

**Results of the
NamibRand Nature Reserve
and Pro-Namib Conservancy
Annual Game Count
31 May 2014**



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1. Introduction

This report provides summarised results and analysis of the annual game count held on the NamibRand Nature Reserve and the Pro-Namib Conservancy on the 31st of May 2014. This is the tenth consecutive year that the count was held since 2005 and the third year that the farms Springbokvlakte and Saffier have been included.

Teamwork was once again the essence of the day as concessionaires, landowners, neighbours and NRNR staff joined in to participate in the event. The game count briefing, which included a theoretical presentation, discussions and handing out of game count files to the different teams, was held on the 30st of May at the Draaihoek picnic site camp prior to the AGM.

Even though this rainfall season (June 2013 – May 2014) has been marginally better than the previous rainfall season (June 2012 – May 2013) with an average of 74mm, the result of the previous season's poor rainfall has effected a drop in wildlife numbers across the count area. This drop in wildlife numbers is probability also due to the isolated and widespread distribution of the rainfall in the past season, with much of it falling outside of the Reserve, resulting in better grazing elsewhere to which the wildlife migrated.

Please note that while the game count method employed is good for estimating larger numbers of common plains game, it less suited to other species such as kudu and steenbok. No single census method is complete in itself, but needs to be supplemented and complemented on a dynamic basis by local knowledge and other sources of information, e.g. independent total counts of recently re-introduced species, incidental sightings and camera trap recordings.

2. Summary

Data collected in the May 2014 game count were calculated and analyzed, bearing our three core objectives in mind:

Objective 1: Population estimates:

The total number of game seen under 500m and the estimated numbers (total no. corrected for area + species) is shown in the table below.

Total estimated numbers of game (Zone 1-10; Jun 13 - May 2014)					
Species	Jun-13		May-14		Percentage change
	No. Counted under 500m	Total no. corrected for area + for species	No. Counted under 500m	Total no. corrected for area + for species	
Oryx	1943	10087	1762	9385	-6.96%
Springbok	997	5919	772	4614	-22.05%
Kudu	1	11	0	0	-100.00%
Steenbok	0	0	0	0	0.00%
P. zebra*	174	320	173	352	10.00%
Ostrich	81	285	50	193	-32.27%
Hartebeest*	159	204	2	197	-3.43%
Total	3355	16826	2759	14741	-12.39%
Giraffe**(*)		6	1	2	-66.67%
Ludwigs Bustard**	48	177	30	120	-32.20%
Ruppel's Korhaan**			27	76	

* Numbers are known

** Not included in count

- The overall population estimate for all species combined in the count area in May 2014 is 14,741 which is 12.39% less than the previous year's 16,826.
- The total estimate for oryx is 9,385, which is 6.96% less than the previous year's 10,087.
- The total estimate for springbok is 4,614, which is 22.05% less than the previous year's 5,919.
- The estimate number of ludwig's bustard is down by 32.20%. This year 1. bustards were only seen in three routes (route 1, 2 and 10) as opposed to last year where the 1. bustards were seen in seven of the 10 routes.

- As a result of the decrease in the total population estimate, the total biomass of the count area has dropped by 0.34% to 8.8kg/ha in May 2014.

Objective 2: Wildlife distribution/density

The table below shows the total wildlife distribution in 2014 compared to 2013

Total no of animals counted per 100 km per route (June 2013- May 2014)			
Route	Jun-13	May-14	% change (Jun-13 -May-14)
1	515	625	21.36%
2	1052	572	-45.62%
3	1219	621	-49.07%
4	717	521	-27.36%
5	563	514	-8.68%
6	494	557	12.72%
7	350	418	19.43%
8	578	1090	88.57%
9	276	404	46.13%
10	705	729	3.38%
Total	1214	1125	-7.36%

- The total wildlife distribution/density (animals counted per 100 km) decreased by 7.36% compared to June 2013.
- The highest relative densities were recorded in route 8 and 10, whereas densities were lowest in routes 7 and 9.

Objective 3: Population change

- The overall population estimate is down by 12.39% and the number of animals counted per 100km per route has decreased by 7.36%.

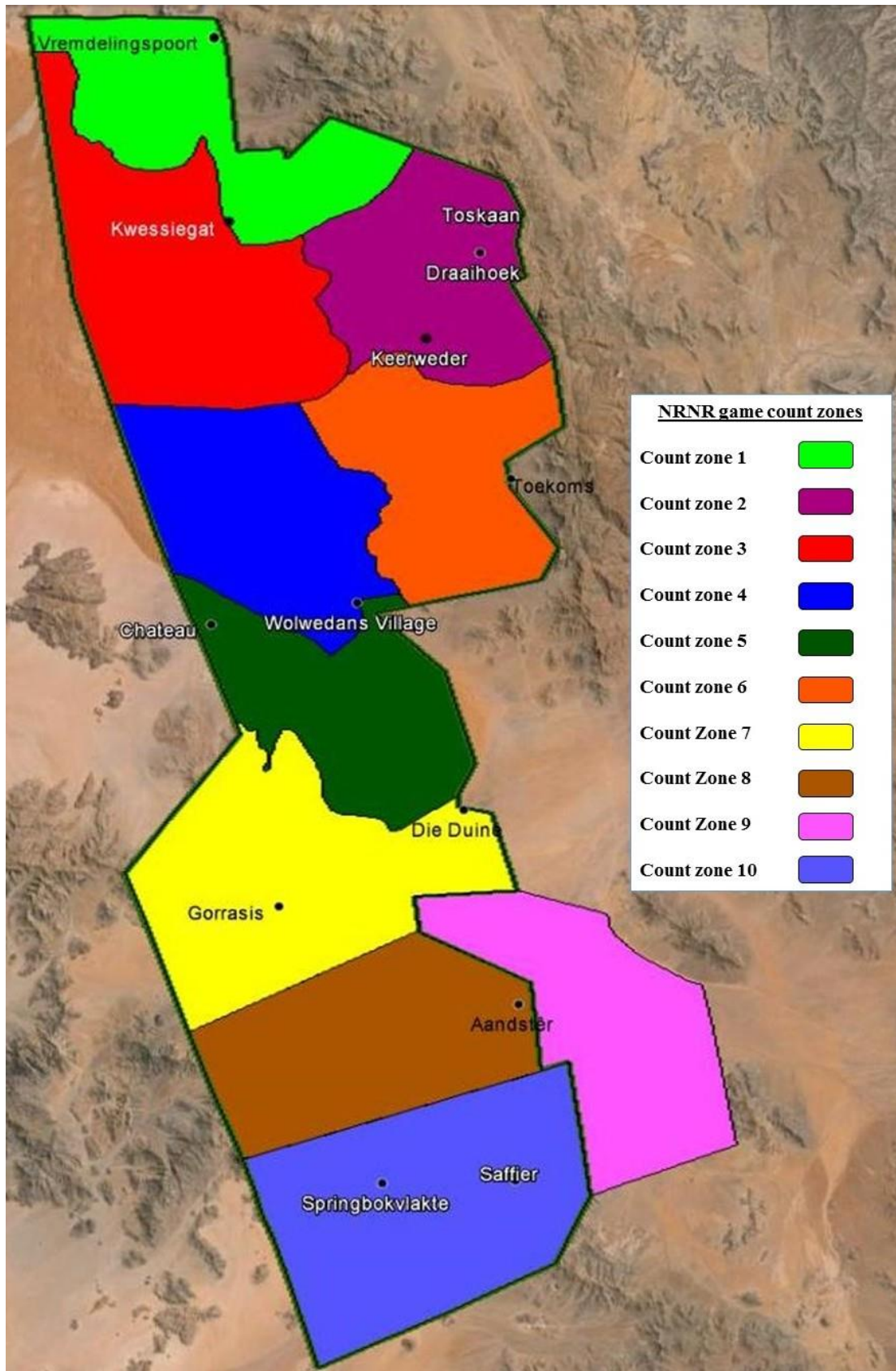
3. Methodology

For the purposes of the count, the total area is divided into ten game count zones, each with its own standardized route. The count zones used in 2014 are shown in figure 1. These include two relatively new zones: Route 9 that was added to the existing NamibRand zones in June 2009 in order to include the adjoining farms Excelsior and Dina, now part of the total area available to game through the establishment of the Pro-Namib Conservancy; and Route 10, added in 2012 to include the farms Springbokvlakte and Saffier, which joined NamibRand officially in June 2012. The total count area (Zone 1 – 10) is 194 232 ha excluding mountainous terrain.

Table 1. Total areas for Zones 1-10, size of mountain areas (excluded), and remaining count area (ha)

Zones		Total area (ha)	Mountains (ha)	Count area (ha)
Zone 1-8	NRNR	172 208.63	179 928.63	154 280.00
Zone 10		30 079.53	6 578.00	23 501.53
TOTAL NRNR AREA		202 288.16	24 506.63	177 781.53
Zone 9 (Dina & Excelsior)		18 155.70	1 705.70	16 450.00
TOTAL COUNT AREA		220 443.86	26 212.33	194 231.53

Figure 1. The game count area, showing the ten zones used in May 2014 for the NamibRand Nature Reserve (1-8, 10) and the Pro-Namib Conservancy (9).



4. Count Methodology

The basic survey methodology used is a combination of the Distance and the Strip-Count census techniques. In Layman's terms, these can be explained as follows:

Distance

All animals are counted and the distance to each animal, or group of animals, is recorded at right angles to the vehicle. This distance allows us to apply a *species' correction factor* for each type of animal counted. This is done in order to compensate for animals not seen.

