FIELDTRIP REPORT

5th January to 7th March 2018

2nd WET SEASON

Report by:

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INTRODUCTION

My final official field trip to Selati Game Reserve (Selati), which was the second wet season sampling period, took place from the 5th January to the 7th March 2018. This fieldtrip was successful in terms of camera trapping, road strip counts, collecting spotted hyaena scats and small mammal trapping. Unfortunately, many of the large carnivore collars have failed in terms of recording GPS locations, which means that very few kill sites were recorded through inspecting GPS clusters on foot. An additional fieldtrip is planned for mid-June to mid-July to collect additional scats with particular importance of to increase our sample size for leopard scats.

PRELIMANRY RESULTS and CONCLUSIONS

Camera trap survey:

The second wet season camera trap survey ran over 60 nights for a total of 1799 trap nights, during which 3010 animal photographs were captured (Table 1.) From these photographs, 36 mammal species were identified of which 12 were carnivores (Table 1).

Table 1: Summary data from the second wet season camera trap survey conducted in Selati Game Reserve between 5th January and 7th March 2018.

	n	%
No. trapping nights	1799	-
Total no.images captured	3010	-
Total prey events	1699	100
Small prey (<30kg)	313	18.43
Medium prey (30-90kg)	749	44.11
Large prey (>90kg)	421	24.79
Megaherbivores (>1000kg)	215	12.66
Total carnivore events	187	100
Small carnivore (<10kg)	11	5.88
Medium carnivore (10-20kg)	80	42.78
Large carnivore (>20kg)	96	51.34
Total mammal species	36	-
Total prey species	24	-
Total carnivore species	12	-

When comparing all four camera trap surveys to one another it is evident that the first wet season survey captured the most number of animal photographs despite having the least number of trap nights (Table 2). The total number of animal capture events (which is the grouping of photographs taken of the same species at the same camera station within a 30 minute interval as a single capture event), steadily increases across the first three surveys and then drastically decreases in the last survey (Table 2). Interestingly, this exact trend of the number of events steadily increasing across the first three surveys and then drastically decreasing in the last survey can be seen across both the total prey events and the small-sized carnivore events (Table 2). The number of events for medium-sized prey, however, drastically increased from the first to the second survey, then slightly increased in the third survey and then decreased in the last survey (Table 2). Selati experiences a summer rainfall (October to March, with a peak in January) and these observed patterns could possibly be linked to the drought which started after the third sampling survey. Additionally, a large number of impala were culled for ecological reasons and could partially explain the decrease in medium-sized prey events. The number of events for both large-sized prey and megaherbivores decreased across the four surveys, which could be attributed to the hunting and selling of these species.

Interestingly, with regards to the total carnivore events and both medium- and large-sized carnivore events, the values were always lower in the two wet seasons compared to the two dry seasons (Table 2).

Additional information such as hunting figures (number of animals per species hunted), sale figures (number of animals per species sold), seasonal rainfall and mortality figures (natural and predatory) will all help when running statistical analyses to determine which factors play the most important roles in determining our findings.

Table 2: Summary data from the first and second dry season and the first wet season camera trap surveys conducted in Selati Game Reserve.

	1st Dry season (8th June to 7th Aug 2016)		1st Wet season (5th Jan to 7th March 2017)		2nd Dry season (1st June to 2nd August 2017)		2nd Wet season (5th January to 7th March 2018)	
	n	%	n	%	n	%	n	%
No. trapping nights	1805	-	1709	-	1780		1799	-
Total no.images captured	3458	-	4031	-	3583	-	3010	-
Total prey events	1660	*100*	1821	*100*	1931	*100*	1699	100
Small prey (<30kg)	277	*16.69*	257	*14.11*	351	*18.18*	313	18.43
Medium prey (30-90kg)	586	*35.30*	810	*44.48*	847	*43.86*	749	44.11
Large prey (>90kg)	532	*32.05*	501	*27.51*	487	*25.22*	421	24.79
Megaherbivores (>1000kg)	265	*15.96*	253	*13.89*	246	*12.74*	215	12.66
Total carnivore events	306	*100*	237	*100*	403	*100*	187	100
Small carnivore (<10kg)	19	*6.21*	27	*11.39*	31	*7.69*	11	5.88
Medium carnivore (10-20kg)	118	*38.56*	105	*44.30*	185	*45.91*	80	42.78
Large carnivore (>20kg)	169	*55.23*	105	*44.30*	187	*46.40*	96	51.34
Total mammal species	36	-	36	-	36	-	36	-
Total prey species	22	-	24	-	23	-	24	-
Total carnivore species	14	-	12	-	13	-	12	-

