

**PRELIMINARY REPORT ON
AERIAL SURVEY OF ELEPHANTS AND OTHER MAMMALS
IN NORTH-WESTERN MATABELELAND**

September 1995

D. St. C. Gibson

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A large herd of around 300 elephants seen in Tsholotsho Communal lands at grid reference 19° 46.8'S 26° 55.8'E on 20/09/1995



Part of the large herd in Tsholotsho Communal lands

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1995 AERIAL SURVEY OF NORTH-WESTERN MATABELELAND

SUMMARY

The annual aerial survey of the elephant range in north-western Matabeleland took place in September 1995. The timing and direction in which the survey proceeded was synchronised with a survey of areas in Botswana adjacent to the border. This was done in order to avoid the possibility of double counting or missing animals crossing the border between the two countries.

The number of elephants within the region fell between 25219 and 36755 (the 95% confidence limits) at an estimated total of 30987 animals.

Other species were counted but the precision of the estimates was low for most cases.

1 INTRODUCTION

The annual dry season aerial survey of the elephant range in north-western Matabeleland was carried out from 08/09/1995 to 20/09/95 inclusive. The survey was synchronised with that taking place in adjacent parts of Botswana to reduce the possibility of double counting (or missing entirely) animals that may have crossed the border between Zimbabwe and Botswana.

This report aims to assist in the production of a more comprehensive report which combines surveys of other parts of Zimbabwe as well as a report for the ELESMAF project on the elephant populations in the whole of the Southern African sub-region. It therefore provides the results of the survey without giving details of methods used nor any discussion of the implications of the results.

2 METHODS

The stratified systematic transect method described by Norton-Griffiths (1978) was used. The position of the first transect in each stratum was chosen randomly, and orientation of the transects was such that major ecological gradients were crossed at right angles.

Analysis was by means of Jolly's (1969) method for unequal sized sampling blocks.

2.1 Stratification and sampling effort

The same strata (Fig. 1) as used on previous surveys of the area were sampled in the order shown in Table 1. To maximise efficiency and precision, the sampling intensity in each stratum (Table 1) was chosen objectively on the basis of densities of elephants in 1994, using Craig's (Gibson 1989, and Craig 1994) method for allocating sampling effort.

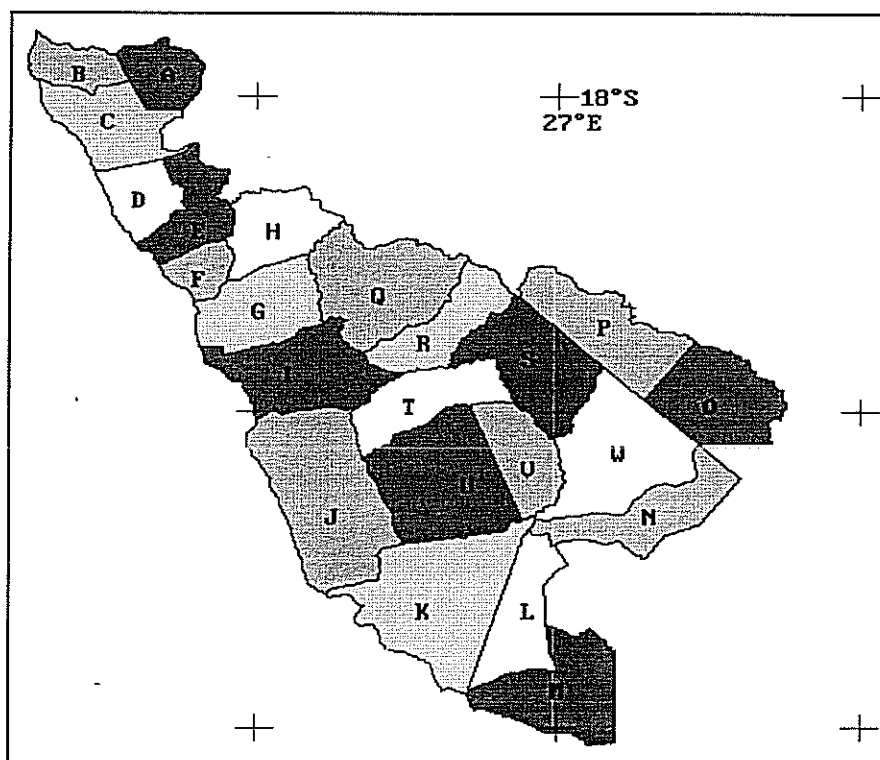


Figure 1 Survey strata. Lettering as in text.
Scale 1:2 645 503

2.2 Survey quality

In order to indicate the quality of a survey, the area surveyed per minute is presented in Table 1. This was calculated from the area actually sampled and the sum of the flying times along the transects in each stratum. This time was not always recorded accurately (i.e. the exact time at which the transect was begun or ended was not always noted) so that the speed at which the transect was flown was often overestimated. The estimate for the area per minute is therefore conservative. In comparison, in 1994 (Craig 1994) the time spent on the transect was calculated by subtracting the average time spent flying between transects (at an average speed of 90 knots) from the total time spent on the survey. As the start and end of adjacent transects are not always perpendicular to each other, this method can slightly underestimate the area sampled per minute.

Table 1. Sample and flight data

(trans = transect; samp. = sample; int. = intensity)

STRATUM	Area km ²	Trans space km	No. of Trans	Tran area km ²	Samp. int. %	Date	Hours flown		km ² /min	Mean speed kts
							trans	total		
A Zambezi N.P.	543	3	11	61.68	11.36	09/09 am	57.4	4.5	1.07	104
B Kazungula	446	4	8	35.50	7.96	09/09 am	36.2	''	0.98	97
C Panda Masuie	963	5	12	63.94	6.64	09/09 am	58.8	''	1.09	106
D Kazuma	561	6	5	30.41	5.42	09/09 pm	31.1	1.2	0.98	100
E Matetsi	703	6.5	7	36.20	5.15	10/09 am	34.4	4.8	1.05	102
F Rosslyn	344	3.5	6	33.06	9.61	10/09 am	31.9	''	1.04	102
G Robins	1029	3	11	113.09	10.99	11/09 am	107.9	3.3	1.05	103
H Zanguja	839	4	10	70.14	8.36	10/09 am	65.2	''	1.08	105
I Dandari	1290	3.5	22	120.74	9.36	13/09 am	112.2	3.8	1.08	101
J Shakwanki	2143	9	7	77.15	3.6	13/09 pm	75.6	2.8	1.02	101
K Dzivanini	2098	4	15	173.09	8.25	19/09 am	163.1	4.7	1.06	104
L Tsholotsho E.	910	6	10	48.78	5.36	20/09 am	46.7	5.1	1.04	103
M Maitengwe	1224	9	6	51.04	4.17	20/09 am	46.4	'	1.10	107
N Tsholotsho N.	976	9	8	37.87	3.88	20/09 am	33.9	'	1.12	109
O Ngamo Forest	1171	7	7	59.49	5.08	18/09 pm	54.1	2.1	1.10	106
P Sikumi Forest	1173	7	9	53.37	4.55	15/09 pm	49.4	1.6	1.08	107
Q Sinamatella	1522	4	15	126.63	8.32	12/09 am	122.2	3.5	1.04	102
R Mtoa	826	3	20	92.26	11.17	12/09 pm	84.8	2.8	1.09	106
S Main Camp	1261	3	20	138.21	10.96	17/09 am	139.0	3.9	0.99	98
T Shapi	923	3	19	101.90	11.04	15/09 am	101	3.4	1.01	99
U Central B	1723	6	8	88.39	5.13	16/09 am	89.3	2.8	0.99	98
V Central A	775	3	15	85.17	10.99	16/09 pm	87.4	2.7	0.97	96
W Ngamo	1629	3	19	174.95	10.74	18/09 am	173.2	4.4	1.01	100

2.3 Transect selection

The selection of transects for the survey was done in the same way as in 1994 by means of the computer programme described in Craig (1994). The transects flown are shown in Fig. 2.

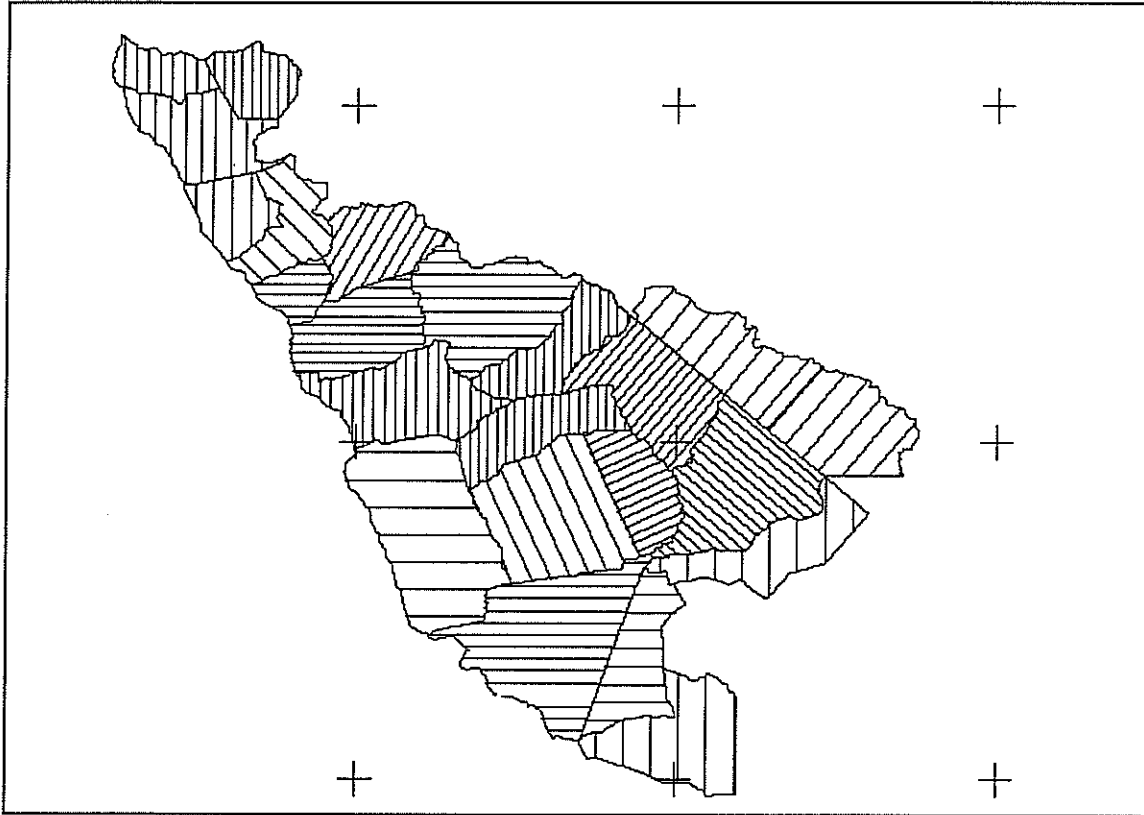


Figure 2 Transects flown on the 1995 survey

2.4 Flight planning

The survey began in the north and moved south and eastward. This was in anticipation of the possible movement of elephant out of these areas and thus intended to reduce the possibility of counting the same elephants twice. This also enabled synchronisation of the survey with that taking place in adjacent areas in Botswana.

3 CALIBRATION OF STRIP WIDTHS

This was done as usual by flying at known heights across numbers marked at 10m intervals on the ground.

Table 2. Results of calibration of strip widths

HEIGHT (ft a.g.l.)	STRIP WIDTH (adjusted to 300ft a.g.l.)	
	LEFT (Muroki)	RIGHT (Chipisi)
290	155.17	144.83
280	139.29	182.14
300	150.00	170.00
310	164.52	154.84
250	156.00	204.00
300	140.00	200.00
250	144.00	192.00
200	165.00	180.00
260	150.00	207.69
260	150.00	196.15
270	111.11	211.11
190	173.68	173.68
295	162.71	213.56
300	160.00	190.00
295	142.37	183.05
260	150.00	196.15
250	156.00	180.00
240	150.00	200.00
240	150.00	175.00
290	144.83	165.52
285	147.37	168.42
290	144.83	175.86
300	150.00	150.00
290	155.17	155.17
280	171.43	160.71
310	145.16	154.84
250	144.00	192.00
200	150.00	195.00
260	138.46	161.54
MEAN	150.38	180.46

4 DATA COLLECTION

The survey was flown at a nominal height of 300 ft a.g.l. and at speeds of around 100 knots (Table 1). The resultant search intensity is also given in Table 1 in terms of km²/min.

The positions of sightings were recorded from the GPS and height a.g.l. was recorded at 30 second intervals from the radar altimeter.

Carcasses were recorded in three classes following Douglas-Hamilton & Hillman (1981):

- Class 1 Fresh, with skin and flesh present
- Class 2 Bones, with rot patch on ground
- Class 3 Bones bleached white, no rot patch

Cull sites and poachers camps were also recorded but these were not included in the present analysis. Standing water was also recorded.

5 PARTICIPANTS

The survey crew comprised C. Davies (coordinator and data recorder), D. Gibson (pilot and author of this report), F. Muroki (left observer) and D. Chipisi (right observer).

6 RESULTS

A total area of 25074km² was sampled at a mean sampling intensity of 7.5%. The total flying time (including commuting to and from strata) was 57.4 hours with an additional 8.4 hours spent in positioning and calibration.

The results of the surveys are summarised in Tables 3 to 15, with details provided in Appendix I.

Distributions of sightings are illustrated for some species.

The density distribution is not indicated on these maps (i.e. the circles represent a single sighting whether that sighting contains 1 or 100 animals). The maps also do not take into account differences in sampling intensity between strata and may give a biased view of distributions as a result. They are useful nevertheless as a minimum indication of distributions.

The raw data (i.e. printouts of the data sheets from the survey) are presented in Appendix II.

6.1 Elephants in north-western Matabeleland

Table 3. Numbers of elephants in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.i.
MATETSI COMPLEX				
Zambezi N.P.	132	1162	478 - 1846	58.8
Kazungula	60	753	60 - 1947	158.5
Panda Masuie	28	422	28 - 981	132.8
Kazuma	18	332	18 - 915	175.8
Matetsi	21	408	21 - 1071	162.8
Rosslyn	23	239	23 - 566	136.6
Zanguja	93	1112	93 - 2402	115.9
TOTAL	375	4429	2560 - 6297	42.2
HWANGE NATIONAL PARK				
Robins Camp	400	3641	2216 - 5067	39.1
Dandari	149	1591	635 - 2547	60.1
Shakwanki	0	0	-	
Dzivanini	71	861	306 - 1416	64.5
Sinamatella	300	3605	1820 - 5391	49.5
Mtoa	173	1548	737 - 2359	52.4
Main Camp	523	4770	2940 - 6600	38.4
Shapi	121	1096	393 - 1800	64.1
Central B	3	59	3 - 146	150.3
Central A	149	1355	149 - 3018	122.7
Ngamo	455	4235	2029 - 6440	52.1
TOTAL	2344	22762	18712 - 26812	17.8
COMMUNAL AREAS				
Tsholotsho E	89	1661	89 - 4331	160.7
Maitengwe	50	1198	50 - 4514	276.7
Tsholotsho N	0	0	-	
TOTAL	139	2860	139 - 6496	127.1
FOREST AREAS				
Ngamo Forest	13	256	13 - 561	118.9
Sikumi Forest	31	681	31 - 1951	181.3
TOTAL	44	937	44 - 2096	123.7
GRAND TOTAL	2902	30987	25219 - 36755	18.6

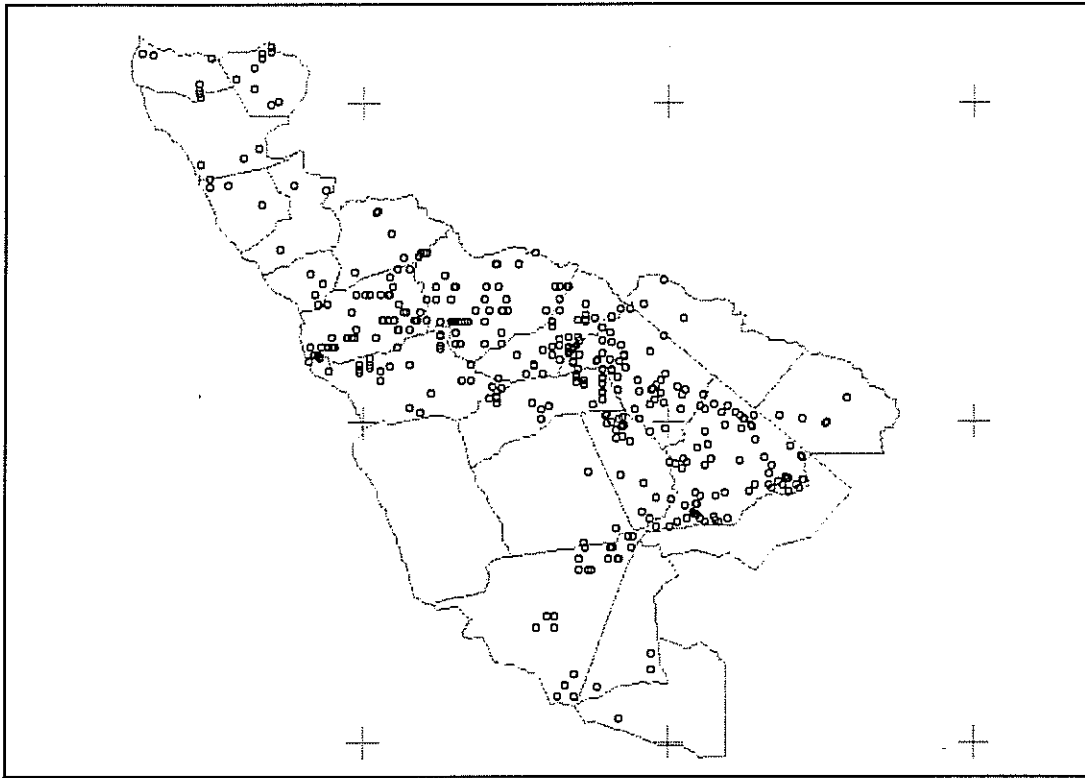


Figure 3 Sightings of elephants in north-west Matabeleland

6.2 Elephant family groups

Table 4. Numbers of elephant family groups in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	80	704	94 - 1315	86.6
Kazungula	45	565	45 - 1498	165.1
Panda Masuie	17	256	17 - 758	196.0
Kazuma	0	0	-	
Matetsi	14	272	14 - 951	249.9
Rossllyn	12	125	12 - 461	269.0
Zanguja	91	1088	91 - 2396	120.2
TOTAL	259	3011	1324 - 4697	56.0
HWANGE NATIONAL PARK				
Robins Camp	315	2867	1343 - 4392	53.2
Dandari	109	1164	214 - 2114	81.6
Shakwanki	0	0	-	
Dzivanini	38	461	38 - 909	97.3
Sinamatella	215	2584	1260 - 3907	51.2
Mtoa	105	940	332 - 1547	64.7
Main Camp	437	3986	2216 - 5756	44.4
Shapi	87	788	188 - 1388	76.1
Central B	0	0	-	
Central A	116	1055	116 - 2520	138.9
Ngamo	336	3127	818 - 5436	73.8
TOTAL	1758	16972	13153 - 20791	22.5
COMMUNAL AREAS				
Tsholotsho E	19	355	19 - 816	130.0
Maitengwe	49	1174	49 - 4423	276.7
Tsholotsho N	0	0	-	
TOTAL	68	1529	68 - 4192	174.1
FOREST AREAS				
Ngamo Forest	4	79	4 - 263	233.3
Sikumi Forest	20	439	20 - 1478	236.5
TOTAL	24	518	24 - 1481	185.8
GRAND TOTAL	2109	22030	17052 - 27007	22.6

6.3 Elephant bull groups

Table 5. Number of elephant bull groups in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	52	458	52 - 876	91.3
Kazungula	15	188	15 - 489	159.8
Panda Masuie	11	166	11 - 462	179.0
Kazuma	18	332	18 - 915	175.8
Matetsi	7	136	7 - 334	146.0
Rossllyn	11	114	11 - 225	122.9
Zanguja	2	24	2 - 72	202.1
TOTAL	116	1418	714 - 2122	49.6
HWANGE NATIONAL PARK				
Robins Camp	85	774	137 - 1411	82.3
Dandari	40	427	236 - 619	44.8
Shakwanki	0	0	-	
Dzivanini	33	400	57 - 743	85.6
Sinamatella	85	1022	350 - 1693	65.7
Mtoa	68	609	126 - 1091	79.3
Main Camp	86	784	489 - 1079	37.6
Shapi	34	308	34 - 612	98.7
Central B	3	59	3 - 146	150.3
Central A	33	300	67 - 533	77.6
Ngamo	119	1108	653 - 1562	41.0
TOTAL	586	5790	4579 - 7001	20.9
COMMUNAL AREAS				
Tsholotsho E	70	1307	70 - 3991	205.4
Maitengwe	1	24	1 - 90	276.7
Tsholotsho N	0	0	-	
TOTAL	71	1331	71 - 3799	185.5
FOREST AREAS				
Ngamo Forest	9	177	9 - 484	233.3
Sikumi Forest	11	242	11 - 678	180.6
TOTAL	20	419	20 - 901	115.1
GRAND TOTAL	793	8957	6165 - 11749	31.2

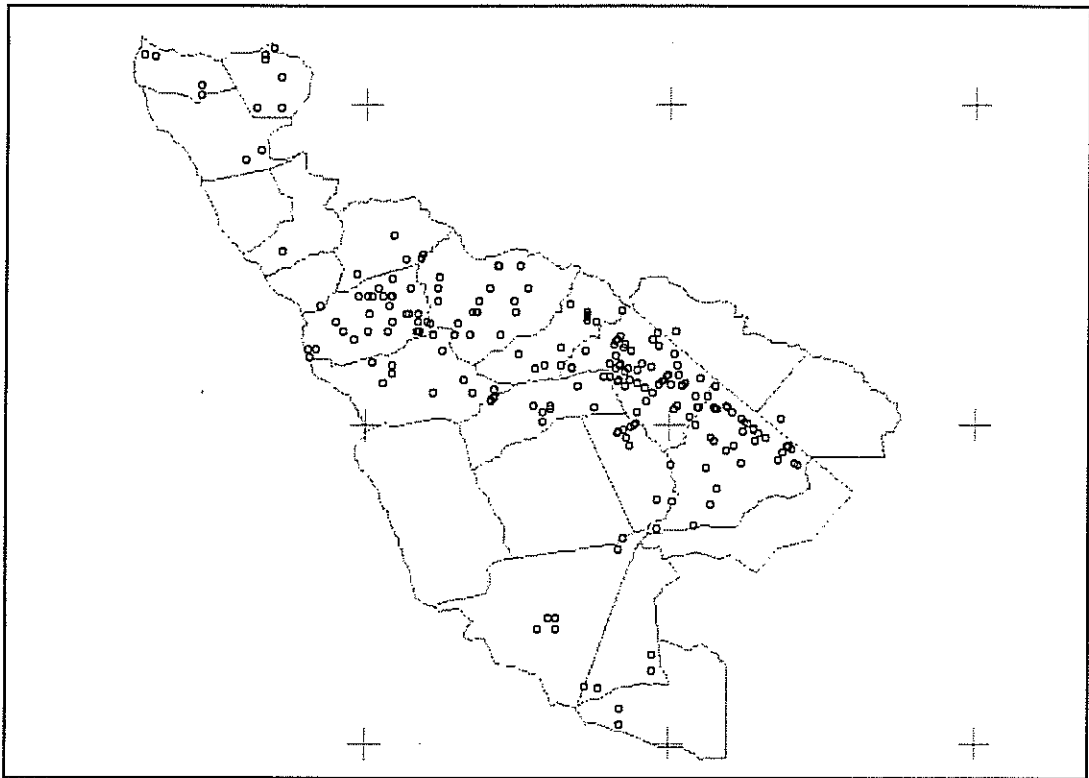


Figure 4 Sightings of elephant family groups in north-west Matabeleland

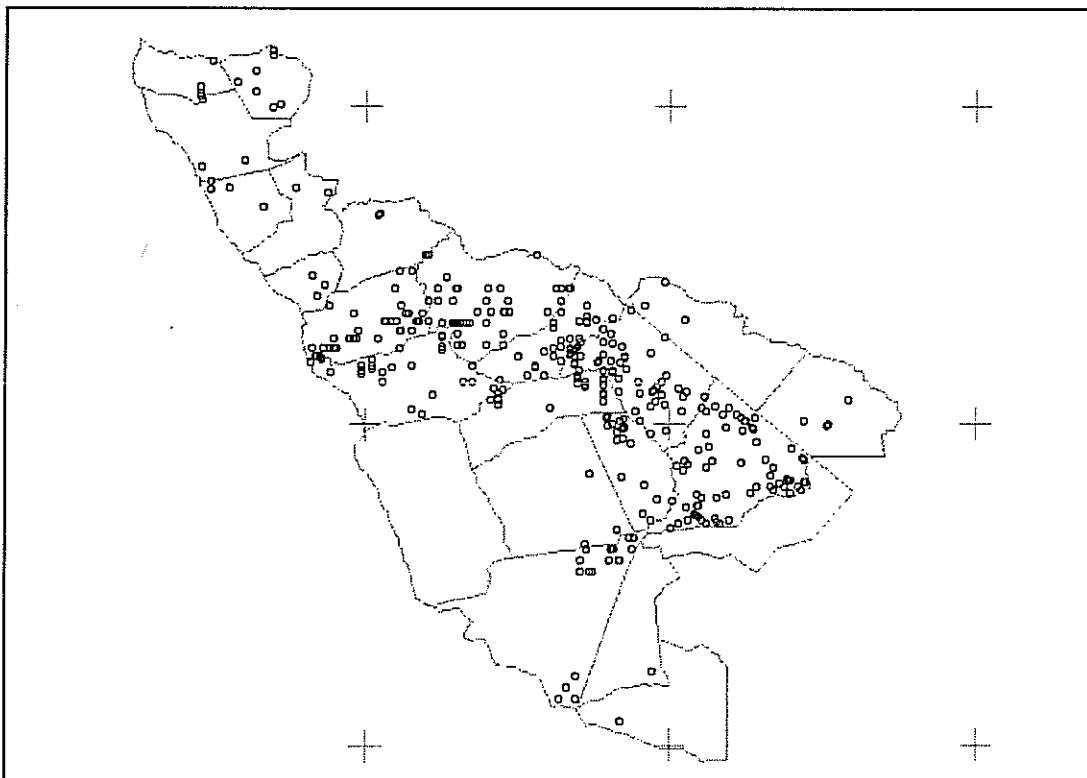


Figure 5 Sightings of elephant bull groups in north-west Matabeleland

6.4 Elephant carcasses (Class 2)

Only 4 elephant carcasses in class 2 were seen as shown in Table 6.