For example, the chances of seeing large animals like zebra over a great distance are much higher than the probability or chances of seeing a smaller animal like a steenbok. Therefore a correction factor of 1.2 can be used for zebra (because one is likely to see most of them over a set distance). A much higher correction factor of 10 can be used for steenbok – over the same set distance one is likely to see only a few steenbok while the rest will be hidden by “dead” ground or obstacles.

Strip-Count

All animals are counted and the distance to each recorded, at right angles to the vehicle. A strip-width is then determined - 1 000m in our case, so that the area covered can then be multiplied into the overall area. This is known as an *area correction factor* (the number of times a 1 000m wide strip will fit into the whole area). Only the animals inside the 1000m area (500m on either side of the road) are multiplied by the correction factor, in order to determine the population estimate for the total area

Table 2 on the next page lists the area correction factors and species' correction factors used for the game counted in May 2014. Note that the area correction factors are based on the precise odometer readings for the route length.

Table 2

Correction factors (May 2014)					
Route No.	Total count area per zone (ha)	Route distance (km)	Area Correction Factor (a.c.f)	Species	Species correction Factor (s.c.f)
1	16100	55	3.10	Oryx	1.4
2	16330	50	3.13	Springbok	1.6
3	24110	58	4.19	Kudu	2.6
4	18780	48	4.00	Steenbok	10.0
5	16120	76	2.27	Plains Zebra	1.2
6	17270	35	4.93	Ostrich	1.1
7	25380	56	4.53	Red Hartebeest	1.5
8	20190	51	3.94	Ludwig's Bustard	1.0
9	16450	50	3.23		
10	23502	59	4.09		
Total	194232	538			

5. Objectives

5.1 Population estimates (P) – how many animals:

Actual number of animals seen* (S)

Area correction factor (A)

Species correction factor (B)

Formula for calculating population estimates*

$$(S \times A) \times B = P$$

*Known numbers

Note that where total numbers of species with small populations are known (e.g. for recently introduced species such as red hartebeest, burchell's zebra and giraffe), these known totals are used for the final population estimates in preference to the above calculated estimates.

5.2 Biomass estimates and change

Population estimates are multiplied by the mean weight of the species and divided by the total count area (ha) to get the estimated biomass per species.

Estimated wildlife numbers (E)
Mean mass per species (M)
Total no. of hectares (H)

Formula for calculating biomass estimates

$$(E \times M) \div H = B$$

5.3 Wildlife distribution/density (K) – where are they?

Data from actual sightings (i.e. not estimates) for all count routes are “normalised” to animals counted per 100km. This is done in order to standardize the results to a value that is uniform for all count routes, thus enabling us to obtain accurate density and distribution figures for count zones.

Actual number of animals seen (S)
Length of route (R)
Animals seen per 100km driven (K)

Formula for calculating animals seen per 100km driven

$$(S \div R) \times 100 = K$$

5.4 Population change (R) – are numbers increasing or decreasing?

Data from actual sightings (i.e. not estimates) are also used to calculate the change in population over the previous year. As with distribution above, normalised or standardised data need to be used so that meaningful comparisons can be made. The data from each route (total number seen per 100km) are then compared to previous count data and the percentage change for each route and for the Reserve as a whole can be calculated. The percentage change for the total of each species can be calculated in the same way.

Previous value (P)
Current value (C)
Percentage change (R)

Formula for calculating percentage change

$$[(C - P) \div P] \times 100 = R$$

Population changes over the longer term are also investigated by means of a comparative data analysis, covering the full period since the inception of the game counts (June 2005).

6. Results for the May 2014 count:

6.1 Population estimates:

For each route, the number of each species counted within the strip width (< 500m) was recorded. The total number counted per species per route was then multiplied first by the relevant area correction factor (a.c.f.; see Table 1) for each route, and then by the relevant species correction factor (s.c.f.) in order to produce a total estimate per species per zone. These data are shown in Tables 8.1 – 8.10 (see Appendix 1).

The total estimates per species per zone were then combined for all zones in order to determine the total population estimate for each plains game species in the count area (see table 3.1 below).

Table 3.1

Total estimated numbers of game (Zone 1-10; May 2014)		
Species	No seen under 500m	Total no. corrected for area + species
Oryx	1762	9385
Springbok	772	4614
Kudu	0	0
Steenbok	0	0
P. zebra*	174	352
Ostrich	50	193
Hartebeest*	2	197
Total	2760	14741
Giraffe**	1	
Ludwigs Bustard**	30	
Ruppel's Korhaan**	27	

* Numbers are known

** Not included in count

6.2 Biomass estimates

Biomass estimates are important in terms of managing habitat conditions and inter-specific competition. Note that agricultural Livestock Units (LSU) are not used for determining the biomass of wildlife species, due to differences between domestic and wild animals in aspects such as grazing/browsing patterns, and agricultural stocking according to a camps system as opposed to the open, unfenced system within the Reserve.

Table 4.1 Wildlife biomass estimates for May 2014

Total wildlife numbers and wildlife biomass estimates for May 2014 (Zone 1-10; 194232 ha)				
Wildlife Species	Mean mass (kg)	Estimated wildlife numbers from May 14 game count	Species biomass (kg)	Biomass per ha (kg)
Oryx	220	9391	2066020	10.64
Springbok	38	4614	175332	0.90
Kudu	180	0	0	0.00
Steenbok	11	0	0	0.00
B. Zebra*	280	352	98560	0.51
Ostrich	68	193	13124	0.07
Red Hartebeest*	130	197	25610	0.13
Total	927	14747	13670469	12.25

* Numbers are known

Table 4.2 Wildlife Biomass percentage change compared to the count of June 2013.

Total wildlife numbers and wildlife biomass on NamibRand for June 2013 and May 2014 (Zone 1-10) ; 194232 ha)								
Wildlife species	Mean mass (kg)	Jun-13			May-14			
		Estimated wildlife numbers from June 2013 game count	Species Biomass (kg)	Biomass per ha (kg)	Estimated wildlife numbers from May 2014 game count	Species Biomass (kg)	Biomass per ha (kg)	Biomass percentage change
				TOTAL			TOTAL	
Oryx	220	10087	2219140	11.43	9391	2066020	10.64	-6.90
Springbok	38	5919	224922	1.16	4614	175332	0.90	-22.05
Kudu	180	11	1980	0.01	0	0	0.00	-100.00
Steenbok	11	0	0	0.00	0	0	0.00	0.00
B. zebra *	280	320	89600	0.46	352	98560	0.51	10.00
Ostrich	68	285	19380	0.10	193	13124	0.07	-32.28
Red Hartebeest*	130	204	26520	0.14	197	25610	0.13	-3.43
Total		16826	2581542	13.29	14747	2378646	12.25	-7.86

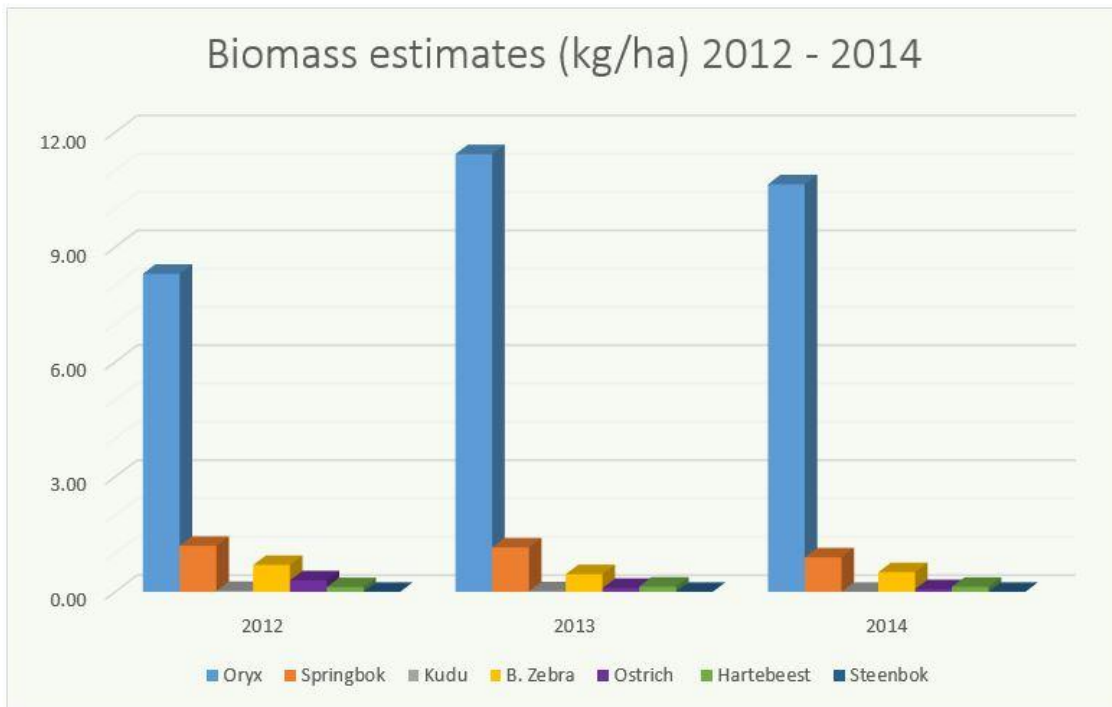
* Numbers are known

Table 4.3 Wildlife Biomass estimates from 2012 to 2014

Total wildlife biomass estimates (kg/ha) on NamibRand June 2012 to May 2014					
Wildlife species	Jun-12	Jun-13	% change from Jun-12	May-14	% change from Jun-13
Oryx	8.30	11.43	0.38	10.64	-0.07
Springbok	1.20	1.16	-0.03	0.90	-0.22
Kudu	0.02	0.01	-0.49	0.00	-1.00
Steenbok	0.00	0.00	0.00	0.00	0.00
B. Zebra	0.70	0.43	-0.39	0.51	0.19
Ostrich	0.30	0.10	-0.67	0.07	-0.30
Hartebeest	0.12	0.14	0.14	0.13	-0.05
Total	10.6	13.3	0.25	8.8	-0.34