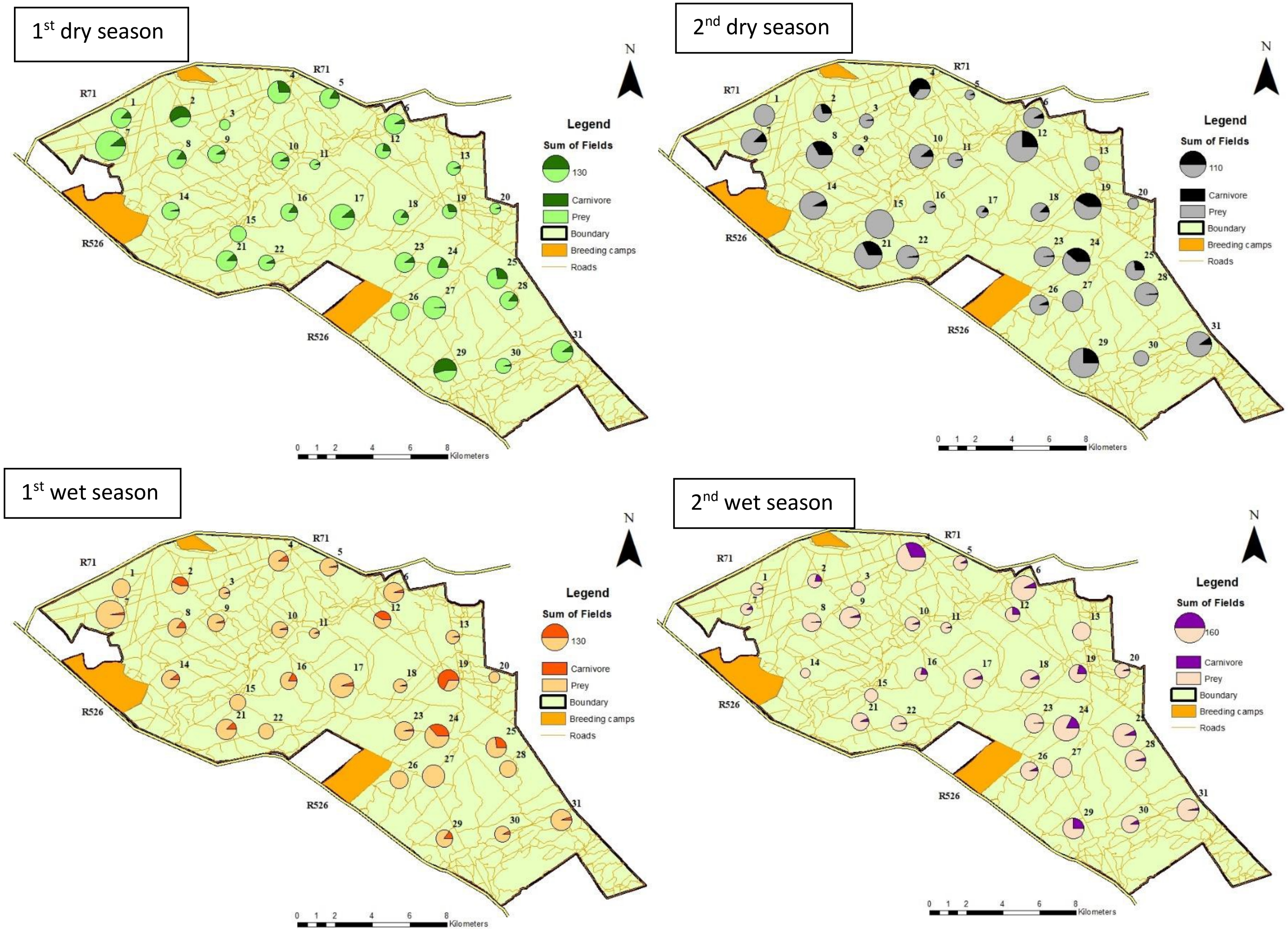


Figure 1: Comparison of the total number of events for prey and carnivore species at each of the 31 camera trap sites in Selati Game Reserve during all four camera trap surveys.

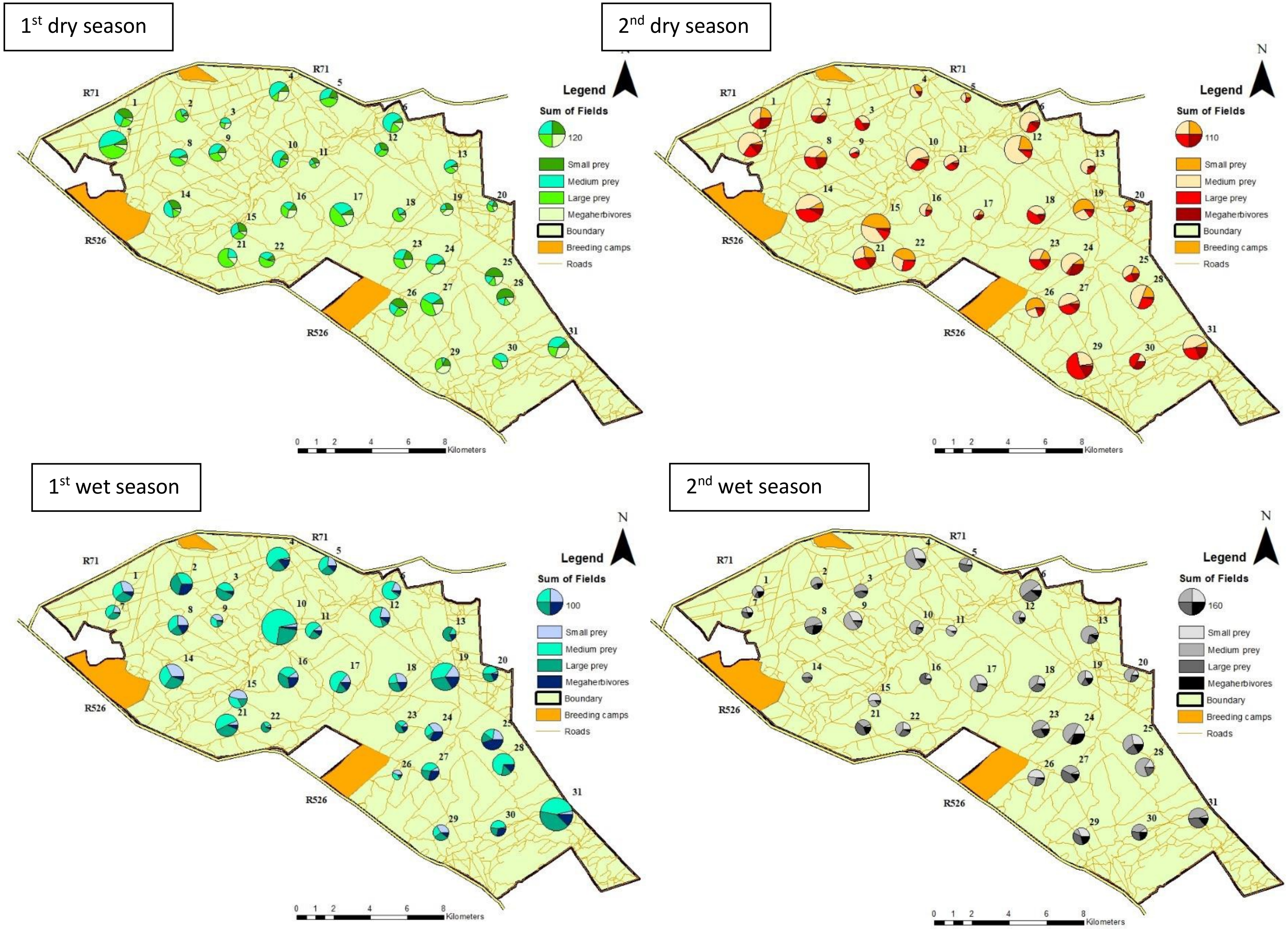


Figure 2: Comparison of the total number of events for small, medium and large prey species including megaherbivore species at each of the 31 camera trap sites during all four camera trap surveys in Selati Game Reserve.

