tree savanna where there is open perennial grassland. They were also often seen in open areas with Mopane trees and in the Makololo area and north around Ngweshla they occurred in Baikiaea/ Acacia woodland. However they certainly prefer the open grassland around Shumba and north into the Robins area.

Habits

Some very valuable data on the sex and age composition of 21 groups of roan were obtained by members of the Wildlife Society during the 1996 annual game count at waterholes from 27 to 28th September 1996. Full details of these 21 groups are given in Table 51, Additional details are also given of the size of various herds encountered during the survey. These included records from "road strip counts", Wildlife forms and from aerial surveys. (Table 52).

I believe there is no doubt that roan are nervous of the presence of sable males at the same pan when coming down to drink. Wilson (1975) gave several instances of roan moving off and well away from a waterhole once sable appeared on the scene. This same thing was observed on three occasions at Ngweshla Pan when roan and sable met at the pan. It was the roan that retreated rapidly at the sight of sable.

This behaviour may account for the few roan seen in the Makololo/ Ngamo/ Ngweshla area where sable were plentiful while in the Robins area around Deka Camp, Reedbuck Vlei and other areas where sable are not common, there is a greater concentration of roan. These

Table 51 - Age & sex composition of 21 groups of roan seen by members of Wildlife Society during 24 hour game count 27-28th September 1996

Locality	Time	Sex and age composition	Total
Ngweshla	1222	1 male	1
	1540	1 male + 3 females	4
Manga III	1120	2 males + 5 females	7
	1500	1 female + 1 young	2
Mbazu	3.50???	7 unsexed	7
White Hills	1110	3 females	3
Skova	0835	1 unsexed	1
Bejane	1157	1 female + 2 young	3
Dandari II	0620	1 male	1
Deka Camp Spring	1415	1 unsexed	1
Deka Home Vlei	1257	1 female + 2 young	3
	1112	1 male + 6 female + 4 young	11
	1151	2 males + 7 unsexed + 6 young	15
	1156	3 males + 7 females + 4 young	14
Manzimbomvu	1455	1 male	1
	1518	1 male + 2 females	3
Reedbuck Vlei	1325	1 male	1
	1115	1 male	1
	1152	2 male	2
	1156	1 male + 9 females	10
Tsamhole	1200	1 male	1
Total			92

observations require a lot more detailed research and is a project that could well be initiated by the Parks and Wildlife staff.

Foods & Breeding

Not a great deal of additional data was obtained during the present survey but the reader is referred to the Mammals of Wankie National Park (Wilson 1975) which gives some data on these two subjects.

Status

Best, et. al. (1970) estimated that the roan population in the Hwange National Park in about 1970 was in the region of not less than 350 animals. They indicated that by far the greatest concentration of roan in Rhodesia (now Zimbabwe) occurred in the Hwange National Park.

Wilson (1975) gave a figure of around 600 roan for the Hwange National Park. This data referred to the population in November 1973 while Jones (1989) also gave a roan population of 600. Presumably the figure of 600 given by Jones was merely quoting my original figure of 600 for 1973. (Wilson 1975).

The September 1996 aerial survey estimated the roan population in the Park to be as few as 39 animals. This is clearly a gross underestimate of the roan population as the Wildlife

Table 52 - Number and size of roan groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms, and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	6	8	4	-	4	-	22
Two	3	2	4	-	1	-	10
Three	2	5	5	-	0	-	12
Four	3	1	6	-	1	-	11
Five	0	0	0	-	1	-	1
Six	0	0	2	-	1	-	3
Seven	0	2	1	-	0	-	3
Eight	0	0	1	-	0	-	1
Nine	0	0	0	-	0	-	0
Ten	0	1	0	-	0	-	1
Eleven	0	1	0	-	0	-	1
Twelve	0	0	0	-	0	-	0
Thirteen	1	0	0	-	0	-	1
Fourteen	0	1	0	-	0	-	1
Fifteen	0	1	0	-	0	-	1
Sixteen	0	0	0	-	0	-	0
Seventeen	0	0	0	-	0	-	0
Eighteen	0	0	0	-	0	-	0
Nineteen	0	0	0	-	0	-	0
Twenty	0	0	0	-	0	-	0
21-30	0	0	0	-	0	-	0
31-40	0	0	0	-	0	-	0
41-50	0	0	0	-	0	-	0
51-100	0	0	0	-	0	-	0
101 and over	0	0	0	-	0	-	0

Society counted a minimum of 92 roan at several different areas in 24 hours during the same month. (See Table 51).

Only detailed research over a period of several years will give an accurate figure of the population of roan in the Hwange National Park and the one year (1996) allocated for the present survey was definitely not anywhere enough time.

However, taking all the visual records into account it is apparent that the roan population in the Hwange National Park could not be less than 300 animals. Additional details of estimates of the population of roan in the Park are included in Table 53 below.

Table 53 - Estimate of number of roan in the Hwange National Park

Year	No. seen	No. estimated	95% C.L. (Range)	95% C.L. (%)	Author
1970		350			Best et.al. (1970)
1975		600			Wilson (1975)
1989		600			Jones (1989)
1994	19	182	19-366	100.9	Davies (1994)
1995	7	67	20-114	69.9	Davies (1995)
1996	4	39	5-73	87.0	Davies (1996)

Sable

Hippotragus niger (Harris 1838)

Hippotragus niger niger (Harris 1838)

Colloquial name

The name sable, as discussed by Skinner & Smithers (1990) is unfortunate as only fully adult bulls are sable in colour. However, the name is now so well entrenched that it would be pointless calling the animal anything else.

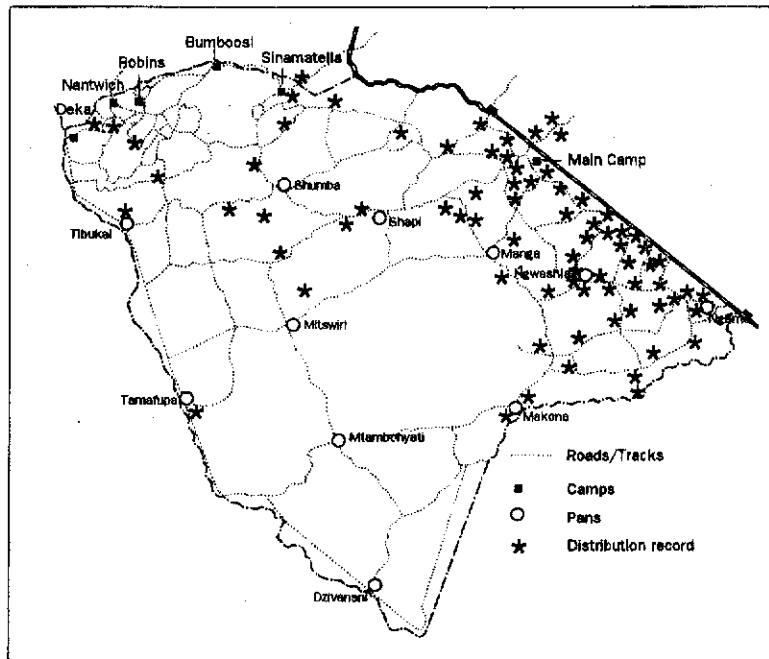
Taxonomic notes

Only one sub-species occurs in southern Africa and that being *H.n. niger* which was first described from the Cashan Mountains (Magaliesberg, west of Pretoria). The species no longer occurs in that area.

Distribution

Wilson (1975) mentioned that during the 1969/71 survey the sable had a very wide distribution in the Hwange National Park and was found to occur throughout. However, it was found to be far more common in the well watered parts of the Park and particularly in the Ngweshla/ Ngamo area. It was also common in the Robins and Sinamatella area during 1969/71. At that time there were a few visual records of the species in the Leasha/ Dzivanini area and north eastwards towards Madundumela.

While Smithers (1971) mentioned that sable occurred all along the Zimbabwe/Botswana border the 1969/71 survey only showed a limited number in the area and the species was also seen at Tamafupa. (Wilson 1975). During the present survey sable were again found to have a wide distribution in the Hwange National Park with the densest population



Map 39 - Distribution of sable in the Hwange National Park as determined from marked transects ("road strip counts"), aerial surveys by fixed wing aircraft and helicopter, Wildlife Society game count and wildlife forms

occurring around Ngamo/ Samavundhla/ Ngweshla.