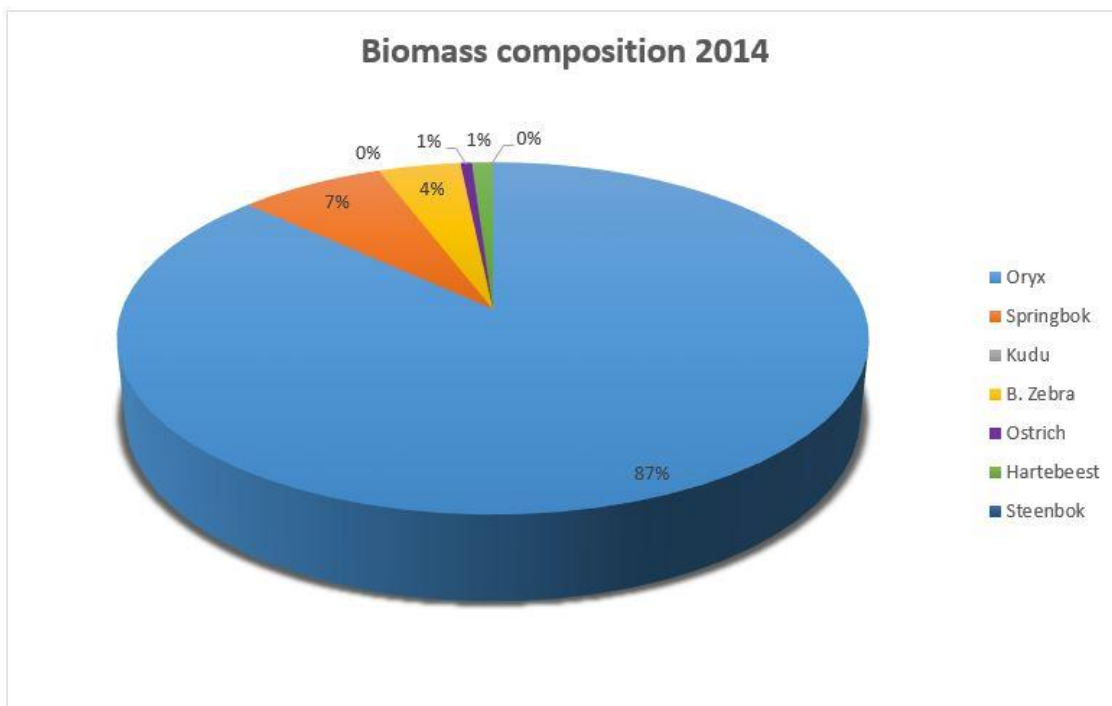
The graph in figure 2 below show the biomass estimates (kg/ha) from 2012 to 2014

Figure 2



The chart in figure 3 below shows the biomass composition of the different species across the count area for the year 2014.

Figure 3



6.3 Wildlife distribution/density

Wildlife distribution is based on density: the actual number of animals per species counted (at a distance of <500m) per 100 km per route. The distribution and density of the major individual species (oryx, springbok, b. zebra and ostrich) per count zone in May 2014 are presented below (Figure 4.1 – 4.4). The total distribution and density for the count area is shown in Figure 4.5. Note that the data are indicated on a gradient from light (low values) to dark (high values).