Table 6. Numbers of elephant carcasses (class 2) in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	1	9	1 - 27	203.8
Kazungula	0	0	-	
Panda Masuie	0	0	-	
Kazuma	0	0	-	
Matetsi	0	0	-	
Rossllyn	0	0	-	
Zanguja	1	12	1 - 37	208.5
TOTAL	2	21	2 - 48	131.5
HWANGE NATIONAL PARK				
Robins Camp	0	0	-	
Dandari	0	0	-	
Shakwanki	0	0	-	
Dzivanini	0	0	-	
Sinamatella	0	0	-	
Mtoa	0	0	-	
Main Camp	0	0	-	
Shapi	1	9	1 - 27	194.8
Central B	0	0	-	
Central A	0	0	-	
Ngamo	1	9	1 - 28	204.0
TOTAL	2	18	2 - 43	134.0
COMMUNAL AREAS				
Tshlotsho E	0	0	-	
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	0	0	-	
FOREST AREAS				
Ngamo Forest	0	0	-	
Sikumi Forest	0	0	-	
TOTAL	0	0	-	
GRAND TOTAL	4	39	4 - 76	94.0

6.5 Elephant carcasses (Class 3)

Class 3 (a year or older) elephant carcasses were fairly numerous in several strata as indicated by Table 7 and Fig. 6.

Table 7. Numbers of elephant carcasses (class 3) in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	4	35	4 - 74	110.9
Kazungula	5	63	5 - 144	129.6
Panda Masuie	2	30	2 - 67	123.3
Kazuma	2	37	2 - 126	242.5
Matetsi	0	0	-	
Rossllyn	1	10	1 - 33	220.6
Zanguja	2	24	2 - 57	138.4
TOTAL	16	199	88 - 311	55.9
HWANGE NATIONAL PARK				
Robins Camp	1	9	1 - 28	210.2
Dandari	6	64	19 - 109	70.5
Shakwanki	2	56	2 - 146	163.4
Dzivanini	22	267	178 - 355	33.3
Sinamatella	7	84	7 - 180	113.9
Mtoa	2	18	2 - 54	203.4
Main Camp	13	119	52 - 185	55.7
Shapi	7	63	16 - 111	74.6
Central B	3	59	3 - 149	154.6
Central A	6	55	6 - 111	103.1
Ngamo	13	121	57 - 185	52.9
TOTAL	82	914	709 - 1119	22.4
COMMUNAL AREAS				
Tsholotsho E	0	0	-	
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	7	150	27 - 273	81.8
FOREST AREAS				
Ngamo Forest	0	0	-	
Sikumi Forest	0	0	-	
TOTAL	6	125	18 - 232	85.3
GRAND TOTAL	111	1388	1109 - 1668	20.1

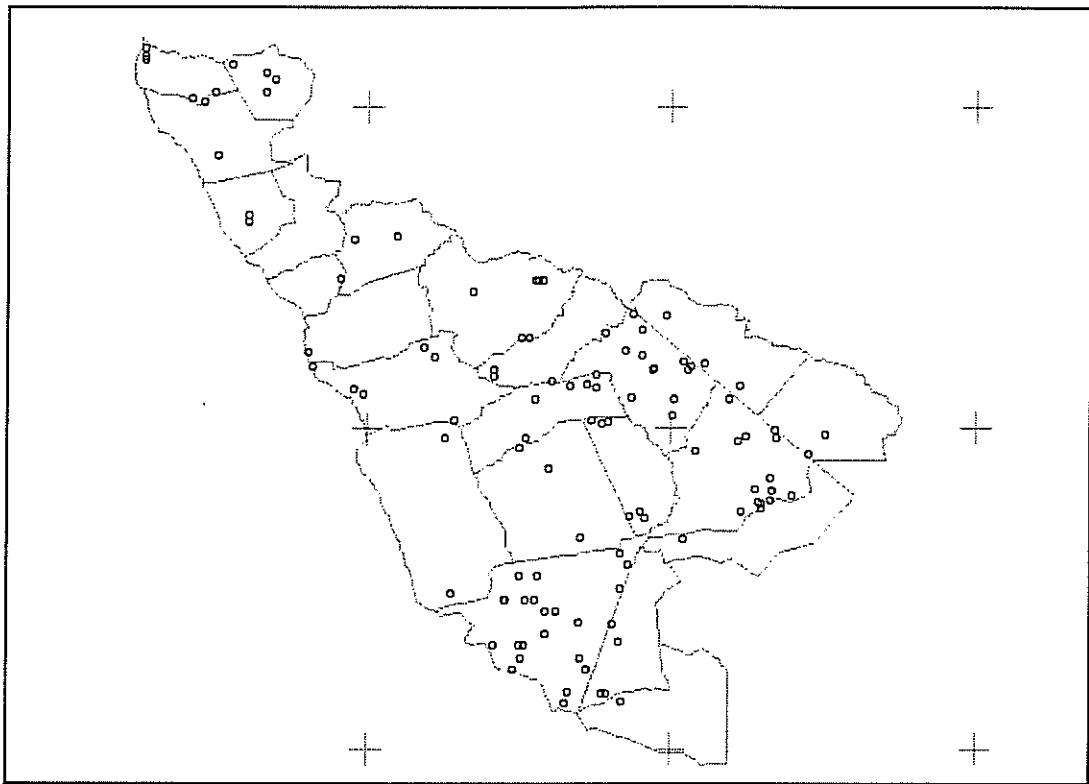


Figure 6 Sightings of class 3 elephant carcasses in north west Matabeleland

6.6 Water

Any standing water seen within the transects was recorded to provide some idea of the distribution of available water. This can be seen in Fig. 7. It should be noted that this is a minimum, and that although water was not recorded in the Ngamo stratum, for example, there were waterholes which contained water but which did not appear between the streamers. It may have been more useful, since an estimate of density was not required, to record all sightings of water, within or outside the streamers.

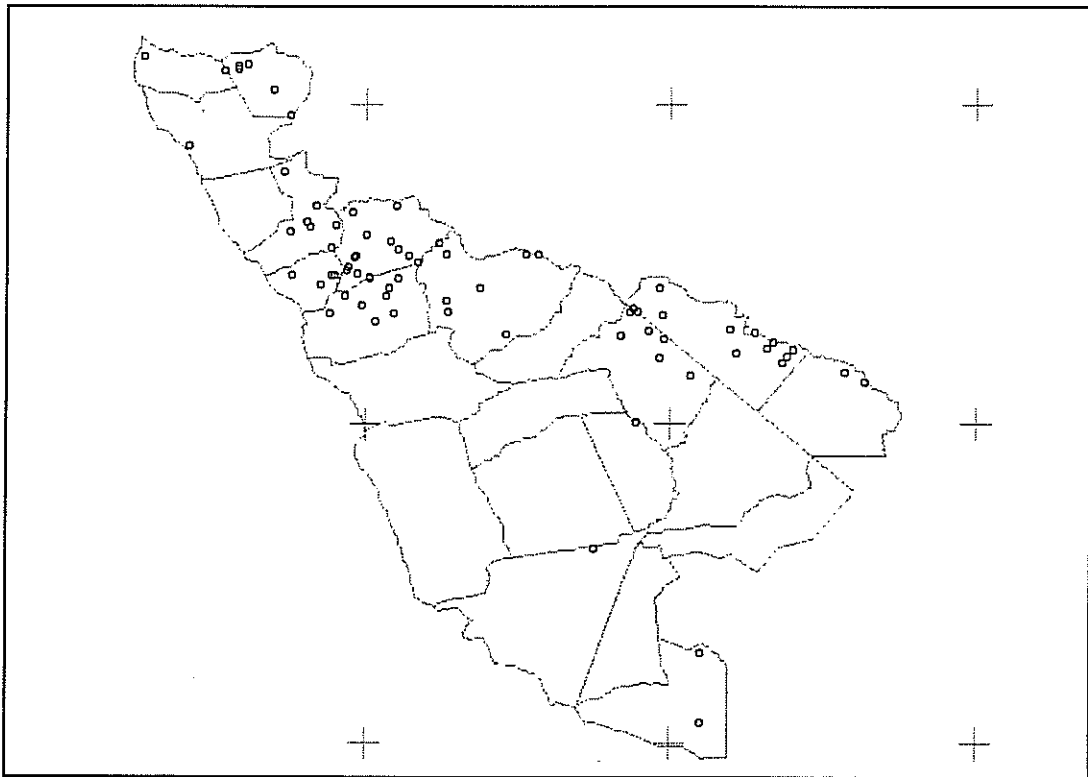


Figure 7 Sightings of water during the 1995 survey

6.7 Buffalo

Table 8 Numbers of buffalo in north western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	228	2007	228 - 5019	150.0
Kazungula	53	666	53 - 2156	223.9
Panda Masuie	0	0	-	
Kazuma	0	0	-	
Matetsi	30	582	30 - 1730	197.0
Rosslyn	0	0	-	
Zanguja	35	419	35 - 1261	201.2
TOTAL	346	3674	460 - 6888	87.5
HWANGE NATIONAL PARK				
Robins Camp	8	73	8 - 181	149.1
Dandari	0	0	-	
Shakwanki	0	0	-	
Dzivanini	0	0	-	
Sinamatella	7	84	7 - 196	132.5
Mtoa	7	63	7 - 194	209.7
Main Camp	30	274	75 - 472	72.5
Shapi	0	0	-	
Central B	0	0	-	
Central A	0	0	-	
Ngamo	99	921	99 - 2180	136.6
TOTAL	151	1415	192 - 2637	86.4
COMMUNAL AREAS				
Tsholotsho E	0	0	-	
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	0	0	-	
FOREST AREAS				
Ngamo Forest	16	315	16 - 1068	238.9
Sikumi Forest	0	0	-	
TOTAL	16	315	16 - 980	210.9
GRAND TOTAL	513	5404	1911 - 8897	64.6

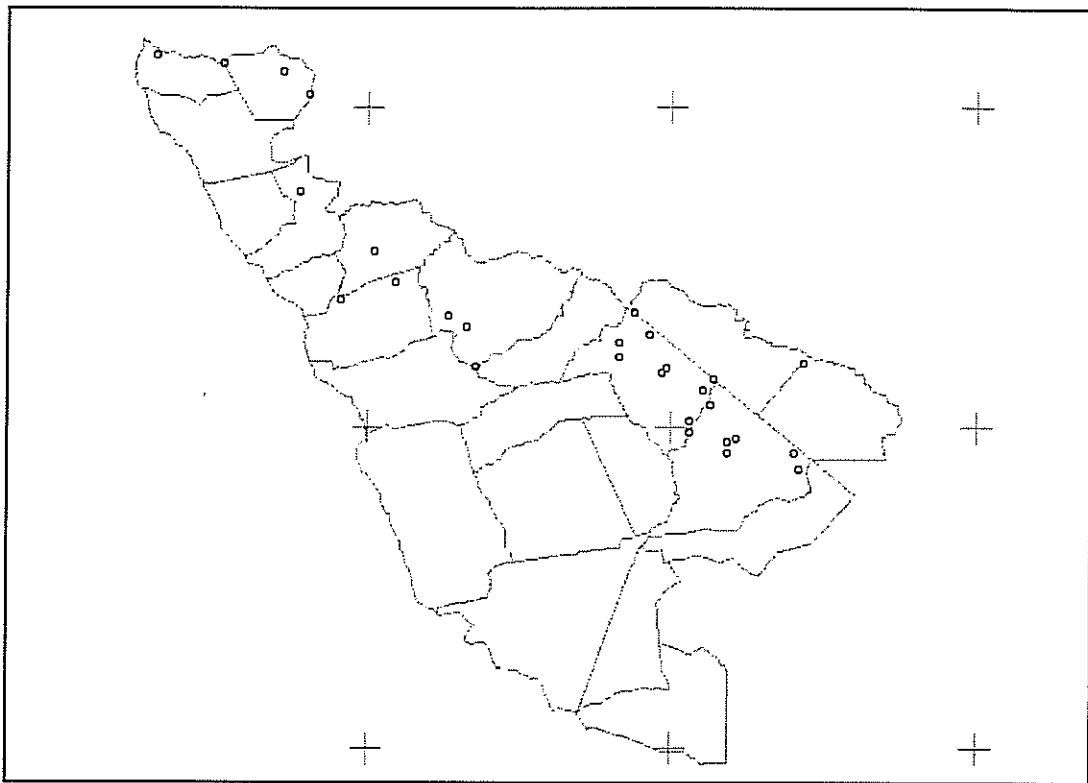


Figure 8 Sightings of buffalo in north-west Matabeleland

6.8 Giraffe

Table 9. Numbers of giraffe in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	10	88	10 - 207	134.7
Kazungula	0	0	-	
Panda Masuie	0	0	-	
Kazuma	1	18	1 - 63	242.5
Matetsi	0	0	-	
Rosslyn	3	31	3 - 108	247.4
Zanguja	2	24	2 - 59	144.8
TOTAL	16	162	32 - 292	80.5
HWANGE NATIONAL PARK				
Robins Camp	13	118	21 - 216	82.5
Dandari	0	0	-	
Shakwanki	8	222	8 - 500	124.9
Dzivanini	20	242	50 - 435	79.5
Sinamatella	18	216	18 - 438	102.4
Mtoa	13	116	13 - 235	102.4
Main Camp	67	611	157 - 1066	74.4
Shapi	2	18	2 - 43	135.0
Central B	10	195	10 - 428	119.1
Central A	9	82	9 - 166	103.1
Ngamo	23	214	23 - 422	97.4
TOTAL	183	2036	1388 - 2684	31.8
COMMUNAL AREAS				
Tsholotsho E	0	0	-	
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	0	0	-	
FOREST AREAS				
Ngamo Forest	0	0	-	
Sikumi Forest	1	22	1 - 72	228.6
TOTAL	1	22	1 - 68	208.8
GRAND TOTAL	200	2220	1557 - 2882	29.8

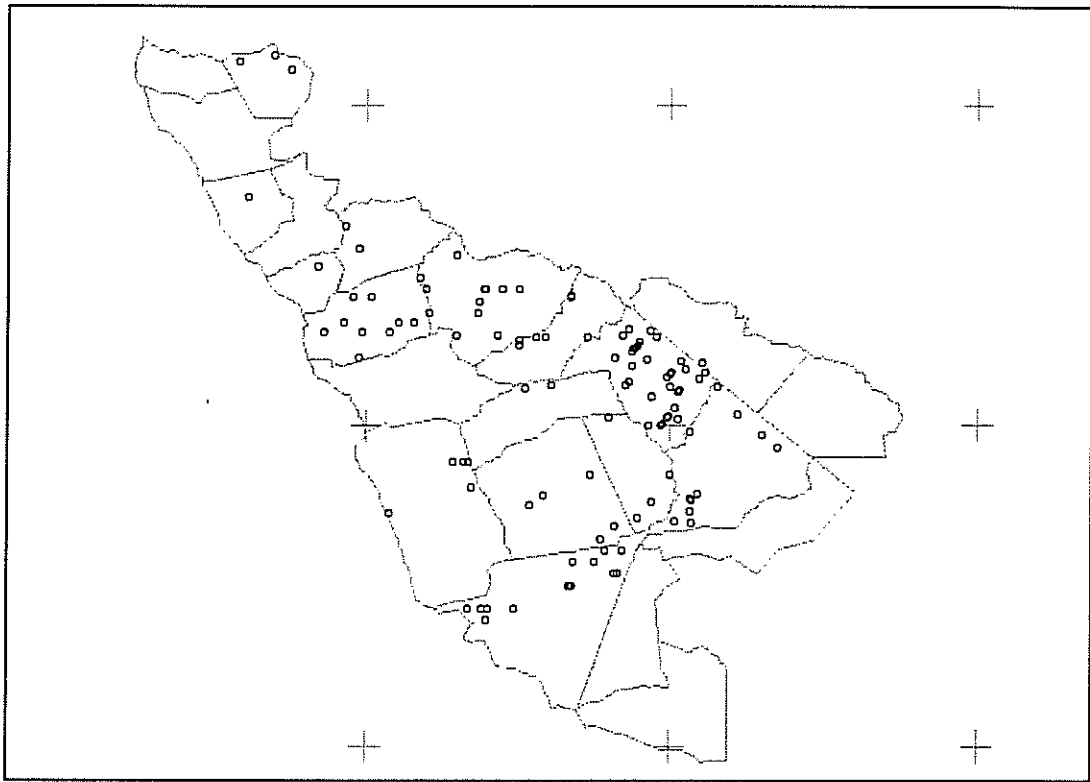


Figure 9 Sightings of giraffe in north-west Matabeleland

6.9 Impala

Table 10. Numbers of impala in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	1	9	1 - 27	201.5
Kazungula	14	176	14 - 561	219.4
Panda Masuie	0	0	-	
Kazuma	0	0	-	
Matetsi	20	388	20 - 1280	229.6
Rossllyn	10	104	10 - 334	220.6
Zanguja	92	1100	261 - 1940	76.3
TOTAL	137	1777	673 - 2882	62.1
HWANGE NATIONAL PARK				
Robins Camp	148	1347	374 - 2321	72.3
Dandari	15	160	15 - 382	138.2
Shakwanki	13	361	13 - 1013	180.2
Dzivvanini	4	48	4 - 150	208.5
Sinamatella	66	793	232 - 1355	70.8
Mtoa	0	0	-	
Main Camp	22	201	22 - 560	179.0
Shapi	3	27	3 - 81	196.3
Central B	0	0	-	
Central A	0	0	-	
Ngamo	2	19	2 - 43	132.4
TOTAL	273	2957	1734 - 4180	41.4
COMMUNAL AREAS				
Tsholotsho E	0	0	-	
Maitengwe	1	24	1 - 80	235.7
Tsholotsho N	0	0	-	
TOTAL	1	24	1 - 70	190.7
FOREST AREAS				
Ngamo Forest	0	0	-	
Sikumi Forest	8	176	8 - 525	198.7
TOTAL	8	176	8 - 494	181.4
GRAND TOTAL	419	4934	3259 - 6609	33.9

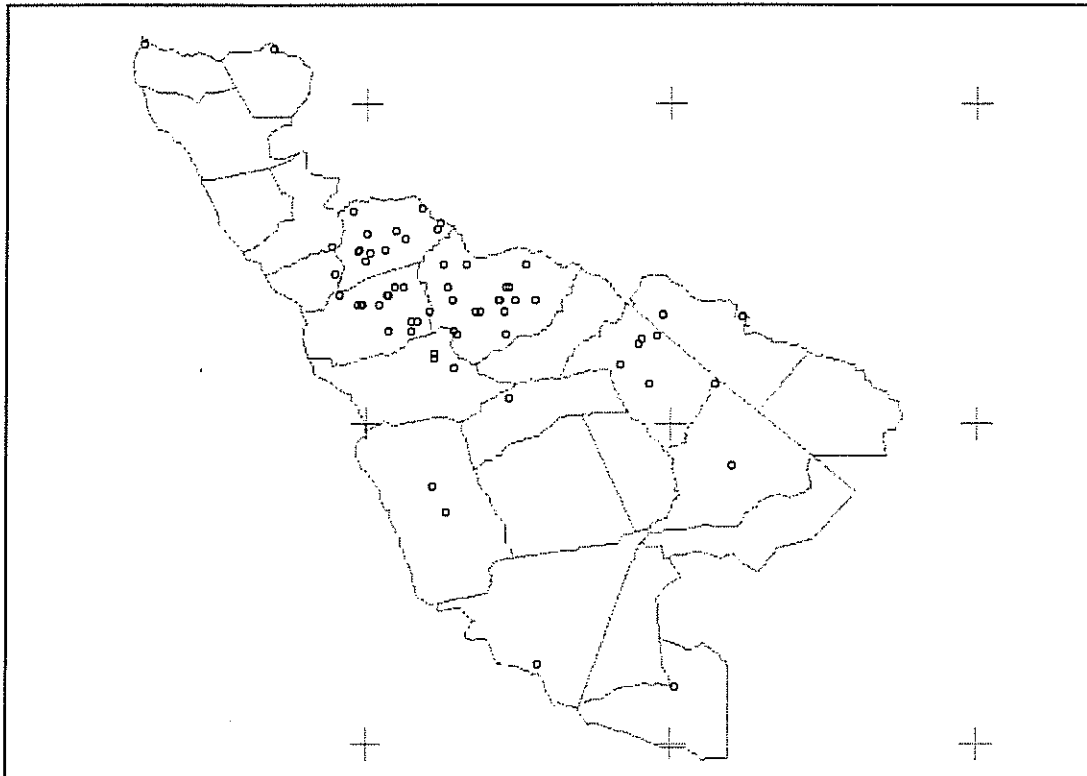


Figure 10 Sightings of impala in north-west Matabeleland

6.10 Roan

Table 11. Numbers of roan in north-west Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	0	0	-	
Kazungula	0	0	-	
Panda Masuie	0	0	-	
Kazuma	0	0	-	
Matetsi	0	0	-	
Rosslyn	0	0	-	
Zanguja	1	12	1 - 38	214.6
TOTAL	1	12	1 - 35	189.7
HWANGE NATIONAL PARK				
Robins Camp	2	18	2 - 43	134.6
Dandari	0	0	-	
Shakwanki	0	0	-	
Dzivanini	1	12	1 - 37	201.9
Sinamatella	0	0	-	
Mtoa	0	0	-	
Main Camp	1	9	1 - 27	194.4
Shapi	1	9	1 - 27	199.4
Central B	0	0	-	
Central A	1	9	1 - 27	201.3
Ngamo	1	9	1 - 28	199.7
TOTAL	7	67	20 - 114	69.9
COMMUNAL AREAS				
Tsholotsho E	0	0	-	
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	0	0	-	
FOREST AREAS				
Ngamo Forest	0	0	-	
Sikumi Forest	0	0	-	
TOTAL	0	0	-	
GRAND TOTAL	8	79	27 - 131	65.9