Good numbers also occur around Sinanga, Caterpillar, Mbazu and at Mbiza and Dandari while the areas with the lowest populations are along the Botswana border, Leasha/ Dzivanini and the central areas of the Park. The sable also occurs in the Robins and Sinamatella areas but the population in those two areas appear to be less than they were 25 years ago.

Map 39 gives the distribution of sable as determined from all methods of survey used.

Habitat

Sable are a savanna woodland species and they are dependent on good cover and the constant availability of water. That is perhaps why the species becomes less common in certain dry areas of the Park, e.g. Robins and Sinamatella areas. They prefer open woodland particularly around pans, vleis and open grasslands, especially if there is a good cover of grass. They generally avoid dense woodland but the species was often seen in tall *Baikiaea* woodland between Main Camp and Kennedy I.

Habits

Wilson (1975) recorded several large herds of sable in the Hwange National Park during the 1969/71 survey as follows:

- 40 seen at Kennedy II by Attwell (NPR. 11/69)
- 37 seen at Makololo by Higgins (NPR. 65/68)
- 33 seen at Tshowe Drive by Wilson 27th May 1970.
- 22 seen at Tshowe Drive by Williamson 1973
- Herds of 10 to 20 animals often seen

During the present survey 2 large herds of between 31 and 40 animals were recorded and another 3 herds of between 21 and 30 animals. (See Table 54). There were records of 108 single animals and 18 records of two together. Six animals together were seen on 18 occasions and herds of 13, 14 and 15 seen on several occasions (See Table 54).

Table 54 - Number and size of sable groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	25	30	15	-	38	-	108
Two	5	6	3	-	4	-	18
Three	2	2	3	-	2	-	9
Four	3	3	3	-	2	-	11
Five	0	0	4	-	3	-	7
Six	3	1	2	-	2	-	8
Seven	1	0	0	-	2	-	3
Eight	3	0	0	-	1	-	4
Nine	0	0	0	-	1	-	1
Ten	0	0	1	-	2	-	3
Eleven	3	1	1	-	2	-	7
Twelve	1	0	0	-	0	-	1
Thirteen	1	2	1	-	2	-	6
Fourteen	7	0	0	-	1	-	8
Fifteen	3	0	1	-	2	-	6
Sixteen	0	0	1	-	0	-	1
Seventeen	0	0	0	-	0	-	0
Eighteen	3	0	1	-	0	-	4
Nineteen	0	0	0	-	0	-	0
Twenty	2	0	0	-	0	-	2
21-30	0	1	2	-	0	-	3
31-40	0	1	1	-	0	-	2
41-50	0	0	0	-	0	-	0
51-100	0	0	0	-	0	-	0
101 and over	0	0	0	-	0	-	0

Sable are gregarious animals and are usually found in small to large herds in the Hwange National Park. Their social organisation was found to be mainly large territorial bulls, groups of bachelor groups of young and old bulls and then the herds of cows and calves. Territorial bulls usually defended a territory at least during the period when females were in oestrus and it was also at waterholes, e.g. Ngweshla, that these territorial bulls were seen to chase roan away from the water.

Food

No new data available on food and feeding habits of sable in the Hwange National Park. A list of grasses eaten by the species is presented in "Mammals of Wankie National Park". (Wilson 1975).

Breeding

Newly born sable calves were seen in the Makwa area on 5th March 1996 and those appeared to be the first breeding record during 1996. From then on young, with the umbilical cord still present, were seen on numerous occasions throughout the remainder of March and most of April 1996. There were no records of young being dropped during May 1996 so there appeared to be a very restricted period during which time babies were born. To give some indication on the number of young sable per group of females the following records were obtained:

Makwa	5th April 1996	6 adult females	5 newly born young
Kennedy	11th March 1996	11 adult females	6 newly born young
Samavundhla	16th March 1996	18 adult females	4 newly born young
Ngweshla	21st March 1996	15 adult females	12 newly born young
Makwa	30th March 1996	7 adult females	4 newly born young
Dopi	3rd April 1996	21 adult females	13 newly born young

Status

As far back as 1928 a nucleus of sable occurred in the Hwange National Park (Davison 1967). By 1973 it was estimated that there were about 1 800 sable in the Hwange National Park (Wilson 1975) while Wilson & Cumming (1989) gave a population of about 2 700 in the Park. Jones (1989) from aerial surveys estimated the population to be 1 548. Davies (1995) gave an estimate of 1 405 for 1995 and in 1996 the aerial survey gave an estimated population of 1 942 sable (Davies 1996).

The 1996 aerial survey gave a 95% C.L. range of from 1 224 to 2 660 sable. I therefore believe after looking closely at this species on the ground and from aerial surveys by helicopter, that the figure of 2 660 sable would be a more realistic population for the Hwange National Park.

Genus ORYX (Blainville 1816)

Gemsbok

Oryx gazella (Linnaeus 1758)

Oryx gazella gazella

Colloquial name

No details of how this species obtained the name gemsbok is available.

Taxonomic notes

While Ansell (1972) recognised five sub-species of *Oryx gazella* from the African continent only one sub-species occurs in southern Africa, namely *O. gazella gazella*.

Distribution and status

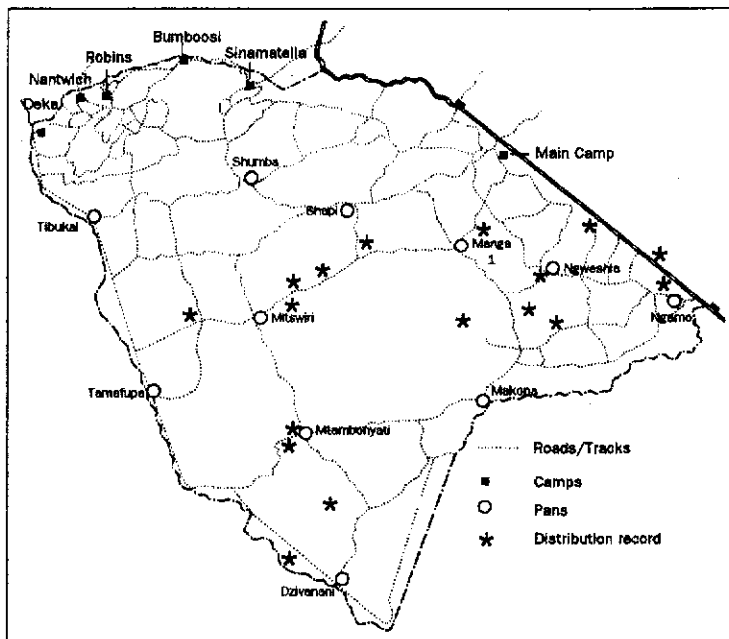
Wilson (1975) said that the species was widely distributed in the Hwange National Park. This data was as a result of the 1969/71 survey when the following animals were seen:

Kennedy Vlei	12 unsexed	15th January 1970
Ngweshla	2 "	21st June 1969
Dett Vlei	2 "	2nd July 1970
Tendele	8 "	18th September 1969
Mitswiri	4 "	25th November 1969
Ngwasha	7 "	18th November 1969
Skoffels	4 "	15th April 1970
Libuti	1 male	22nd November 1969
Nehimba	5 unsexed	12th November 1969

Wilson (1975) felt that the species was, however, absent from the Basalt and Mopane areas around Sinamatella, Robins, Mtoa and Bumboosie.

During the present survey gemsbok were seen on 16 different occasions and all of these visual records were from the south and east of the Park and all on Kalahari sand.

Map 40 gives the localities where these 16 groups were seen while Table 55 gives a breakdown of the size of those 16 groups.