Figure 4.1 Distribution/density of oryx

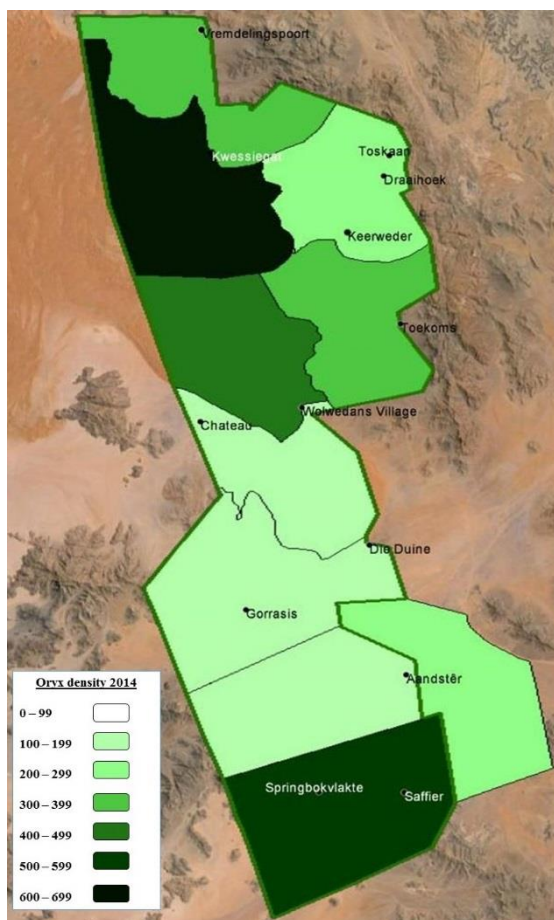


Figure 4.2 Distribution/density of springbok

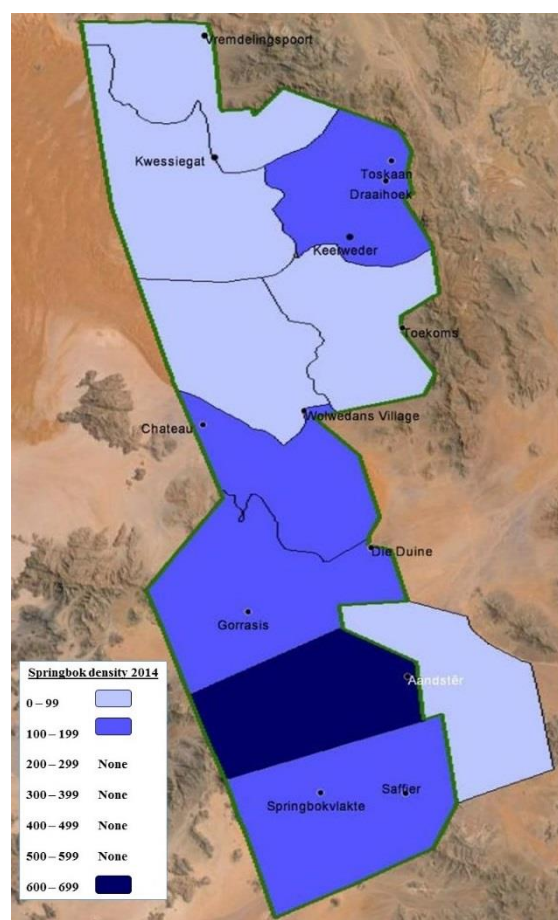


Figure 4.3 Distribution/density of *b. zebra*

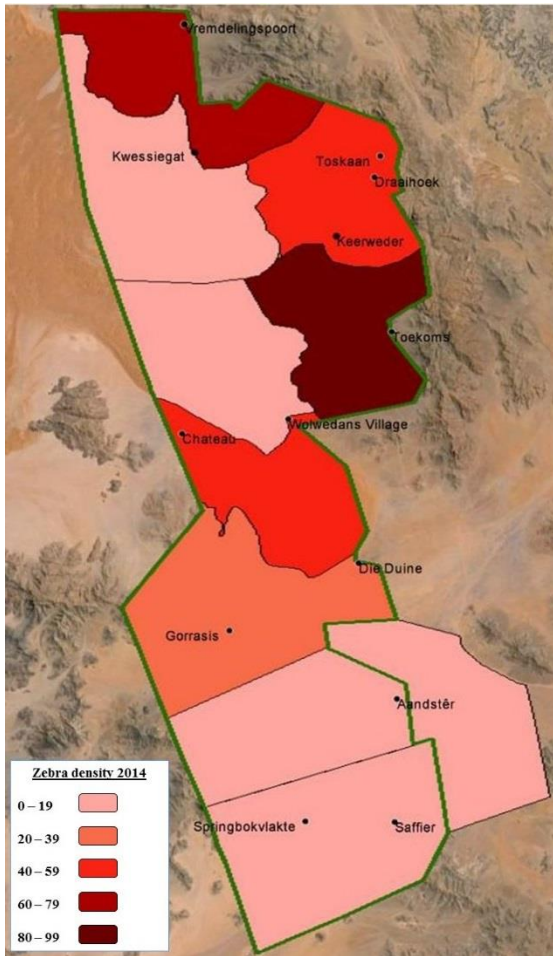


Figure 4.4 Distribution/density of ostrich

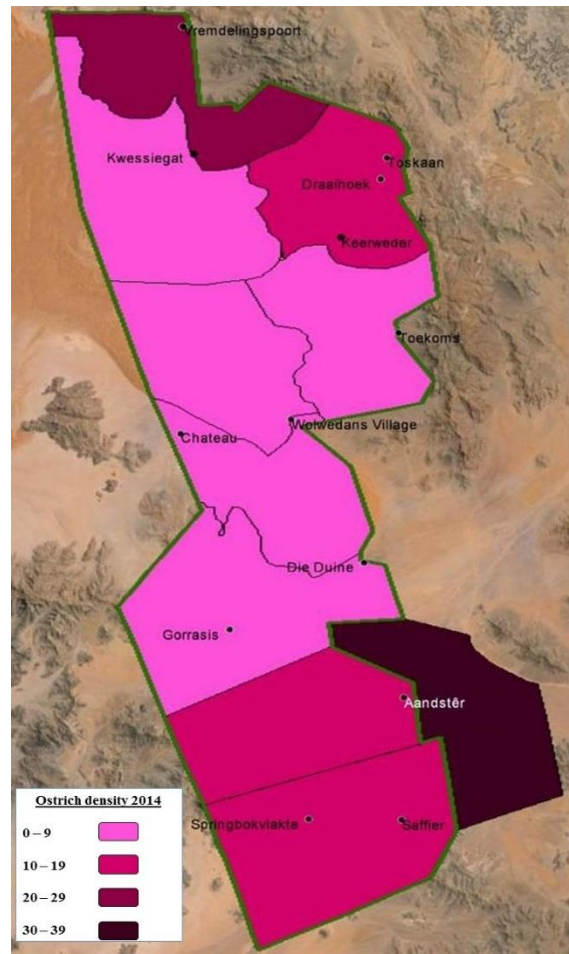
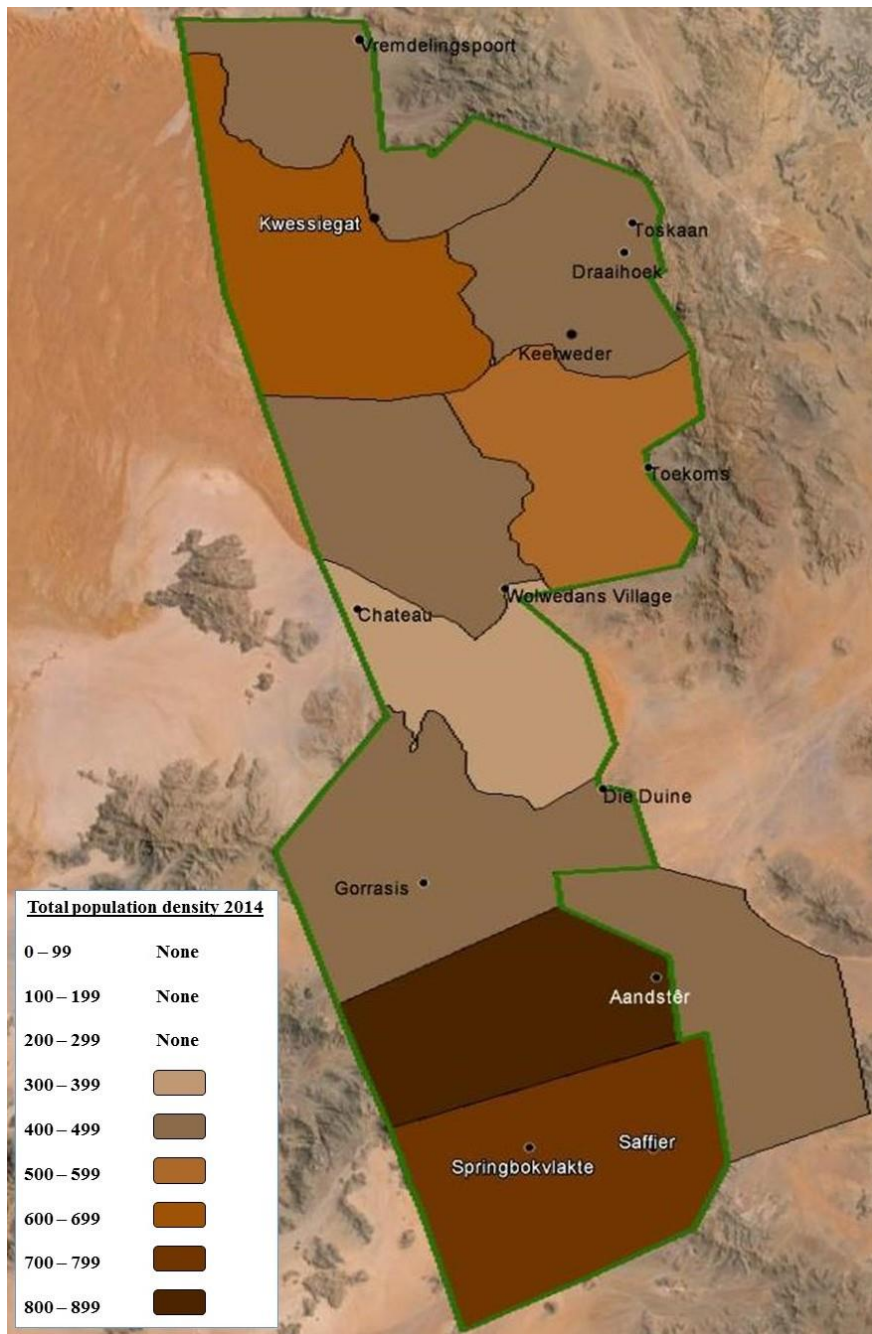


Figure 4.5 Total wildlife distribution/density



The total wildlife distribution/density for all species (including ludwig's bustard and ruppel's korhaan) combined in the count area in May 2014, compared to June 2013 and June 2012, is shown in table 5 below.

Table 5

Total no of animals counted per 100 km per route (June 2012- May 2014)				
Route	Jun-12	Jun-13	May-14	% change (Jun-13 -May-14)
1	1067	515	625	21.36%
2	894	1052	572	-45.62%
3	1155	1219	621	-49.07%
4	638	717	521	-27.36%
5	756	563	514	-8.68%
6	1663	494	557	12.72%
7	261	350	418	19.43%
8	408	578	1090	88.57%
9	627	276	404	46.13%
10	430	705	729	3.38%
Total	1482	1214	1125	-7.36%

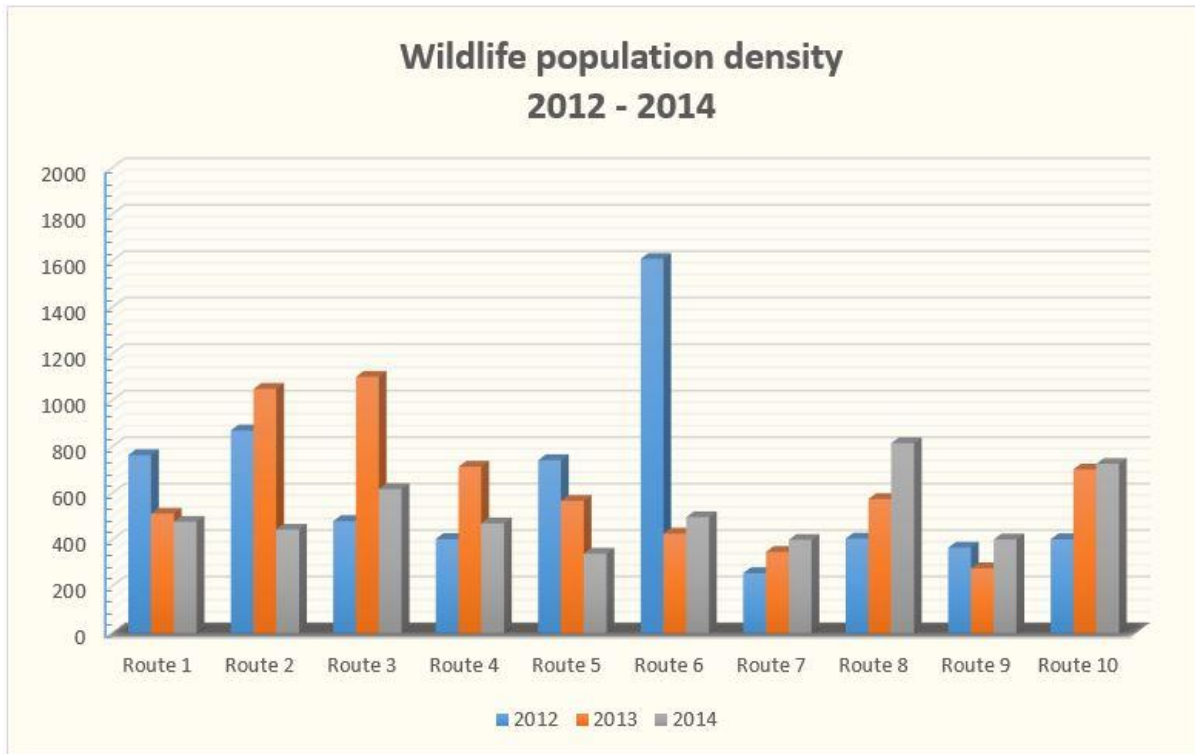
The number of animals (including ludwig's bustards and ruppel's korhaan) counted in each count strip in the count area in May 2014, compared to June 2013 and June 2012 is shown in table 6 below. Please note that these figures include only animals seen below 500m.