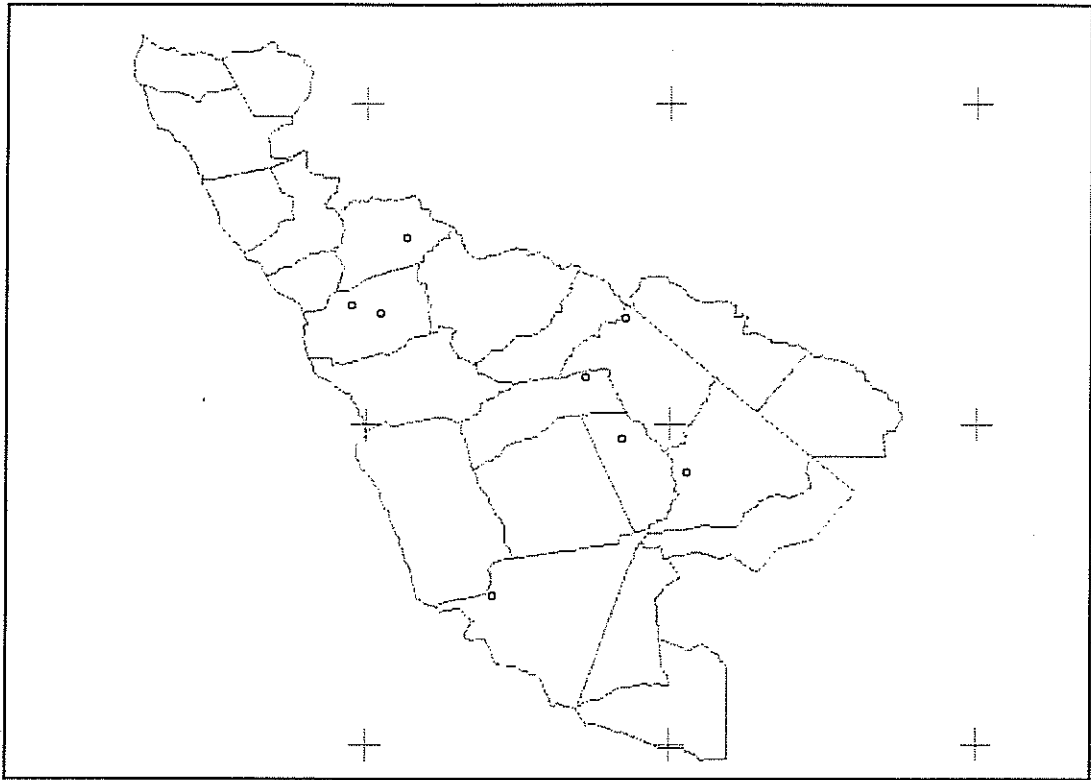


Figure 11 Sightings of roan in north-west Matabeleland

6.11 Sable

Table 12. Numbers of sable in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	31	273	31 - 675	120.0
Kazungula	6	75	6 - 184	144.8
Panda Masuie	16	241	33 - 449	86.4
Kazuma	2	37	2 - 126	242.5
Matetsi	29	563	29 - 1465	160.1
Rosslyn	20	208	20 - 640	207.5
Zanguja	20	239	20 - 583	143.7
TOTAL	124	1635	674 - 2599	58.8
HWANGE NATIONAL PARK				
Robins Camp	15	137	15 - 335	145.1
Dandari	7	75	7 - 148	98.2
Shakwanki	0	0	-	
Dzivanini	0	0	-	
Sinamatella	3	36	3 - 108	200.8
Mtoa	4	36	4 - 68	90.2
Main Camp	28	255	28 - 551	115.7
Shapi	2	18	2 - 42	131.7
Central B	2	39	2 - 127	225.7
Central A	4	36	4 - 78	115.4
Ngamo	83	772	349 - 1196	54.8
TOTAL	148	1405	865 - 1944	38.4
COMMUNAL AREAS				
Tsholotsho E	0	0	-	
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	0	0	-	
FOREST AREAS				
Ngamo Forest	85	1674	535 - 2814	68.1
Sikumi Forest	55	1208	55 - 2364	95.7
TOTAL	0	0	-	
GRAND TOTAL	412	5923	4180 - 7667	29.4

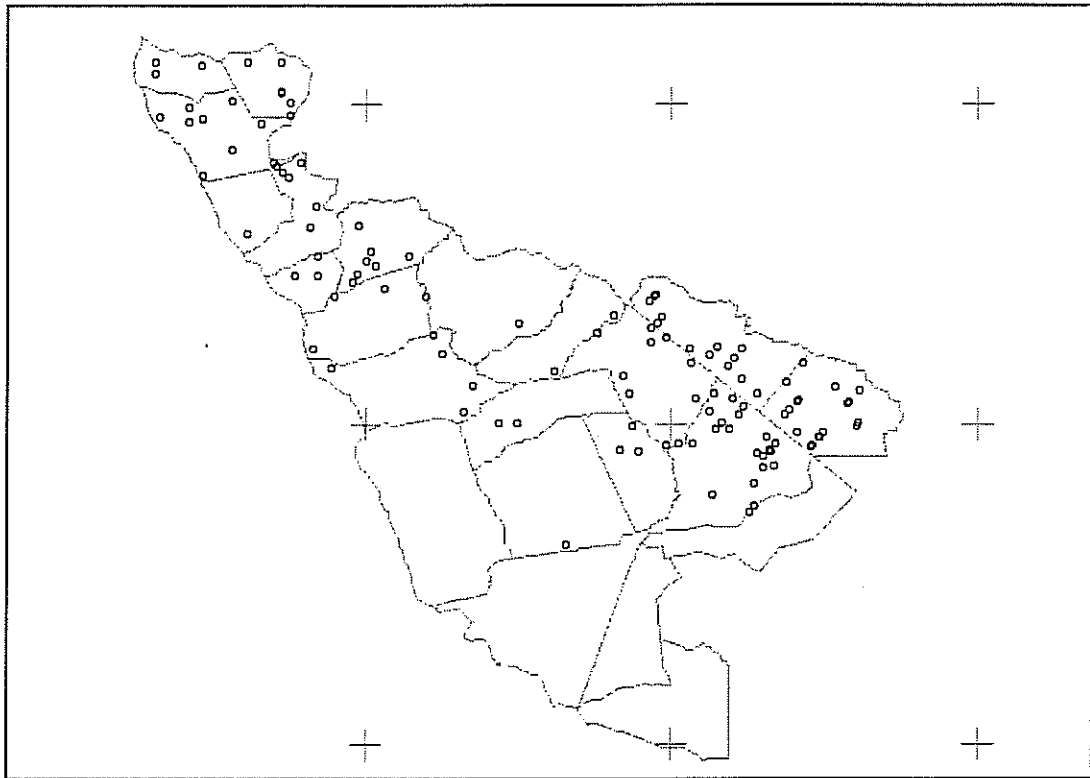


Figure 12 Sightings of sable in north-west Matabeleland

6.12 Wildebeest

Table 13. Numbers of wildebeest in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	0	0	-	
Kazungula	0	0	-	
Panda Masuie	0	0	-	
Kazuma	0	0	-	
Matetsi	0	0	-	
Rosslyn	0	0	-	
Zanguja	0	0	-	
TOTAL	0	0	-	
HWANGE NATIONAL PARK				
Robins Camp	0	0	-	
Dandari	0	0	-	
Shakwanki	0	0	-	
Dzivanini	0	0	-	
Sinamatella	2	24	2 - 77	218.8
Mtoa	0	0	-	
Main Camp	0	0	-	
Shapi	0	0	-	194.8
Central B	0	0	-	
Central A	0	0	-	
Ngamo	66	614	66 - 1553	152.8
TOTAL	68	638	68 - 1529	139.6
COMMUNAL AREAS				
Tsholotsho E	2	37	2 - 124	232.5
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	2	37	2 - 117	213.8
FOREST AREAS				
Ngamo Forest	0	0	-	
Sikumi Forest	0	0	-	
TOTAL	0	0	-	
GRAND TOTAL	70	676	70 - 1570	132.4

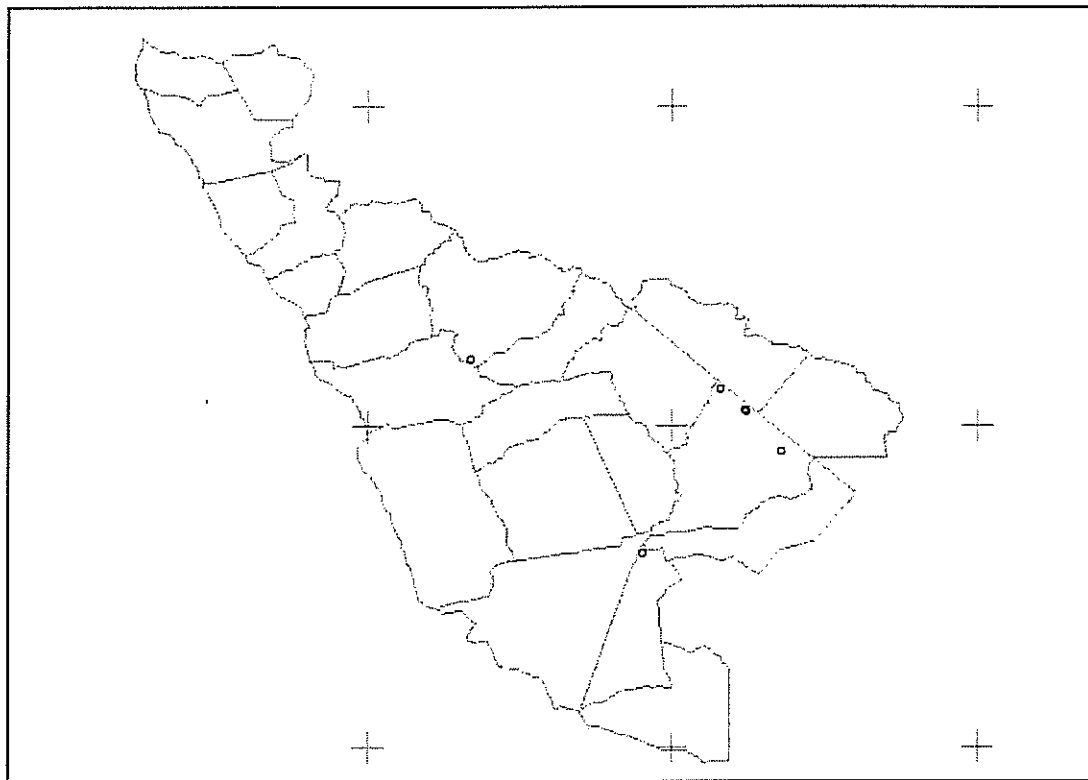


Figure 13 Sightings of wildebeest in north-west Matabeleland

6.13 Zebra

Table 14. Numbers of zebra in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	24	244	24 - 624	195.2
Kazungula	0	0	-	
Panda Masuie	0	0	-	
Kazuma	1	18	1 - 65	253.0
Matetsi	45	874	45 - 1939	122.0
Rossiyn	11	114	11 - 374	227.0
Zanguja	110	1316	110 - 2648	101.3
TOTAL	191	2534	1009 - 4059	60.2
HWANGE NATIONAL PARK				
Robins Camp	99	901	354 - 1448	60.7
Dandari	17	182	52 - 311	71.5
Shakwanki	0	0	-	
Dzivanini	0	0	-	
Sinamatella	52	625	157 - 1093	74.9
Mtoa	19	170	19 - 436	156.3
Main Camp	61	556	164 - 948	70.4
Shapi	5	45	5 - 134	195.9
Central B	0	0	-	
Central A	20	182	20 - 436	139.5
Ngamo	41	382	41 - 782	105.0
TOTAL	314	3043	2116 - 3970	30.5
COMMUNAL AREAS				
Tsholotsho E	0	0	-	
Maitengwe	0	0	-	
Tsholotsho N	0	0	-	
TOTAL	0	0	-	
FOREST AREAS				
Ngamo Forest	4	79	4 - 259	228.3
Sikumi Forest	3	66	3 - 216	227.4
TOTAL	7	145	7 - 354	144.9
GRAND TOTAL	512	5721	3926 - 7516	31.4

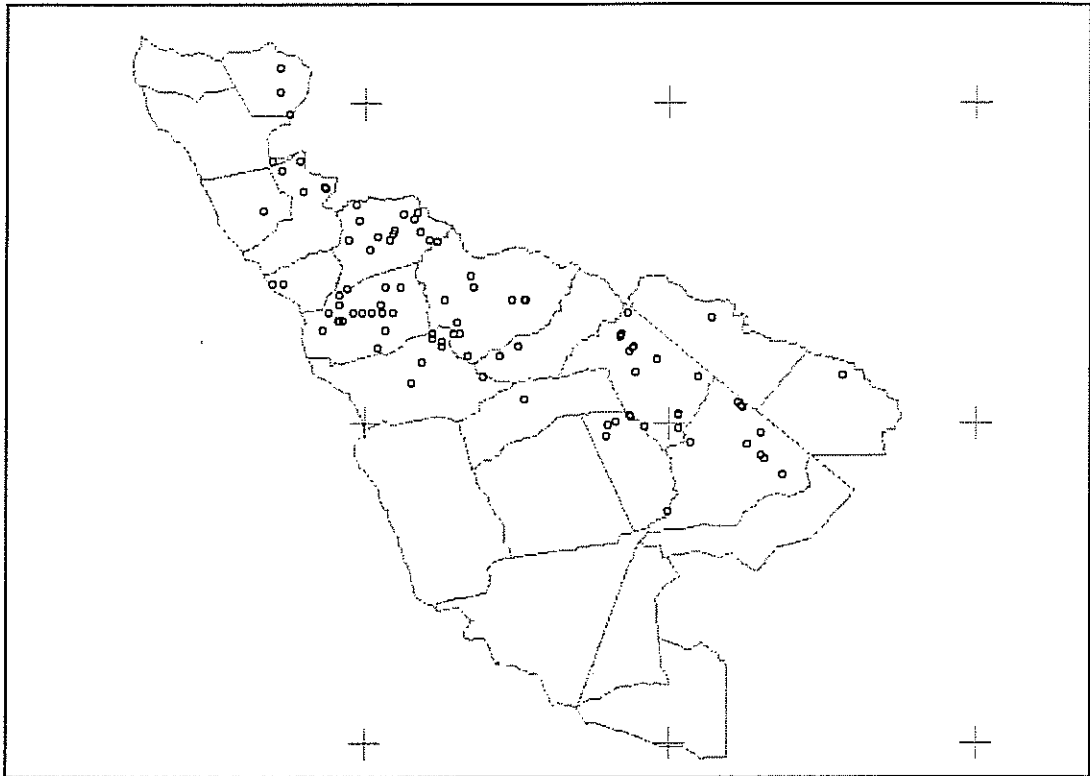


Figure 14 Sightings of zebra in north-west Matabeleland

6.14 Cattle

Table 15. Numbers of cattle in north-western Matabeleland

STRATUM	NO. SEEN	NO. ESTIMATED	95% RANGE	95% c.l.
MATETSI COMPLEX				
Zambezi N.P.	0	0	-	
Kazungula	0	0	-	
Panda Masuie	0	0	-	
Kazuma	0	0	-	
Matetsi	0	0	-	
Rosslyn	0	0	-	
Zanguja	0	0	-	
TOTAL	0	0	-	
HWANGE NATIONAL PARK				
Robins Camp	0	0	-	
Dandari	0	0	-	
Shakwanki	0	0	-	
Dzivanini	0	0	-	
Sinamatella	0	0	-	
Mtoa	0	0	-	
Main Camp	0	0	-	
Shapi	0	0	-	
Central B	0	0	-	
Central A	0	0	-	
Ngamo	0	0	-	
TOTAL	0	0	-	
COMMUNAL AREAS				
Tsholotsho E	116	2165	188 - 4143	91.3
Maitengwe	153	3667	867 - 6467	76.4
Tsholotsho N	135	3481	1212 - 5750	65.2
TOTAL	404	9313	5789 - 12837	37.8
FOREST AREAS				
Ngamo Forest	11	217	11 - 751	246.6
Sikumi Forest	39	857	39 - 2336	172.7
TOTAL	50	1073	50 - 2505	133.4
GRAND TOTAL	454	10387	6748 - 14025	35.0

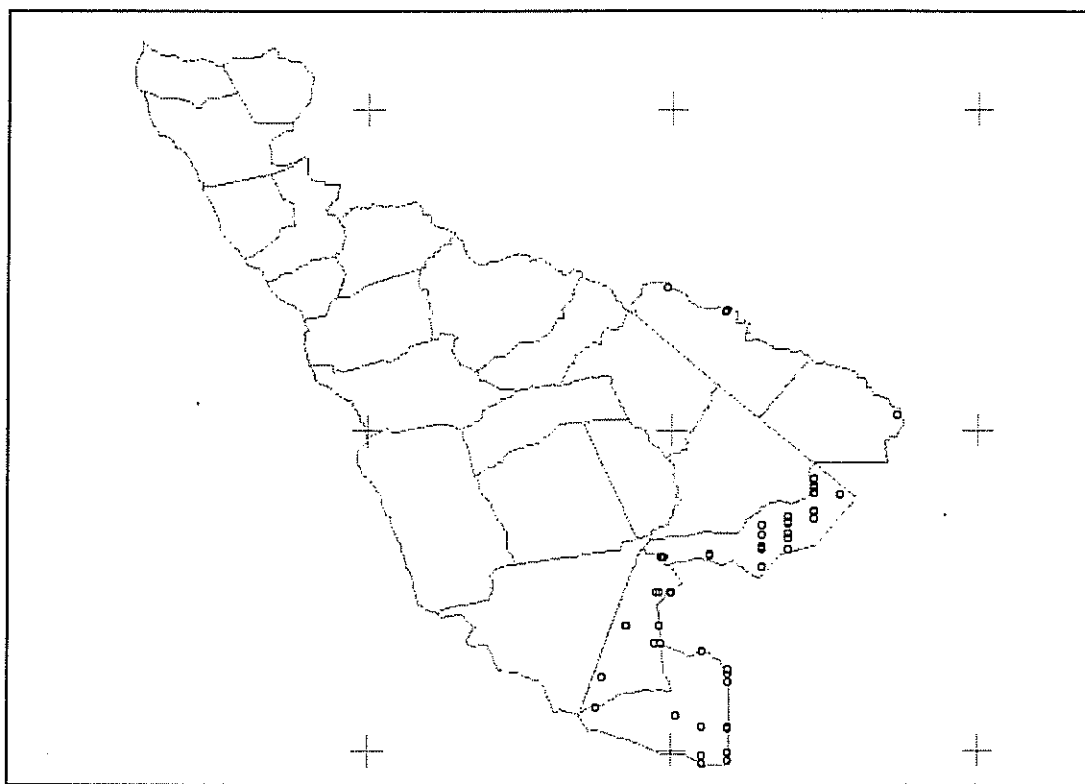


Figure 15 Sightings of cattle in north-west Matabeleland

6.15 Distributions of minor species

Distribution maps of the sightings of eland, gemsbok, kudu, ostrich and waterbuck have been included for comparison with the 1994 survey results.

Estimates of numbers and densities of these and other minor species are given in Appendix I.