Map 40 - Distribution of gemsbok in the Hwange National Park as determined from marked transects ("road strip counts"), Wildlife Society game count, wildlife forms and all aerial surveys

Table 55 - Number and size of gemsbok groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	2	0	0	-	6	-	8
Two	1	0	1	-	2	-	4
Three	0	0	0	-	1	-	1
Four	0	0	0	-	0	-	0
Five	0	0	1	-	0	-	1
Six	1	0	0	-	0	-	1

The National Parks 1996 annual aerial survey recorded 11 gemsbok from the following localities:

Dzivanini	:	2	(1 + 1)
Main Camp	:	2	
Ngamo	:	1	
Shapi	:	5	(3 + 1 + 1)
Central B	:	1	

The largest group seen was of 7 animals which were spotted near the railway line near Intundla by Keith Stewart and Pat Cox on 28th July 1996. This herd of gemsbok also had one very small baby with them. Another baby gemsbok was seen with an adult male and female from the helicopter in September 1996 east of Tindergrass Pan.

Wilson (1975) felt that in November 1973 there were about 120 gemsbok in the Hwange National Park while the same figure is quoted by Jones (1989). Davies (1996) estimated the population to be 125 animals after seeing a total of 11 from the air during the 1996 annual survey. She gave a 95% C.L. range of from 37 to 212 gemsbok.

From the data available and from visual records of gemsbok during the 1996 survey, it appears as if the population has not changed in the last 25 years. It is possible that there are still about 100 gemsbok in the Park and while the population may not be increasing it is nevertheless still remaining constant around the 100 mark.

It is also of interest to note that two baby gemsbok were seen indicating that they are at least breeding and all visual records found the animals to all be in very good condition. However, all animals seen were extremely nervous and on being sighted disappeared at great speed.

Genus *SYNCERUS* (Hodgson 1847)

African buffalo

Syncerus caffer (Sparrman 1779)

Syncerus caffer caffer (Sparrman 1779)

Colloquial name

This name has its origin in the Portuguese word for the species, bufalo. (Skinner & Smithers 1990).

Taxonomic notes

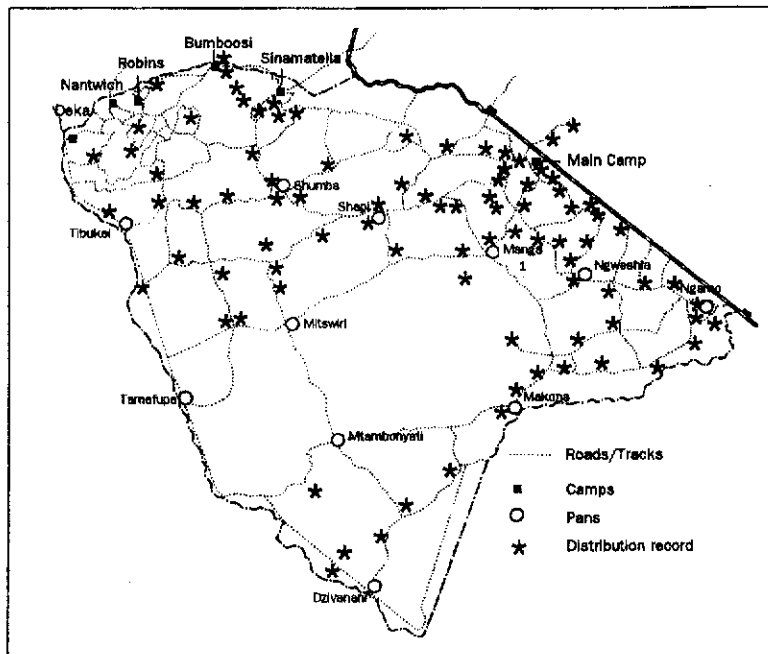
Only the large savanna buffalo, *Syncerus caffer caffer* is found in southern Africa. The subspecies *S.c. nanus* is confined to the forest areas of west and central Africa.

Distribution

The 1969/71 survey showed the distribution of the buffalo covering the entire Hwange National Park. (Wilson 1975).

The present survey, however, shows a much reduced range of the buffalo and there were large areas of the Park where it was not recorded. These include much of the central and western sections of the Park, especially around Matambonyati and Tamafupa. However, the present survey lasted for only one year (i.e. 1996) whereas the previous survey of 25 years ago covered two full years (1969/71).

If more time was available the distribution pattern of the buffalo may well have been slightly different. Map 41 gives the distribution of buffalo as determined for 1996.



Map 41 - Distribution of buffalo in the Hwange National Park as determined from marked transects ("road strip counts"), Wildlife Society game counts at waterholes, wildlife forms and aerial surveys by helicopter and light aircraft.

Habitat

There appear to be three essential habitat requirements for the African buffalo in the Hwange National Park. These included shade, a plentiful supply of permanent water and good grazing. If any of these conditions were not available the buffalo would move to

greener pastures.

During the present survey, buffalo were very rarely, if ever, found more than 10 kilometres from water. Their distribution and indeed abundance was found to coincide with its main habitat requirements. Apart from the open grassland at Shumba, the Robins area, Ngamo, Ngweshla, Kennedy and the Shakwanki area, buffalo were also recorded in Baikiaea, Mopane and Acacia woodlands. As long as water was present they remained in those areas.

Habits

When I commenced my survey in January 1996 there were very few buffalo in the Main Camp/ Makwa/ Kennedy area and from helicopter and fixed wing aircraft flights over the central parts of the Park, it was obvious that the buffalo had moved into areas that would not normally have a lot of surface water but because of the good rains the entire area was covered with thousands of small pans. As the dry season approached and the surface water dried up so the buffalo moved into areas where there was a more permanent supply of water.

During the 1969/71 survey Wilson (1975) recorded several very large herds of buffalo in the Park. A few examples follow:

- | | | |
|----|---------------------|-------------------------------------|
| 1. | 15th July 1972 | herd of \pm 1 200 in Robins area |
| 2. | 8th September 1972 | herd of \pm 965 at Kennedy II |
| 3. | 7th September 1973 | herd of \pm 814 at Ngweshla |
| 4. | 12th September 1973 | herd of \pm 800 at Dolilo Springs |
| 5. | 11th October 1973 | herd of \pm 700-800 at Ngamo |
| 6. | 25th September 1973 | herd of \pm 600 at Limpande Dam |
| 7. | 28th June 1968 | herd of \pm 600 at Chingahobi |

At certain times of the year large buffalo herds split into smaller groups and that I could see was mainly during the rainy season which was also the time when a large number of calves were with the herds. It appears as if the survival of the calves is greater if the herds were small compared to very large herds.

If one examined the data presented above it was obvious that all the large herds of buffalo were recorded during the dry months of the year and when the small herds had once again come together. This was also the case during the present survey when almost every large herd seen was for the period June to October 1996. During the rains it was usually small herds that were encountered.

Duckworth (1972) carried out a survey on distribution and movement of buffalo from October 1970 and July 1972. The following herds of over 400 buffalo were recorded:

- | | |
|--------------------|---------------------------|
| 7th October 1970 | herd of 400 at Kennedy II |
| 28th October 1970 | " of 600 at Makwa |
| 7th December 1970 | " of 500 at Samavundhla |
| 23rd December 1970 | " of 400 at Dett |
| 5th April 1971 | " of 400 at Dett |
| 12th May 1971 | " of 500 at Dett |
| 18th May 1970 | " of 400 at Makololo |
| 30th June 1971 | " of 500 at Makololo |
| 15th July 1971 | " of 400 at Kennedy I |
| 16th July 1971 | " of 400 at Makwa |
| 23rd July 1971 | " of 500 at Dett |

15th August 1971	Herd of 700 at Kennedy I
7th September 1971	" of 400 at Makwa
17th September 1971	" of 600 at Kennedy I
5th October 1971	" of 600 at Makwa
15th October 1971	" of 800 at Kennedy II

During the 1996 survey no really large herds of buffalo were seen anywhere in the Hwange National Park. In fact on only two occasions were herds of over 350 animals seen. One of these herds was in the Robins area which I estimated to be between 350 and 400 animals and the same herd also moved towards Sinamatella and then to Shumba Pan. Another large herd of between 350 and 450 were seen in the Dopi and then Kennedy I/ Kennedy II area. This same herd was seen on three occasions.

Herds of over 100 buffalo but less than 200 animals were also seen on several occasions. All these large herds have been lumped together in Table 56, recorded as herds of 101 and over. Many of the records of buffalo herds as given in this table are of repeat sightings.