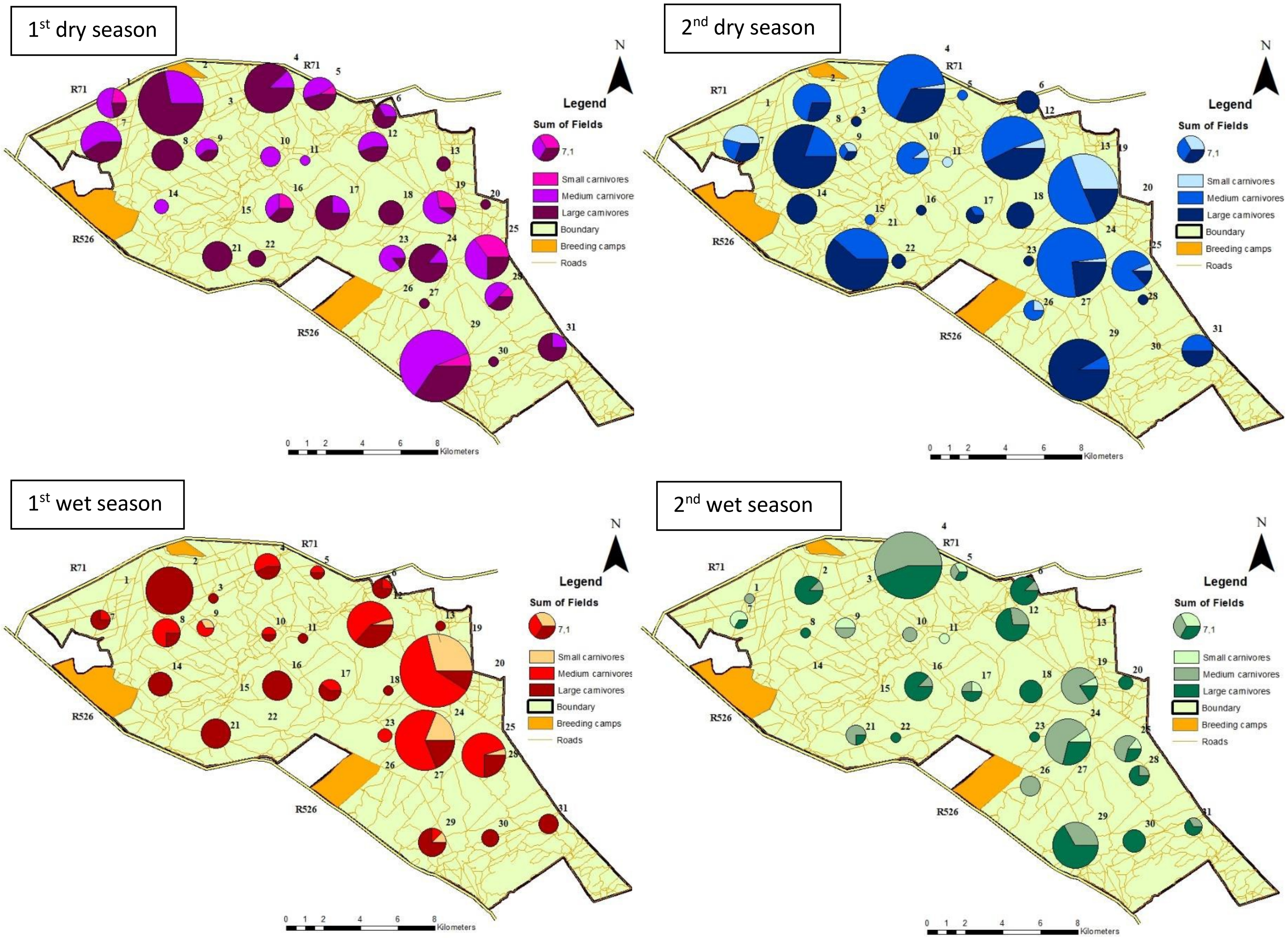


Figure 3: Comparison of the total number of events for small, medium and large carnivore species at each of the 31 camera trap sites during all four camera trap surveys in Selati Game Reserve.

Prey species were captured throughout the reserve, at all 31 camera trap sites, across all four surveys, whereas carnivore species were not (Figure 1). Interestingly, during the dry season surveys, carnivores were captured at more camera trap sites (n = 27 & 28) than during the wet season surveys (n= 24 & 26; Figure 1 & 3). With regards to prey species, medium- and large-sized prey were always captured at all 31 camera trap sites, whereas small-sized prey species were not captured at two camera trap sites during the first dry season (sites: 3,21), second dry season (sites:3,30) and second wet season (sites:2,3). During the first dry season small prey species were not captured at four camera trap sites (sites: 2, 3, 13, 28; Figure 2). Captivatingly, site 3 was the only site throughout all four camera trap surveys to never capture a small-sized prey species (Figure 2).

Concerning the capture events of carnivore species, site 15 was the only camera trap site to not capture carnivores, except for a single photograph of a medium-sized carnivore during the second dry season survey. The last survey (second wet season) is the only survey during which no camera trap sites captured more carnivore events than prey specie events, whereas during the other three surveys there was always one (Figure 1). As was expected, the majority of carnivore capture events occurred at the camera trap sites, which were placed along roads instead of along game paths (Figure 3). Capture events of prey species, however, do not show a clear preference towards camera traps placed along either roads or game paths (Figure 2).

Across all four camera trap surveys, at sites which only captured large carnivores, either large- or medium-sized prey (or both) dominated the capture events (Figure 2). In fact during the last survey (second wet season), at sites where small prey species dominated prey capture events there were no large carnivore captures recorded (Figure 2 & 3). This enhances our suspicions from the beginning, that the large carnivores on Selati are utilising areas of the reserve, which are resource rich as large carnivores are behaviourally and morphologically adapted to kill medium and large sized prey.

Across all four surveys, small carnivores were predominantly only captured at sites where large carnivores did not dominate capture events (Figure 3). This could therefore, indicate that the large carnivores are indeed influencing the spatial dynamics of the smaller, less dominant carnivores through intra-guild competition. As was observed from the second dry season survey, site 11 was once again the only camera trap site during the second wet season survey to capture only small carnivores (Figure 3).

In order to gain a better understanding of the spatial distributions of the prey and carnivore species and the possible influence of season, statistical analyses need to be conducted.

Leopard

A total of 11 leopard photographs were captured during the second wet season camera trap survey, which is similar to the first dry season survey (n=18) but much less than what was captured during the first wet season (n=36) and second dry season (n=35).

From the 11 photographs, one was unidentifiable due to overexposure (Figure 4) and the remaining 10 photographs were evenly split between right- and left-hand side photographs of the leopards. From the five left-hand side photographs four individuals were identified of which two were recaptured individuals (one male and one collared female; Figure 5) and two were newly identified individuals (sex unknown).