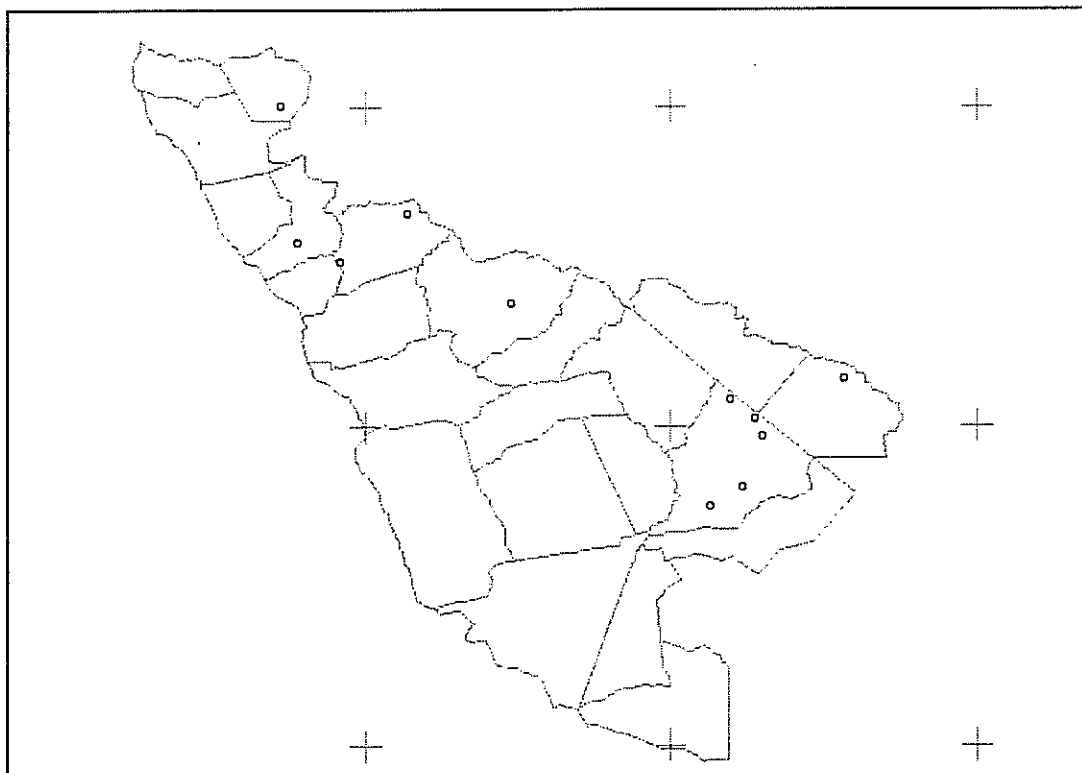


Figure 16 Sightings of eland in north-west Matabeleland

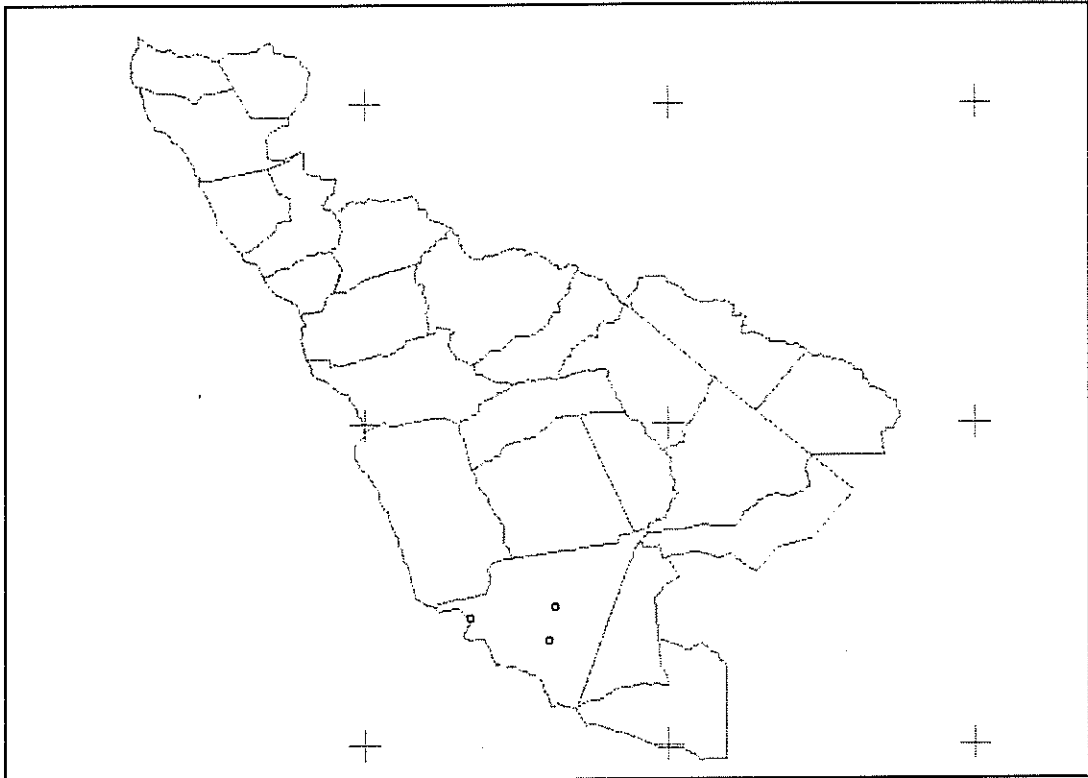


Figure 17 Sightings of gemsbok in north-west Matabeleland

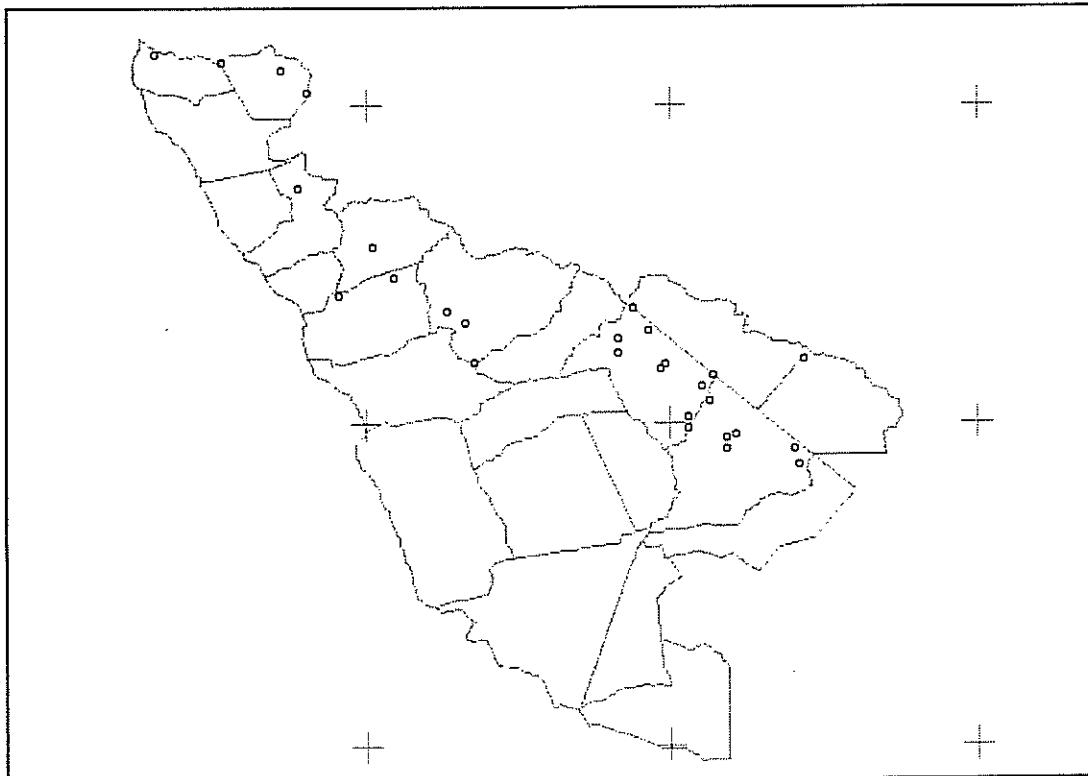


Figure 18 Sightings of kudu in north-west Matabeleland

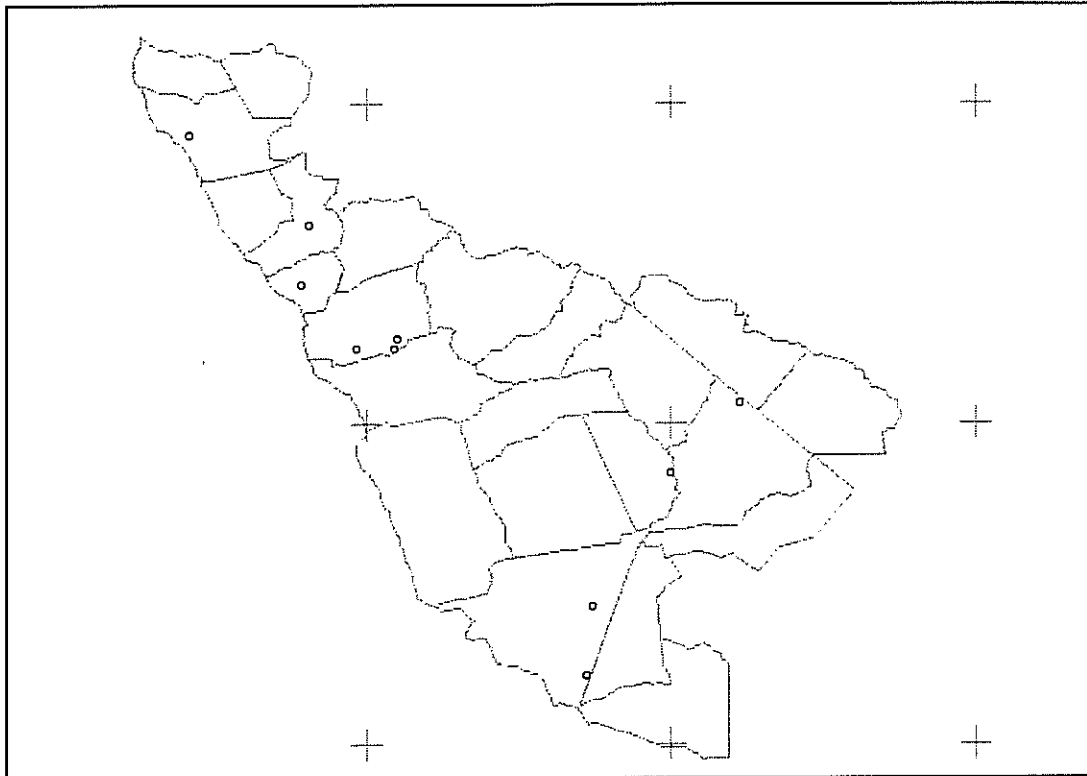


Figure 19 Sightings of ostrich in north-west Matabeleland

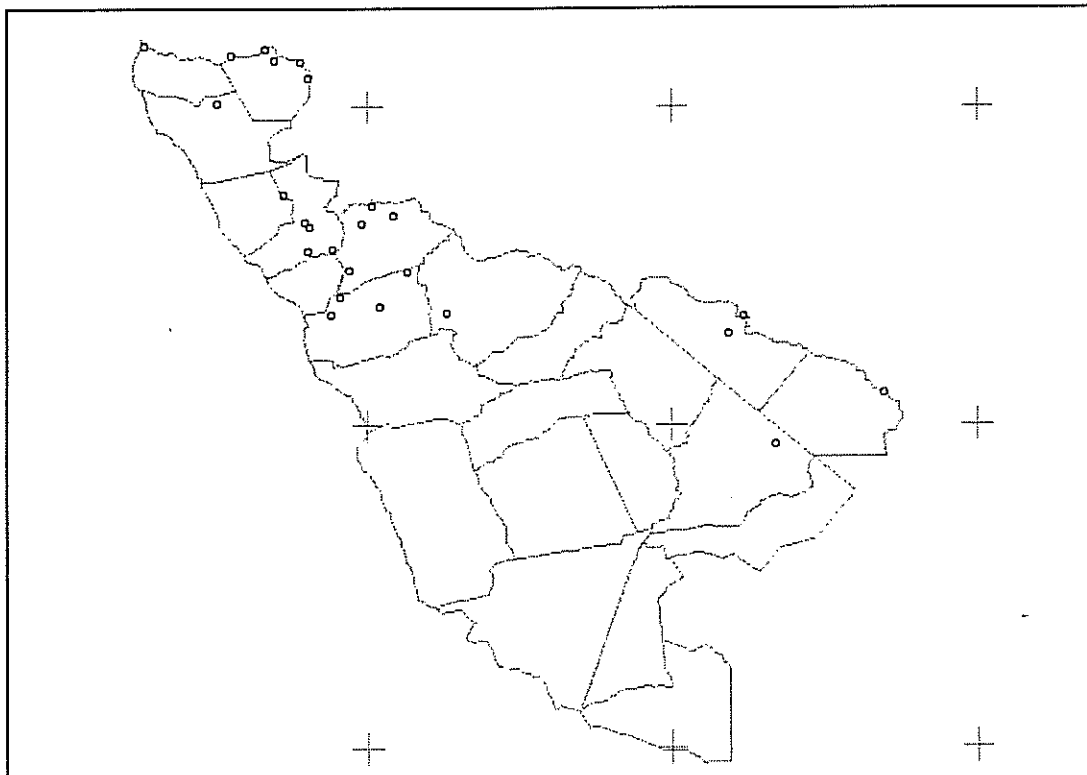


Figure 20 Sightings of waterbuck in north-west Matabeleland

7 DISCUSSION

Estimates of elephant numbers are within the range expected from earlier surveys of the area. The estimate of the overall elephant numbers is fairly precise with confidence limits of $\pm 18.6\%$.

The confidence interval for the estimated number of elephants in 1994 was somewhat wider than this. This was probably due to an estimate of large numbers of elephants in the Dzivanini stratum which had not been sampled very intensively and in which animals were very clumped in their distribution. During the present survey, despite a fairly intensive sample (8.25%), very few elephants were seen in Dzivanini. However the distribution (Fig.3) is very similar to that of 1994, with animals concentrating around water in the centre of the stratum, and it is possible that, because of the low sample intensity, the 1994 survey over-estimated numbers in that stratum.

There is no doubt, however, that there were fewer elephants in Dzivanini and it was interesting to find this compensated for, to some extent by large numbers in the adjacent communal lands. Three extremely large herds of elephant were seen in Tsholotsho Communal land - one of about 300 animals, one of over 70 (all bulls) and a third of 30 to 40 elephants. A photograph of the very large herd is shown in the frontispiece.

There were no fresh carcasses seen on the transects, although there was a sighting of a recently dead cow and calf at Nehimba Seeps, the site of many mortalities in 1994. The numbers suggest a low "carcass ratio".

8 REFERENCES

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APPENDIX I

Summary of Estimates

MATABELELAND NORTH WEST - Overall estimates

BLOCKS INCLUDED:

A	TOTAL AREA:	543	km ²
B	TOTAL AREA:	446	km ²
C	TOTAL AREA:	963	km ²
D	TOTAL AREA:	561	km ²
E	TOTAL AREA:	703	km ²
F	TOTAL AREA:	344	km ²
G	TOTAL AREA:	1029	km ²
H	TOTAL AREA:	839	km ²
I	TOTAL AREA:	1290	km ²
J	TOTAL AREA:	2143	km ²
K	TOTAL AREA:	2098	km ²
L	TOTAL AREA:	910	km ²
M	TOTAL AREA:	1224	km ²
N	TOTAL AREA:	976	km ²
O	TOTAL AREA:	1171	km ²
P	TOTAL AREA:	1173	km ²
Q	TOTAL AREA:	1522	km ²
R	TOTAL AREA:	826	km ²
S	TOTAL AREA:	1261	km ²
T	TOTAL AREA:	923	km ²
U	TOTAL AREA:	1723	km ²
V	TOTAL AREA:	775	km ²
W	TOTAL AREA:	1629	km ²

BLOCK AREA: 25074 km² SAMPLE AREA: 1875 SAMPLING INTENSITY: 7.58 %

COMBINED ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	30987	2902	8317550	18.6	25219 - 36755	1.24
ELEPHANT F	22030	2109	6193401	22.6	17052 - 27007	0.88
ELEPHANT M	8957	793	1948714	31.2	6165 - 11749	0.36
ELE CARC.2	39	4	338	94.0	4 - 76	0.00
ELE CARC.3	1388	111	19538	20.1	1109 - 1668	0.06
BABOON	2386	178	1094994	87.7	293 - 4479	0.10
BUFFALO	5404	513	3050645	64.6	1911 - 8897	0.22
DUIKER	867	62	20453	33.0	581 - 1153	0.03
ELAND	663	53	71045	80.4	130 - 1196	0.03
GEMSBOK	48	4	622	102.9	4 - 98	0.00
GIRAFFE	2220	200	109705	29.8	1557 - 2882	0.09
HIPPO	334	29	27731	99.7	29 - 667	0.01
IMPALA	4934	419	701208	33.9	3259 - 6609	0.20
KUDU	2505	205	96746	24.8	1883 - 3127	0.10
OSTRICH	157	14	2776	67.0	52 - 263	0.01
BLCK RHINO	75	7	1442	100.9	7 - 151	0.00
WHITE RHINO	37	4	590	131.8	4 - 85	0.00
ROAN	79	8	676	65.9	27 - 131	0.00
SABLE	5923	412	760136	29.4	4180 - 7667	0.24
TSESSEBE	74	5	2611	139.0	5 - 176	0.00
WARTHOG	513	38	19239	54.1	235 - 790	0.02
WATERBUCK	1363	88	240245	71.9	383 - 2343	0.05
WILDEBEEST	676	70	199963	132.4	70 - 1570	0.03
ZEBRA	5721	512	805585	31.4	3926 - 7516	0.23
CROCODILE	156	15	5282	93.1	15 - 302	0.01
HONEY BADG	66	5	1703	124.2	5 - 149	0.00
SPT HYAENA	94	8	1677	86.8	12 - 176	0.00
JACKAL	24	1	450	177.0	1 - 66	0.00
LION	24	2	486	184.4	2 - 68	0.00
CATTLE	10387	454	3309419	35.0	6748 - 14025	0.41
SHEEP+GOAT	5964	252	2908898	57.2	2553 - 9375	0.24
DONKEY	1775	72	440178	74.7	448 - 3102	0.07

MATETSI COMPLEX

BLOCKS INCLUDED:

A	TOTAL AREA:	543	km ²
B	TOTAL AREA:	446	km ²
C	TOTAL AREA:	963	km ²
D	TOTAL AREA:	561	km ²
E	TOTAL AREA:	703	km ²
F	TOTAL AREA:	344	km ²
H	TOTAL AREA:	839	km ²

BLOCK AREA: 4400 km² SAMPLING INTENSITY: 7.52 %

COMBINED ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	4429	375	872572	42.2	2560 - 6297	1.01
ELEPHANT F	3011	259	710989	56.0	1324 - 4697	0.68
ELEPHANT M	1418	116	123758	49.6	714 - 2122	0.32
ELE CARC.2	21	2	186	131.5	2 - 48	0.00
ELE CARC.3	199	16	3107	55.9	88 - 311	0.05
BABOON	1644	135	1001903	121.7	135 - 3646	0.37
BUFFALO	3674	346	2582281	87.5	460 - 6888	0.83
DUIKER	90	7	1807	94.6	7 - 175	0.02
ELAND	323	21	46254	133.4	21 - 753	0.07
GIRAFFE	162	16	4228	80.5	32 - 292	0.04
HIPPO	334	29	27731	99.7	29 - 667	0.08
IMPALA	1777	137	304937	62.1	673 - 2882	0.40
KUDU	961	79	30515	36.3	612 - 1311	0.22
OSTRICH	60	4	1259	118.4	4 - 131	0.01
BLCK RHINO	24	2	547	195.5	2 - 71	0.01
ROAN	12	1	129	189.7	1 - 35	0.00
SABLE	1636	124	231680	58.8	674 - 2599	0.37
TSESSEBE	55	3	2336	174.7	3 - 152	0.01
WARTHOG	248	21	6302	64.0	89 - 407	0.06
WATERBUCK	715	48	118963	96.5	48 - 1405	0.16
ZEBRA	2534	191	581419	60.2	1009 - 4059	0.58
CROCODILE	108	11	3313	106.5	11 - 223	0.02
SPT HYAENA	10	1	80	171.6	1 - 28	0.00
LION	24	2	486	184.4	2 - 68	0.01

HWANGE NATIONAL PARK

BLOCKS INCLUDED:

G	TOTAL AREA:	1029	km ²
I	TOTAL AREA:	1290	km ²
J	TOTAL AREA:	2143	km ²
K	TOTAL AREA:	2098	km ²
Q	TOTAL AREA:	1522	km ²
R	TOTAL AREA:	826	km ²
S	TOTAL AREA:	1261	km ²
T	TOTAL AREA:	923	km ²
U	TOTAL AREA:	1723	km ²
V	TOTAL AREA:	775	km ²
W	TOTAL AREA:	1629	km ²

BLOCK AREA: 15219 km² SAMPLING INTENSITY: 8.49 %

COMBINED ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	22762	2344	4100868	17.8	18712 - 26812	1.50
ELEPHANT F	16972	1758	3645305	22.5	13153 - 20791	1.12
ELEPHANT M	5790	586	366722	20.9	4579 - 7001	0.38
ELE CARC.2	18	2	152	134.0	2 - 43	0.00
ELE CARC.3	914	82	10508	22.4	709 - 1119	0.06
BABOON	138	15	8474	133.6	15 - 322	0.01
BUFFALO	1415	151	373675	86.4	192 - 2637	0.09
DUIKER	694	51	17137	37.7	432 - 956	0.05
ELAND	301	30	23440	101.8	30 - 607	0.02
GEMSBOK	48	4	622	102.9	4 - 98	0.00
GIRAFFE	2036	183	105026	31.8	1388 - 2684	0.13
IMPALA	2957	273	374005	41.4	1734 - 4180	0.19
KUDU	1290	114	50024	34.7	842 - 1737	0.08
OSTRICH	97	10	1517	79.9	20 - 175	0.01
BLCK RHINO	51	5	895	116.5	5 - 111	0.00
WHTC RHINO	37	4	590	131.8	4 - 85	0.00
ROAN	67	7	547	69.9	20 - 114	0.00
SABLE	1405	148	72649	38.4	865 - 1944	0.09
TSESSEBE	18	2	276	182.4	2 - 51	0.00
WARTHOG	117	10	1891	74.0	31 - 204	0.01
WATERBUCK	155	16	4396	85.5	22 - 288	0.01
WILDEBEEEST	638	68	198490	139.6	68 - 1529	0.04
ZEBRA	3043	314	214749	30.5	2116 - 3970	0.20
CROCODILE	48	4	1969	184.6	4 - 137	0.00
HONEY BADG	66	5	1703	124.2	5 - 149	0.00
SPT HYAENA	84	7	1597	95.2	7 - 164	0.01

COMMUNAL AREAS

BLOCKS INCLUDED:

L TOTAL AREA: 910 km²
 M TOTAL AREA: 1224 km²
 N TOTAL AREA: 976 km²

BLOCK AREA: 3110 km² SAMPLING INTENSITY: 4.43 %

COMBINED ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	2860	139	3056083	127.1	139 - 6496	0.92
ELEPHANT F	1529	68	1638524	174.1	68 - 4192	0.49
ELEPHANT M	1331	71	1408452	185.5	71 - 3799	0.43
ELE CARC.3	150	7	3485	81.8	27 - 273	0.05
DUIKER	63	3	1139	111.2	3 - 133	0.02
IMPALA	24	1	483	190.7	1 - 70	0.01
KUDU	147	7	8646	132.0	7 - 340	0.05
WILDEBEEST	37	2	1473	213.8	2 - 117	0.01
JACKAL	24	1	450	184.1	1 - 68	0.01
CATTLE	9313	404	2870337	37.8	5789 - 12837	2.99
SHEEP+GOAT	5701	240	2843303	61.5	2194 - 9208	1.83
DONKEY	1657	66	425994	81.9	300 - 3015	0.53

FOREST AREAS

BLOCKS INCLUDED:

O TOTAL AREA: 1171 km²
 P TOTAL AREA: 1173 km²

BLOCK AREA: 2345 km² SAMPLING INTENSITY: 4.81 %

COMBINED ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	937	44	288025	123.7	44 - 2096	0.40
ELEPHANT F	518	24	198583	185.8	24 - 1481	0.22
ELEPHANT M	419	20	49783	115.1	20 - 901	0.18
ELE CARC.3	125	6	2437	85.3	18 - 232	0.05
BABOON	604	28	84617	104.1	28 - 1232	0.26
BUFFALO	315	16	94689	210.9	16 - 980	0.13
DUIKER	20	1	370	210.9	1 - 61	0.01
ELAND	39	2	1351	201.5	2 - 119	0.02
GIRAFFE	22	1	451	208.8	1 - 68	0.01
IMPALA	176	8	21783	181.4	8 - 494	0.07
KUDU	108	5	7561	174.6	5 - 295	0.05
SABLE	2882	140	455808	50.6	1424 - 4341	1.23
WARTHOG	147	7	11046	154.5	7 - 374	0.06
WATERBUCK	493	24	116886	149.7	24 - 1232	0.21
ZEBRA	145	7	9417	144.9	7 - 354	0.06
CATTLE	1073	50	439083	133.4	50 - 2505	0.46
SHEEP+GOAT	264	12	65594	209.9	12 - 817	0.11
DONKEY	118	6	14184	217.7	6 - 375	0.05

Stratum ZAMBEZI NATIONAL PARK

BLOCK AREA: 543 km² SAMPLING INTENSITY: 11.36 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1162	132	94164	58.8	478 - 1846	2.14
ELEPHANT F	704	80	75006	86.6	94 - 1315	1.30
ELEPHANT M	458	52	35232	91.3	52 - 876	0.84
ELE CARC.2	9	1	65	203.8	1 - 27	0.02
ELE CARC.3	35	4	307	110.9	4 - 74	0.06
BABOON	123	14	11005	189.6	14 - 357	0.23
BUFFALO	2007	228	1826726	150.0	228 - 5019	3.70
ELAND	9	1	65	204.7	1 - 27	0.02
GIRAFFE	88	10	2832	134.7	10 - 207	0.16
HIPPO	70	8	1804	134.3	8 - 165	0.13
IMPALA	9	1	63	201.5	1 - 27	0.02
KUDU	123	14	4409	120.0	14 - 271	0.23
SABLE	273	31	32501	147.2	31 - 675	0.50
WARTHOG	62	7	1425	136.5	7 - 146	0.11
WATERBUCK	106	12	2190	98.7	12 - 210	0.19
ZEBRA	211	24	34284	195.2	24 - 624	0.39
CROCODILE	70	8	2028	142.5	8 - 171	0.13

Stratum KAZUNGULA

BLOCK AREA: 446 km² SAMPLING INTENSITY: 7.96 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	753	60	254890	158.5	60 - 1947	1.69
ELEPHANT F	565	45	155582	165.1	45 - 1498	1.27
ELEPHANT M	188	15	16202	159.8	15 - 489	0.42
ELE CARC.3	63	5	1183	129.6	5 - 144	0.14
BABOON	1017	81	925223	223.6	81 - 3292	2.28
BUFFALO	666	53	397006	223.9	53 - 2156	1.49
HIPPO	264	21	25927	144.4	21 - 645	0.59
IMPALA	176	14	26591	219.4	14 - 561	0.39
KUDU	100	8	2549	118.9	8 - 220	0.23
SABLE	75	6	2128	144.8	6 - 184	0.17
WARTHOG	50	4	2171	219.4	4 - 160	0.11
WATERBUCK	63	5	3392	219.4	5 - 201	0.14
CROCODILE	38	3	1285	225.0	3 - 122	0.08

Stratum PANDAMASUI

BLOCK AREA: 963 km² SAMPLING INTENSITY: 6.64 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	422	28	64679	132.8	28 - 981	0.44
ELEPHANT F	256	17	51947	196.0	17 - 758	0.27
ELEPHANT M	166	11	18141	179.0	11 - 462	0.17
ELE CARC.3	30	2	284	123.3	2 - 67	0.03
DUIKER	45	3	829	140.3	3 - 109	0.05
KUDU	30	2	746	199.6	2 - 90	0.03
OSTRICH	30	2	843	212.2	2 - 94	0.03
SABLE	241	16	8942	86.4	33 - 449	0.25
WARTHOG	45	3	1896	212.2	3 - 141	0.05
WATERBUCK	15	1	187	199.7	1 - 45	0.02

Stratum KAZUMA PAN

BLOCK AREA: 561 km² SAMPLING INTENSITY: 5.42 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	332	18	44158	175.8	18 - 915	0.59
ELEPHANT M	332	18	44158	175.8	18 - 915	0.59
ELE CARC.3	37	2	1038	242.5	2 - 126	0.07
GIRAFFE	18	1	260	242.5	1 - 63	0.03
SABLE	37	2	1038	242.5	2 - 126	0.07
TSESSEBE	55	3	2336	242.5	3 - 189	0.10
WATERBUCK	258	14	79808	303.8	14 - 1042	0.46
ZEBRA	18	1	282	253.0	1 - 65	0.03

Stratum MATETSI

BLOCK AREA: 703 km² SAMPLING INTENSITY: 5.15 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	408	21	73566	162.8	21 - 1071	0.58
ELEPHANT F	272	14	77053	249.9	14 - 951	0.39
ELEPHANT M	136	7	6573	146.0	7 - 334	0.19
BABOON	155	8	15641	197.0	8 - 461	0.22
BUFFALO	582	30	219948	197.0	30 - 1730	0.83
ELAND	194	10	37924	245.4	10 - 671	0.28
IMPALA	388	20	132700	229.6	20 - 1280	0.55
KUDU	194	10	8506	116.2	10 - 420	0.28
OSTRICH	19	1	332	229.6	1 - 64	0.03
SABLE	563	29	135768	160.1	29 - 1465	0.80
WARTHOG	19	1	244	197.0	1 - 58	0.03
WATERBUCK	214	11	32322	206.0	11 - 653	0.30
ZEBRA	874	45	189673	122.0	45 - 1939	1.24

Stratum ROSSLYN

BLOCK AREA: 344 km² SAMPLING INTENSITY: 9.61 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	239	23	16168	136.6	23 - 566	0.70
ELEPHANT F	125	12	17066	269.0	12 - 461	0.36
ELEPHANT M	114	11	2995	122.9	11 - 255	0.33
ELE CARC.3	10	1	80	220.6	1 - 33	0.03
BABOON	229	22	46472	242.1	22 - 783	0.67
DUIKER	21	2	411	250.4	2 - 73	0.06
GIRAFFE	31	3	903	247.4	3 - 108	0.09
IMPALA	104	10	7972	220.6	10 - 334	0.30
KUDU	166	16	9262	148.6	16 - 414	0.48
OSTRICH	10	1	84	227.0	1 - 34	0.03
SABLE	208	20	28211	207.5	20 - 640	0.60
ZEBRA	114	11	10211	227.0	11 - 374	0.33
SPT HYAENA	10	1	80	220.6	1 - 33	0.03

Stratum ROBINS

BLOCK AREA: 1029 km² SAMPLING INTENSITY: 10.99 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	3641	400	409236	39.1	2216 - 5067	3.54
ELEPHANT F	2867	315	467957	53.2	1343 - 4392	2.79
ELEPHANT M	774	85	81736	82.3	137 - 1411	0.75
ELE CARC.3	9	1	74	210.2	1 - 28	0.01
BUFFALO	73	8	2374	149.1	8 - 181	0.07
GIRAFFE	118	13	1922	82.5	21 - 216	0.12
IMPALA	1347	148	190925	72.3	374 - 2321	1.31
KUDU	64	7	1104	116.2	7 - 138	0.06
OSTRICH	36	4	684	160.0	4 - 95	0.04
BLCK RHINO	27	3	312	144.2	3 - 67	0.03
ROAN	18	2	121	134.6	2 - 43	0.02
SABLE	137	15	7903	145.1	15 - 335	0.13
TSESSEBE	18	2	276	203.2	2 - 55	0.02
WATERBUCK	91	10	2623	125.3	10 - 205	0.09
ZEBRA	901	99	60336	60.7	354 - 1448	0.88
SPT HYAENA	36	4	667	158.0	4 - 94	0.04