Table 57 - Plants recorded eaten by buffalo in the Hwange National Park

<i>Aristida stipitata</i>	<i>Digitaria lunularis</i>	<i>Monechma debile</i>
<i>Aristida pilgeri</i>	<i>Digitaria gayana</i>	
<i>Aristida meridionalis</i>	<i>Diheteropogon amplexans</i>	<i>Oxygonum alatum</i>
<i>Aristida vestita</i>	<i>Dactyloctenium giganteum</i>	<i>Oxygonum sunuatum</i>
<i>Aristida canescens</i>	<i>Diplorhynchus condylocarpon</i>	
<i>Aristida congesta</i>		<i>Pogonarthria fleckii</i>
<i>Andropogon gayanus</i>	<i>Eragrostis species</i>	<i>Pogonarthria squarrosa</i>
<i>Acrotome lancifolia</i>	<i>Eragrostis rigidior</i>	<i>Perotis patens</i>
<i>Andropogon schinzii</i>	<i>Eragrostis pallens</i>	<i>Pygmaeothamnus zeyheri</i>
	<i>Eragrostis trichophora</i>	<i>Panicum species</i>
<i>Baphia massaiensis</i>	<i>Eragrostis superba</i>	<i>Panicum maximum</i>
<i>Bauhinia macrantha</i>	<i>Eragrostis nindensis</i>	<i>Panicum heterostachyum</i>
<i>Brachiaria nigropedata</i>	<i>Elyonurus brazzae</i>	
<i>Brachiaria brizantha</i>		<i>Rhynchelytrum subglabrum</i>
<i>Brachiaria dura</i>	<i>Fimbristylis hispidula</i>	<i>Rhynchelytrum repens</i>
<i>Brachystegia boehmii</i>		
<i>Brachystegia spiciformis</i>	<i>Guibourtia coleosperma</i>	<i>Schizachyrium sanguineum</i>
<i>Brackenridgea arenaria</i>	<i>Grewia monticola</i>	<i>Sporobolus fimbriatus</i>
<i>Borreria senensis</i>	<i>Gisekia pharnaceoides</i>	<i>Sporobolus panicoides</i>
<i>Bidens pilosa</i>		<i>Setaria anceps</i>
	<i>Hyparrhenia filipendula</i>	<i>Setaria pallide-fusca</i>
<i>Cyperus laevigatus</i>	<i>Hyperthelia dissoluta</i>	<i>Setaria verticillata</i>
<i>Cynodon dactylon</i>	<i>Heteropogon contortus</i>	<i>Schmidtia pappophoroides</i>
<i>Colophospermum mopane</i>	<i>Hyparrhenia rufa</i>	<i>Sesbania species</i>
<i>Cassia falcinella</i>	<i>Heteropogon melanocarpus</i>	<i>Sida cordifolia</i>
<i>Combretum zeyheri</i>	<i>Hibiscus mastersonianus</i>	
<i>Commelina eckloniana</i>		<i>Tricholaena monachne</i>
<i>Commelina africana</i>	<i>Julbernardia globiflora</i>	<i>Tristachya superba</i>
<i>Corchorus tridens</i>	<i>Justicia leptocarpa</i>	<i>Triraphis schinzii</i>
<i>Clerodendrum ternatum</i>	<i>Justicia kiriana</i>	<i>Tragia okanyua</i>
<i>Digitaria pentzii</i>	<i>Loudetia flavida</i>	<i>Urochloa bolbodes</i>
<i>Digitaria milaniana</i>		<i>Urochloa brachyura</i>
<i>Digitaria perrottetii</i>	<i>Mariscus dubius</i>	
Totals:		
Trees/scrub - 12		
Herbs - 21		
Grasses - 52		
(15 annuals, 37 perennials)		

Table 56 - Number and size of buffalo groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	10	10	2	-	6	-	28
Two	6	4	1	-	7	-	18
Three	8	2	2	-	6	-	18
Four	8	4	0	-	0	-	12
Five	2	3	1	-	5	-	11
Six	1	4	1	-	1	-	7
Seven	3	1	0	-	0	-	4
Eight	0	0	0	-	0	-	0
Nine	0	3	1	-	0	-	4
Ten	0	0	0	-	0	-	0
Eleven	2	1	0	-	0	-	3
Twelve	0	0	0	-	0	-	0
Thirteen	0	1	0	-	2	-	3
Fourteen	0	0	0	-	1	-	1
Fifteen	1	0	0	-	5	-	6
Sixteen	1	0	0	-	0	-	1
Seventeen	1	2	1	-	0	-	4
Eighteen	0	0	0	-	0	-	0
Nineteen	0	0	0	-	0	-	0
Twenty	0	0	0	-	1	-	1
21-30	2	1	1	-	5	-	9
31-40	4	0	1	-	2	-	7
41-50	2	2	0	-	2	-	6
51-100	7	5	3	-	3	-	18
101 and over	5	1	4	-	0	-	10

As a result of the considerable amount of groundwork and also many hours of aerial survey by both fixed wing aircraft and helicopter no large herds of buffalo were seen during 1996. Even the National Parks aerial survey of September 1996 which systematically covered the entire National Park and followed distinct patterns of transects as discussed by Davies (1996) failed to find even one large herd of buffalo. (See Status below for additional data).

Food

During the 1969/71 survey (Wilson 1975) recorded buffalo feeding on the sedge *Cyperus laeugatus* and the following grasses: *Andropogon gayanus*, *Aristida pilgeri*, *Eragrostis pallens*, *E. rigidior*, *Cynodon dactylon*, *Loudetia flavida* and various other species. A detailed list of grasses and other plants eaten by buffalo is given in Table 57. This data is from Duckworth (1972).

Breeding

Wilson (1975) has suggested that the buffalo in the Hwange National Park breed throughout the year, while in Zambia, Ansell (1960) feels that while the buffalo calve throughout the year there is a possible peak during the dry season.

From data collected of very small calves seen with herds during the present survey (1996), it appears as if there is indeed a peak in calving which occurs between December and March/April and it is also at this time of the year that the smallest herds of buffalo were observed. Unfortunately the data is insufficient and much more detailed research is necessary to determine the main breeding season of this very important and valuable grazer.

History and present day status

When Davison first moved into the then Wankie Game Reserve in 1928 he mentioned that in those early days he never saw any sign of wildebeest or buffalo and very few zebra. (Davison 1967). Table 58 gives details of how the buffalo population in the Hwange National Park had increased from a mere 50 animals in 1935 to a peak of over 10 000 in 1973. From that period until the present time (1996) the buffalo population appears to have decreased considerably to what it was in 1973.

At the time of writing (1997) it now appears as if the buffalo population lies in the region of between 4 000 and 5 000 animals or roughly half of what it was 20 years earlier. During that same period the elephant population has doubled in numbers from about 10 500 in 1973 to over 20 000 in 1996.

Genus *TRAGELAPHUS* (Blainville 1816)

Kudu

Tragelaphus strepsiceros (Pallas 1766)

Tragelaphus strepsiceros strepsiceros

Colloquial name

This is derived from the Khockhoi name kudu (Skinner & Smithers 1990).

Taxonomic notes

Ansell (1972) listed four sub-species from the continent of which only one occurs in southern Africa, namely *T.s. strepsiceros*.