Figure 4: Leopard photograph which was unidentifiable due to overexposure from the cameras flash.

Figure 5: Photographs of the recaptured male (left) and female (right) leopards from the left-hand side photographs.

From the five right-hand side photographs four individuals were also identified of which two were recaptures (one male and one collared female; Figure 6) and two were newly identified individuals (sex unknown). It was the same collared female that was identified from the right- and left-hand side photographs.

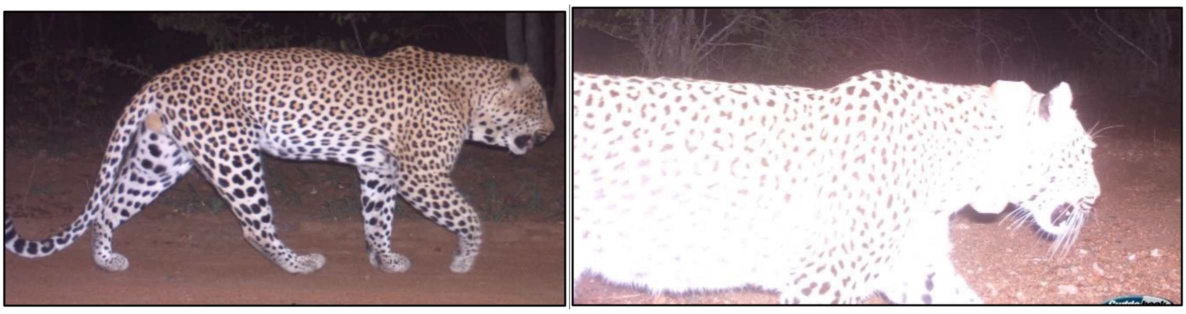


Figure 6: Photographs of the recaptured male (left) and female (right) leopards from the right-hand side photographs.

The total number of individually identified leopards from all left-hand side photographs is 20 and from all right-hand side photographs is 16.

Spotted hyaena

A total of 87 spotted hyaena photographs were captured throughout the second wet season camera trap survey. Interestingly the first wet season survey produced similar captures for spotted hyaenas (n=81), whereas the two dry season surveys produced practically double the number of photographs (dry season 2016 = 164, dry season 2017 = 169). Of the 87 spotted hyaena photographs, 15 were unable to be individually identified as the photographs were either overexposed or the photograph was of the front of the animal and either side of the animal could be seen clearly enough to accurately identify (Figure 7). The remaining 72 photographs were evenly split between left-hand side and right-hand side photographs of spotted hyaenas.

Figure 7: Examples of unidentifiable spotted hyaena photographs.

From the left-hand side photographs 14 individuals were identified as recaptures and nine new individuals were identified (Figure 8). From the right-hand side photographs eight individuals were identified as recaptures and 17 new individuals were identified (Figure 9).

Figure 8: Photographs of one of the recaptured spotted hyaenas (left) and one of the newly identified spotted hyaenas (right) from the left-hand side photographs.

Figure 9: Photographs of one of the recaptured spotted hyaenas (left) and one of the newly identified spotted hyaenas (right) from the right-hand side photographs.

The total number of individually identified spotted hyaenas from left-hand side photographs is 62, whereas from right-hand side photographs it is 49.

Scat collection:

During the second wet season sampling session 40 spotted hyaena scats were collected and only four leopard scats. The total number of spotted hyaena scats is now 72 and the total number of leopard scats is 24. The reason for so many spotted hyaena scats being collected during this sampling period, is because I visited spotted hyaena latrine sites, for which the GPS locations had been recorded by the Selati Research team. Spotted hyaenas repeatedly deposit scats at specific locations, known as latrines, as a means of olfactory communication and territorial marking. Therefore, knowing the location of latrine sites is a great way to collect carnivore scats. Leopards, however, do not make use of latrine sites, which makes collecting their scats a lot tougher.

Collar data:

To date four lions (two males and two females), four leopards (one male and three females) and four spotted hyaenas (sex unknown) have been collared (Table 4). Unfortunately, the GPS component of all the collars except for two of the lion collars have failed (Table 4).

An animal's home range and core area, which is utilized more intensely, can be determined by using an acclimation of 95% and 50% of their GPS fixes respectively.

From the maps in Figure 10 it is evident that the home ranges of the two male lions basically encompass the entire reserve and are the largest of all the collared animals (Table 3 & Figure 10). In fact both male lion's home ranges include areas outside of Selati's boundary (Figure 10). Dela, however, has a much larger proportion of his home range outside of Selati's boundary and he even has a part of his core area extending over the boundary (Figure 10).

Both Dela's home range area and core area are much larger than Mburri's (Table 3 & Figure 10). The two female lion's home ranges and core areas are much smaller than the males and are slightly more centralised within the reserve (Figure 10). The vast difference in the two male lion's home ranges could potentially be explained by the fact that they are father (Mburri) and son (Dela) and that male felids distributions are influenced by their ability to access and successfully mate with a number of females without interference from neighbouring males (Figure 10). Although, through visual observations Dela and Mburri are seen as a coalition, Dela's extended home range could be due to him searching for mating opportunities, as Mburri would to an extent prevent Dela from mating with the female lions.

The leopard home ranges and core areas are much smaller than that of the lions, which is expected. Unfortunately, the male leopard left Selati after three months of being collared, which means comparisons between male and female leopards cannot be made (Figure 10). This is, however, a natural process as male leopards are solitary and defend territories and the movement of the collared male leopard leads us to suspect that he moved off Selati in search of a new territory. As expected, the female leopard home ranges and core areas are much smaller than the lions (Table 3 & Figure 10). Similar to the male lions, female leopard 2 (LF2) also has a portion of her home range, which falls outside of Selati (Figure 10). Concerning female felids, their distributions are usually dictated by food-supply, high-quality habitats to raise young successfully, water and access to mates.

Therefore, LF2 could be incorporating that area into her home range for either of those aspects, however, Selati supplies water all year round to their wildlife and LF2's home range falls over quite a large section of the river, which holds pools of water. Additionally, as has been identified from the camera trap surveys, Selati has quite a few male leopards.

Therefore, I would suspect that she is either utilising that area outside of Selati because there are no lions, which pose as a threat to her young, or because it provides an easy hunting ground.

With regards to the spotted hyaenas, there is limited data, especially for SH2. We are hoping that when the collars are removed additional data stored on the collars will be retrieved. Despite the lack of data, it is still interesting to note how neither of the spotted hyaenas home ranges overlap (Figure 10). It is also interesting to note how the home ranges of the spotted hyaenas do not overlap with the core areas of lions (Figure 10). This leads us to suspect that there is carnivore intra-guild competition occurring on Selati in terms of space use between spotted hyaenas and lions.