Stratum ZANGUJA

BLOCK AREA: 839 km² SAMPLING INTENSITY: 8.36 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1112	93	324947	115.9	93 - 2402	1.33
ELEPHANT F	1088	91	334335	120.2	91 - 2396	1.30
ELEPHANT M	24	2	457	202.1	2 - 72	0.03
ELE CARC.2	12	1	122	208.5	1 - 37	0.01
ELE CARC.3	24	2	214	138.4	2 - 57	0.03
BABOON	120	10	3562	112.9	10 - 255	0.14
BUFFALO	419	35	138600	201.2	35 - 1261	0.50
DUIKER	24	2	568	225.4	2 - 78	0.03
ELAND	120	10	8265	171.9	10 - 325	0.14
GIRAFFE	24	2	234	144.8	2 - 59	0.03
IMPALA	1100	92	137611	76.3	261 - 1940	1.31
KUDU	347	29	5044	46.3	186 - 508	0.41
BLCK RHINO	24	2	547	221.1	2 - 77	0.03
ROAN	12	1	129	214.6	1 - 38	0.01
SABLE	239	20	23090	143.7	20 - 583	0.29
WARTHOG	72	6	566	75.0	18 - 126	0.09
WATERBUCK	60	5	1065	123.4	5 - 134	0.07
ZEBRA	1316	110	346968	101.3	110 - 2648	1.57
LION	24	2	486	208.5	2 - 74	0.03

Stratum DANDARI

BLOCK AREA: 1290 km² SAMPLING INTENSITY: 9.36 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1591	149	211219	60.1	635 - 2547	1.23
ELEPHANT F	1164	109	208751	81.6	214 - 2114	0.90
ELEPHANT M	427	40	8459	44.8	236 - 619	0.33
ELE CARC.3	64	6	472	70.5	19 - 109	0.05
DUIKER	21	2	179	130.1	2 - 49	0.02
IMPALA	160	15	11326	138.2	15 - 382	0.12
KUDU	107	10	6149	152.7	10 - 270	0.08
SABLE	75	7	1246	98.2	7 - 148	0.06
ZEBRA	182	17	3900	71.5	52 - 311	0.14
SPT HYAENA	11	1	101	195.7	1 - 32	0.01

Stratum SHAKWANKI

BLOCK AREA: 2143 km² SAMPLING INTENSITY: 3.60 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
ELE CARC.3	56	2	1379	163.4	2 - 146	0.03
DUIKER	195	7	6592	102.1	7 - 393	0.09
GIRAFFE	222	8	12890	124.9	8 - 500	0.10
IMPALA	361	13	70809	180.2	13 - 1013	0.17
KUDU	167	6	7210	124.6	6 - 375	0.08
SPT HYAENA	28	1	753	241.5	1 - 95	0.01

Stratum DZIVANINI

BLOCK AREA: 2098 km² SAMPLING INTENSITY: 8.25 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	861	71	66927	64.5	306 - 1416	0.41
ELEPHANT F	461	38	43662	97.3	38 - 909	0.22
ELEPHANT M	400	33	25504	85.6	57 - 743	0.19
ELE CARC.3	267	22	1712	33.3	178 - 355	0.13
DUIKER	170	14	3032	69.6	52 - 288	0.08
GEMSBOK	48	4	622	110.3	4 - 102	0.02
GIRAFFE	242	20	8079	79.5	50 - 435	0.12
IMPALA	48	4	2222	208.5	4 - 150	0.02
KUDU	73	6	2160	137.1	6 - 172	0.03
OSTRICH	24	2	248	139.3	2 - 58	0.01
ROAN	12	1	130	201.9	1 - 37	0.01

Stratum TSHOLOTSO EAST

BLOCK AREA: 910 km² SAMPLING INTENSITY: 5.36 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1661	89	1393283	160.7	89 - 4331	1.83
ELEPHANT F	355	19	41570	130.0	19 - 816	0.39
ELEPHANT M	1307	70	1407787	205.4	70 - 3991	1.44
ELE CARC.3	75	4	1717	125.5	4 - 168	0.08
DUIKER	37	2	593	147.6	2 - 92	0.04
KUDU	75	4	4597	205.4	4 - 228	0.08
WILDEBEEST	37	2	1473	232.5	2 - 124	0.04
CATTLE	2165	116	764310	91.3	188 - 4143	2.38
SHEEP+GOAT	1064	57	311821	118.7	57 - 2327	1.17
DONKEY	93	5	8555	224.2	5 - 303	0.10

Stratum MAITENGWE

BLOCK AREA: 1224 km² SAMPLING INTENSITY: 4.17 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1198	50	1662800	276.7	50 - 4514	0.98
ELEPHANT F	1174	49	1596953	276.7	49 - 4423	0.96
ELEPHANT M	24	1	665	276.7	1 - 90	0.02
ELE CARC.3	24	1	665	276.7	1 - 90	0.02
IMPALA	24	1	483	235.7	1 - 80	0.02
KUDU	72	3	4050	227.5	3 - 236	0.06
JACKAL	24	1	450	227.5	1 - 79	0.02
CATTLE	3667	153	1185864	76.4	867 - 6467	3.00
SHEEP+GOAT	1079	45	329337	136.8	45 - 2554	0.88
DONKEY	120	5	6867	177.8	5 - 333	0.10

Stratum TSHOLOTSO NORTH

BLOCK AREA: 976 km² SAMPLING INTENSITY: 3.88 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
ELE CARC.3	52	2	1103	152.3	2 - 130	0.05
DUIKER	26	1	545	214.2	1 - 81	0.03
CATTLE	3481	135	920163	65.2	1212 - 5750	3.57
SHEEP+GOAT	3558	138	2202145	98.6	138 - 7068	3.65
DONKEY	1444	56	410572	104.9	56 - 2959	1.48

Stratum NGAMO FOREST

BLOCK AREA: 1171 km² SAMPLING INTENSITY: 5.08 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	256	13	15491	118.9	13 - 561	0.22
ELEPHANT F	79	4	5644	233.3	4 - 263	0.07
ELEPHANT M	177	9	15743	173.2	9 - 484	0.15
ELE CARC.3	59	3	1406	155.2	3 - 151	0.05
BABOON	98	5	8610	230.5	5 - 326	0.08
BUFFALO	315	16	94689	238.9	16 - 1068	0.27
DUIKER	20	1	370	238.9	1 - 67	0.02
ELAND	39	2	1351	228.3	2 - 129	0.03
KUDU	20	1	353	233.3	1 - 66	0.02
SABLE	1674	85	216921	68.1	535 - 2814	1.43
WARTHOG	59	3	3329	238.9	3 - 200	0.05
WATERBUCK	295	15	80394	234.8	15 - 989	0.25
ZEBRA	79	4	5404	228.3	4 - 259	0.07
CATTLE	217	11	47674	246.6	11 - 751	0.18
DONKEY	118	6	14184	246.6	6 - 410	0.10

Stratum SIKUMI FOREST

BLOCK AREA: 1173 km² SAMPLING INTENSITY: 4.55 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	681	31	272534	181.3	31 - 1915	0.58
ELEPHANT F	439	20	192939	236.5	20 - 1478	0.37
ELEPHANT M	242	11	34039	180.6	11 - 678	0.21
ELE CARC.3	66	3	1031	115.3	3 - 142	0.06
BABOON	505	23	76008	129.1	23 - 1157	0.43
GIRAFFE	22	1	451	228.6	1 - 72	0.02
IMPALA	176	8	21783	198.7	8 - 525	0.15
KUDU	88	4	7208	228.6	4 - 289	0.07
SABLE	1208	55	238887	95.7	55 - 2364	1.03
WARTHOG	88	4	7718	236.5	4 - 296	0.07
WATERBUCK	198	9	36491	228.6	9 - 649	0.17
ZEBRA	66	3	4013	227.4	3 - 216	0.06
CATTLE	857	39	391409	172.7	39 - 2336	0.73
SHEEP+GOAT	264	12	65594	229.8	12 - 869	0.22

Stratum SINAMATELLA

BLOCK AREA: 1522 km² SAMPLING INTENSITY: 8.32 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	3605	300	692835	49.5	1820 - 5391	2.37
ELEPHANT F	2584	215	380776	51.2	1260 - 3907	1.70
ELEPHANT M	1022	85	97951	65.7	350 - 1693	0.67
ELE CARC.3	84	7	1996	113.9	7 - 180	0.06
BUFFALO	84	7	2699	132.5	7 - 196	0.06
ELAND	96	8	7847	197.6	8 - 286	0.06
GIRAFFE	216	18	10664	102.4	18 - 438	0.14
IMPALA	793	66	68493	70.8	232 - 1355	0.52
KUDU	433	36	20428	70.9	126 - 739	0.28
BLCK RHINO	24	2	583	215.4	2 - 76	0.02
SABLE	36	3	1139	200.8	3 - 108	0.02
WARTHOG	108	9	1818	84.5	17 - 200	0.07
WATERBUCK	36	3	1108	198.0	3 - 107	0.02
WILDEBEEST	24	2	601	218.8	2 - 77	0.02
ZEBRA	625	52	47607	74.9	157 - 1093	0.41
CROCODILE	48	4	1969	198.0	4 - 143	0.03

Stratum MTOA

BLOCK AREA: 826 km² SAMPLING INTENSITY: 11.17 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1548	173	148905	52.4	737 - 2359	1.88
ELEPHANT F	940	105	83613	64.7	332 - 1547	1.14
ELEPHANT M	609	68	52802	79.3	126 - 1091	0.74
ELE CARC.3	18	2	300	203.4	2 - 54	0.02
BABOON	45	5	1050	152.1	5 - 113	0.05
BUFFALO	63	7	3911	209.7	7 - 194	0.08
DUIKER	9	1	73	200.4	1 - 27	0.01
GIRAFFE	116	13	3213	102.4	13 - 235	0.14
KUDU	45	5	525	107.6	5 - 93	0.05
SABLE	36	4	236	90.2	4 - 68	0.04
ZEBRA	170	19	16008	156.3	19 - 436	0.21

Stratum MAIN CAMP

BLOCK AREA: 1261 km² SAMPLING INTENSITY: 10.96 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	4770	523	764354	38.4	2940 - 6600	3.78
ELEPHANT F	3986	437	715045	44.4	2216 - 5756	3.16
ELEPHANT M	784	86	19863	37.6	489 - 1079	0.62
ELE CARC.3	119	13	996	55.7	52 - 185	0.09
BUFFALO	274	30	8975	72.5	75 - 472	0.22
DUIKER	27	3	343	141.7	3 - 66	0.02
GIRAFFE	611	67	47161	74.4	157 - 1066	0.48
IMPALA	201	22	29447	179.0	22 - 560	0.16
KUDU	319	35	9412	63.6	116 - 522	0.25
WHITE RHINO	18	2	294	196.8	2 - 54	0.01
ROAN	9	1	72	194.4	1 - 27	0.01
SABLE	255	28	19940	115.7	28 - 551	0.20
ZEBRA	556	61	35057	70.4	164 - 948	0.44

Stratum SHAPI

BLOCK AREA: 923 km² SAMPLING INTENSITY: 11.04 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1096	121	111999	64.1	393 - 1800	1.19
ELEPHANT F	788	87	81550	76.1	188 - 1388	0.85
ELEPHANT M	308	34	20937	98.7	34 - 612	0.33
ELE CARC.2	9	1	71	194.8	1 - 27	0.01
ELE CARC.3	63	7	508	74.6	16 - 111	0.07
DUIKER	36	4	376	112.3	4 - 77	0.04
GIRAFFE	18	2	136	135.0	2 - 43	0.02
IMPALA	27	3	645	196.3	3 - 81	0.03
ROAN	9	1	74	199.4	1 - 27	0.01
SABLE	18	2	129	131.7	2 - 42	0.02
ZEBRA	45	5	1785	195.9	5 - 134	0.05
HONEY BADG	18	2	295	199.2	2 - 54	0.02

Stratum CENTRAL B

BLOCK AREA: 1723 km² SAMPLING INTENSITY: 5.13 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	59	3	1383	150.3	3 - 146	0.03
ELEPHANT M	59	3	1383	150.3	3 - 146	0.03
ELE CARC.3	59	3	1463	154.6	3 - 149	0.03
DUIKER	98	5	5124	173.6	5 - 267	0.06
GIRAFFE	195	10	9657	119.1	10 - 428	0.11
SABLE	39	2	1386	225.7	2 - 127	0.02
HONEY BADG	39	2	1324	220.6	2 - 125	0.02

Stratum CENTRAL A

BLOCK AREA: 775 km² SAMPLING INTENSITY: 10.99 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	1355	149	601126	122.7	149 - 3018	1.75
ELEPHANT F	1055	116	466489	138.9	116 - 2520	1.36
ELEPHANT M	300	33	11776	77.6	67 - 533	0.39
ELE CARC.3	55	6	687	103.1	6 - 111	0.07
DUIKER	45	5	416	96.2	5 - 89	0.06
GIRAFFE	82	9	1548	103.1	9 - 166	0.11
KODU	36	4	1181	202.6	4 - 110	0.05
OSTRICH	18	2	288	200.3	2 - 55	0.02
ROAN	9	1	73	201.3	1 - 27	0.01
SABLE	36	4	383	115.4	4 - 78	0.05
ZEBRA	182	20	13995	139.5	20 - 436	0.23
SPT HYAENA	9	1	77	207.0	1 - 28	0.01

Stratum NGAMO

BLOCK AREA: 1629 km²

SAMPLING INTENSITY: 10.74 %

ESTIMATES:

SPECIES	Pop. est.	No. seen	Variance	95%cl %est.	95%Range	Dens /km ²
TOTAL ELES	4235	455	1092886	52.1	2029 - 6440	2.60
ELEPHANT F	3127	336	1197462	73.8	818 - 5436	1.92
ELEPHANT M	1108	119	46312	41.0	653 - 1562	0.68
ELE CARC.2	9	1	81	204.0	1 - 28	0.01
ELE CARC.3	121	13	920	52.9	57 - 185	0.07
BABOON	93	10	7424	195.3	10 - 275	0.06
BUFFALO	921	99	355716	136.6	99 - 2180	0.57
DUIKER	93	10	1002	71.8	26 - 160	0.06
ELAND	205	22	15593	128.7	22 - 468	0.13
GIRAFFE	214	23	9756	97.4	23 - 422	0.13
IMPALA	19	2	137	132.4	2 - 43	0.01
KUDU	47	5	1854	195.3	5 - 137	0.03
OSTRICH	19	2	297	195.3	2 - 55	0.01
WHITE RHINO	19	2	296	195.0	2 - 55	0.01
ROAN	9	1	78	199.7	1 - 28	0.01
SABLE	772	83	40285	54.8	349 - 1196	0.47
WARTHOG	9	1	73	193.7	1 - 27	0.01
WATERBUCK	28	3	666	195.0	3 - 82	0.02
WILDEBEEST	614	66	197889	152.8	66 - 1553	0.38
ZEBRA	382	41	36060	105.0	41 - 782	0.23
HONEY BADG	9	1	83	206.3	1 - 29	0.01

APPENDIX II

Transect Data

Transect ZA01

Start S 17° 51.77' E 25° 31.50'
 End S 17° 52.37' E 25° 31.50'
 Width: 338 m Length: 1.11 km
 Sighting positions are given in decimal minutes south

Sightings:
 BUFFALO HIPPO CROCODILE
 Pos No Pos No Pos No
 1 51.86 90 51.86 4 51.86 4

Transect ZA02

Start S 17° 50.39' E 25° 33.20'
 End S 17° 55.27' E 25° 33.20'
 Width: 357 m Length: 9.03 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3 BABOON KUDU WATERBUCK
 Pos No Pos No Pos No Pos No
 1 52.14 1 50.39 12 52.95 1 50.56 1

Transect ZA03

Start S 17° 50.41' E 25° 34.90'
 End S 17° 58.12' E 25° 34.90'
 Width: 330 m Length: 14.30 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M GIRAFFE KUDU CROCODILE WATER
 Pos No Pos No Pos No Pos No Pos No
 1 55.40 16 51.96 6 53.54 1 50.91 3 52.96 1
 2 53.36 1

Transect ZA04

Start S 17° 50.33' E 25° 36.60'
 End S 18° 0.92' E 25° 36.60'
 Width: 335 m Length: 19.64 km
 Sighting positions are given in decimal minutes south

Sightings:
 BABOON KUDU SABLE WATER
 Pos No Pos No Pos No Pos No
 1 50.88 2 50.51 2 52.11 1 52.60 1
 2 51.21 2
 3 51.21 4

Transect ZA05

Start S 17° 50.18' E 25° 38.30'
 End S 18° 2.40' E 25° 38.30'
 Width: 340 m Length: 22.67 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M ELE CARC.2 CROCODILE
 Pos No Pos No Pos No Pos No
 1 0.57 10 57.31 14 58.07 1 50.40 1
 2 53.50 2

Transect ZA06

Start S 17° 49.16' E 25° 40.00'
 End S 18° 2.40' E 25° 40.00'
 Width: 339 m Length: 24.56 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELE CARC.3 HIPPO WARTHOG WATERBUCK
 Pos No Pos No Pos No Pos No Pos No
 1 50.74 25 57.23 1 49.16 3 51.51 3 49.27 3
 2 51.51 8 53.80 1 49.16 2

Transect ZA07

Start S 17° 48.98' E 25° 41.70'
 End S 18° 2.40' E 25° 41.70'
 Width: 334 m Length: 24.89 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M ELE CARC.3 GIRAFFE HIPPO IMPALA
 Pos No Pos No Pos No Pos No Pos No Pos No
 1 49.45 12 49.45 5 54.98 1 50.68 1 49.01 1 49.73 1
 2 50.42 6 50.68 2
 3 0.45 5
 KUDU WATERBUCK WATER
 Pos No Pos No Pos No
 1 59.42 1 51.36 1 57.44 1

Transect ZA08

Start S 17° 50.54' E 25° 43.40'
 End S 18° 2.40' E 25° 43.40'
 Width: 339 m Length: 22.00 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M BUFFALO ELAND SABLE ZEBRA
 Pos No Pos No Pos No Pos No Pos No Pos No
 1 0.73 20 59.76 4 53.45 100 59.76 1 57.89 1 58.04 7
 2 55.02 5 53.45 25 57.61 20 53.45 9
 3 53.45 10 52.08 1 53.45 7

Transect ZA09

Start S 17° 51.00' E 25° 45.11'
 End S 18° 2.27' E 25° 45.11'
 Width: 303 m Length: 20.91 km
 Sighting positions are given in decimal minutes south

Sightings:
 GIRAFFE SABLE WARTHOG ZEBRA WATER
 Pos No Pos No Pos No Pos No Pos No
 1 53.55 1 59.71 1 2.05 4 2.05 1 2.05 1
 2 2.05 7

Transect ZA10

Start S 17° 51.64' E 25° 46.81'
 End S 18° 0.25' E 25° 46.81'
 Width: 347 m Length: 15.96 km
 Sighting positions are given in decimal minutes south

Sightings:
 KUDU WATERBUCK
 Pos No Pos No
 1 52.48 3 51.65 4

Transect ZA11

Start S 17° 53.06' E 25° 48.51'
 End S 17° 57.97' E 25° 48.51'
 Width: 344 m Length: 9.11 km
 Sighting positions are given in decimal minutes south

Sightings:
 BUFFALO WATERBUCK
 Pos No Pos No
 1 57.77 3 54.73 1

Transect ZB01

Start S 17° 47.76' E 25° 16.40'
 End S 17° 56.78' E 25° 16.40'
 Width: 332 m Length: 16.73 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELE CARC.3 BABOON HIPPO IMPALA WARTHOG
 Pos No Pos No Pos No Pos No Pos No Pos No
 1 50.57 3 51.40 1 51.93 4 48.62 9 48.94 14 51.74 4
 2 50.57 1
 3 49.17 1
 WATERBUCK WATER
 Pos No Pos No
 1 48.62 5 50.99 1

Transect ZB02

Start S 17° 49.30' E 25° 18.66'
 End S 17° 57.49' E 25° 18.66'
 Width: 325 m Length: 15.19 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F BUFFALO KUDU SABLE
 Pos No Pos No Pos No Pos No
 1 50.93 8 50.29 3 53.34 2 54.35 2
 2 50.29 50 52.26 1

Transect ZB03

Start S 17° 50.24' E 25° 20.93'
 End S 17° 57.95' E 25° 20.93'
 Width: 319 m Length: 14.30 km
 Sighting positions are given in decimal minutes south

Sightings:
 KUDU
 Pos No
 1 54.31 4

Transect ZB04

Start S 17° 50.62' E 25° 23.20'
 End S 17° 58.12' E 25° 23.20'
 Width: 340 m Length: 13.92 km
 Sighting positions are given in decimal minutes south

Sightings:
 HIPPO
 Pos No
 1 51.24 12

Transect ZB05

Start S 17° 50.87' E 25° 25.46'
 End S 17° 58.79' E 25° 25.46'
 Width: 329 m Length: 14.68 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3 BABOON
 Pos No Pos No
 1 58.59 1 51.96 1

Transect ZB06

Start S 17° 50.62' E 25° 27.73'
 End S 17° 58.46' E 25° 27.73'
 Width: 330 m Length: 14.53 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M KUDU SABLE CROCODILE
 Pos No Pos No Pos No Pos No Pos No
 1 58.21 14 56.31 3 52.04 2 52.84 3 51.07 3
 2 56.31 20 56.31 2
 3 57.76 1
 4 58.21 4

Transect ZB07

Start S 17° 51.60' E 25° 30.00'
 End S 17° 57.85' E 25° 30.00'
 Width: 331 m Length: 11.60 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ELE CARC.3 BABOON
 Pos No Pos No Pos No
 1 51.60 5 57.46 1 51.85 1

Transect ZB08

Start S 17° 53.67' E 25° 32.26'
 End S 17° 57.47' E 25° 32.26'
 Width: 324 m Length: 7.04 km
 Sighting positions are given in decimal minutes south

Sightings:
 BABOON WATER
 Pos No Pos No
 1 54.04 75 53.76 1

Transect ZC01

Start S 17° 56.75' E 25° 16.58'
 End S 17° 58.63' E 25° 16.58'
 Width: 327 m Length: 3.49 km
 NOTHING SEEN

Transect ZC02

Start S 17° 57.86' E 25° 19.42'
 End S 18° 4.78' E 25° 19.42'
 Width: 326 m Length: 12.83 km
 Sighting positions are given in decimal minutes south

Sightings:
 SABLE
 Pos No
 1 2.42 2

Transect ZC03

Start S 17° 58.03' E 25° 22.25'
 End S 18° 6.87' E 25° 22.25'
 Width: 332 m Length: 16.40 km
 NOTHING SEEN

Transect ZC04

Start S 17° 58.64' E 25° 25.09'
 End S 18° 9.35' E 25° 25.09'
 Width: 334 m Length: 19.87 km
 Sighting positions are given in decimal minutes south

Sightings:
 DUKER OSTRICH SABLE WARTHOG WATER
 Pos No Pos No Pos No Pos No Pos No
 1 0.56 1 5.81 2 3.41 2 5.43 3 7.72 1
 2 3.41 1
 3 0.56 1

Transect ZC05

Start S 17° 58.18' E 25° 27.93'
 End S 18° 14.15' E 25° 27.93'
 Width: 337 m Length: 29.61 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ELE CARC.3 KUDU SABLE
 Pos No Pos No Pos No Pos No
 1 58.75 6 59.12 1 0.17 2 2.63 1
 2 58.75 1 13.31 1
 3 11.32 3

Transect ZC06

Start S 17° 57.83' E 25° 30.77'
 End S 18° 13.96' E 25° 30.77'
 Width: 332 m Length: 29.93 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3 DUIKER WATERBUCK
 Pos No Pos No Pos No
 1 9.06 1 11.74 1 59.40 1
 2 4.09 1

Transect ZC07

Start S 17° 57.15' E 25° 33.60'
 End S 18° 13.45' E 25° 33.60'
 Width: 335 m Length: 30.23 km
 Sighting positions are given in decimal minutes south

Sightings:
 SABLE
 Pos No
 1 59.54 6
 2 8.47 1

Transect ZC08

Start S 18° 0.65' E 25° 36.44'
 End S 18° 12.93' E 25° 36.44'
 Width: 327 m Length: 22.78 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M
 Pos No Pos No
 1 10.34 16 10.12 1

Transect ZC09

Start S 18° 2.40' E 25° 39.28'
 End S 18° 12.42' E 25° 39.28'
 Width: 328 m Length: 18.59 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F SABLE
 Pos No Pos No
 1 8.39 1 3.70 1

Transect ZC10

Start S 18° 10.02' E 25° 42.11'
 End S 18° 11.67' E 25° 42.11'
 Width: 301 m Length: 3.06 km
 NOTHING SEEN

Transect ZC11

Start S 18° 2.40' E 25° 42.11'
 End S 18° 4.88' E 25° 42.11'
 Width: 328 m Length: 4.59 km
 NOTHING SEEN

Transect ZC12

Start S 18° 9.80' E 25° 44.95'
 End S 18° 10.65' E 25° 44.95'
 Width: 342 m Length: 1.59 km
 NOTHING SEEN

Transect ZD01

Start S 18° 14.10' E 25° 29.84'
 End S 18° 19.04' E 25° 29.84'
 Width: 333 m Length: 9.17 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M
 Pos No
 1 15.54 9
 2 14.15 1

Transect ZD02

Start S 18° 13.51' E 25° 33.25'
 End S 18° 25.10' E 25° 33.25'
 Width: 329 m Length: 21.49 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M
 Pos No
 1 15.36 1
 2 15.36 1
 3 15.36 4

Transect ZD03

Start S 18° 12.90' E 25° 36.66'
 End S 18° 27.72' E 25° 36.66'
 Width: 325 m Length: 27.50 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3 GIRAFFE SABLE TSESSEBE
 Pos No Pos No Pos No Pos No
 1 21.32 1 17.19 1 24.15 2 19.91 3
 2 20.14 1