Table 6

No of animals counted (<500m) per 100 km per route (June 2012- May 2014)				
Route	Jun-12	Jun-13	May-14	% change (Jun-13 -May-14)
1	767	515	480	-6.80%
2	873	1052	468	-55.51%
3	483	1104	621	-43.75%
4	406	717	473	-34.03%
5	745	570	351	-38.42%
6	1611	429	500	16.55%
7	259	350	418	19.43%
8	408	578	818	41.52%
9	369	280	404	44.29%
10	405	705	729	3.40%
Total	1187	1182	978	-17.27%

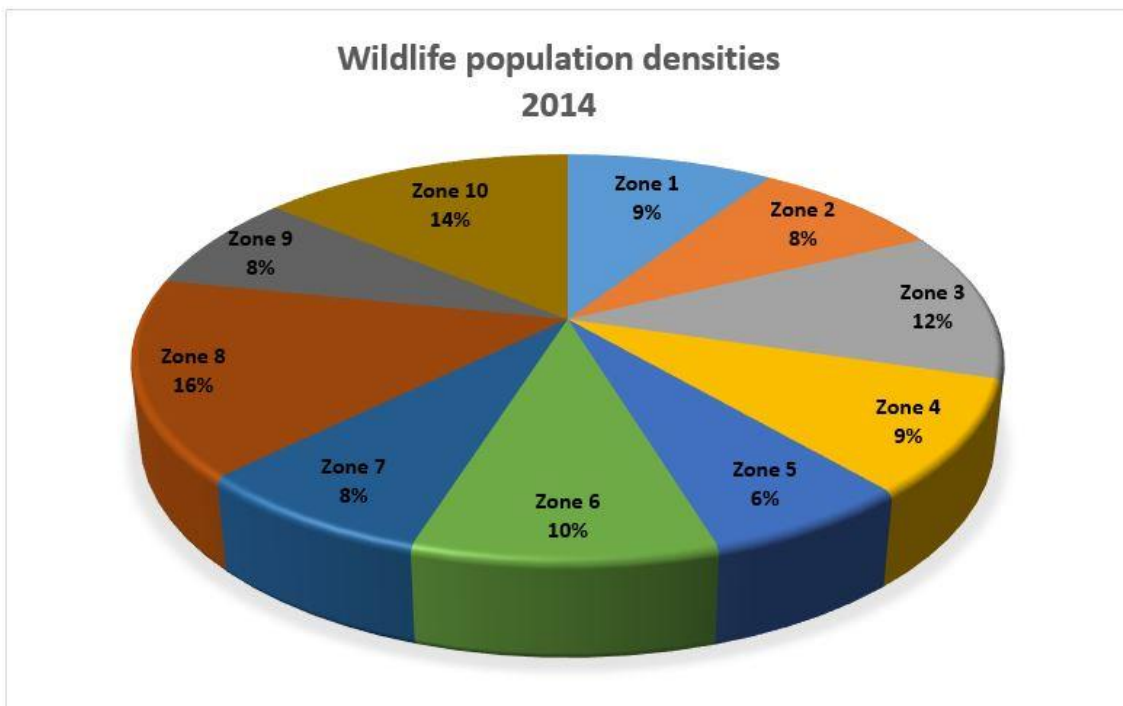
The graph in figure 5 show the change in population density estimates over the past 3 year in all 10 routes.

Figure 5



The chart in figure 6 below show the wildlife distribution percentages throughout the count area in 2014

Figure 6



6.4 Population change

The long term total population estimates are presented in tables 7.1 and 7.2 below.

Table 7.1 Population estimates for years 2005 to 2008

Total estimated numbers of game (Jun 05 - Jun 09)								
Species	Jun-05	Summer Nov 05	Jun-06	Summer Dec 06	Jun-07	Jun-08	Jun 09 (1-8)	Jun 09 (1-9)
Oryx	4320	5583	1447	3689	4295	3258	4700	5415
Springbok	7733	9207	17900	13127	9013	12451	12551	13400
Kudu	290	827	583	834	486	75	79	79
P.zebra*	174	311	439	442	677	668	318	318
Ostrich	409	443	213	951	669	262	829	935
Hartebeest*	50	55	70	75	80	80	80	80
Steenbok	53	100	44	88	125	174	0	32
Blesbok*	10	11	15	18	20	20	7	23
Total	13039	16537	20711	19224	15365	16988	18564	20282
%change	-	26.8	25.2	-7.2	-20.1	10.6	9.3	19.4

* Numbers are known

Table 7.2 Population estimates for year 2009 to 2014

Total estimated numbers of game (Jun 10 - May 14)									
Species	Jun 10 (1-8)	Jun 10 (1-9)	Jun 11 (1-8)	Jun 11 (1-9)	Jun 12 (1-8)	Jun 12 (1-9)	Jun 12 (1-10)	Jun 13 (1-10)	May 14 (1-10)
Oryx	4262	4683	4873	5162	6054	6913	7296	10087	9385
Springbok	7590	8060	8878	9405	4964	5393	6069	5919	4614
Kudu	24	24	38	38	41	41	41	11	0
P.zebra*	350	350	370	370	464	470	470	320	352
Ostrich	550	644	302	348	448	615	765	285	193
Hartebeest*	110	110	125	125	177	177	177	204	197
Steenbok	0	0	0	0	0	0	0	0	0
Blesbok*	1	19	0	18	1	7	7	3	0
Total	12887	13890	14586	15466	12149	13616	14825	16829	14741
%change	-30.6	-31.5	13.2	11.4	-16.7	-12	8.88%	13.52%	-12.41%
Girrafe**	8	8	6	6	6	6	6	6	2
L. Bustard**	160	223	136	143	109	109	116	177	120

* Numbers are known

** Not included in count

Table 7.3 The total estimated numbers of game for the May 2014 count compared to those from the June 2013 count

Total estimated numbers of game (Zone 1-10; Jun 13 - May 2014)					
Species	Jun-13		May-14		Percentage change
	No. Counted under 500m	Total no. corrected for area + for species	No. Counted under 500m	Total no. corrected for area + for species	
Oryx	1943	10087	1762	9385	-6.96%
Springbok	997	5919	772	4614	-22.05%
Kudu	1	11	0	0	-100.00%
Steenbok	0	0	0	0	0.00%
B. Zebra*	174	320	173	352	10.00%
Ostrich	81	285	50	193	-32.27%
R. Hartebeest*	159	204	2	197	-3.43%
Total	3355	16826	2759	14741	-12.39%
Giraffe**(*)		6	1	2	-66.67%
Ludwigs Bustard**	48	177	30	120	3.45%
Ruppel's Korhaan**			27	76	

* Numbers are known

** Not included in count

The graph in figure 7 below show the total long term species estimate change. Please note that these figures are taken from the population estimates from the maximum number of routes counted in each year (i.e. 2005 to 2008 route 1 – 8, 2009 – 2011 route 1 to 9, and 2012 to 2014 route 1 to 10)

Figure 7

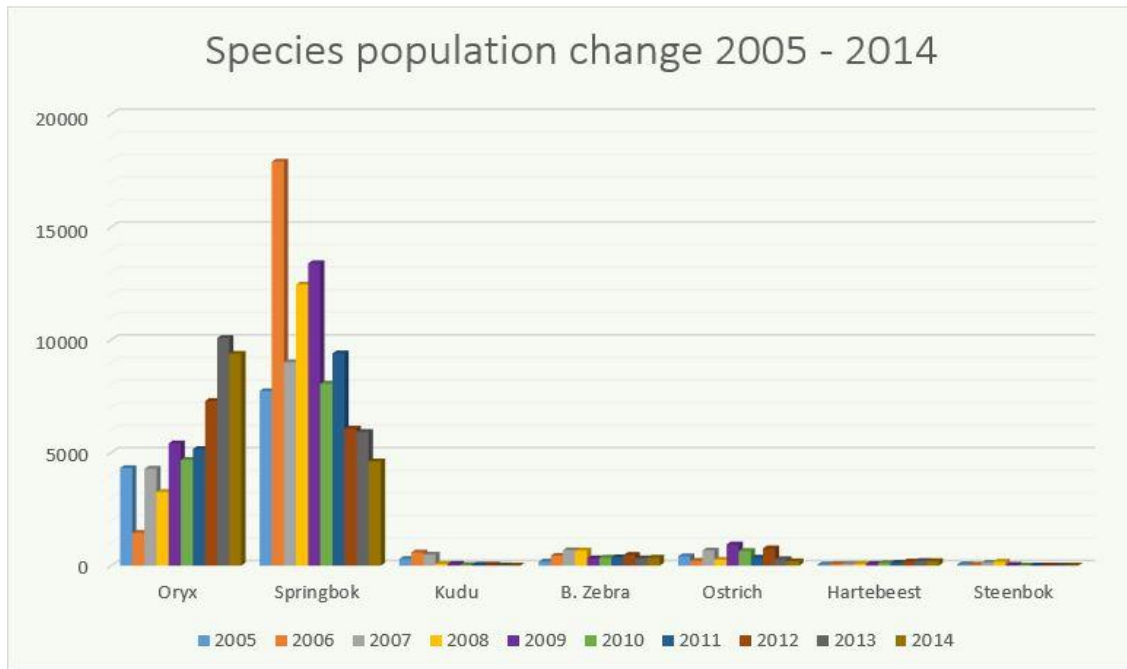
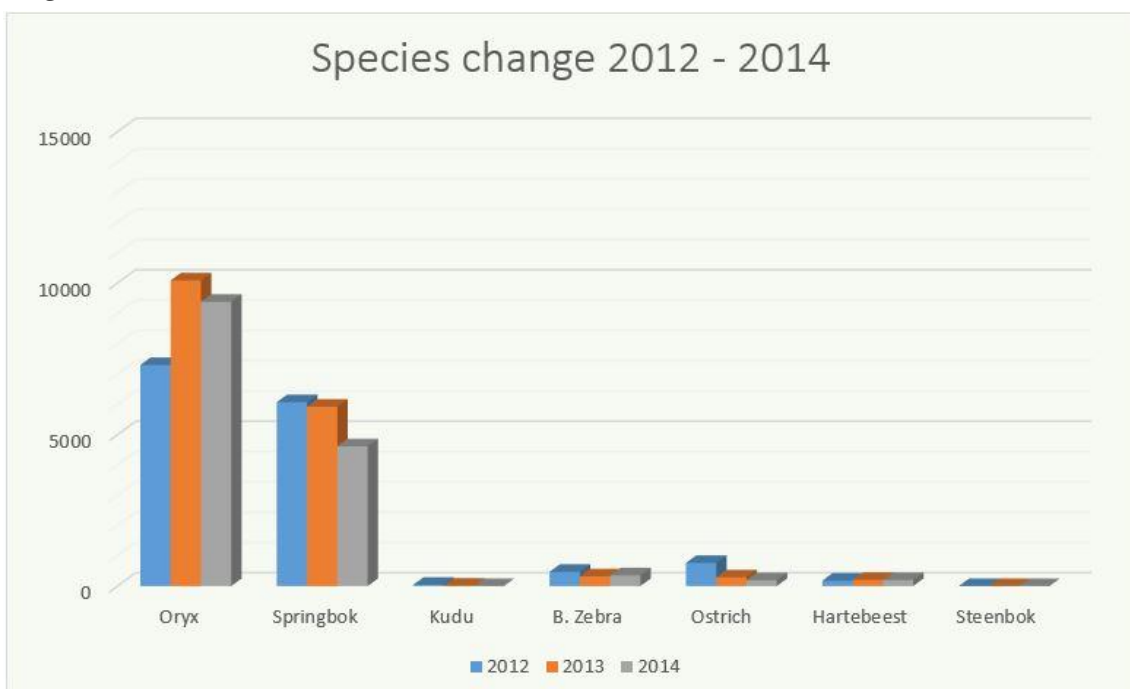