Distribution

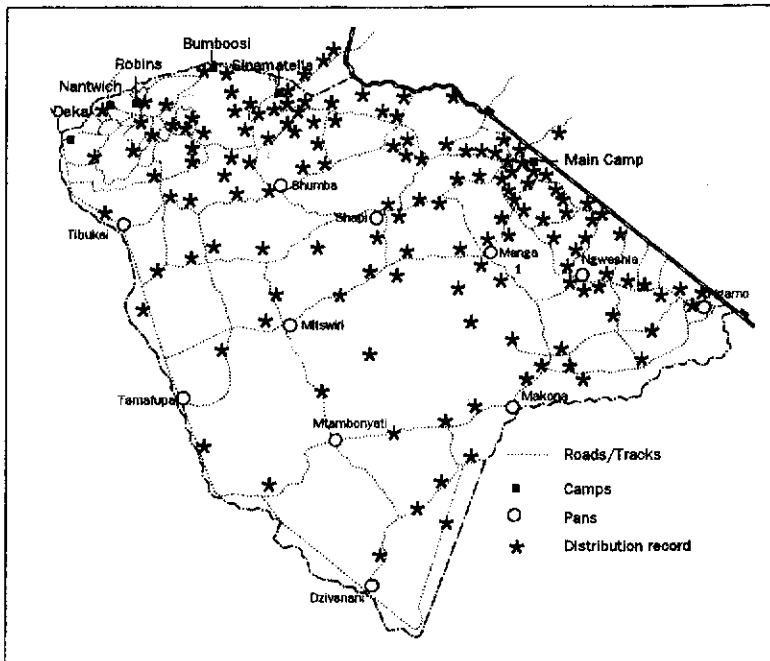
Wilson (1975) indicated that during the 1969/71 survey the species occurred throughout

Table 58 - Chronological order of buffalo numbers and distribution in the Hwange National Park. From Davison annual reports (1936-1961) and from several other sources

Date	Details of size of buffalo herds and other observations
1929	Only known buffalo in reserve confined to dense bush in Deka. These were not permanent and moved backwards and forwards into Botswana
1935	Buffalo encountered for first time in open county. Then only small parties and usually all bulls
1937	First herd of buffalo seen at Shumba and Nehimba soon after
1935	Herd of 50 buffalo seen at Libuti
1936	Total population estimated to be between 200 and 300
1943	Estimated 1 500 buffalo in Park and southern limit being a line between Main Camp and Shakwanki
1944	Buffalo appeared for first time on Kennedy Vlei
1949	Two herds (80 and 50) recorded at Ngweshla
1951	Buffalo reported for first time at Ngamo. Main buffalo concentration then at that time east of Shumba
1959	Buffalo population increased to estimated 3 500 animals including several large herds of over 500 strong.
1962	Bruce Austin saw large herd of between 4 000 to 6 000 buffalo at Masuma Dam
1962	Estimated 1 000 buffalo died of thirst in Botswana
1963	Davison counted 3 000 buffalo in one herd at Mandavu
1964	Heavy concentrations of buffalo seen. One herd of over 3 000 being counted and herds of several hundred commonplace. (1964 National Parks Annual Report)
1966	150 buffalo culled. (1966 National Parks Annual Report)
1967	1 200 buffalo culled in many areas of Park (August 1967 to October 1967)
1967	Estimated buffalo population at time of culling between 5 000 and 6 000 animals of which 1 500 were in Robins area, 1 700 at Sinamatella and 2 000 in Main Camp area
1973	Wilson (1975) gives buffalo population as C. 10 000 animals.
1989	Population estimated at 11 000 animals (Jones 1989)
1994	1994 National Parks annual aerial survey: 416 buffalo seen, estimated population 3 237, 95% C.L. range 1 093-5 382. 95% C.L. % estimate 66.2 (Davies 1994)
1995	1995 National Parks annual aerial survey: 151 buffalo seen, estimated population 1 415, 95% C.L. range 192-2 637. 95% C.L. % estimate 86.4 (Davies 1995)
1996	1996 National Parks annual aerial survey: 158 buffalo seen, estimated population 1 840, 95% C.L. range 693-2 987. 95% C.L. % estimate 62.3 (Davies 1996)
1996 (Sept)	Wildlife Society annual game count at waterholes. 1 121 buffalo seen at 25 waterpoints
1996	After full one years survey of entire National Park no herds of buffalo in excess of 500 animals seen. Total population estimated at not more than 4 000 - 5 000 buffalo

the Park. The exact same situation applied during the present 1996 survey where kudu were found throughout the Hwange National Park. While there were less records of the species from the south and west of the Park that was only because those areas were not visited as often as the other areas of the Park.

See Map 42 for distribution of kudu as determined during the 1996 survey.



Map 42 - Distribution of kudu in Hwange National Park as determined from marked transects ("road strip counts"), wildlife forms, Wildlife Society game count and from aerial surveys

Habitat

The kudu was found in every possible habitat type in the Hwange National Park. They are extremely common on the Kalahari sand areas especially around Main Camp, Nyamandhlovu, Balla Balla, Sinanga, Ngweshla, Kennedy Vlei, Ngamo and even towards Tendele, Verneys and further south in the Park.

In the Mopane woodland around Sinamatella and Robins Camp they are also common and in the riverine vegetation along the Lukosi River. They are also equally at home in the broken hilly country around Bumboosie and south of Sinamatella in the granite areas around Tshompani and Tshakabika.

Habits

A gregarious species and during the present survey groups of up to eighteen kudu were seen together. It is of interest to note that even during the 1969/71 survey the largest herd seen consisted of 17 animals (Wilson 1975). Table 59 gives full details of all herds encountered during the present survey. It also gives number of times each herd size was recorded during the 1969/71 survey. (See Wilson 1975, page 116).

All male herds were also seen on dozens of occasions with the largest group of males observed being 14 animals. The largest group of males seen together during the 1969/71 survey was 7. (Wilson 1975).

Food

Kudu are essentially browsers but lush green grass is also eaten from time to time.

The kudu is one of the large antelope that is very easily studied and in the Hwange National Park they will often stand very close to the road and continue feeding. In this way a large number of observations on the plants eaten and the feeding behaviour of the species can be obtained.

Table 59 - Number and size of kudu groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand Total	
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observation		
Single	28	17	4	-	18	-	67	(19)
Two	45	23	9	-	11	-	88	(12)
Three	34	15	7	-	0	-	56	(24)
Four	28	17	5	-	5	-	55	(38)
Five	17	13	5	-	2	-	37	(40)
Six	19	12	6	-	3	-	40	(59)
Seven	16	9	2	-	0	-	27	(32)
Eight	4	9	3	-	0	-	16	(18)
Nine	4	4	1	-	0	-	9	(7)
Ten	3	1	0	-	1	-	5	(10)
Eleven	6	1	0	-	0	-	7	(4)
Twelve	5	0	1	-	0	-	6	(8)
Thirteen	1	0	0	-	0	-	1	(7)
Fourteen	1	0	1	-	0	-	2	(2)
Fifteen	2	0	0	-	0	-	2	(0)
Sixteen	0	2	0	-	0	-	2	(1)
Seventeen	0	1	1	-	0	-	2	(1)
Eighteen	3	0	0	-	0	-	3	(1)
Nineteen	0	0	0	-	0	-	0	(0)
Twenty	0	0	0	-	0	-	0	(0)
21-30	0	0	0	-	0	-	0	(0)
31-40	0	0	0	-	0	-	0	(0)
41-50	0	0	0	-	0	-	0	(0)
51-100	0	0	0	-	0	-	0	(0)
101 and over	0	0	0	-	0	-	0	(0)

N.B. Figures in brackets under grand total represent number of observations recorded in 1969/71. Wilson (1975).

A detailed study on the feeding behaviour of the kudu together with a list of plants eaten was undertaken in the Hwange National Park by Conybeare from October 1970 to June 1972 and the results published in March 1975. (Conybeare 1975).

During the present survey of the Hwange National Park kudu were found feeding on a large variety of plants including browsing on the leaves of trees, feeding on grasses, fruits and herbs. Details of the plants eaten are given in Table 60 together with the habitat type where these observations were made.

Breeding

Wilson (1975) recorded baby kudu believed to be under 1 month old during the following months: January (2); February (7); March (11); April (1); June (1); August (1); November (4) and December (5). It was suggested that the species in the Hwange National Park bred throughout the year.

During the present survey, baby kudu were very rarely seen with their mothers until they were already a month or two old and from this it appears as if the young are hidden for some time before accompanying the mother. Wilson (1975) has already pointed out that in eastern Zambia, calves are hidden for some time after parturition before accompanying their mothers.

Data obtained during the present survey now suggests that kudu do indeed have a peak in calving in the Hwange National Park and that peak is between the months of January to April. This is similar to what Simpson (1968) found in the lowveld of Zimbabwe and Wilson (1965) for eastern Zambia.

Status

The kudu is one of the most common large antelopes in the Hwange National Park. Wilson (1975) gave an estimated population of 3 500 animals while Jones (1989) mentioned 4 000 kudu in the Park. Davies (1994), as a result of the 1994 aerial survey of the Park and the Deka safari area, gave the population of kudu as 1 283 with a 95% C.L. range of from 777 to 1 790 animals.