The outcomes of statistical analyses (Table 5 & 6) reiterate what we see in the maps of the home ranges. Overlap indices are useful for determining the spatial interactions between animals using relocations of animals occupying similar areas. Table 5 shows the results of a percent overlap index, which calculates the proportion of animal *i's* home range that is overlapped by animal *j's* home range. Therefore, the first column in Table 5 shows how Dela's home range greatly overlaps with all the other animals home ranges, whereas the first row shows how little all the other animals' home ranges actually overlap with Dela's home range, which is the largest by far. Table 6 shows the results of a volume of intersection index, which calculates the volume of intersection of all the animals' home ranges, where the values range from zero (no overlap) to one (complete overlap). Therefore, Table 6, shows how at a coarse spatial scale there is actually little overlap amongst the animals, except with regards to the lions, whose home ranges overlap considerably with one another.

Table 3: Table depicting the home range area (km^2) and core area (km^2) for each collared large carnivore.

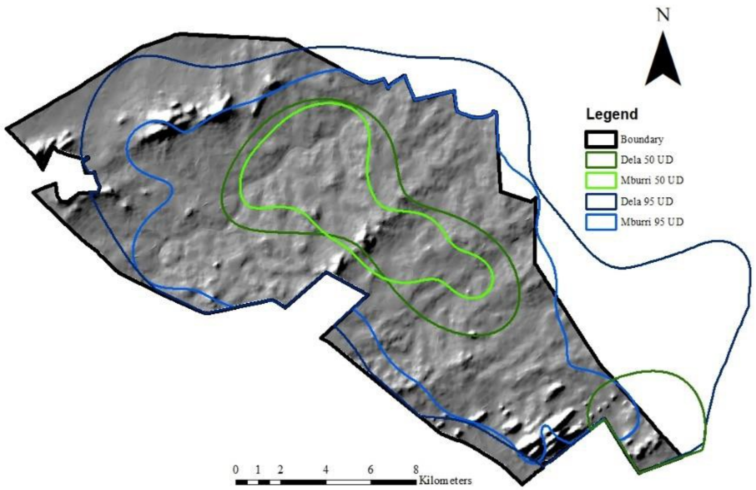
Species	**Animal ID**	**Sex**	**Home range area (km^2)**	**Core area (km^2)**
Lion				
	Dela	M	315.30	80.55
	Mburri	M	196.93	39.42
	Matumi	F	132.49	28.86
	Mfuti	F	105.26	18.82
Leopard				
	LM1	M	164.26	24.24
	LF1	F	31.34	10.30
	LF2	F	75.31	13.96
Spotted hyaena				
	SH1	U	33.93	8.39
	SH2	U	29.28	4.69
	SH3	U	35.86	5.98

Table 4: Summary of collared large carnivores on Selati Game Reserve.

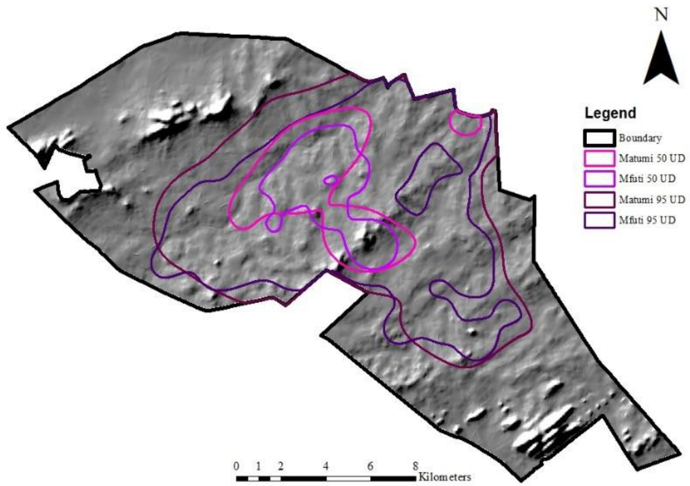
Species	Name	Sex	GSM	Telemetry	Date collared	GPS data until	Method of collaring	Comments
Lion								
	Mburri	M	1733	149.1600	09/09/16	05/01/18	Free dart	
	Dela	M	2019	148.5100	29/05/17	21/04/18	Free dart	
	Matumi	F	2020	148.5300	29/04/17	10/04/18	Free dart	
	Mfuti	F	1734	149.1900	16/09/16	11/09/17	Free dart	
Leopard								
	LM1	M	1735	149.2300	16/09/16	26/11/16	Baited cage	Moved out of Selati
	LF1	F	1737	149.4300	22/09/16	05/06/17	Baited cage	Collar needs to be cleared
	Cleo (LF2)	F	2012	148.2400	08/06/17	04/12/17	Baited cage	
	LF3	F	1739	149.8900	15/06/17	N/A	Baited cage	Collar needs to be cleared
Spotted hyaena								
	SH1	U	1736	149.3700	16/09/16	06/05/17	Free dart - helicopter	Shot 07/06/17
	SH2	U	1738	149.6500	02/05/17	14/05/17	Baited cage	Collar needs to be cleared
	SH3	U	2011		19/07/17	20/11/17	Transmitter dart	
	SH4	U	1736	149.3700	15/06/17	N/A	Transmitter dart	Collar needs to be cleared

Collar data:

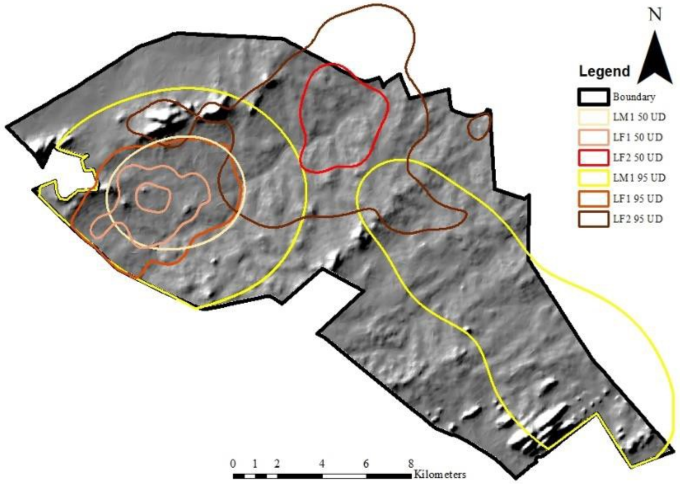
Male lions



Female lions



Leopards



Spotted hyaenas

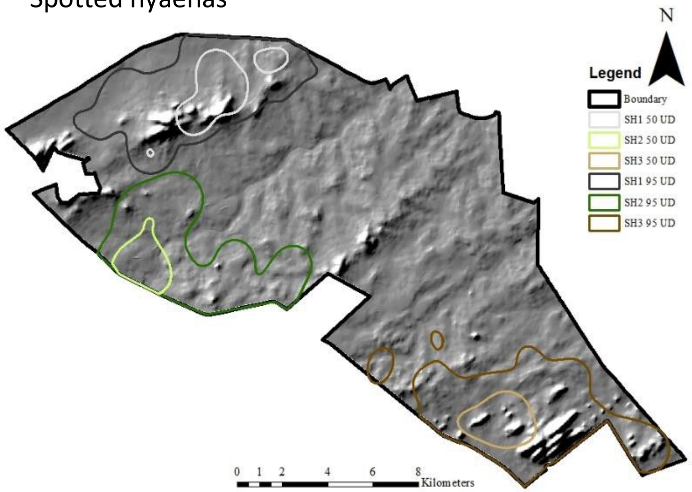


Figure 10: The home ranges (95 UD) and core areas (50 UD) of all collared animals with GPS data.

Table 5: Percent overlap indicated as a proportion of animal *i's* home range that is overlapped by animal *j's* home range (95% utilization distribution)

	Dela	LF1	LF2	LM1	Matumi	Mburri	Mfuti	SH1	SH2	SH3
Dela	-	0.05557700	0.2211501	0.3647240	0.2574296	0.4314936	0.2134311	0.08297954	0.04824392	0.08143574
LF1	0.8520710	-	0.5798817	0.4497041	0.6213018	0.7928994	0.4497041	0.31360947	0.36686391	0
LF2	0.7519685	0.12860892	-	0.6141732	0.3832021	0.4304462	0.4212598	0.20603675	0.11417323	0
LM1	0.7482185	0.06017419	0.3705463	-	0.4006334	0.5771971	0.3903405	0.13064133	0.05621536	0.13697546
Matumi	0.9099591	0.14324693	0.3983629	0.6903138	-	0.8567531	0.6957708	0.14870396	0.14051842	0.18963165
Mburri	0.9186524	0.11010682	0.2695152	0.5990140	0.5160230	-	0.3434675	0.13886606	0.09695974	0.20542317
Mfuti	0.8168390	0.11225997	0.4741507	0.7282127	0.7533235	0.6174298	-	0.06203840	0.14475628	0.14180207
SH1	1.0000000	0.24651163	0.7302326	0.7674419	0.5069767	0.7860465	0.1953488	-	0.11627907	0
SH2	0.7352941	0.36470588	0.5117647	0.4176471	0.6058824	0.6941176	0.5764706	0.14705882	-	0
SH3	0.7617329	0	0	0.6245487	0.5018051	0.9025271	0.3465704	0	0	-

Table 6: Volume of intersection indicating overlap (zero = no overlap, 1 = complete overlap) amongst the home ranges of the collared animals (95% utilization distribution)

	Dela	LF1	LF2	LM1	Matumi	Mburri	Mfuti	SH1	SH2	SH3
Dela	-	0.05430837	0.26573086	0.30848475	0.2145962	0.3939044	0.15464896	0.12241809	0.03817950	0.05303594
LF1		-	0.16332583	0.03223565	0.1400122	0.1336100	0.09548511	0.21810161	0.20878849	0
LF2			-	0.35915834	0.2555059	0.2341232	0.29298125	0.21958743	0.08672906	0
LM1				-	0.3316802	0.3788495	0.35250207	0.12517113	0.05742738	0.11238010
Matumi					-	0.4492581	0.57393811	0.17076688	0.13608390	0.19932248
Mburri						-	0.25686075	0.17300451	0.10696387	0.21224505
Mfuti							-	0.03636971	0.11098283	0.13587261
SH1								-	0.08472501	0
SH2									-	0
SH3										-

Kill sites:

Large carnivore kill data can be collected using the Global Positioning System (GPS) cluster method or through the opportunistic location of kill sites in the field. GPS data fixes (GPS clusters) from collared large carnivores can be used to provide valuable insight into these animals diet and prey selection. GPS clusters are defined as two or more consecutive recorded times with each pair of fixes being less than 100m apart. ArcGIS is used to plot location fixes and sequentially identify potential GPS/kill clusters. Once potential clusters/kill sites are identified, cluster co-ordinates are uploaded onto a handheld GPS unit and investigated on foot for prey remains. Potential predation events are usually identified from the presence of prey stomach contents, teeth, hooves, hair or bones.

Locating kill sites has proven to be less successful than hoped, especially because the GPS component of many of the collars has failed. Additionally, not finding prey remains at potential kill sites, could be because of the high spotted hyaena density on the reserve. Although spotted hyaenas are known to hunt, they are also opportunistic scavengers and could be easily carrying away the carcasses of the lions and especially the leopards, who predominantly hunt small to medium prey species.

The two tables below list information regarding kill sites recorded for lions (Table 5) and leopards (Table 6) which were either located through GPS clusters or were opportunistically located in the field by various people.

Table 5: Kill site information for lions on Selati Game Reserve

	Animal ID	Date	S	E	Kill information		
					Species	**Sex**	**Age**
1	Mfuti	2017/02/27	-23,962	30,733	Waterbuck	M	A
2	Mburri and Dela	2017/03/01	-23,959	30,735	Porcupine	U	A
3	Mfuti	2017/03/02	-23,980	30,738	Kudu	M	A
4	Mburri	2017/04/01	-23,972	30,719	Waterbuck	M	A
5	Mfuti	2017/04/01	-23,972	30,719	Waterbuck	M	A
6	Mfuti	2017/04/04	-23,966	30,000	Tortoise		
7	Mburri	2017/04/09	-23,964	30,728	Eland	F	A
8	Mburri and Dela	2017/04/26	-24,002	30,814	Waterbuck	M	A
9	Dela	2017/04/30	-23,978	30,776	Wildebeest		
10	Mfuti	2017/05/03	-23,972	30,734	Impala	M	A
11	Mburri and Dela	2017/05/05	-23,959	30,735	Warthog		A
12	Lion	2017/05/18	-23,775	30,941	Spotted hyaena	U	A
13	Dela	2017/07/01	-24,011	30,822	Warthog	A	U
14	Lion	2017/07/19	-23,964	30,676	Waterbuck	U	A
15	Mfuti and female	2017/07/23	-23,944	30,762	Waterbuck	M	A
16	Mfuti, Matumi, Acacia and cubs	2017/07/27	-23,990	30,820	Wildebeest	U	A
17	Dela	2017/07/31	-23,991	30,792	Wildebeest	U	A