Figure 8 below shows the comparison of the total species estimates from 2012 to 2014 (routes 1 to 10).

Figure 8



The graphs in figure 9 and 10 below show the total long term and short term (last 3 years) oryx and springbok estimate changes. Please note that as with the previous graphs, the figures of these graphs are taken from the respective species estimates from the maximum number of routes counted in each year.

Figure 9

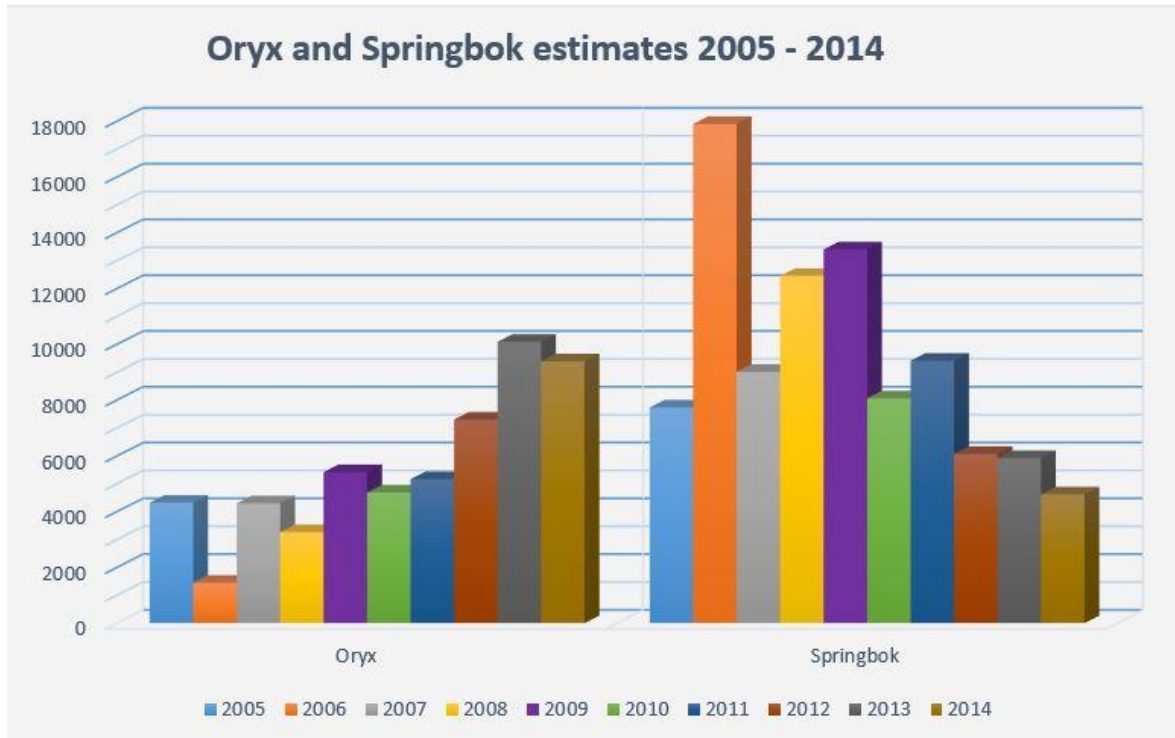
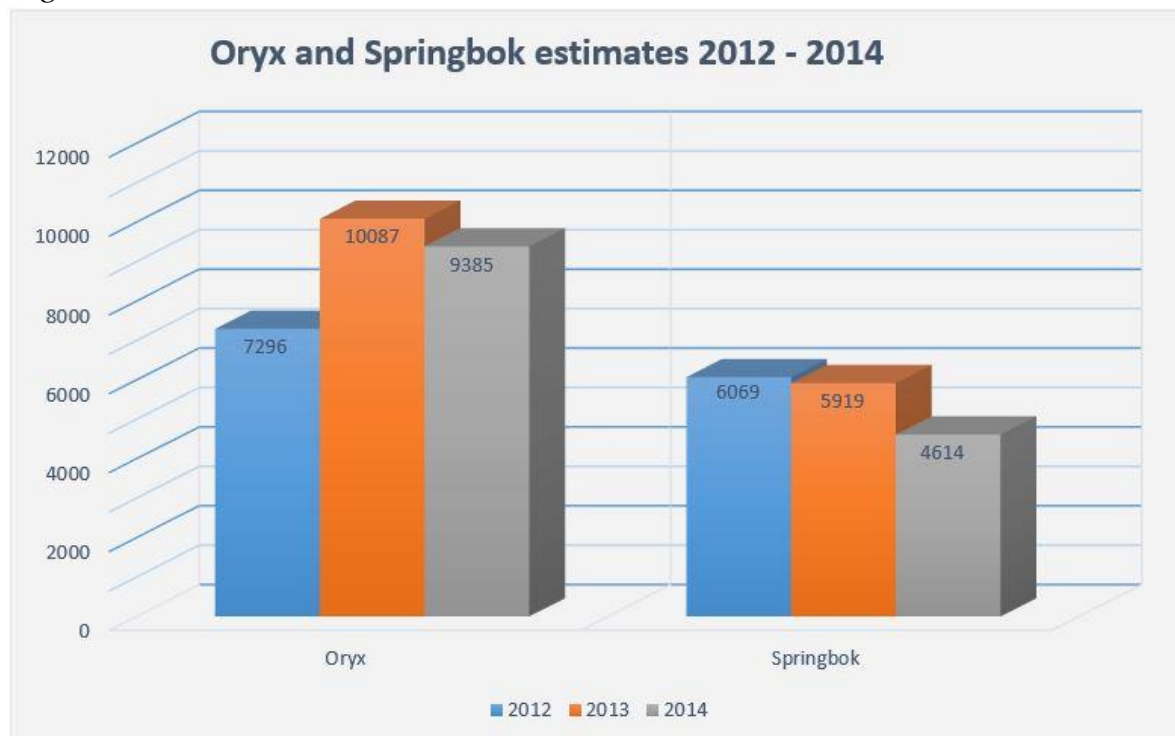


Figure 10



The graphs in figure 11 and 12 below show the total long term and short term (last 3 years) total population estimate changes. Please note that as with the previous graphs, the figures of these graphs are taken from the total population estimates from the maximum number of routes counted in each year.