In 1995 Davies (1995) gave a figure of 1 290 kudu with a 95% C.L. range of between 842 and 1 737 animals. During the present 1996 survey another aerial survey took place and Davies (1996) gave a figure of 1 419 kudu with a 95% C.L. range of from 977 to 1 860 animals. However, I believe these figures are on the very low side as the kudu is very difficult to see from the air especially as they are more commonly encountered in woodland and dense cover and not often seen out in the open unless they are moving to a pan to drink. Therefore I believe the figure of 4 000 kudu as given by Jones (1987) would be a more realistic figure of the population in the Park during 1996.

Bushbuck

Tragelaphus scriptus (Pallas 1766)

Tragelaphus scriptus ornatus (Pocock 1900)

Colloquial name

The colloquial name of this species indicates the habitat type in which it occurs.

Taxonomic notes

The sub-species *T.s. ornatus* is the one which occurs in the Zambezi Valley and extends up the main tributaries towards the Plateau country. The sub-species to the south of the watershed is *T.s. roualeyni* Gray 1852) which occurs in the Limpopo Valley and up to its tributaries.

Table 60 - Food plants eaten by Kudu during 1996 from direct observations

Plant species	Month	Habitat Vegetation type *
Browser & Fruits		
<i>Acacia ataxacantha</i>	Apr, Aug.	Type 2
<i>Acacia erioloba</i>	Jan, Feb, June, Aug, Sept.	Type 18, Type 20
<i>Acacia fleckii</i>	Mar.	Type 20
<i>Acacia galpinii</i>	June	Type 20
<i>Acacia karroo</i>	Feb, Mar, Apr, July.	Type 20
<i>Azanza garckeana</i>	Mar.	Type
<i>Baikiaea plurijuga</i>	Jan, June, Aug, Oct, Dec.	Type 25
<i>Baphia massaiensis</i>	Apr.	Type 24
<i>Bauhinia petersiana</i>	Nov, Dec.	Type 25
<i>Piliostigma thonningii</i>	Mar, July, Dec.	Type 25
<i>Bridelia cathartica</i>	Dec.	Type 6
<i>Capparis tomentosa</i>	Feb, Apr.	Type 25
<i>Cassia abbreviata</i>	Mar.	Type 6
<i>Colophospermum mopane</i>	Dec, Jan, Feb, Mar.	Type 7
<i>Combretum apiculatum</i>	Jan, Jun.	Type 7
<i>Combretum hereroense</i>	Jan	Type 6
<i>Combretum molle</i>	Apr, Nov.	Type 7
<i>Combretum zeyheri</i>	Dec.	Type 25
<i>Croton gratissimus</i>	Jan, Nov, Dec.	Type 6
<i>Dichrostachys cinerea</i>	Apr, May	Type 2/Type 7
<i>Diospyros lycioides</i>	Nov.	Type 4
<i>Diospyros mespiliformis</i>	Jan, Nov.	Type 24
<i>Dombeya rotundifolia</i>	Dec.	Type 21
<i>Ficus sur</i>	Jan, Apr.	Type 21
<i>Ficus sycomorus</i>	May.	Type 8
<i>Flacourtia indica</i>	Feb.	Type 7
<i>Grewia flavescens</i>	Aug.	Type 9
<i>Grewia monticola</i>	Sept. oct.	Type 7
<i>Guibourtia coleosperma</i>	Jan, Aug, Dec.	Type 28
<i>Ipomoea shirambensis</i>	Mar.	Type 20
<i>Lannea edulis</i>	Feb, Dec.	Type 27
<i>Pavetta lanciflora</i>	Nov.	Type 27
<i>Peltophorum africanum</i>	Nov.	Type 12
<i>Pseudolachnostylis maprouneifolia</i>	May, Oct.	Type 26
<i>Flueggea virosa</i>	Mar, Apr, Oct.	Type 9
<i>Terminalia sericea</i>	Feb, Mar, Nov.	Type 21
<i>Ximenia caffra</i>	Nov.	Type 26
<i>Ziziphus mucronata</i>	Dec.	Type 18
	Sub Total: 38 browse species	
Herbs		
<i>Adenia gummifera</i>	Jan, Feb.	Type 7
<i>Cissus cornifolia</i>	Oct.	Type 8
<i>Citrullus lanatus</i>	Oct, Dec.	Type 25
<i>Hibiscus mastersonianus</i>	May.	Type 27
<i>Commelina africana</i>	Feb.	Type 21
<i>Ipomea coptica</i>		Type 20
	Sub Total: 6 herb species	
Grass		
<i>Panicum maximum</i>	Jan.	Type 24
<i>Cynodon dactylon</i>	Feb, Mar.	Type 26
<i>Eragrostis indica</i>	Mar.	Type 26
<i>Diataria maniculata</i>	Feb.	Type 26
	Sub Total: 4 grass species	
	Total: 48 plant species	

* For description of Habitat and Vegetation type see section under Vegetation of this report.

Distribution and status

Wilson (1975) mentioned that during the 1969/71 survey bushbuck were not common in the Hwange National Park and single individuals were seen at Tshompani Dam, in the Lukozi River, near Pangoro, at Inyantue and a few other places.

At that time (1969/71) the bushbuck was confined to the Lukozi River in the thick riverine vegetation along its banks and that the species was also recorded in the broken country near Tshompani Dam.

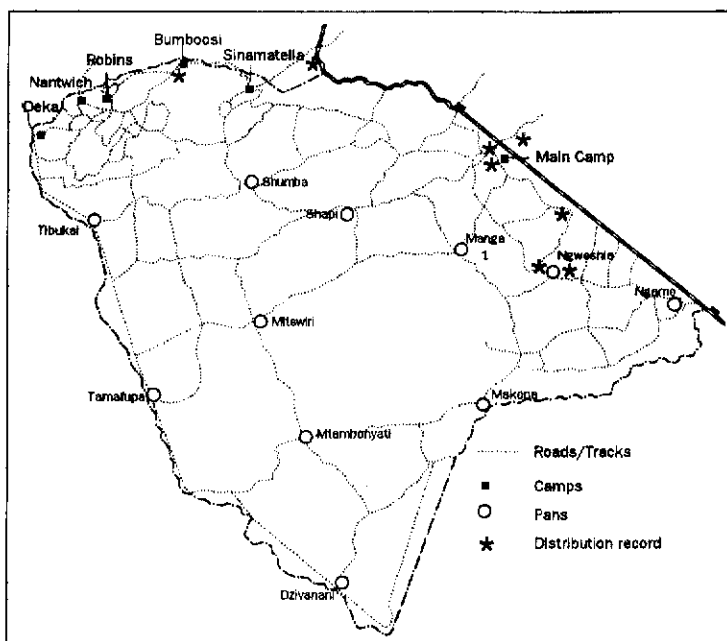
The distribution and status of the bushbuck has changed considerably over the past 25 years. First of all no sign of bushbuck whatsoever was found along the Lukozi River in the riverine vegetation except one male near the railway line at Lukozi Siding within 50 metres of an old deserted building. Mr. R. Msalwa, a scout from Sinamatella Camp, also saw a male bushbuck at Bumboosie Camp on 11th February 1996 at 1400 hours.

The dense riverine vegetation along the Lukozi River, discussed by Wilson (1975), has been degraded considerably and the area is now a lot more open than it was previously. (See also section on grysbok above). As a result the habitat is no longer as suitable for bushbuck as it was 25 years ago.

The second and most interesting aspect regarding the distribution of bushbuck in the Hwange National Park is that the species is now found at Main Camp (within 100 metres of the buildings) at Kennedy I and at Ngweshla. I personally have seen a male and then also a female in the Acacia thicket within 100 metres of the entrance into the Park at Main Camp. The staff living at Main Camp have also seen the pair near the staff houses and also in the actual visitors camping area at night.

There appears to be only two animals (a male and a female) at Main Camp. Mr. H.P. Erwee of the Wildlife Society saw an adult male bushbuck drinking at Ngweshla Pan on 27th September 1996 at 1550 hours.