Transect ZD04

Start S 18° 12.28' E 25° 40.07'
 End S 18° 25.41' E 25° 40.07'
 Width: 331 m Length: 24.36 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ZEBRA
 Pos No Pos No
 1 18.83 2 20.14 1

Transect ZD05

Start S 18° 16.60' E 25° 43.48'
 End S 18° 21.97' E 25° 43.48'
 Width: 335 m Length: 9.95 km
 Sighting positions are given in decimal minutes south

Sightings:
 WATERBUCK
 Pos No
 1 16.61 14

Transect ZE01

Start S 18° 27.08' E 25° 37.92'
 End S 18° 31.28' E 25° 42.35'
 Width: 330 m Length: 11.01 km
 NOTHING SEEN

Transect ZE02

Start S 18° 24.85' E 25° 40.79'
 End S 18° 29.73' E 25° 45.93'
 Width: 339 m Length: 12.78 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F
 Pos No
 1 27.45 14

Transect ZE03

Start S 18° 22.14' E 25° 43.16'
 End S 18° 28.01' E 25° 49.34'
 Width: 321 m Length: 15.40 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELAND KUDU WATERBUCK WATER
 Pos No Pos No Pos No Pos No
 1 25.33 10 27.65 1 27.16 1 23.85 1
 2 23.85 1

Transect ZE04

Start S 18° 19.09' E 25° 45.17'
 End S 18° 27.06' E 25° 53.57'
 Width: 335 m Length: 20.92 km
 Sighting positions are given in decimal minutes south

Sightings:
 IMPALA KUDU OSTRICH SABLE WATERBUCK WATER
 Pos No Pos No Pos No Pos No Pos No Pos No
 1 26.71 20 22.80 6 22.46 1 22.80 2 22.46 3 21.99 1
 2 26.71 6 26.71 1
 3 21.67 1 21.99 1
 4 22.80 1

Transect ZE05

Start S 18° 11.55' E 25° 42.45'
 End S 18° 23.78' E 25° 55.33'
 Width: 337 m Length: 32.08 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M BABOON BUFFALO KUDU SABLE WARTHOG
 Pos No Pos No Pos No Pos No Pos No Pos No
 1 15.29 3 18.75 6 15.57 30 20.20 2 19.00 4 20.20 1
 2 15.76 2 11.90 1 13.71 1
 3 12.64 3
 4 11.55 15
 5 10.94 2
 ZEBRA WATER
 Pos No Pos No
 1 16.68 4 22.62 1
 2 12.64 20 19.00 1
 3 10.94 5 12.80 1

Transect ZE06

Start S 18° 12.96' E 25° 49.15'
 End S 18° 16.91' E 25° 53.32'
 Width: 352 m Length: 10.37 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ZEBRA
 Pos No Pos No
 1 16.27 4 15.52 4
 2 16.01 7

Transect ZE07

Start S 18° 9.85' E 25° 45.88'
 End S 18° 11.87' E 25° 48.01'
 Width: 352 m Length: 5.30 km
 Sighting positions are given in decimal minutes south

Sightings:
 SABLE ZEBRA
 Pos No Pos No
 1 10.94 2 10.94 5

Transect ZF01

Start S 18° 28.17' E 25° 53.97'
 End S 18° 28.17' E 25° 48.72'
 Width: 319 m Length: 9.24 km
 Sighting positions are given in decimal minutes east

Sightings:
 BABOON KUDU SABLE
 Pos No Pos No Pos No
 1 50.55 20 51.93 2 50.55 1

Transect ZF02

Start S 18° 30.06' E 25° 55.13'
 End S 18° 30.06' E 25° 45.39'
 Width: 325 m Length: 17.14 km
 Sighting positions are given in decimal minutes east

Sightings:
 GIRAFFE
 Pos No
 1 50.56 3

Transect ZF03

Start S 18° 31.95' E 25° 54.76'
 End S 18° 31.95' E 25° 40.09'
 Width: 329 m Length: 25.79 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M ELE CARC.3 BABOON IMPALA SABLE SPT HYAENA
 Pos No Pos No Pos No Pos No Pos No Pos No
 1 49.55 2 54.73 1 52.44 1 53.64 10 45.84 18 53.21 1
 2 52.44 1 50.44 1
 WATER
 Pos No
 1 53.21 1
 2 45.42 1
 3 53.64 1

Transect ZF04

Start S 18° 33.84' E 25° 54.20'
 End S 18° 33.84' E 25° 41.07'
 Width: 339 m Length: 23.07 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M KUDU OSTRICH ZEBRA WATER
 Pos No Pos No Pos No Pos No Pos No
 1 51.93 7 51.15 1 47.27 1 41.88 8 50.95 1
 2 42.22 4 43.98 3
 3 51.93 1
 4 50.95 5

Transect ZF05

Start S 18° 35.72' E 25° 53.04'
 End S 18° 35.72' E 25° 43.85'
 Width: 326 m Length: 16.09 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M DUIKER KUDU
 Pos No Pos No Pos No
 1 50.57 2 48.61 2 49.37 3

Transect ZF06

Start S 18° 37.61' E 25° 52.04'
 End S 18° 37.61' E 25° 46.77'
 Width: 325 m Length: 9.26 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT F
 Pos No
 1 51.20 12

Transect ZG01

Start S 18° 31.03' E 26° 9.97'
 End S 18° 31.03' E 26° 5.95'
 Width: 375 m Length: 7.07 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		WATERBUCK	
Pos	No	Pos	No
1	6.57	1	7.92
2	9.11	1	

Transect ZG02

Start S 18° 32.65' E 26° 0.35'
 End S 18° 32.65' E 26° 10.06'
 Width: 333 m Length: 17.07 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		BUFFALO		WATER	
Pos	No	Pos	No	Pos	No
1	5.28	21	5.64	4	0.57
2					6.25

Transect ZG03

Start S 18° 34.27' E 26° 11.71'
 End S 18° 34.27' E 25° 57.39'
 Width: 334 m Length: 25.18 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		GIRAFFE		IMPALA		KUDU		SABLE	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	2.59	23	5.74	3	11.71	1	5.40	4	5.40	1	3.64
2	8.92	2					5.40	1			
3							7.35	15			

ZEBRA		WATER	
Pos	No	Pos	No
1	4.02	2	4.49
2	4.02	2	
3	7.03	1	

Transect ZG04

Start S 18° 35.89' E 25° 52.87'
 End S 18° 35.89' E 26° 12.00'
 Width: 319 m Length: 33.63 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		BUFFALO		GIRAFFE		IMPALA		KUDU		BLCK RHINO	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	58.45	13	54.58	4	57.32	2	3.87	25	55.00	1	11.68
2	3.44	5			1.02	2	4.43	5			
3	4.86	15					54.58	15			
4	58.59	4									
5	0.28	30									
6	1.30	15									
7	3.44	6									
8	5.16	6									

SABLE		WATERBUCK		ZEBRA		SPT HYAENA		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	53.72	3	54.58	1	55.00	12	56.27	1	55.80
2	11.95	1			55.00	2		3.87	1
3					55.00	6			

Transect ZG05

Start S 18° 37.51' E 26° 12.56'
 End S 18° 37.51' E 25° 52.07'
 Width: 328 m Length: 36.00 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		IMPALA		ROAN		WATERBUCK		ZEBRA		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	4.71	5	7.13	1	58.21	6	56.96	1	2.35	6	54.84	2	59.27
2			52.91	1	2.35	10				3.12	3		
3					59.27	2							
4					58.76	10							

Transect ZG06

Start S 18° 39.12' E 25° 47.39'
 End S 18° 39.12' E 26° 12.06'
 Width: 326 m Length: 43.35 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		BLCK RHINO		ROAN		WATERBUCK		ZEBRA	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	0.83	21	57.77	1	11.98	2	2.75	1	52.77	2	52.77
2	8.44	2	8.44	1							1.42
3	10.19	10	11.17	1							5.44
4	10.19	3	8.04	2							57.77
5	8.04	1									59.51
6	8.44	8									3.40
7	10.19	9									

WATER	
Pos	No
1	52.77
2	5.44

Transect ZG07

Start S 18° 40.74' E 26° 12.49'
 End S 18° 40.74' E 25° 48.05'
 Width: 334 m Length: 42.94 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		GIRAFFE		IMPALA		KUDU		ZEBRA		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	12.01	10	12.29	1	6.54	2	10.02	4	2.22	2	55.56	16
2	10.43	6	9.86	2	55.56	1	8.86	20	53.00	2	54.84	5
3	54.15	13	6.21	2	9.38	1					54.60	7
4	5.13	8	4.82	1								
5			3.87	1								
6			3.74	1								
7			10.63	1								
8			10.43	1								

WATER

Pos	No
1	1.92

Transect ZG08

Start S 18° 42.36' E 25° 47.66'
 End S 18° 42.36' E 26° 12.40'
 Width: 329 m Length: 43.45 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		GIRAFFE		IMPALA		TSESSEBE		ZEBRA		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	0.41	8	58.60	2	51.53	1	4.44	27	58.13	2	51.53	7
2	55.64	2	6.72	1	59.05	1	8.65	4			4.04	6
3	4.28	1	6.85	1	4.68	1						
4	9.90	11	9.08	1								
5	10.29	6										
6	10.47	2										

Transect ZG09

Start S 18° 43.98' E 26° 9.20'
 End S 18° 43.98' E 25° 47.61'
 Width: 330 m Length: 37.93 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		OSTRICH		SPT HYAENA	
Pos	No	Pos	No	Pos	No	Pos	No
1	57.60	3	2.46	1	6.21	1	2.29
2	57.60	19	58.14	1			
3			57.60	6			
4			57.04	1			
5			56.86	11			
6			53.77	15			

Transect ZG10

Start S 18° 45.60' E 25° 47.87'
 End S 18° 45.60' E 26° 7.07'
 Width: 324 m Length: 33.73 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		OSTRICH		SABLE		ZEBRA	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	50.10	7	52.85	1	48.23	1	57.91	1	49.43	10	2.50
2	48.67	8	54.38	1			5.48	2			
3			49.43	3							
4			51.63	2							
5			53.17	4							
6			53.89	1							
7			54.05	5							
8			54.32	2							
9			6.62	1							

Transect ZG11

Start S 18° 47.21' E 26° 1.16'
 End S 18° 47.21' E 25° 48.27'
 Width: 330 m Length: 22.63 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		GIRAFFE		KUDU	
Pos	No	Pos	No	Pos	No	Pos	No
1	48.94	12	50.47	1	58.71	1	49.99
2			50.27	1			
3			51.03	1			

Transect ZH01

Start S 18° 19.91' E 25° 55.05'
 End S 18° 20.84' E 25° 54.48'
 Width: 375 m Length: 1.98 km
 NOTHING SEEN

Transect ZH02

Start S 18° 18.29' E 25° 58.66'
 End S 18° 23.73' E 25° 55.35'
 Width: 333 m Length: 11.66 km
 Sighting positions are given in decimal minutes south

Sightings:

GIRAFFE		IMPALA		ZEBRA		WATER		
Pos	No	Pos	No	Pos	No	Pos	No	
1	22.72	1	20.16	25	19.05	7	20.16	1

Transect ZH03

Start S 18° 17.55' E 26° 1.74'
 End S 18° 29.19' E 25° 54.65'
 Width: 324 m Length: 24.94 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3		ELAND		KUDU		SABLE		WARTHOG		WATERBUCK		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	24.78	1	28.81	8	25.64	6	22.64	3	21.99	2	18.81	2
2											21.99	1

ZEBRA

Pos	No
1	21.99
2	25.64

Transect ZH04

Start S 18° 17.88' E 26° 4.16'
 End S 18° 34.54' E 25° 54.02'
 Width: 341 m Length: 35.68 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M		GIRAFFE		IMPALA		KUDU		WARTHOG		WATERBUCK		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	20.48	1	26.93	1	27.73	7	27.73	2	23.17	2	30.68	1
2	20.31	1			27.27	6	26.49	1				
3					24.40	3						

WATER

Pos	No
1	30.88
2	30.48
3	28.49
4	28.23
5	24.40

Transect ZH05

Start S 18° 17.77' E 26° 6.85'
 End S 18° 34.76' E 25° 56.51'
 Width: 341 m Length: 36.39 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		BABOON		BUFFALO		IMPALA		KUDU		SABLE		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	31.74	40	21.59	1	26.88	35	28.02	2	19.48	4	33.24	5
2	31.74	15	34.40	2			29.58	15	27.71	1	27.26	1
3											29.07	1
4											31.74	8

WARTHOG WATERBUCK ZEBRA WATER

Pos	No	Pos	No	Pos	No	Pos	No
1	23.00	1	20.36	1	24.99	25	19.05
2					24.99	9	31.74
3					27.51	20	
4					34.66	4	

Transect ZH06

Start S 18° 17.38' E 26° 9.71'
 End S 18° 32.61' E 26° 0.45'
 Width: 319 m Length: 32.60 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELE CARC.2		ELE CARC.3		ELAND		IMPALA		KUDU	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	24.33	3	28.51	1	23.99	1	19.88	2	23.81	5	26.56
2									27.28	3	25.52
3											18.11

SABLE WARTHOG ZEBRA LION WATER

Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	30.14	1	32.23	1	23.81	3	26.56	2	32.23
2					20.64	9			25.52
3					25.52	8			
4					24.33	12			

Transect ZH07

Start S 18° 19.50' E 26° 11.05'
 End S 18° 31.67' E 26° 3.64'
 Width: 333 m Length: 26.06 km
 Sighting positions are given in decimal minutes south

Sightings:

IMPALA		KUDU		ROAN		ZEBRA		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	25.20	2	28.03	4	24.92	1	20.52	1	27.00
2	19.59	1	26.16	2			21.82	2	
3			24.24	1					

Transect ZH08

Start S 18° 21.16' E 26° 12.66'
 End S 18° 30.81' E 26° 6.80'
 Width: 327 m Length: 20.65 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		BABOON		KUDU		BLCK RHINO		SABLE		ZEBRA		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	28.81	15	23.17	3	27.03	2	30.69	2	28.17	1	24.09	1

WATER

Pos	No
1	28.17
1	28.17

Transect ZH09

Start S 18° 21.93' E 26° 14.82'
 End S 18° 29.96' E 26° 9.94'
 Width: 319 m Length: 17.18 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		BABOON		DUIKER		IMPALA		ZEBRA		WATER		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	28.55	3	24.56	4	23.85	1	23.46	7	25.52	3	29.35	1
2	28.11	15			24.56	1	22.27	16				

Transect ZH10

Start S 18° 22.70' E 26° 16.98'
 End S 18° 24.98' E 26° 15.59'
 Width: 323 m Length: 4.89 km
 NOTHING SEEN

Transect ZI01

Start S 18° 47.41' E 25° 49.28'
 End S 18° 48.56' E 25° 49.28'
 Width: 338 m Length: 2.13 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M ELE CARC.3			
Pos	No	Pos	No
1	48.44	2	48.55
2	48.44	1	48.55

Transect ZI02

Start S 18° 47.40' E 25° 51.28'
 End S 18° 51.14' E 25° 51.28'
 Width: 328 m Length: 6.94 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M			
Pos	No	Pos	No
1	47.94	1	
2	47.42	1	

Transect ZI03

Start S 18° 48.90' E 25° 53.27'
 End S 18° 52.40' E 25° 53.27'
 Width: 333 m Length: 6.50 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M		KUDU		SABLE	
Pos	No	Pos	No	Pos	No
1	50.31	3	49.66	7	49.41

Transect ZI04

Start S 18° 48.58' E 25° 55.27'
 End S 18° 53.86' E 25° 55.27'
 Width: 333 m Length: 9.80 km
 NOTHING SEEN

Transect ZI05

Start S 18° 48.30' E 25° 57.26'
 End S 18° 55.41' E 25° 57.26'
 Width: 343 m Length: 13.19 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3			
Pos	No	Pos	No
1	52.50	1	

Transect ZI06

Start S 18° 47.52' E 25° 59.26'
 End S 18° 59.07' E 25° 59.26'
 Width: 334 m Length: 21.43 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M ELE CARC.3			
Pos	No	Pos	No
1	50.45	1	53.52
2	50.07	1	
3	49.11	1	

Transect ZI07

Start S 18° 47.20' E 26° 1.25'
 End S 19° 0.73' E 26° 1.25'
 Width: 331 m Length: 25.10 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M

Pos	No	Pos	No
1 48.23	3	49.71	4
2		47.98	1
3		48.99	2

Transect ZI08

Start S 18° 46.65' E 26° 3.25'
 End S 18° 59.64' E 26° 3.25'
 Width: 329 m Length: 24.08 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M SPT HYAENA

Pos	No	Pos	No	Pos	No
1 52.17	7	51.90	1	54.44	1
2		50.27	2		

Transect ZI09

Start S 18° 46.47' E 26° 5.24'
 End S 19° 0.28' E 26° 5.24'
 Width: 335 m Length: 25.62 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M DUIKER

Pos	No	Pos	No	Pos	No
1 48.73	9	49.20	1	53.86	1
2 50.16	16				

Transect ZI10

Start S 18° 45.51' E 26° 7.24'
 End S 18° 59.77' E 26° 7.24'
 Width: 334 m Length: 26.46 km
 NOTHING SEEN

Transect ZI11

Start S 18° 43.97' E 26° 9.23'
 End S 18° 59.47' E 26° 9.23'
 Width: 337 m Length: 28.74 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M DUIKER ZEBRA

Pos	No	Pos	No	Pos	No
1 49.09	1	55.69	1	52.45	4
2 57.01	1				

Transect ZI12

Start S 18° 43.54' E 26° 11.23'
 End S 18° 59.31' E 26° 11.23'
 Width: 325 m Length: 29.24 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ELE CARC.3 ZEBRA

Pos	No	Pos	No	Pos	No
1 57.91	1	44.95	1	48.47	4

Transect ZI13

Start S 18° 42.81' E 26° 13.22'
 End S 18° 58.96' E 26° 13.22'
 Width: 329 m Length: 29.94 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M ELE CARC.3 IMPALA SABLE ZEBRA

Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1 43.14	25	54.31	2	46.51	1	46.78	2	43.14	1	43.14	1
2 43.14	6					47.59	8			43.86	1
3 53.83	6									43.86	1

Transect ZI14

Start S 18° 41.73' E 26° 15.22'
 End S 18° 58.76' E 26° 15.22'
 Width: 322 m Length: 31.59 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M KUDU SABLE ZEBRA

Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1 45.97	5	45.97	1	43.76	3	46.51	1	44.68	1
2		45.49	1					45.49	2
3		43.76	1						
4		43.45	4						

Transect ZI15

Start S 18° 46.46' E 26° 17.21'
 End S 18° 59.11' E 26° 17.21'
 Width: 330 m Length: 23.45 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3 IMPALA

Pos	No	Pos	No
1 58.50	1	49.28	1

Transect ZI16

Start S 18° 42.09' E 26° 17.21'
 End S 18° 42.60' E 26° 17.21'
 Width: 325 m Length: 0.94 km
 Sighting positions are given in decimal minutes south

Sightings:
 IMPALA

Pos	No
1 42.28	4

Transect ZI17

Start S 18° 47.55' E 26° 19.21'
 End S 18° 59.21' E 26° 19.21'
 Width: 333 m Length: 21.63 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M SABLE

Pos	No	Pos	No	Pos	No
1 51.53	6	52.15	1	57.60	1

Transect ZI18

Start S 18° 48.67' E 26° 21.20'
 End S 18° 58.28' E 26° 21.20'
 Width: 334 m Length: 17.82 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M SABLE

Pos	No	Pos	No	Pos	No
1 53.88	3	52.04	1	52.79	1
2		49.06	2		

Transect ZI19

Start S 18° 50.66' E 26° 23.20'
 End S 18° 56.02' E 26° 23.20'
 Width: 331 m Length: 9.94 km
 Sighting positions are given in decimal minutes south

Sightings:
 ZEBRA

Pos	No
1 51.05	3

Transect ZI20

Start S 18° 51.47' E 26° 25.19'
 End S 18° 54.80' E 26° 25.19'
 Width: 331 m Length: 6.17 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M

Pos	No	Pos	No
1 54.55	15	53.17	1
2 54.79	3		
3 54.79	2		
4 53.17	3		

Transect ZI21

Start S 18° 51.97' E 26° 27.18'
 End S 18° 53.85' E 26° 27.18'
 Width: 325 m Length: 3.49 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M

Pos	No
1 53.45	1
2 53.45	1

Transect ZI22

Start S 18° 52.29' E 26° 29.18'
 End S 18° 52.58' E 26° 29.18'
 Width: 353 m Length: 0.55 km
 NOTHING SEEN

Transect ZJ01

Start S 19° 1.81' E 26° 18.90'
 End S 19° 1.81' E 25° 59.91'
 Width: 323 m Length: 33.29 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELE CARC.3 DUIKER KUDU SPT HYAENA
 Pos No Pos No Pos No Pos No
 1 15.37 1 5.01 1 7.40 2 5.01 1
 2 8.94 2

Transect ZJ02

Start S 19° 6.66' E 26° 20.40'
 End S 19° 6.66' E 25° 58.16'
 Width: 328 m Length: 38.99 km
 Sighting positions are given in decimal minutes east

Sightings:
 GIRAFFE KUDU
 Pos No Pos No
 1 20.12 1 20.12 1
 2 19.43 1
 3 17.23 2

Transect ZJ03

Start S 19° 11.52' E 26° 22.35'
 End S 19° 11.52' E 26° 1.82'
 Width: 331 m Length: 35.95 km
 Sighting positions are given in decimal minutes east

Sightings:
 DUIKER GIRAFFE IMPALA
 Pos No Pos No Pos No
 1 16.93 1 20.78 1 12.86 3

Transect ZJ04

Start S 19° 16.37' E 26° 25.27'
 End S 19° 16.37' E 26° 4.51'
 Width: 327 m Length: 36.35 km
 Sighting positions are given in decimal minutes east

Sightings:
 DUIKER GIRAFFE IMPALA
 Pos No Pos No Pos No
 1 21.90 1 4.55 3 15.79 10

Transect ZJ05

Start S 19° 21.22' E 26° 27.33'
 End S 19° 21.22' E 26° 6.36'
 Width: 327 m Length: 36.70 km
 Sighting positions are given in decimal minutes east

Sightings:
 DUIKER KUDU
 Pos No Pos No
 1 17.62 1 15.60 3
 2 18.34 1

Transect ZJ06

Start S 19° 26.08' E 26° 24.96'
 End S 19° 26.08' E 26° 8.43'
 Width: 324 m Length: 28.92 km
 NOTHING SEEN

Transect ZJ07

Start S 19° 30.93' E 26° 24.19'
 End S 19° 30.93' E 26° 9.65'
 Width: 331 m Length: 25.41 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELE CARC.3
 Pos No
 1 16.74 1

Transect ZK01

Start S 19° 21.17' E 26° 55.18'
 End S 19° 21.17' E 26° 50.30'
 Width: 333 m Length: 8.55 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT F ELEPHANT M
 Pos No Pos No
 1 50.75 7 52.19 1
 2 53.00 1

Transect ZK02

Start S 19° 23.33' E 26° 53.46'
 End S 19° 23.33' E 26° 41.99'
 Width: 337 m Length: 20.06 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		GIRAFFE		WATER		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	49.83	3	48.85	1	49.63	1	47.20	1	45.21	1
2			49.12	1			50.42	1		
3			49.12	1						
4			43.77	1						
5			48.53	1						
6			52.78	1						

Transect ZK03

Start S 19° 25.48' E 26° 52.44'
 End S 19° 25.48' E 26° 27.05'
 Width: 337 m Length: 44.40 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		ELE CARC.3		DUIKER		GIRAFFE		
Pos	No	Pos	No	Pos	No	Pos	No	
1	48.07	3	51.53	1	45.97	1	45.09	1
2	48.07	1					40.94	1
3	50.33	2						
4	50.03	1						
5	42.56	4						

Transect ZK04

Start S 19° 27.64' E 26° 51.59'
 End S 19° 27.64' E 26° 24.58'
 Width: 329 m Length: 47.24 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		ELE CARC.3		DUIKER		GIRAFFE		
Pos	No	Pos	No	Pos	No	Pos	No	
1	42.43	2	30.07	1	25.02	1	49.12	1
2	44.26	1	33.82	1	28.11	1	49.74	1
3	44.84	3			36.57	1		
4					38.25	1		

Transect ZK05

Start S 19° 29.80' E 26° 50.78'
 End S 19° 29.80' E 26° 24.50'
 Width: 341 m Length: 45.95 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3		DUIKER		GIRAFFE		
Pos	No	Pos	No	Pos	No	
1	49.88	1	38.13	1	40.26	3
2					40.26	1
3					39.97	1
4					40.54	2

Transect ZK06

Start S 19° 31.96' E 26° 49.97'
 End S 19° 31.96' E 26° 22.47'
 Width: 323 m Length: 48.07 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3		DUIKER		KUDU		ROAN		
Pos	No	Pos	No	Pos	No	Pos	No	
1	27.33	1	23.62	1	34.74	2	25.14	1
2	31.43	1	29.64	2	33.42	1		
3	33.05	1	25.54	1				
4	27.02	1						