Figure 11

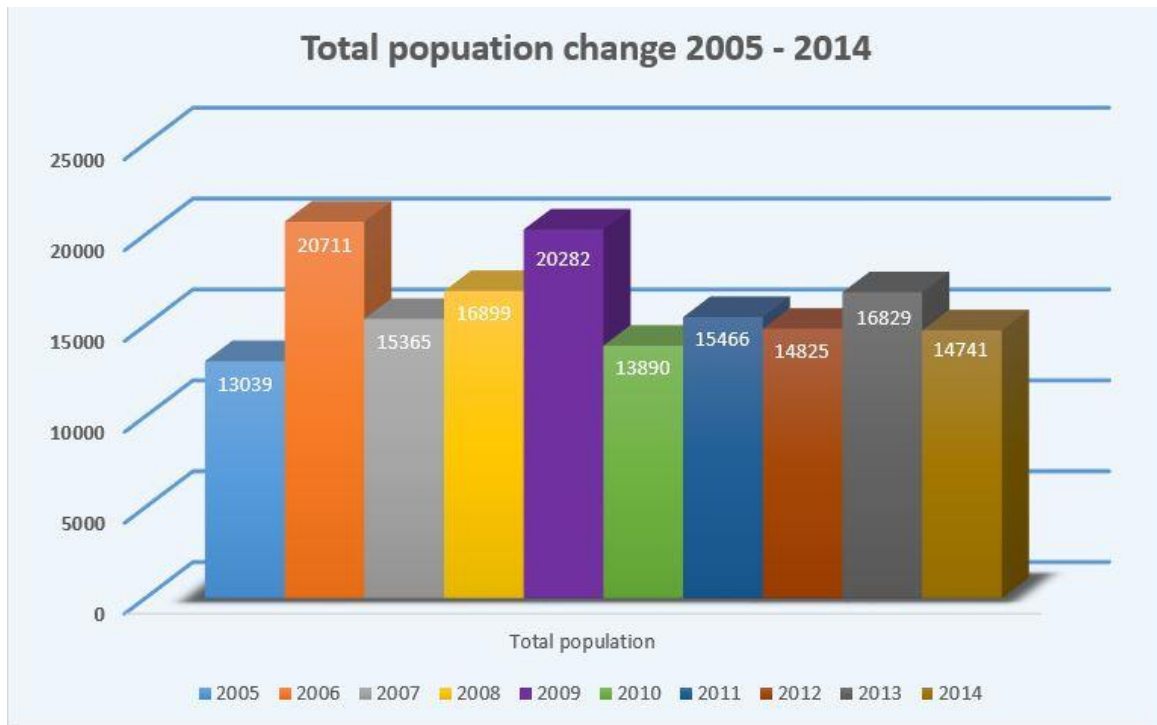
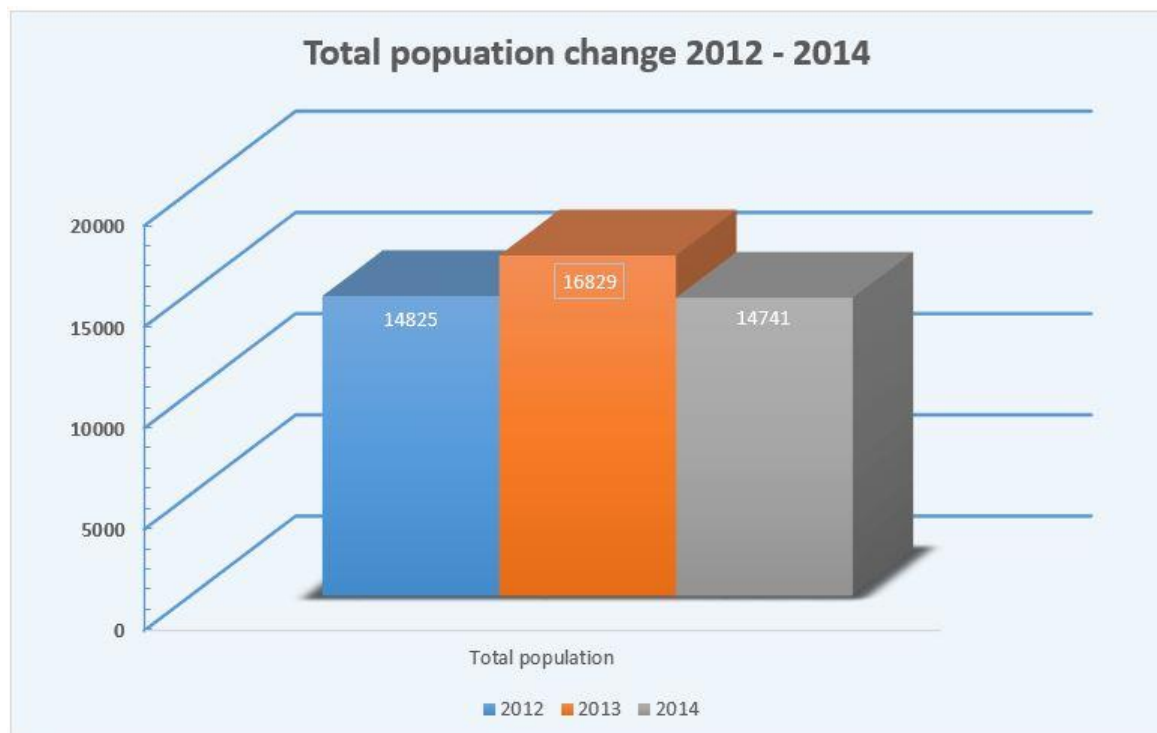


Figure 12



7. Discussion and conclusions

Please note that the population estimates shown in the report is only that - an estimate, while density and distribution are based on actual numbers seen. We use the latter to make managements decisions.

7.1 Individual species

Oryx

The results of the population estimates for oryx show a decline in the estimated number (9385) from last year's record number (10087). This could be as a result of the very poor rainfall received in the 2012 - 2013 season (less than 20mm on average). Although the average rainfall of the 2013 - 2014 season was considerably higher (74mm) than the previous season, the overall veld condition has not improved enough for oryx numbers to have augmented by the time of the game count as rain was received in isolated thunder showers.

As a result of lower population estimates, the oryx biomass per hectare has also gone down by 0.07% to 10.64kg/ha. The pie chart in Figure 3 on page 14 shows the biomass composition of the count area. In this chart, oryx biomass makes up for 87% of the total biomass in the count area. This significant proportion is mainly due to the larger mean mass of the oryx (220kg) in relation to the other dominant species like the Springbok (38kg).

Springbok

The estimated number of springbok has gone down by 22.05% in comparison with last year. This brings the total estimated number of springbok down to an all-time low of 4614. This could be as a result of the fact that a lot of springbok have moved south and east onto neighbouring property following the better rains to the south and east of the Reserve. The decrease is also owing to the fact that quite a number springbok have died, either through natural causes and/or been caught in fences in the attempt to move off the Reserve. The increase in predators, especially wild cheetah, would have also spurred the decrease in springbok numbers.

As a result of lower population estimates, the springbok biomass per hectare has also gone down to 0.90kg/ha compared to 1.16kg/ha in the previous year. The pie chart in Figure 3 on page 14 shows that the total springbok biomass makes up for 7% of the total biomass composition of the count area. This relatively smaller proportion is due to their smaller mean mass (38kg).

Kudu

No kudus were counted in this year's game count. This does not give a true reflection of the kudu numbers, as sightings and camera trap images throughout the year suggest that the numbers of kudu on the Reserve have started to recover again after the plummet in 2013 as a result of the drought experienced in the preceding rainfall season. A lot more kudu, including young ones have been seen in Zone 2, 3 and 6 this year after the better rainfall. One should remember that this census method is not suited for kudu and thus we have to rely on actual sightings and camera trap images to get a better indication of the population estimates.

Steenbok

As in the case of kudus, the census method is not well suited for steenbok, and thus no steenbok were counted in this year's game count as was the case last year as well. This thus cannot reflect the actual number of steenbok in the count area. For that we rely on actual sighting reports.

Burchell's Zebra

The numbers given for burchell's zebra in the population estimates are taken from an independent total count done by the Reserve staff and concessionaires in the north of the Reserve, and from actual sightings in the south of the Reserve as some of the b. zebra were relocated to the south and others have voluntarily moved down to the south.

The number of b zebra seen in the south of the Reserve at the time of the game count was 28. The number of b. zebra counted in the north of the Reserve in June 2014 was 324 (excluding 15 juveniles which are not included in the game count results). This brings the total of b. zebra to 352 for the year 2014, which is an increase of 10% from last year's 320 counted. This increase shows that b. zebra are not as easily naturally affected by drought as the other migratory species like oryx and springbok are, and thus we, as the Reserve management, have to regulate their numbers more closely in order to better preserve the veld condition.

Because of the increase in population size, the species biomass per hectare has also increased by 0.19% from 0.43kg/ha to 0.51kg/ha in the last year.

Ostrich

Ostrich population estimates have continued to decrease. After the decrease in the species estimate in 2013, the number has gone down again in 2014 to 193, thus decreasing another 32.27%. Not a lot of young ones were reported in 2013, thus supporting the lower number counted in 2014.

Red Hartebeest

The numbers given for red hartebeest in the population estimates are taken from an independent total count done by the Reserve staff and concessionaires in the north of the Reserve in June 2014.

The hartebeest numbers have decreased slightly, by 3.43% which is hardly significant in terms of the overall population. What is significant is that fact that the population of r. hartebeest did not increase for the first time in five years. This is largely due to the fact that their reproduction is highly dependent on good rainfall and the effect of poor rainfall is usually only seen in the following year, thus the effect of the 2012 – 2013 low rainfall season is only seen now.

Because of the slight decrease in population size, the species biomass per hectare has gone by minimal 0.05% from last year's 0.14kg/ha to this year's 0.13kg/ha.

Giraffe

The number of giraffe on the Reserve is officially two, after the two cows and two calves were relocated to Excelsior in July 2013 as a result of a board decision to remove the giraffe from the north of the Reserve. However, the two males who were left on Draaihoek, have subsequently been wandering between the Reserve and Neuhof and the last time they came back to the Reserve, the bigger, older bull came back with a female and a sub-adult calve, leaving our younger bull on Neuhof. Thus the total number of giraffe seen on in the north of the Reserve during the game count was three. Of the two cows that were relocated to Excelsior, one gave birth in February 2014, thus bringing the official total to seven giraffe in the count area (not including the two individuals that came over from Neuhof). The herd in the south occasionally wanders onto the Reserve and have been seen as far north as the Family hideout on Stellarine (Zone 7) on various occasions.