See Map 43 for distribution of bushbuck in Hwange National Park.



Map 43 - Distribution of bushbuck in the Hwange National Park as determined from marked transects ("road strip counts"), wildlife forms and from Wildlife Society game counts

The bushbuck is certainly not a common species in the Park and there now appears to be two small populations of them. One in the Main Camp/ Kennedy/ Ngweshla area and another in the Lukozi/ Bumboosie area. In both places the populations are exceptionally very low. The species is definitely more common outside the Park in the land occupied by the Safari Lodge and "Touch the Wild Safaris" where there are at least a dozen or more visual records.

Genus *Taurotragus oryx* (Wagner 1855)

Eland

Taurotragus oryx (Pallas 1766)

Taurotragus oryx livingstonii (P.L. Slater 1864)

Colloquial name

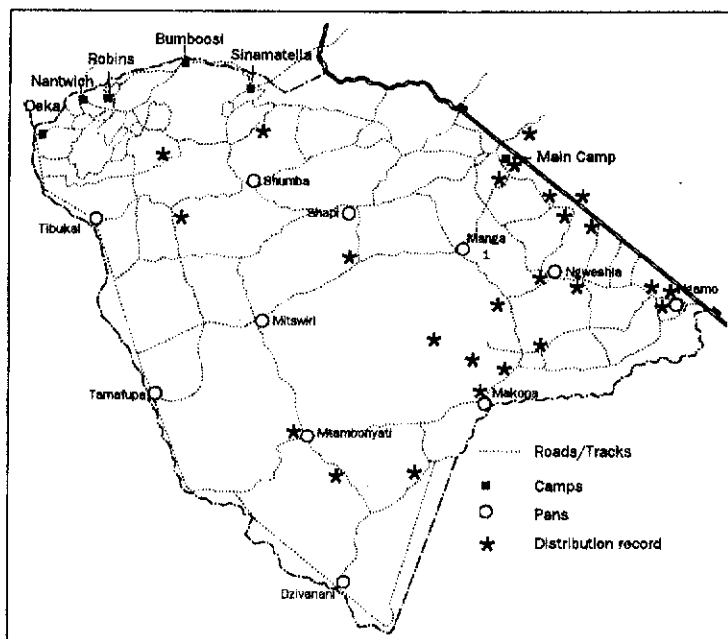
Skinner & Smithers (1990) say the name eland is borrowed from the Dutch eland, meaning elk.

Taxonomic notes

T. oryx oryx occurs in the extreme south of the species range in southern Africa, *T.o. livingstonii* in parts of Angola, Zimbabwe, Zambia, Malawi etc. while *T.o. pattersonianus* occurs to the north of southern Africa.

Distribution and status

Wilson (1975) mentions that in 1969/71 the species was very common and had a wide distribution in the Hwange National Park. Map 44 shows an extremely wide distribution and Wilson (1975) says the species was far more common in the area along the line of rail from Ngamo to Dett than elsewhere in the Park.



Map 44 - Distribution of eland in the Hwange National Park as determined from ground and aerial surveys

He goes on to say that there were a large number of sightings from Ngamo, Makololo, Kennedy, Main Camp and Nyamandhlovu. They also occurred throughout the Robins area

and at Sinamatella. They were also recorded at Tendele Pan, at Hendricks in the Botswana border and at Gomo Dam. Finally they occurred throughout the Shabi Shabi area.

Wilson (1975) mentions large herds of eland of up to 500. He mentions Duckworth seeing about 500 at Samavundhla in January 1971 while Williamson saw 237 in one herd at Ngamo in January 1969 and a total of 562 on Ngamo Flats at one time.

Wilson (1975) gives an estimate of the population of eland in the Hwange National Park in November 1973 as about 1 600 animals. Jones (1989) also gave an estimate of 1 600 eland presumably from the report by Wilson (1975).

During the present survey, only one large group of eland was seen and that was of 70 animals in the Ngamo/ Makololo area. The herd of 70 was seen on three occasions, once from the helicopter at Ngamo and twice on the ground survey at Makololo. Four other reasonable sized herds were seen, three of those being of fifteen, sixteen and eighteen animals and all in the same general area. All three observations could possibly have been of the same group.

See Table 61 for details of all visual observations of eland during the present survey. The species was definitely extremely rare or at least very seldom seen in the Mopane areas around Sinamatella and Robins Camps.

The 1994 National Parks aerial survey of Hwange and the Deka area recorded 63 eland and from that it was estimated that the population was 490 animals with a 95% C.L. range of from 63 to 972. (Davies 1994). The 1995 aerial survey recorded 30 eland and the population was estimated as 301 animals with a 95% C.L. range of from 30 to 607 animals. (Davies (1995). On the other hand the 1996 aerial survey of the Hwange National Park only recorded 9 eland from which Davies (1996) estimated the population to be 104 animals with a 95% C.L. range of 9-203 animals.

Each year for the past three years the eland population has been getting less and less and there is no doubt that if any really large herds existed in the Park during 1996, as was the case 25 years ago when several herds of over 500 were seen, they would have been seen during the extensive air and ground coverage of the Park during 1996.

I personally doubt if there were any herds larger than the 70 seen at Ngamo still in the Park. I would also be surprised if the total population of eland in the Hwange National Park exceeded 500 animals.

Genus *REDUNCA* (H. Smith 1827)

Reedbuck

Redunca arundinum (Boddaert 1785)

Redunca arundinum arundinum (Boddaert 1785)

Colloquial name

The reedbuck was named from its characteristic association with vleis and reedbeds.

Taxonomic notes

Only one sub-species occurs in southern Africa, namely *R.a. arundinum*.

Distribution and status

Wilson (1975) recorded the presence of reedbuck in the following places: Robins area, around Deteema, Masuma, Dolilo, Robins Camp, Chingahobi, below Sinamatella Camp,

Table 61 - Number and size of eland groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	1	5	4	-	8	-	18
Two	3	3	2	-	2	-	10
Three	0	0	1	-	1	-	2
Four	2	1	1	-	1	-	5
Five	0	1	0	-	1	-	2
Six	0	0	0	-	0	-	0
Seven	0	0	0	-	0	-	0
Eight	0	0	0	-	1	-	1
Nine	1	0	0	-	0	-	1
Ten	0	0	0	-	0	-	0
Eleven	1	0	0	-	0	-	1
Twelve	1	0	0	-	1	-	2
Thirteen	1	0	0	-	0	-	1
Fourteen	0	0	0	-	0	-	0
Fifteen	0	0	0	-	1	-	1
Sixteen	0	0	0	-	1	-	1
Seventeen	0	0	0	-	0	-	0
Eighteen	0	1	0	-	1	-	2
Nineteen	0	0	0	-	0	-	0
Twenty	0	0	0	-	0	-	0
21-30	0	0	0	-	0	-	0
31-40	0	0	0	-	0	-	0
41-50	0	0	0	-	0	-	0
51-100	1	0	0	-	1	-	2
101 and over	0	0	0	-	0	-	0

Salt Pans, Shumba, Nehimba, Main Camp, Ten Mile Drive, Shapi, White Hills, Caterpillar, all along the Manga Vlei to Madundumela, Makololo, Ngamo and Samavundhla.

Wilson (1975) mentioned that on 18th February 1970 and after a detailed count of eight different reedbed groups on the Ten Mile Drive, he counted 24 reedbed, as follows: 4, 2, 5, 1, 3, 4, 3 and 2.