18	Lion	2017/08/06	-23,966	30,733	Kudu	U	A
19	Lion	2017/09/27	-23,951	30,679	Spotted hyaena	U	A
20	Lion	2017/10/02	-23,978	30,719	Impala	U	A
21	Lion	2017/10/10	-23,994	30,801	Kudu	F	A
22	Lion	2017/10/25	-23,947	30,761	Kudu	F	A
23	Mburri and Dela	2017/11/08	-23,970	30,705	Kudu	M	A
24	Lion	2017/11/13	-23,978	30,719	Zebra	U	A
25	Mburri and Dela	2017/11/15	-24,005	30,787	Kudu	U	A
26	Mburri	2017/11/19	-23,939	30,771	Waterbuck	U	A
27	Lion	2017/11/24	-23,986	30,721	Tsessebe	U	A
28	Mburri	2017/12/05	-23,960	30,676	Impala	U	A
29	Mburri	2017/12/11	-23,921	30,670	Warthog	U	A
30	Lion	2017/12/28	-23,004	30,825	Kudu	M	A
31	Lion	2017/12/28	-24,039	30,859	Kudu	M	A
32	Mburri	2017/12/30	-23,947	30,817	Impala	U	A
33	Matumi	2017/12/31	-23,979	30,695	Kudu	M	A
34	Dela	2018/01/31	-23,953	30,748	Kudu	F	A
35	Matumi	2018/02/02	-23,951	30,752	Waterbuck	F	A
36	Lion	2018/02/06	-23,932	30,777	Wildebeest	U	A
37	Dela	2018/02/09	-23,962	30,660	Wildebeest	M	A
38	Matumi	2018/02/10	-23,975	30,719	Zebra	U	A
39	Dela	2018/02/10	-23,962	30,687	Kudu	M	A
40	Matumi	2018/02/13	-23,992	30,722	Kudu	U	A
41	Matumi	2018/02/24	-23,997	30,725	Kudu	F	A
42	Lion	2018/02/26	-23,998	30,735	Wildebeest	F	A
43	Lion	2018/02/27	-23,991	30,798	Waterbuck	M	A

*Date represents the date the kill was made and not located

Table 6: Kill site information for leopards on Selati Game Reserve

	Animal ID	Date	S	E	Kill information		
					Species	**Sex**	**Age**
1	LF1	2017/02/19	-23,972	30,655	Cape grysbok	U	A
2	LF1	2017/04/05	-23,974	30,710	Warthog	U	A
3	Cleo	2017/06/25	-23,940	30,776	Impala	U	A
4	Leopard	2017/07/20	-23,947	30,761	Nyala	F	A
5	Leopard	2017/08/22	-23,959	30,735	Nyala	F	A
6	Leopard	2017/10/10	-23,939	30,769	Impala	F	A
7	Leopard	2017/10/11	-23,912	30,718	Impala	F	A
8	Cleo	2017/11/01	-23,943	30,759	Impala	U	A
9	Leopard	2017/11/09	-23,959	30,735	Kudu	F	A
10	Leopard	2017/11/09	-23,939	30,769	Nyala	M	A
11	Leopard	2017/11/12	-23,912	30,718	Impala	U	A
12	Leopard	2018/02/04	-23,945	30,706	Kudu	U	J
13	Leopard	2018/02/07	-23,965	30,719	Wildebeest	U	J
14	Leopard	2018/02/07	-23,971	30,676	Steenbok	U	A

15	Leopard	2018/02/13	-24,008	30,789	Impala	M	A
16	Leopard	2018/02/13	-23,965	30,734	Impala	M	A
17	Leopard	2018/02/13	-24,013	30,789	Impala	M	A
18	Leopard	2018/02/13	-23,958	30,731	Impala	M	A

*Date represents the date the kill was made and not located

Road-strip count:

As was done during the second dry season sampling session, the road-strip count was conducted twice during the second wet season sampling session. This will allow us to test whether conducting the road-strip counts once (first wet and first dry season sampling) or twice (second wet and second dry season sampling) is better in terms of determining large prey species abundance. Interestingly, Route 3, which runs along the south-eastern section of the reserve, recorded the least number of animal sightings across all four sampling periods (Figure 10). There also seem to be seasonal differences, as during both dry season sampling sessions Route 1 produced the greatest number of sightings, whereas during both wet season sampling sessions Route 2 produced the greatest number of sightings. In terms of the number of sightings per species, impala always has the highest, which is expected as it is the most abundant species on the reserve. Other species, which make up a great proportion of sightings across all four sampling sessions include, giraffe, kudu, waterbuck and warthog. Having conducted the road-strip counts over two years (each wet and dry season), has proven to be successful in terms of identifying which prey species are present on the reserve as during each new seasonal sampling session, new species were recorded (Figure).