Ludwig's bustards and Ruppel's Korhaan

The estimate number of Ludwig's bustard is down by 32.20%. This year l. bustards were only seen in three routes (route 1, 2 and 10) as opposed to last year where the l. bustards were seen in seven of the 10 routes. This year we also started to record the number of ruppel's korhaan seen in each route. The estimated number of ruppel's korhaan in 2014 is 76. Please note that estimate of the ruppel's korhaan is derived from only the total seen (27) and the relevant area correction factors - No species correction factor was used in this estimate.

7.2 Wildlife distribution/ density

In our arid environment, wildlife distribution is largely driven by rainfall, and thus the total wildlife density as seen in Figure 4.5 affirms as to where most of the rainfall has been concentrated to the later stages of the past rainfall season.

The pie chart in figure 6 on page 19 shows that 16% of the game counted were counted in Zone 8 which is the highest percentage. Zone 10 makes up for 14% of the total population density whereas Zone 5 makes up for only 5% of the total population density which is the lowest percentage.

Most of the migratory species like springbok and oryx were greatly concentrated in the south of the Reserve (Zone 8 and 10). The oryx densities were also high in Zones 3 and 4 as these area also received relatively higher rainfall during the past rainfall season. The more widespread b. zebra distribution seen in Figure 4.3 is testament to the fact that the b. zebras have been wandering further south on their own account.

7.3 Total population change

The overall population estimate decreased by 12.39% and the number of animals counted per 100km per route is down by 7.36%. This is a significant change resulting primarily from the decrease in springbok (22.05%) and oryx (6.96%) numbers.

Although the rainfall season preceding the June 2013 game count had considerably less rainfall, there was still enough grass cover left over from the previous good rainfall seasons which facilitated an increase in wildlife population numbers in that year (2013). The poor rainfall in the June 2012 – May 2013 rainfall season only took effect this year, as is evident in the population estimate change of the 2014 game count. The widespread and isolated rainfall in the latest rainfall season also contributed to animals moving elsewhere in search of better grazing.

8. Acknowledgments

NamibRand would like to thank all its concessionaires, stakeholders, neighbours and all the participants for their enthusiastic involvement to make this year's game count another success. Participants were: Teresius Aihonya, Rob Baas, Inge Baas, Tanja Baetcke, Helge Bendl, Chris Beker, John Bernstein, Ruben Bonifatius, Albi Brückner, Andreas Brückner, Mandy Brückner, Vicky Endjala, Gustaf Hanghome, Quintin Hartung, Vanessa Hartung , Barbara Imgrund, Gernot Kahr , Sandra Kahr, Franziska Keresztez, Kerstin Klein, Martha Kambidhi, Jakobus Kooper , Priscilla Kuzeeko, Jasper Lober, Elizabeth Lukas, Anne Maier, Johannes Moongela, Helunga Ngwapia, Nils Odendaal , Dickie Roland, Ulle Roland, Danica Shaw, Rosina Shilunga, Thomas Soutche, Willem Rooi , Tobias Thull, Murray Tindall, Abraham Tsaobeb, Eben Tsaobeb , Elton Vries, Wolfgang Werner and Peter Woolfe.

All your help is immensely appreciated.

9. Appendix

Results per count route/zone

Tables 8.1 to 8.10 list the data collected on each route in June 2013, which were used as a basis for analysis. Numbers seen within the strip width (under 500m) have been multiplied first by the relevant area correction factor (a.c.f) for each route, and then by the relevant species correction factor (s.c.f); see Table 2.

Table 8.1

Route 1				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 3.10)	No. corrected for area + species
Oryx	246	181	561	786
Springbok	22	21	65	104
Kudu	0	0	0	0
Steenbok	0	0	0	0
B. Zebra**	49	39	121	145
Ostrich	13	11	34	38
Red Hartebeest**	0	0	0	0
Total	330	252	781	1072
Ludwig's Bustard*	2	2	6	6
Ruppel's Korhaan*	12	12	37	
Porcupine*	2	2	6	
Jackal*	3	3	9	

* Not included in count

** Numbers known

Table 8.2

Route 2				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 3.13)	No. corrected for area + species
Oryx	150	132	413	578
Springbok	77	59	185	295
Kudu	0	0	0	
Steenbok	0	0	0	
B. Zebra**	42	27	85	101
Ostrich	5	5	16	17
Red Hartebeest**	1	0	0	0
Total	275	223	698	993
Ludwig's Bustard*	5	5	16	16
Ruppel's Korhaan*	6	6	19	
Jackal*	2	1	3	
Giraffe**	1	1		

* Not included in count

** Numbers known

Table 8.3

Route 3				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 4.19)	No. corrected for area + species
Oryx	358	358	1500	2100
Springbok	0	0	0	0
Kudu	0	0	0	
Steenbok	0	0	0	
B. Zebra**	2	2	8	10
Ostrich	0	0	0	0
Red Hartebeest**	0	0	0	0
Total	360	360	1508	2110
Aardwolf*	1	1	4	
Bat Eared Fox*	2	2	8	
Jackal*	2	2	8	

* Not included in count

** Numbers known

Table 8.4

Route 4				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 4.00)	No. corrected for area + species
Oryx	242	225	900	1260
Springbok	2	2	8	13
Kudu	0	0	0	0
Steenbok	0	0	0	0
B. Zebra**	6	6	24	29
Ostrich	0	0	0	0
Red Hartebeest**	0	0	0	0
Total	250	233	932	1302
Jackal*	4	4	16	

* Not included in count

** Numbers known

Table 8.5

Route 5				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 2.27)	No. corrected for area + species
Oryx	229	109	247	346
Springbok	106	106	241	385
Kudu	0	0	0	
Steenbok	0	0	0	
B. Zebra**	45	35	79	95
Ostrich	0	0	0	0
Red Hartebeest**	2	2	5	7
Total	382	252	572	834
Ruppel's Korhaan*	9	9	20	
Bat eared Fox*	6	6	14	

* Not included in count

** Numbers known

Table 8.6

Route 6				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 4.93)	No. corrected for area + species
Oryx	116	110	542	759
Springbok	32	32	158	252
Kudu	0	0	0	0
Steenbok	0	0	0	0
B. Zebra**	47	33	163	195
Ostrich	0	0	0	0
Red Hartebeest**	0	0	0	0
Total	195	175	863	1207

* Not included in count

** Numbers known

Table 8.7

Route 7				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 4.53)	No. corrected for area + species
Oryx	89	89	403	564
Springbok	111	111	503	805
Kudu	0	0	0	0
Steenbok	0	0	0	0
B. Zebra**	22	22	100	120
Ostrich	3	3	14	15
Red Hartebeest**	0	0	0	0
Total	225	225	1019	1504
Ludwig's Bustard*	9	9	41	41
Bat eared Fox*	1	1	5	
Jackal*	2	2	9	

* Not included in count

** Numbers known

Table 8.8

Route 8				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 3.94)	No. corrected for area + species
Oryx	152	93	366	513
Springbok	360	309	1217	1948
Kudu	0	0	0	0
Steenbok	0	0	0	0
Plains Zebra**	6	6	24	28
Ostrich	38	9	35	39
Red Hartebeest**	0	0	0	0
Total	556	417	1643	2528
Jackal*	3	3	12	

* Not included in count

** Numbers known

Table 8.9

Route 9				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 3.23)	No. corrected for area + species
Oryx	149	149	481	674
Springbok	38	38	123	196
Kudu	0	0	0	0
Steenbok	0	0	0	0
Plains Zebra**	0	0	0	0
Ostrich	15	15	48	53
Red Hartebeest**	0	0	0	0
Total	202	202	652	923

* Not included in count

** Numbers known

Table 8.10

Route 10				
Species	Number seen total	Number seen under 500m	No. corrected for area (a.f.c. = 4.09)	No. corrected for area + species
Oryx	315	315	1288	1804
Springbok	94	94	384	615
Kudu	0	0	0	0
Steenbok	0	0	0	0
Plains Zebra**	0	0	0	0
Ostrich	7	7	29	31
Red Hartebeest**	0	0	0	0
Total	416	416	1701	2450
Ludwig's Bustard*	14	14	57	57
Bat Eared Fox*	2	2	8	
Jackal*	5	5	20.45	

* Not included in count

** Numbers known

Table 8.11

Total number of Game				
Species	Number seen total	Number seen under 500m	No. corrected for area	No. corrected for area + species
Oryx	2046	1761	6703	9385
Springbok	842	772	2884	4614
Kudu	0	0	0	0
Steenbok	0	0	0	0
Plains Zebra**	219	170	603	724
Ostrich	81	50	176	193
Red Hartebeest**	3	2	5	7
Total	3191	2755	10371	14922
Ludwig's Bustard*	30	30	120	120
Ruppel's Korhaan*	27	27	76	
Bat Eared Fox*	11	11	35	
Jackal*	21	20	78	
Aardwolf*	1	1	4	
Porcupine*	2	2	6	
Giraffe**	1	1	3	

* Not included in count

** Numbers known

NB - The No. Corrected for area and species does not apply to the Burchell's Zebra and Red Hartebeest as the total number for these species are known.