Transect ZK07

Start S 19° 34.11' E 26° 49.16'
 End S 19° 34.11' E 26° 14.05'
 Width: 330 m Length: 61.36 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3		GEMSBOK		GIRAFFE		OSTRICH		
Pos	No	Pos	No	Pos	No	Pos	No	
1	37.21	1	37.70	1	29.18	2	44.51	1
2	35.21	1			24.13	1		
3					22.94	2		
4					20.27	1		

Transect ZK08

Start S 19° 36.27' E 26° 48.35'
 End S 19° 36.27' E 26° 20.48'
 Width: 321 m Length: 48.69 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELE CARC.3		DUIKER		GEMSBOK		GIRAFFE		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	36.19	9	41.76	1	21.73	1	20.69	1	23.87	1
2	37.51	6			34.09	1	20.69	1		

Transect ZK09

Start S 19° 38.43' E 26° 47.54'
 End S 19° 38.43' E 26° 19.92'
 Width: 326 m Length: 48.24 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELE CARC.3		DUIKER	
Pos	No	Pos	No	Pos	No
1	37.76	5	35.29	1	28.20
2	34.10	3			

Transect ZK10

Start S 19° 40.59' E 26° 46.73'
 End S 19° 40.59' E 26° 23.62'
 Width: 323 m Length: 40.36 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3		DUIKER		GEMSBOK		KUDU	
Pos	No	Pos	No	Pos	No	Pos	No
1	25.05	1	27.21	1	36.44	1	46.48
2	30.07	1					
3	31.04	1					

Transect ZK11

Start S 19° 42.74' E 26° 45.92'
 End S 19° 42.74' E 26° 24.68'
 Width: 336 m Length: 37.09 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3	
Pos	No
1	42.05
2	30.39

Transect ZK12

Start S 19° 44.90' E 26° 45.11'
 End S 19° 44.90' E 26° 26.93'
 Width: 325 m Length: 31.74 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3		IMPALA	
Pos	No	Pos	No
1	28.82	1	33.71
2	43.25	1	

Transect ZK13

Start S 19° 47.06' E 26° 44.30'
 End S 19° 47.06' E 26° 33.86'
 Width: 331 m Length: 18.21 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		OSTRICH	
Pos	No	Pos	No
1	41.47	2	43.41

Transect ZK14

Start S 19° 49.21' E 26° 43.49'
 End S 19° 49.21' E 26° 35.20'
 Width: 318 m Length: 14.46 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3	
Pos	No	Pos	No	Pos	No
1	43.49	5	39.89	3	39.89

Transect ZK15

Start S 19° 51.37' E 26° 42.68'
 End S 19° 51.37' E 26° 36.22'
 Width: 326 m Length: 11.26 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		ELE CARC.3	
Pos	No	Pos	No
1	38.11	1	39.17
2	41.40	1	
3	38.11	1	

Transect ZL01

Start S 19° 23.61' E 26° 53.28'
 End S 19° 23.61' E 26° 58.37'
 Width: 311 m Length: 8.91 km
 Sighting positions are given in decimal minutes east

Sightings:

WILDEBEEST		CATTLE	
Pos	No	Pos	No
1	54.02	2	57.76
2			57.76
3			58.16
4			58.37

Transect ZL02

Start S 19° 26.85' E 27° 0.67'
 End S 19° 26.85' E 26° 51.88'
 Width: 330 m Length: 15.37 km
 Sighting positions are given in decimal minutes east

Sightings:

DUIKER
 Pos No
 1 56.90 1

Transect ZL03

Start S 19° 30.08' E 26° 50.68'
 End S 19° 30.08' E 26° 59.88'
 Width: 333 m Length: 16.09 km
 Sighting positions are given in decimal minutes east

Sightings:

DUIKER		CATTLE		SHEEP+GOAT	
Pos	No	Pos	No	Pos	No
1	51.49	1	59.63	8	56.77
2			56.77	1	
3			57.44	9	
4			59.87	2	

Transect ZL04

Start S 19° 33.32' E 26° 57.32'
 End S 19° 33.32' E 26° 49.46'
 Width: 328 m Length: 13.73 km
 Sighting positions are given in decimal minutes east

Sightings:

SHEEP+GOAT		DONKEY	
Pos	No	Pos	No
1	54.30	9	57.19
2	57.19	20	57.19

Transect ZL05

Start S 19° 36.55' E 26° 48.24'
 End S 19° 36.55' E 26° 57.53'
 Width: 328 m Length: 16.22 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3		CATTLE		SHEEP+GOAT	
Pos	No	Pos	No	Pos	No
1	48.58	1	51.27	23	57.47
2			50.80	14	57.47
3			57.47	8	

Transect ZL06

Start S 19° 39.79' E 26° 57.74'
 End S 19° 39.79' E 26° 47.03'
 Width: 334 m Length: 18.71 km
 Sighting positions are given in decimal minutes east

Sightings:

ELE CARC.3		CATTLE		SHEEP+GOAT	
Pos	No	Pos	No	Pos	No
1	49.65	1	57.70	4	57.70
2			56.55	2	

Transect ZL07

Start S 19° 43.03' E 26° 45.81'
 End S 19° 43.03' E 26° 58.10'
 Width: 328 m Length: 21.45 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F
 Pos No
 1 56.71 7

Transect ZL08

Start S 19° 46.26' E 26° 58.90'
 End S 19° 46.26' E 26° 44.60'
 Width: 327 m Length: 24.96 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		KUDU		CATTLE	
Pos	No	Pos	No	Pos	No	Pos	No
1	56.57	2	56.57	70	53.99	4	46.31
						22	

Transect ZL09

Start S 19° 49.50' E 26° 43.38'
 End S 19° 49.50' E 26° 50.39'
 Width: 327 m Length: 12.24 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELE CARC.3	
Pos	No	Pos	No
1	45.91	10	47.15
2			46.30

Transect ZL10

Start S 19° 52.73' E 26° 42.68'
 End S 19° 52.73' E 26° 42.17'
 Width: 342 m Length: 0.89 km
 NOTHING SEEN

Transect ZM01

Start S 19° 56.15' E 26° 45.20'
 End S 19° 51.58' E 26° 45.20'
 Width: 336 m Length: 8.47 km
 Sighting positions are given in decimal minutes south

Sightings:

CATTLE

Pos	No
1 52.01	4
2 52.01	1
3 52.01	5
4 52.01	7
5 52.01	9
6 52.01	8

Transect ZM02

Start S 19° 49.51' E 26° 50.36'
 End S 19° 57.60' E 26° 50.36'
 Width: 332 m Length: 15.00 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F ELEPHANT M ELE CARC.3

Pos	No	Pos	No	Pos	No
1 53.47	28	55.35	1	51.02	1
2 56.25	21				

Transect ZM03

Start S 19° 59.39' E 26° 55.52'
 End S 19° 48.62' E 26° 55.52'
 Width: 327 m Length: 19.97 km
 NOTHING SEEN

Transect ZM04

Start S 19° 41.03' E 27° 0.68'
 End S 20° 0.61' E 27° 0.68'
 Width: 331 m Length: 36.32 km
 Sighting positions are given in decimal minutes south

Sightings:

IMPALA		CATTLE		DONKEY	
Pos	No	Pos	No	Pos	No
1 49.15	1	53.41	20	41.30	4
2		53.41	6		

Transect ZM05

Start S 20° 2.63' E 27° 5.84'
 End S 19° 41.34' E 27° 5.84'
 Width: 337 m Length: 39.48 km
 Sighting positions are given in decimal minutes south

Sightings:

KUDU		JACKAL		CATTLE		SHEEP+GOAT		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1 55.73	3	47.43	1	0.82	5	41.40	9	56.21	1
2				41.40	3	41.40	9	42.96	1
3				2.45	8				
4				55.44	15				
5				41.40	7				

Transect ZM06

Start S 19° 44.56' E 27° 11.00'
 End S 20° 2.68' E 27° 11.00'
 Width: 339 m Length: 33.60 km
 Sighting positions are given in decimal minutes south

Sightings:

CATTLE		SHEEP+GOAT		DONKEY	
Pos	No	Pos	No	Pos	No
1 47.03	4	57.30	3	44.79	1
2 55.92	1	2.24	9		
3 44.79	5	2.24	8		
4 45.41	7	2.24	7		
5 55.33	7				
6 55.57	7				
7 0.27	14				
8 1.75	9				
9 1.92	1				

Transect ZN01

Start S 19° 20.25' E 26° 57.05'
 End S 19° 23.10' E 26° 57.05'
 Width: 337 m Length: 5.28 km
 NOTHING SEEN

Transect ZN02

Start S 19° 24.42' E 27° 2.20'
 End S 19° 19.69' E 27° 2.20'
 Width: 329 m Length: 8.76 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3
 Pos No
 1 20.55 1

Transect ZN03

Start S 19° 18.91' E 27° 7.34'
 End S 19° 24.27' E 27° 7.34'
 Width: 329 m Length: 9.94 km
 Sighting positions are given in decimal minutes south

Sightings:

CATTLE SHEEP+GOAT
 Pos No Pos No
 1 23.33 2 24.20 10
 2 22.99 14

Transect ZN04

Start S 19° 24.52' E 27° 12.48'
 End S 19° 19.17' E 27° 12.48'
 Width: 331 m Length: 9.93 km
 NOTHING SEEN

Transect ZN05

Start S 19° 14.54' E 27° 17.62'
 End S 19° 27.13' E 27° 17.62'
 Width: 336 m Length: 23.35 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3		DUIKER		CATTLE		DONKEY	
Pos	No	Pos	No	Pos	No	Pos	No
1	14.94	1	25.64	1	19.44	2	17.52
2					21.52	2	
3					21.52	2	
4					17.52	1	
5					21.92	6	
6					22.19	13	
7					25.33	15	

Transect ZN06

Start S 19° 22.77' E 27° 22.77'
 End S 19° 13.47' E 27° 22.77'
 Width: 329 m Length: 17.25 km
 Sighting positions are given in decimal minutes south

Sightings:

CATTLE		SHEEP+GOAT		DONKEY	
Pos	No	Pos	No	Pos	No
1	19.92	2	19.92	2	21.05
2	19.92	2	19.03	2	21.05
3	17.42	1	21.05	10	18.37
4	16.17	7	18.61	20	17.06
5	22.12	16			21.05
6	19.23	10			19.92
7	17.06	7			15.70
8	17.06	1			

Transect ZN07

Start S 19° 5.91' E 27° 27.91'
 End S 19° 21.36' E 27° 27.91'
 Width: 333 m Length: 28.65 km
 Sighting positions are given in decimal minutes south

Sightings:

CATTLE		SHEEP+GOAT		DONKEY	
Pos	No	Pos	No	Pos	No
1	10.47	4	8.78	7	10.47
2	14.89	3	11.51	7	10.04
3	8.94	2	18.98	15	10.04
4	10.04	4	8.94	4	15.41
5	10.77	2	9.44	15	15.53
6	11.51	1	9.44	10	16.37
7	15.19	7	10.04	17	17.17
8	16.37	1	10.77	1	17.61
9					17.93

Transect ZN08

Start S 19° 15.73' E 27° 33.05'
 End S 19° 9.96' E 27° 33.05'
 Width: 333 m Length: 10.69 km
 Sighting positions are given in decimal minutes south

Sightings:

CATTLE		SHEEP+GOAT		DONKEY	
Pos	No	Pos	No	Pos	No
1	11.99	8	15.60	7	12.55
2			15.60	4	11.99
3			11.99	7	11.99

Transect Z001

Start S 18° 46.41' E 27° 27.36'
 End S 18° 57.72' E 27° 17.33'
 Width: 332 m Length: 27.37 km
 Sighting positions are given in decimal minutes east

Sightings:
 BUFFALO DUIKER SABLE WARTHOG
 Pos No Pos No Pos No Pos No
 1 26.11 16 26.91 1 25.59 8 27.11 3
 2 22.34 1

Transect Z002

Start S 18° 47.48' E 27° 31.62'
 End S 19° 0.11' E 27° 20.42'
 Width: 336 m Length: 30.57 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT F ELE CARC.3 KUDU SABLE
 Pos No Pos No Pos No Pos No
 1 21.68 4 20.42 1 28.69 1 23.07 1
 2 22.24 1
 3 24.50 1
 4 24.72 19

Transect Z003

Start S 18° 48.74' E 27° 35.71'
 End S 19° 2.50' E 27° 23.51'
 Width: 340 m Length: 33.31 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M ELAND SABLE ZEBRA WATER
 Pos No Pos No Pos No Pos No Pos No
 1 26.28 2 33.92 2 31.92 1 33.92 4 34.25 1
 2 24.49 27

Transect Z004

Start S 18° 51.69' E 27° 38.30'
 End S 19° 4.89' E 27° 26.59'
 Width: 340 m Length: 31.95 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M ELE CARC.3 BABOON SABLE WATER
 Pos No Pos No Pos No Pos No Pos No
 1 31.13 2 26.86 1 26.60 1 27.35 1 37.96 1
 2 35.00 2 30.12 1 28.43 1 27.54 1 37.96 1
 3 30.68 3 28.43 1 28.81 7
 4 26.60 2 34.67 3
 5 36.73 3
 6 28.94 6
 7 29.69 1
 8 34.53 1

Transect Z005

Start S 18° 53.62' E 27° 41.80'
 End S 19° 5.85' E 27° 30.95'
 Width: 336 m Length: 29.61 km
 Sighting positions are given in decimal minutes east

Sightings:
 SABLE WATERBUCK
 Pos No Pos No
 1 36.52 2 41.54 6
 2 36.09 1 41.54 9

Transect Z006

Start S 18° 56.39' E 27° 44.56'
 End S 19° 5.85' E 27° 36.16'
 Width: 324 m Length: 22.90 km
 Sighting positions are given in decimal minutes east

Sightings:
 CATTLE DONKEY
 Pos No Pos No
 1 44.09 9 44.09 6
 2 44.09 2

Transect Z007

Start S 19° 5.21' E 27° 41.95'
 End S 19° 5.85' E 27° 41.37'
 Width: 358 m Length: 1.56 km
 NOTHING SEEN

Transect ZP02

Start S 18° 32.54' E 26° 59.38'
 End S 18° 38.97' E 26° 53.69'
 Width: 330 m Length: 15.56 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M SABLE CATTLE WATER
 Pos No Pos No Pos No Pos No
 1 33.00 3 35.49 1 33.00 10 38.97 1
 2 33.00 3 35.68 10 34.32 1
 3 37.51 2 36.61 1

Transect ZP03

Start S 18° 34.74' E 27° 2.64'
 End S 18° 41.39' E 26° 56.75'
 Width: 327 m Length: 16.11 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3		IMPALA		SABLE		WATER		
Pos	No	Pos	No	Pos	No	Pos	No	
1	38.91	1	39.46	1	41.04	4	39.46	1
2					41.04			1
3					41.04			1
4					39.85			1

Transect ZP04

Start S 18° 36.86' E 27° 5.97'
 End S 18° 43.82' E 26° 59.80'
 Width: 336 m Length: 16.87 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		WARTHOG		
Pos	No	Pos	No	Pos	No	
1	42.49	20	40.45	3	38.85	4

Transect ZP05

Start S 18° 36.75' E 27° 11.27'
 End S 18° 46.25' E 27° 2.86'
 Width: 327 m Length: 22.99 km
 Sighting positions are given in decimal minutes south

Sightings:

BABOON		SABLE		ZEBRA		CATTLE		
Pos	No	Pos	No	Pos	No	Pos	No	
1	41.80	13	45.65	1	40.17	3	37.65	5
2							37.65	1
3							37.39	23

Transect ZP06

Start S 18° 39.50' E 27° 14.04'
 End S 18° 48.67' E 27° 5.91'
 Width: 328 m Length: 22.21 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3		BABOON		GIRAFFE		IMPALA		KUDU		SABLE		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	47.92	1	39.71	7	48.23	1	39.71	7	41.03	3	45.47	1
2									41.03	1	47.01	1

WATERBUCK

WATERBUCK		WATER		
Pos	No	Pos	No	
1	39.50	6	42.25	1
2	39.50	2	42.25	1
3	42.86	1		

Transect ZP07

Start S 18° 42.70' E 27° 16.41'
 End S 18° 51.10' E 27° 8.97'
 Width: 332 m Length: 20.34 km
 Sighting positions are given in decimal minutes south

Sightings:

SABLE		WATER		
Pos	No	Pos	No	
1	48.91	1	42.83	1
2	47.46	1	46.73	1
3	45.87	21		

Transect ZP08

Start S 18° 44.51' E 27° 20.01'
 End S 18° 53.52' E 27° 12.02'
 Width: 322 m Length: 21.82 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3		SABLE		SHEEP+GOAT		WATER		
Pos	No	Pos	No	Pos	No	Pos	No	
1	52.08	1	51.54	1	45.60	6	44.54	1
2					45.60	6	45.79	1

Transect ZP09

Start S 18° 44.93' E 27° 24.54'
 End S 18° 55.94' E 27° 15.08'
 Width: 330 m Length: 26.66 km
 Sighting positions are given in decimal minutes south

Sightings:

BABOON		SABLE		WATER		
Pos	No	Pos	No	Pos	No	
1	45.09	3	54.11	9	48.51	1
2					47.30	1
3					46.14	1

Transect ZQ01

Start S 18° 23.63' E 26° 17.44'
 End S 18° 23.63' E 26° 16.92'
 Width: 353 m Length: 0.90 km
 NOTHING SEEN

Transect ZQ02

Start S 18° 25.79' E 26° 18.67'
 End S 18° 25.79' E 26° 14.09'
 Width: 336 m Length: 8.05 km
 Sighting positions are given in decimal minutes east

Sightings:

KUDU		ZEBRA		WATER		
Pos	No	Pos	No	Pos	No	
1	18.37	1	14.19	5	14.41	1

Transect ZQ03

Start S 18° 27.95' E 26° 11.42'
 End S 18° 27.95' E 26° 20.47'
 Width: 315 m Length: 15.92 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		GIRAFFE		KUDU		BLCK RHINO		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	11.80	1	17.92	2	17.49	1	20.35	2	16.05
2	12.42	1			17.49	2			
3					17.92	1			

Transect ZQ04

Start S 18° 27.95' E 26° 26.13'
 End S 18° 27.95' E 26° 31.74'
 Width: 320 m Length: 9.86 km
 Sighting positions are given in decimal minutes east

Sightings:

KUDU		WATER	
Pos	No	Pos	No
1	29.06	4	31.49

Transect ZQ05

Start S 18° 27.95' E 26° 33.06'
 End S 18° 27.95' E 26° 34.40'
 Width: 331 m Length: 2.36 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		WATER	
Pos	No	Pos	No
1	33.68	1	34.03
2			34.03

Transect ZQ06

Start S 18° 30.10' E 26° 37.97'
 End S 18° 30.10' E 26° 10.16'
 Width: 329 m Length: 48.91 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		IMPALA		KUDU		WARTHOG	
Pos	No	Pos	No	Pos	No	Pos	No
1	30.49	5	31.42	4	36.26	1	15.05
2	26.10	9	19.76	7	15.05	1	
3	25.89	4	15.05	9			

Transect ZQ07

Start S 18° 30.10' E 26° 40.14'
 End S 18° 30.10' E 26° 41.79'
 Width: 328 m Length: 2.91 km
 NOTHING SEEN

Transect ZQ08

Start S 18° 32.26' E 26° 10.08'
 End S 18° 32.26' E 26° 41.03'
 Width: 343 m Length: 54.42 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		GIRAFFE		KUDU		WARTHOG	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	14.55	8	15.89	1	33.12	1	10.47	1	31.08	1	29.95
2					34.57	1					
3					33.22	1					
4					33.72	1					

ZEBRA	
Pos	No
1	20.96
2	20.96

Transect ZQ09

Start S 18° 34.42' E 26° 40.13'
 End S 18° 34.42' E 26° 11.69'
 Width: 330 m Length: 50.00 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		GIRAFFE		IMPALA		KUDU	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	14.10	14	38.51	10	20.83	1	26.77	1	28.00	4	18.37
2	32.01	11	37.78	2			23.19	5	27.46	1	23.19
3	24.35	8	26.60	3			30.06	1	15.87	3	23.19
4			40.08	5			23.43	1			
5			24.06	1			23.35	2			
6			18.08	1							
7			17.94	1							
8			14.18	1							

WARTHOG		ZEBRA		WATER	
Pos	No	Pos	No	Pos	No
1	39.34	2	21.45	5	22.70
				1	

Transect ZQ10

Start S 18° 36.58' E 26° 12.11'
 End S 18° 36.58' E 26° 38.56'
 Width: 330 m Length: 46.49 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELAND		GIRAFFE		IMPALA		KUDU	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	14.20	13	12.55	1	28.71	8	22.40	1	29.10	1	19.44
2	22.21	11	14.20	3				15	16.77	15	23.92
3	14.20	25	17.33	1				1	26.02	1	12.35
4	14.20	8	38.56	1				3	26.18		
5	29.37	6	17.10	3				1	33.06		
6			23.77	1							
7			27.99	1							

ZEBRA		WATER	
Pos	No	Pos	No
1	31.65	3	16.04
2	15.77	8	
3	28.96	3	
4	31.24	3	

Transect ZQ11

Start S 18° 38.73' E 26° 38.31'
 End S 18° 38.73' E 26° 12.23'
 Width: 330 m Length: 45.83 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		BUFFALO		GIRAFFE		IMPALA		WARTHOG	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	29.44	6	35.77	1	15.96	4	22.00	1	12.31	1	21.51
2	22.00	7	28.31	3			12.52	1	27.01	1	
3	21.72	12	27.35	1					22.27	2	
4	21.20	10	27.19	1					21.51	6	
5			24.84	2							
6			22.00	2							

WATERBUCK		CROCODILE		WATER	
Pos	No	Pos	No	Pos	No
1	15.69	3	16.36	4	16.36
2				1	16.43

Transect ZQ12

Start S 18° 40.89' E 26° 12.52'
 End S 18° 40.89' E 26° 36.24'
 Width: 325 m Length: 41.68 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		BUFFALO		KUDU		SABLE		ZEBRA	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	12.80	20	17.26	3	19.74	3	16.32	3	30.19	3	18.05
2	18.25	20	17.53	1							
3			17.71	3							
4			18.05	1							
5			19.91	4							
6			15.09	1							
7			17.71	1							
8			18.57	3							
9			18.84	2							
10			20.46	4							
11			20.57	1							
12			23.72	1							

Transect ZQ13

Start S 18° 43.05' E 26° 32.84'
 End S 18° 43.05' E 26° 16.78'
 Width: 330 m Length: 28.21 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		GIRAFFE		IMPALA		ZEBRA	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	17.52	6	26.98	2	31.93	1	26.07	1	27.29	3	18.80
2	26.67	5	18.24	1	30.42	1	17.93	1	17.93	4	17.61
3	20.52	7	18.12	2							

WATER	
Pos	No
1	27.87

Transect ZQ14

Start S 18° 45.21' E 26° 16.59'
 End S 18° 45.21' E 26° 27.56'
 Width: 317 m Length: 19.27 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M
 Pos No
 1 18.21 3
 2 18.93 1
 3 23.84 1
 4 27.04 1

Transect ZQ15

Start S 18° 47.36' E 26° 23.41'
 End S 18° 47.36' E 26° 18.09'
 Width: 322 m Length: 9.35 km
 Sighting positions are given in decimal minutes east

Sightings:
 WILDEBEEST ZEBRA
 Pos No Pos No
 1 20.19 2 20.19 4

Transect ZR01

Start S 18° 48.80' E 26° 21.54'
 End S 18° 48.38' E 26° 21.54'
 Width: 303 m Length: 0.78 km
 Sighting positions are given in decimal minutes south

Sightings:
 BUFFALO
 Pos No
 1 48.45 7

Transect ZR02

Start S 18° 47.43' E 26° 23.25'
 End S 18° 50.68' E 26° 23.25'
 Width: 327 m Length: 6.04 km
 NOTHING SEEN

Transect ZR03

Start S 18° 46.02' E 26° 24.96'
 End S 18° 51.38' E 26° 24.96'
 Width: 319 m Length: 9.94 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3
 Pos No
 1 49.05 1
 2 50.19 1

Transect ZR04

Start S 18° 45.93' E 26° 26.67'
 End S 18° 51.91' E 26° 26.67'
 Width: 333 m Length: 11.09 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ZEBRA
 Pos No Pos No
 1 51.72 1 47.20 6
 2 47.20 8

Transect ZR05

Start S 18° 44.75' E 26° 28.38'
 End S 18° 52.11' E 26° 28.38'
 Width: 329 m Length: 13.65 km
 Sighting positions are given in decimal minutes south

Sightings:
 DUIKER KUDU
 Pos No Pos No
 1 49.17 1 46.19 2

Transect ZR06

Start S 18° 43.39' E 26° 30.09'
 End S 18° 52.24' E 26° 30.09'
 Width: 328 m Length: 16.42 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M GIRAFFE ZEBRA
 Pos No Pos No Pos No Pos No
 1 46.60 4 47.34 1 44.71 3 45.51 5
 2 43.97 1
 3 44.96 2