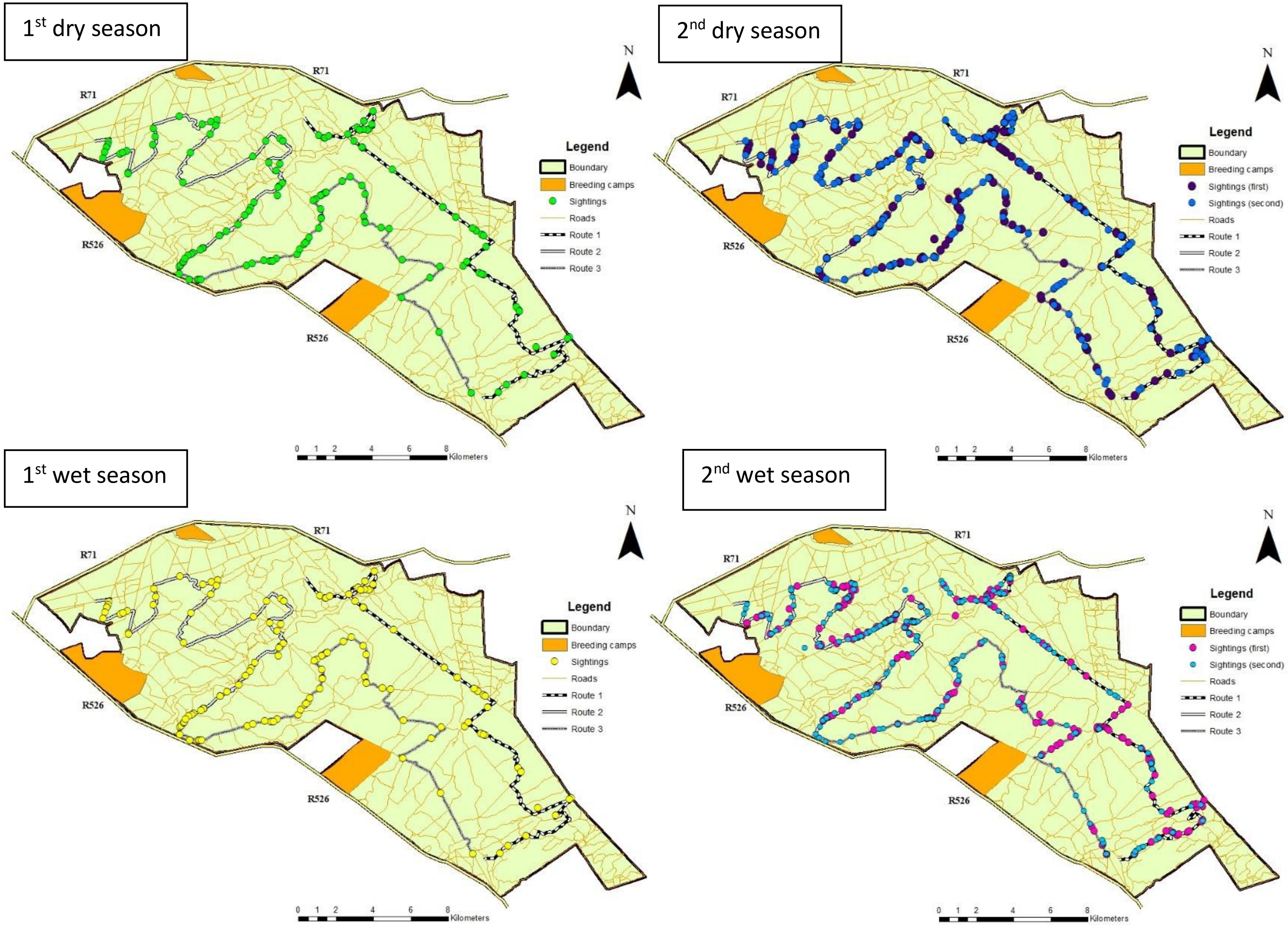


Figure 11: Map depicting where sightings of animals were counted along the three road-strip routes during the various sampling periods.

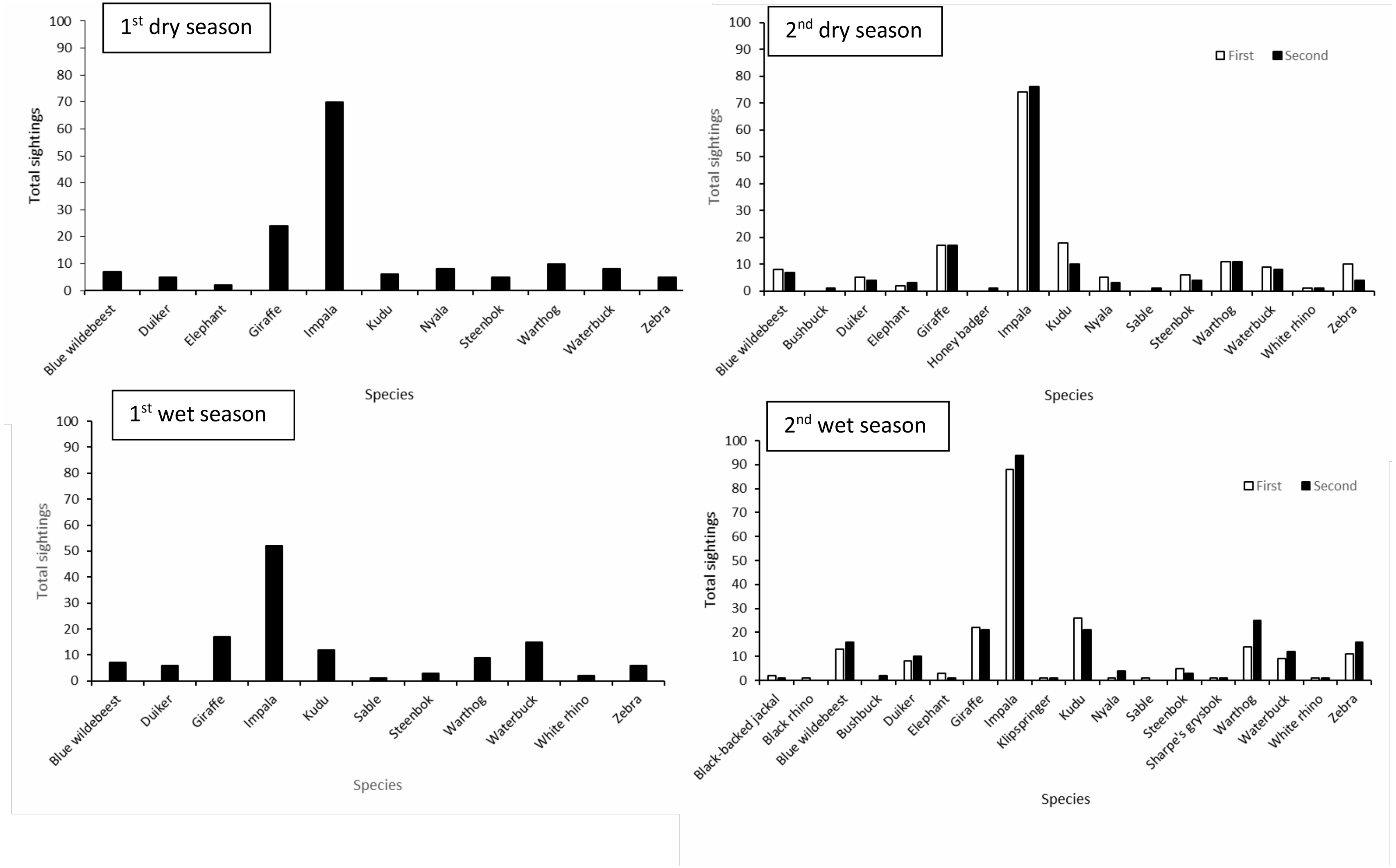


Figure 12: Total number of sightings for each species from the first and second road-strip count survey done during the second dry season.