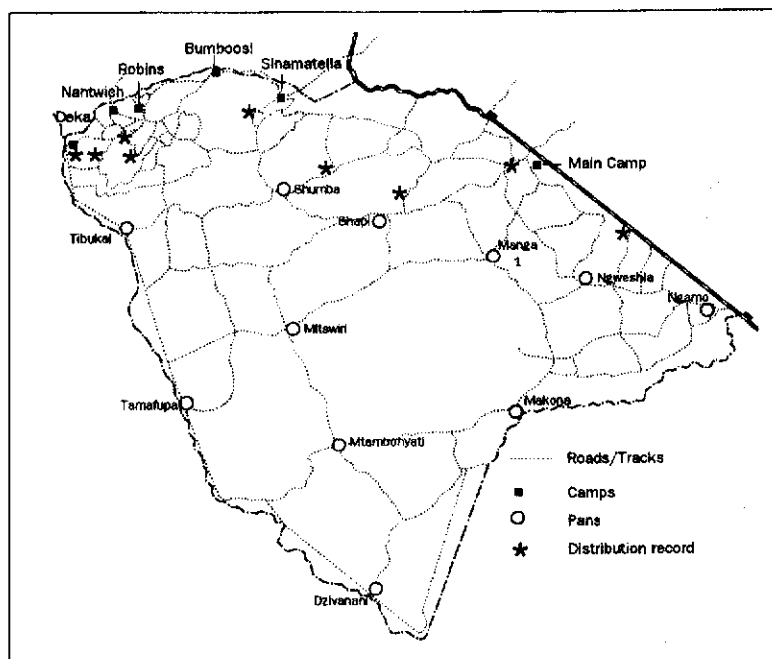
In the Shumba area Wilson (1975) reported no less than 28 different reedbed and he indicated that while the species was not common in the Park there must have been at least 150-200 animals. Wilson (1975) felt that by November 1973 the reedbed population was estimated at 250 animals. While it is not known where Jones (1989) got his data from he estimated the population of reedbed in the Hwange National Park to be 600 animals.

It is interesting to note that during the present survey a considerable amount of time was spent in the "Ten Mile Drive" area near Main Camp and not a single reedbed was seen. They appeared to have disappeared altogether from that area and if any still remain there they are not common. However, one reedbed was seen near Livingi Pan, another near Mbiza and a third was seen from the helicopter in Bembezi Vlei.

The species is still a lot more common in the Robins area where the following were seen by the Wildlife Society during their annual game count in September 1996: Big Tom (20); Deka Home Vlei (11); Little Toms (1) and Reedbed Vlei (8). This gave a total of 47 reedbed seen in the Robins area. A single reedbed was also seen in the Sinamatella area at Salt Springs during the same game count.

Table 62 gives a breakdown of the size of the various groups seen during 1996 while Map 45 shows the distribution of the visual records of all reedbed.

The population of reedbed could perhaps still be as high as 200 animals but most of them would be concentrated in the Robins area.



Map 45 - Distribution of reedbed in the Hwange National Park as determined from "road strip counts", Wildlife Society game count and aerial surveys

Table 62 - Number and size of reedbuck groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	0	8	0	-	1	-	9
Two	0	9	2	-	0	-	11
Three	0	4	3	-	0	-	7
Four	0	1	1	-	0	-	2
Five	0	2	0	-	0	-	2

Genus *KOBUS* (A. Smith 1840)

Waterbuck

Kobus ellipsiprymnus (Ogilby 1833)

Kobus ellipsiprymnus ellipsiprymnus (Ogilby 1833)

Colloquial name

The waterbuck was named as a result of the species being constantly found or associated with water.

Taxonomic notes

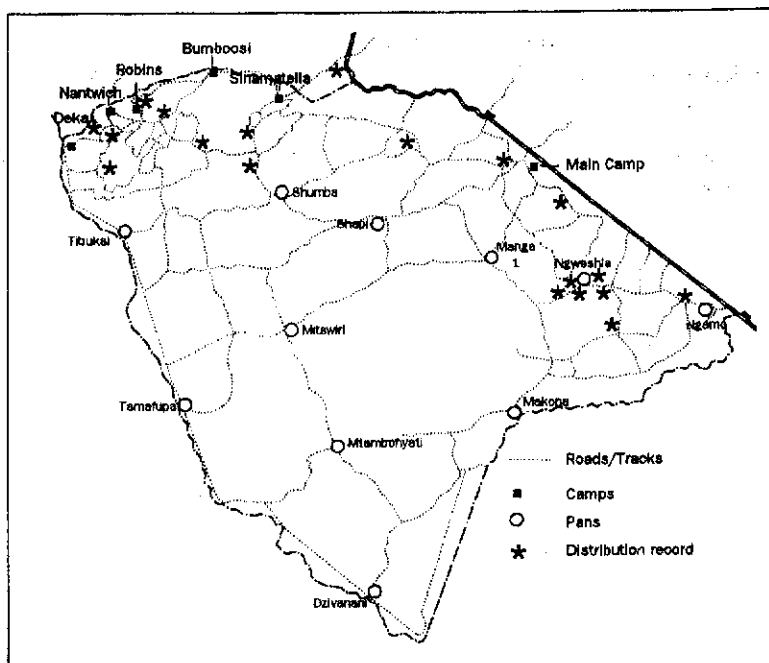
Only one sub-species occurs in the southern African subregion and that is *Kobus ellipsiprymnus*.

Distribution and status

During the original survey of the mammals of the Hwange National Park carried out in 1969/71, Wilson (1975) recorded that the waterbuck was more common in the northern part of the Park in the Robins and Sinamatella areas and also around Main Camp, Dett and Kennedy.

There were also a few records of the species in the south west at Limpandi, Gomo and Dzivanini. The largest herd seen during the 1969/71 survey was of 24 animals at Deteema Dam and there were many sightings of herds of 10 to 15 waterbuck. Wilson (1975) estimated the population of waterbuck to be about 800 animals in the Hwange National Park while Jones (1989) estimated the population at 600 but gave no details of how he obtained that figure.

During the present survey which was undertaken by several different methods including aerial surveys by light fixed wing aircraft and a helicopter, waterbuck were seen mainly in the Ngweshla area and around Robins Camp. There were also a number of other localities where the species was seen and these included Makwa, Main Camp, Makololo, North of Shumba and a few other areas. There were no records of the species from along the Botswana border or in the south west at Dzivanini/ Leasha.



Map 46 - Distribution of waterbuck in the Hwange National Park as determined from "road strip counts" Wildlife Society game count, wildlife forms and aerial surveys

The Wildlife Society annual game count recorded the waterbuck at the following localities: Makololo (25); Mandavu (22); Masuma (5); Mtoa (1); Ngweshla (17) and Reedbuck Vlei (3). The Wildlife Society covered 76 different water points during their 24 hour game count in September 1996 and waterbuck were only recorded at the six localities mentioned above.

During the present survey a good population of waterbuck was found in the Ngweshla/ Makololo area and another near Mandavu/ Masuma area. The largest group seen during 1996 consisted of eighteen animals and there were also 4 groups of fifteen. See Table 63 for details of size of the various herds encountered.

During the 1994 aerial survey of the Park by the National Parks team, a total of 18 waterbuck were seen and from that Davies (1994) estimated the population to be 163 animals with a 95% C.L. range of from 18 to 350 animals. The 1995 aerial survey gave a population of 155 waterbuck (95% C.L. range 22-288). (Davies 1995). The 1996 aerial survey of the Park saw 14 waterbuck and an estimated population of 164 animals was given. The 95% C.L. range was 14 to 365 (123.2, 95% C.L. % estimate).

Taking all the above records and estimates into account it appears as if the population of waterbuck now remaining in the Hwange National Park would perhaps be in the region of not more than 400 animals.

Table 63 - Number and size of waterbuck groups as determined by marked transects (road strip counts), Wildlife Society game count, wildlife report forms and all aerial surveys.

Size of group	Number of records of each group size						Grand total
	Road strip counts	Wildlife Soc.	Wildlife form	Carnivore survey	All aerial surveys	Night observations	
Single	8	8	4	-	43	-	63
Two	12	2	1	-	2	-	17
Three	8	4	1	-	0	-	13
Four	1	1	0	-	0	-	2
Five	0	2	1	-	0	-	3
Six	3	3	1	-	1	-	8
Seven	4	0	0	-	0	-	4
Eight	4	1	0	-	1	-	5
Nine	2	0	0	-	0	-	2
Ten	2	1	1	-	0	-	4
Eleven	3	0	0	-	0	-	3
Twelve	2	0	0	-	0	-	2
Thirteen	1	0	1	-	0	-	2
Fourteen	2	0	0	-	0	-	2
Fifteen	4	0	0	-	0	-	4
Sixteen	0	0	0	-	0	-	0
Seventeen	0	0	0	-	0	-	0
Eighteen	1	0	0	-	0	-	1