Transect ZR07

Start S 18° 43.20' E 26° 31.79'
 End S 18° 51.76' E 26° 31.79'
 Width: 323 m Length: 15.87 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M
 Pos No
 1 50.91 1

Transect ZR08

Start S 18° 42.90' E 26° 33.50'
 End S 18° 51.58' E 26° 33.50'
 Width: 332 m Length: 16.11 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		GIRAFFE		
Pos	No	Pos	No	Pos	No	
1	49.45	3	49.10	1'	43.26	1
2		2	49.45	3		

Transect ZR09

Start S 18° 41.80' E 26° 35.21'
 End S 18° 51.33' E 26° 35.21'
 Width: 326 m Length: 17.66 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		GIRAFFE		
Pos	No	Pos	No	Pos	No	
1	48.71	1	50.70	3	43.22	1
2	48.71	9	46.32	2		

Transect ZR10

Start S 18° 39.52' E 26° 36.92'
 End S 18° 51.02' E 26° 36.92'
 Width: 335 m Length: 21.33 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M		SABLE	
Pos	No	Pos	No
1	47.12	1	49.87
2	41.05	2	
3	41.87	2	
4	45.71	1	

Transect ZR12

Start S 18° 36.52' E 26° 38.63'
 End S 18° 50.25' E 26° 38.63'
 Width: 328 m Length: 25.46 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M	
Pos	No	Pos	No
1	48.61	21	38.73
2	45.38	3	48.28
3			45.57
4			44.36
5			38.73

Transect ZR13

Start S 18° 34.26' E 26° 40.33'
 End S 18° 47.21' E 26° 40.33'
 Width: 343 m Length: 24.01 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		BABOON		GIRAFFE		KUDU	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	37.23	4	45.93	1	46.84	1	35.57	2	44.73
2	37.23	3	34.30	11			35.85	2	40.00
3	37.23	3	34.30	4					
4			43.92	1					
5			45.77	1					
6			46.04	4					
7			46.08	1					
8			46.61	4					
9			46.84	3					
10			46.84	1					

Transect ZR14

Start S 18° 33.64' E 26° 40.33'
 End S 18° 33.86' E 26° 40.33'
 Width: 343 m Length: 0.41 km
 NOTHING SEEN

Transect ZR15

Start S 18° 30.84' E 26° 42.04'
 End S 18° 44.96' E 26° 42.04'
 Width: 337 m Length: 26.18 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M		BABOON		KUDU	
Pos	No	Pos	No	Pos	No
1	43.82	1	33.44	1	41.80
2	40.70	1	32.65	3	

Transect ZR16

Start S 18° 31.75' E 26° 43.75'
 End S 18° 44.20' E 26° 43.75'
 Width: 342 m Length: 23.10 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		GIRAFFE	
Pos	No	Pos	No	Pos	No
1	38.96	5	40.72	1	43.47
2	39.46	4	40.88	1	
3	39.68	4	37.64	1	
4	39.77	4	39.77	1	
5	40.18	3	40.59	1	
6	40.27	6			

Transect ZR17

Start S 18° 32.13' E 26° 45.46'
 End S 18° 43.46' E 26° 45.46'
 Width: 336 m Length: 21.01 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		SABLE	
Pos	No	Pos	No	Pos	No
1	40.59	10	40.21	1	42.67

Transect ZR15

Start S 18° 30.84' E 26° 42.04'
 End S 18° 44.96' E 26° 42.04'
 Width: 337 m Length: 26.18 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M		BABOON		KUDU	
Pos	No	Pos	No	Pos	No
1	43.82	1	33.44	1	41.80
2	40.70	1	32.65	3	

Transect ZR19

Start S 18° 35.27' E 26° 48.87'
 End S 18° 40.89' E 26° 48.87'
 Width: 328 m Length: 10.42 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M		SABLE	
Pos	No	Pos	No
1	39.91	3	39.34

Transect ZR20

Start S 18° 36.81' E 26° 50.58'
 End S 18° 38.81' E 26° 50.58'
 Width: 331 m Length: 3.71 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F	
Pos	No
1	38.57

Transect ZS01

Start S 18° 47.47' E 26° 39.95'
 End S 18° 48.06' E 26° 39.43'
 Width: 336 m Length: 1.42 km
 NOTHING SEEN

Transect ZS02

Start S 18° 44.32' E 26° 42.75'
 End S 18° 46.85' E 26° 40.50'
 Width: 344 m Length: 6.13 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M	
Pos	No
1	42.53
2	41.42
3	40.71
4	42.53
5	41.88
6	41.22

Transect ZS03

Start S 18° 43.57' E 26° 45.64'
 End S 18° 51.09' E 26° 38.97'
 Width: 329 m Length: 18.22 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M	
Pos	No	Pos	No
1	40.69	9	42.42
2	43.48	10	41.10
3	40.56	4	41.38
4		42.31	2

Transect ZS04

Start S 18° 40.85' E 26° 48.05'
 End S 18° 43.25' E 26° 45.93'
 Width: 329 m Length: 5.80 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		ELE CARC.3		KUDU	
Pos	No	Pos	No	Pos	No
1	46.99	1	46.84	1	46.18
				2	

Transect ZS05

Start S 18° 37.23' E 26° 51.27'
 End S 18° 37.34' E 26° 51.17'
 Width: 298 m Length: 0.27 km
 NOTHING SEEN

Transect ZS06

Start S 18° 38.16' E 26° 52.67'
 End S 18° 50.19' E 26° 42.00'
 Width: 335 m Length: 29.15 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		ELE CARC.3		BUFFALO		ROAN		ZEBRA		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	52.34	3	52.34	1	52.64	3	51.12	1	51.85	1	52.07
2	48.31	5									52.64
3	42.26	1									
4	47.09	2									

Transect ZS07

Start S 18° 39.20' E 26° 53.98'
 End S 18° 49.61' E 26° 44.75'
 Width: 329 m Length: 25.22 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		BUFFALO		GIRAFFE		ZEBRA		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	49.07	7	47.03	1	49.67	1	50.54	1	50.12	5	50.39
2	49.46	9	48.90	1			50.54	1	50.39	5	
3	49.76	8	45.73	1			51.65	1	50.54	4	
4	50.20	6	45.99	1					50.39	5	

Transect ZS08

Start S 18° 40.24' E 26° 55.29'
 End S 18° 49.65' E 26° 46.95'
 Width: 322 m Length: 22.80 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		BUFFALO		GIRAFFE		KUDU	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	51.21	13	50.63	1	50.72	1	49.65	7	49.21	1	51.74
2	50.72	21	48.36	1	54.22	1					49.21
3	49.48	29									51.90
4	48.01	4									

Transect ZS09

Start S 18° 41.28' E 26° 56.60'
 End S 18° 50.98' E 26° 48.00'
 Width: 326 m Length: 23.49 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		BUFFALO		GIRAFFE		IMPALA		KUDU		ZEBRA	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	49.98	13	48.74	1	55.61	1	53.30	1	49.98	8	52.03	7	52.74
2	52.40	4	48.79	2			53.89	1	54.13	5			52.18
3	48.23	12	50.22	1			53.89	1	53.52	7			52.95
4	49.51	6	51.03	2			53.89	1					
5	49.98	3	51.19	2			53.89	1					
6	50.34	18					53.89	2					
7							53.89	2					
8							52.46	1					
9							52.80	3					
10							52.80	2					
11							52.95	3					
12							52.95	2					
13							53.52	1					
14							55.83	1					

SABLE		WATER	
Pos	No	Pos	No
1	56.06	1	55.69
			1

Transect ZS16

Start S 18° 48.56' E 27° 5.77'
 End S 19° 0.62' E 26° 55.07'
 Width: 338 m Length: 29.20 km
 Sighting positions are given in decimal minutes east

Sightings:

	ELEPHANT F		ELEPHANT M		ELE CARC.3		GIRAFFE		ZEBRA		WATER	
	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	2.80	2	1.64	1	0.55	1	1.64	1	55.22	3	3.66	1
2	2.19	8	58.94	1			1.44	1				
3	2.37	1					55.76	1				

Transect ZS17

Start S 18° 49.60' E 27° 7.08'
 End S 19° 2.19' E 26° 55.92'
 Width: 323 m Length: 30.47 km
 Sighting positions are given in decimal minutes east

Sightings:

	ELEPHANT F		ELEPHANT M		ELE CARC.3		GIRAFFE		ZEBRA	
	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	5.80	8	56.27	1	0.24	1	57.94	1	5.60	5
2	0.72	3	2.64	1			58.24	2	5.60	6
3	1.26	13	3.23	1			59.28	1		
4							59.54	1		
5							0.89	1		
6							6.68	4		
7							5.60	2		

Transect ZS18

Start S 18° 50.64' E 27° 8.39'
 End S 19° 3.13' E 26° 57.31'
 Width: 329 m Length: 30.24 km
 Sighting positions are given in decimal minutes east

Sightings:

	ELEPHANT F		ELEPHANT M		BUFFALO		GIRAFFE		KUDU		SABLE	
	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	5.07	7	2.23	2	8.15	4	1.37	1	1.37	2	4.58	1
2	4.95	2	2.33	1	6.21	4			7.84	2		
3			59.20	1								

ZEBRA

	Pos	No
1	1.57	4
2	1.73	1

Transect ZS19

Start S 18° 54.06' E 27° 7.59'
 End S 19° 4.50' E 26° 58.33'
 Width: 326 m Length: 25.27 km
 Sighting positions are given in decimal minutes east

Sightings:

	ELEPHANT F		ELEPHANT M		BUFFALO		DUIKER		WHITE RHINO		SABLE	
	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	3.83	4	6.91	1	3.63	5	1.99	1	4.78	2	59.05	1
2	5.31	5										
3	5.44	1										
4	7.32	5										
5	7.32	1										

ZEBRA

	Pos	No
1	1.71	1

Transect ZS20

Start S 19° 1.88' E 27° 2.88'
 End S 19° 4.23' E 27° 0.80'
 Width: 321 m Length: 5.68 km
 Sighting positions are given in decimal minutes east

Sightings:

SABLE		
	Pos	No
1	1.52	14

Transect ZT01

Start S 19° 2.88' E 26° 19.47'
 End S 18° 59.16' E 26° 19.47'
 Width: 335 m Length: 6.89 km
 NOTHING SEEN

Transect ZT02

Start S 19° 8.53' E 26° 21.19'
 End S 18° 58.28' E 26° 21.19'
 Width: 331 m Length: 19.00 km
 NOTHING SEEN

Transect ZT03

Start S 19° 7.51' E 26° 22.90'
 End S 18° 55.99' E 26° 22.90'
 Width: 328 m Length: 21.37 km
 NOTHING SEEN

Transect ZT04

Start S 18° 55.03' E 26° 24.61'
 End S 19° 6.75' E 26° 24.61'
 Width: 332 m Length: 21.73 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.2	
Pos	No	Pos	No	Pos	No
1	55.03	5	55.45	3	55.45
2	55.03	1			
3	55.03	2			
4	55.45	2			
5	55.45	1			

Transect ZT05

Start S 19° 6.00' E 26° 26.32'
 End S 18° 53.92' E 26° 26.32'
 Width: 326 m Length: 22.40 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT M		DUIKER		SABLE	
Pos	No	Pos	No	Pos	No
1	56.30	1	55.75	2	59.60
2	55.45	1			
3	55.05	1			
4	54.17	1			

Transect ZT06

Start S 18° 53.42' E 26° 28.03'
 End S 19° 3.90' E 26° 28.03'
 Width: 333 m Length: 19.43 km
 Sighting positions are given in decimal minutes south

Sightings:

IMPALA	
Pos	No
1	55.13
	3

Transect ZT07

Start S 19° 3.46' E 26° 29.74'
 End S 18° 52.30' E 26° 29.74'
 Width: 329 m Length: 20.69 km
 Sighting positions are given in decimal minutes south

Sightings:

SABLE	
Pos	No
1	59.42
	1

Transect ZT08

Start S 18° 52.00' E 26° 31.45'
 End S 19° 2.87' E 26° 31.45'
 Width: 332 m Length: 20.16 km
 Sighting positions are given in decimal minutes south

Sightings:

ELE CARC.3		GIRAFFE		ZEBRA	
Pos	No	Pos	No	Pos	No
1	1.58	1	52.87	1	55.35
				5	

Transect ZT09

Start S 19° 2.41' E 26° 33.16'
 End S 18° 51.53' E 26° 33.16'
 Width: 319 m Length: 20.17 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELE CARC.3		DUIKER	
Pos	No	Pos	No	Pos	No
1	56.15	3	54.52	1	59.95
				1	

Transect ZT10

Start S 18° 51.45' E 26° 34.87'
 End S 19° 1.16' E 26° 34.87'
 Width: 332 m Length: 18.02 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F	
Pos	No
1	59.21
2	57.50
	12

Transect ZT11

Start S 18° 59.88' E 26° 36.59'
 End S 18° 51.06' E 26° 36.59'
 Width: 321 m Length: 16.36 km
 Sighting positions are given in decimal minutes south

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		GIRAFFE	
Pos	No	Pos	No	Pos	No	Pos	No
1	56.24	16	56.99	2	51.12	1	52.42
2	56.84	4					

Transect ZT12

Start S 18° 51.30' E 26° 38.30'
 End S 18° 58.70' E 26° 38.30'
 Width: 337 m Length: 13.72 km
 NOTHING SEEN

Transect ZT13

Start S 18° 58.37' E 26° 40.01'
 End S 18° 50.99' E 26° 40.01'
 Width: 323 m Length: 13.69 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3
 Pos No
 1 52.04 1

Transect ZT14

Start S 18° 50.34' E 26° 41.72'
 End S 18° 58.29' E 26° 41.72'
 Width: 329 m Length: 14.74 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M
 Pos No Pos No
 1 52.64 10 50.80 4
 2 51.44 1
 3 52.43 1

Transect ZT15

Start S 18° 58.22' E 26° 43.43'
 End S 18° 50.02' E 26° 43.43'
 Width: 327 m Length: 15.21 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ELE CARC.3 DUIKER ROAN
 Pos No Pos No Pos No Pos No
 1 52.92 1 51.78 1 55.85 1 51.28 1
 2 52.72 1
 3 52.16 1

Transect ZT16

Start S 18° 49.72' E 26° 45.14'
 End S 18° 57.90' E 26° 45.14'
 Width: 335 m Length: 15.18 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELE CARC.3 HONEY BADG
 Pos No Pos No Pos No
 1 56.47 25 49.92 1 55.32 2
 2 52.42 1

Transect ZT17

Start S 18° 57.90' E 26° 46.85'
 End S 18° 49.65' E 26° 46.85'
 Width: 332 m Length: 15.30 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT F ELEPHANT M
 Pos No Pos No
 1 50.99 5 55.54 1
 2 54.50 2
 3 54.30 1
 4 50.06 1
 5 52.78 1
 6 51.81 5
 7 51.57 4
 8 49.91 1

Transect ZT18

Start S 18° 52.13' E 26° 48.56'
 End S 18° 57.86' E 26° 48.56'
 Width: 336 m Length: 10.63 km
 NOTHING SEEN

Transect ZT19

Start S 18° 57.85' E 26° 50.27'
 End S 18° 55.40' E 26° 50.27'
 Width: 331 m Length: 4.55 km
 NOTHING SEEN

Transect ZU01

Start S 19° 20.66' E 26° 27.33'
 End S 19° 25.00' E 26° 29.47'
 Width: 320 m Length: 8.86 km
 NOTHING SEEN

Transect ZU02

Start S 19° 8.46' E 26° 21.31'
 End S 19° 12.65' E 26° 23.38'
 Width: 317 m Length: 8.57 km
 NOTHING SEEN

Transect ZU03

Start S 19° 6.76' E 26° 24.25'
 End S 19° 24.54' E 26° 33.03'
 Width: 330 m Length: 36.40 km
 NOTHING SEEN

Transect ZU04

Start S 19° 4.83' E 26° 27.08'
 End S 19° 24.09' E 26° 36.59'
 Width: 326 m Length: 39.40 km
 Sighting positions are given in decimal minutes south

Sightings:
 DUIKER GIRAFFE
 Pos No Pos No
 1 14.22 1 14.98 1

Transect ZU05

Start S 19° 3.38' E 26° 30.14'
 End S 19° 23.61' E 26° 40.13'
 Width: 330 m Length: 41.39 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELE CARC.3 GIRAFFE SABLE
 Pos No Pos No Pos No
 1 3.41 1 12.95 1 22.50 2

Transect ZU06

Start S 19° 2.34' E 26° 33.41'
 End S 19° 23.10' E 26° 43.66'
 Width: 324 m Length: 42.48 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M ELE CARC.3
 Pos No Pos No
 1 22.48 1 7.49 1
 2 20.23 1

Transect ZU07

Start S 19° 0.24' E 26° 36.15'
 End S 19° 22.72' E 26° 47.25'
 Width: 333 m Length: 45.99 km
 Sighting positions are given in decimal minutes south

Sightings:
 GIRAFFE HONEY BADG
 Pos No Pos No
 1 21.20 2 12.00 2

Transect ZU08

Start S 18° 58.59' E 26° 39.12'
 End S 19° 21.20' E 26° 50.28'
 Width: 328 m Length: 46.28 km
 Sighting positions are given in decimal minutes south

Sightings:
 ELEPHANT M DUIKER GIRAFFE
 Pos No Pos No Pos No
 1 19.64 1 12.28 1 18.66 3
 2 9.24 1 12.67 2 18.66 1
 3 2.37 1 9.09 1
 4 9.09 1

Transect ZV01

Start S 18° 59.01' E 26° 42.59'
 End S 18° 57.90' E 26° 45.10'
 Width: 325 m Length: 4.86 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELE CARC.3
 Pos No
 1 44.33 1

Transect ZV02

Start S 19° 0.47' E 26° 43.32'
 End S 18° 57.77' E 26° 49.45'
 Width: 339 m Length: 11.87 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M ELE CARC.3 GIRAFFE SPT HYAENA
 Pos No Pos No Pos No Pos No
 1 47.47 1 46.50 1 47.94 1 47.47 1
 2 47.94 1 47.47 1
 3 47.47 1

Transect ZV03

Start S 19° 1.93' E 26° 44.05'
 End S 18° 58.46' E 26° 51.93'
 Width: 328 m Length: 15.24 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		DUIKER		ZEBRA	
Pos	No	Pos	No	Pos	No
1	47.80	1	48.22	1	48.00
2	48.86	1	48.63	1	49.33
3	50.40				51.92
4	50.99	2			

Transect ZV04

Start S 18° 59.36' E 26° 53.95'
 End S 19° 3.40' E 26° 44.78'
 Width: 324 m Length: 17.74 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		KUDU		SABLE		ZEBRA		WATER	
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No
1	53.34	19	50.90	3	48.62	1	52.43	2	47.60	1	53.34
2	52.91	20	49.54	1	48.62	3					
3	52.43	10	50.49	2							
4	53.34	19	50.49	2							
5	50.90	3	51.31	1							
6	49.94	6	50.90	3							
7	49.54	4									

Transect ZV05

Start S 19° 0.64' E 26° 55.09'
 End S 19° 4.86' E 26° 45.51'
 Width: 338 m Length: 18.53 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ROAN	
Pos	No	Pos	No	Pos	No
1	51.34	6	50.94	1	50.49
2			49.75	1	

Transect ZV06

Start S 19° 2.10' E 26° 55.83'
 End S 19° 6.32' E 26° 46.24'
 Width: 328 m Length: 18.54 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		SABLE	
Pos	No	Pos	No	Pos	No
1	52.16	10	52.42	1	49.89
					1

Transect ZV07

Start S 19° 3.20' E 26° 57.39'
 End S 19° 7.79' E 26° 46.97'
 Width: 331 m Length: 20.15 km
 Sighting positions are given in decimal minutes east

Sightings:

SABLE	
Pos	No
1	53.56
	1

Transect ZV08

Start S 19° 4.55' E 26° 58.36'
 End S 19° 9.25' E 26° 47.70'
 Width: 325 m Length: 20.62 km
 NOTHING SEEN

Transect ZV09

Start S 19° 5.80' E 26° 59.59'
 End S 19° 10.71' E 26° 48.43'
 Width: 326 m Length: 21.58 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT M		DUIKER	
Pos	No	Pos	No
1	50.46	1	58.34
			1

Transect ZV10

Start S 19° 7.31' E 27° 0.20'
 End S 19° 12.18' E 26° 49.16'
 Width: 330 m Length: 21.35 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F	
Pos	No
1	0.20
	5
2	0.20
	3

Transect ZV11

Start S 19° 8.97' E 27° 0.49'
 End S 19° 13.64' E 26° 49.89'
 Width: 326 m Length: 20.49 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M DUIKER GIRAFFE OSTRICH
 Pos No Pos No Pos No Pos No
 1 55.04 1 57.84 1 59.96 2 59.96 2

Transect ZV12

Start S 19° 10.64' E 27° 0.76'
 End S 19° 15.11' E 26° 50.62'
 Width: 335 m Length: 19.60 km
 NOTHING SEEN

Transect ZV13

Start S 19° 12.37' E 27° 0.89'
 End S 19° 16.57' E 26° 51.35'
 Width: 329 m Length: 18.43 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT F ELEPHANT M ELE CARC.3 DUIKER GIRAFFE
 Pos No Pos No Pos No Pos No Pos No
 1 57.41 5 57.41 1 53.81 1 57.41 1 56.33 3
 2 57.41 2 51.72 1 56.33 1

Transect ZV14

Start S 19° 14.33' E 27° 0.48'
 End S 19° 18.03' E 26° 52.08'
 Width: 338 m Length: 16.23 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT F ELEPHANT M ELE CARC.3 GIRAFFE
 Pos No Pos No Pos No Pos No
 1 0.36 4 0.36 3 54.81 1 53.58 1
 2 54.81 1 53.58 1

Transect ZV15

Start S 19° 16.47' E 26° 59.69'
 End S 19° 19.50' E 26° 52.81'
 Width: 323 m Length: 13.29 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M ZEBRA
 Pos No Pos No
 1 56.34 1 59.68 7
 2 56.34 2

Transect ZW02

Start S 19° 18.62' E 26° 56.55'
 End S 19° 20.26' E 26° 58.62'
 Width: 331 m Length: 4.72 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT F DUIKER
 Pos No Pos No
 1 57.51 10 57.08 1

Transect ZW03

Start S 19° 17.80' E 26° 58.19'
 End S 19° 19.73' E 27° 0.61'
 Width: 322 m Length: 5.54 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M
 Pos No
 1 0.12 1

Transect ZW04

Start S 19° 16.77' E 26° 59.55'
 End S 19° 19.63' E 27° 3.16'
 Width: 327 m Length: 8.26 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT M GIRAFFE
 Pos No Pos No
 1 1.59 1 0.81 1

Transect ZW05

Start S 19° 15.15' E 27° 0.17'
 End S 19° 19.31' E 27° 5.41'
 Width: 337 m Length: 11.99 km
 Sighting positions are given in decimal minutes east

Sightings:
 ELEPHANT F ELEPHANT M GIRAFFE
 Pos No Pos No Pos No
 1 4.80 3 3.51 1 4.07 1

Transect ZW18

Start S 18° 53.54' E 27° 7.55'
 End S 19° 8.71' E 27° 26.67'
 Width: 330 m Length: 43.77 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		BUFFALO		ELAND		GIRAFFE		WHITE RHINO		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	11.30	6	11.67	1	25.20	1	17.97	6	17.79	1	10.20	2
2	14.61	8	14.12	1					17.79	2		
3	16.39	20	14.87	1					20.81	1		
4	16.55	3	16.55	1					12.97	1		
5	16.55	6	13.23	1					12.97	3		
6	17.41	11	14.61	1					12.97	3		
7	24.65	3	14.87	1								
8	25.10	13	16.23	1								
9	11.07	15										
10	12.33	14										
11	14.12	4										
12	14.61	3										
13	15.17	3										
14	18.73	4										
15	22.07	4										

SABLE		WATERBUCK		WILDEBEEST		ZEBRA		
Pos	No	Pos	No	Pos	No	Pos	No	
1	8.38	1	20.24	2	21.59	15	17.97	2
2	18.46	1	20.24	1				
3	8.38	4						
4	13.23	1						
5	20.24	9						

Transect ZW19

Start S 18° 52.19' E 27° 8.51'
 End S 19° 6.98' E 27° 27.16'
 Width: 331 m Length: 42.69 km
 Sighting positions are given in decimal minutes east

Sightings:

ELEPHANT F		ELEPHANT M		ELE CARC.3		BABOON		BUFFALO		ELAND		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	22.97	10	26.12	1	11.43	1	14.87	7	24.09	4	16.42	8
2	23.86	3	26.37	1	20.63	1	14.87	3			11.70	5
3	23.45	7	23.86	2							11.70	1
4	9.02	5	16.70	1								
5	23.86	8										
6	23.23	13										
7	23.08	2										
8	22.97	25										

GIRAFFE		IMPALA		OSTRICH		SABLE		WILDEBEEST		ZEBRA		
Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	Pos	No	
1	9.21	1	8.70	1	13.30	2	13.85	1	14.40	10	14.40	3
2							11.99	1	14.40	13	14.12	3
3									14.62	5	14.12	3
4									14.62	4	13.85	3
5									14.62	7	13.30	4
6									9.55	12	13.30	3

UNITED STATES AGENCY
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