



**RHODES UNIVERSITY**  
*Where leaders learn*



*Selati*  
GAME RESERVE



*The Selati River flowing*

## **FIELDTRIP REPORT**

5<sup>th</sup> January to 7<sup>th</sup> March 2017

1<sup>st</sup> WET SEASON

Report by:

Jessica Comley, Rhodes University, Grahamstown

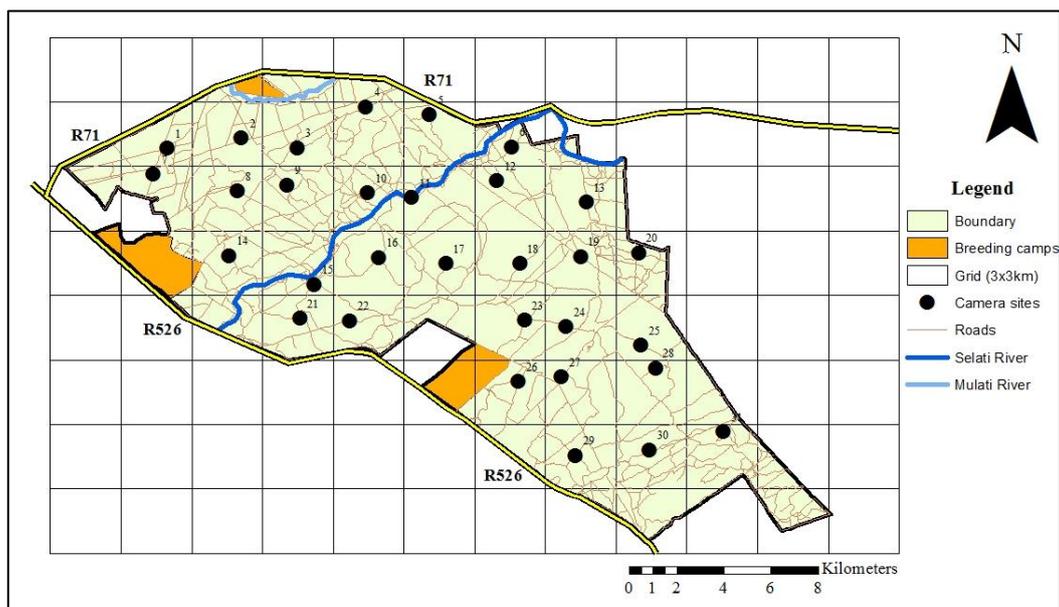
## INTRODUCTION

My second field trip to Selati Game Reserve (Selati), was the first wet season sampling period and took place from the 5<sup>th</sup> January to the 7<sup>th</sup> March 2017. The first wet season field trip was not as successful as the first dry season field trip in terms of scat collection and locating kill sites, but this is not unexpected due to the environmental (longer grass, increased water sources, etc.) and biological changes (abundance of food etc.) that occur during the wet season. The camera trap survey was successful, despite the unfortunate loss of 1 of the 31 Cuddeback Attack cameras. Due to periods of bad weather the road-strip count was conducted over 9 days, from the 13<sup>th</sup> to the 21<sup>st</sup> February. The next fieldtrip, which will be the second dry season sampling period will take place from the end of May to the beginning of August.

## PRELIMINARY RESULTS and CONCLUSIONS

### Camera trap survey:

The 31 Cuddeback Attack cameras were set up in the exact same locations as the previous dry season sampling period (Figure 1). The cameras were checked every two weeks when possible, to download the pictures captured, replace batteries if needed as well as to ensure that the cameras were still functioning properly. During this wet season fieldtrip the cameras were often found to be removed by elephants or either pushed over by elephants or rhinos. After the 60 night period, all animal pictures captured on all 31 camera traps were analysed in the software programme Camera Base (Version 1.6, Mathias Tobler).



**Figure 1:** The 31 camera trap sites situated throughout Selati Game Reserve.

The first wet season camera trap survey ran over 60 nights for a total of 1709 trap nights, during which 4031 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 first wet season camera trap survey conducted in Selati Game Reserve between 5<sup>th</sup> January and 7<sup>th</sup> March 2017.

	n	%
No. trapping nights	1709	-
Total no.images captured	4031	-
Total prey events	1821	100
Small prey (<30kg)	257	14.11
Medium prey (30-90kg)	810	44.48
Large prey (>90kg)	501	27.51
Megaherbivores (>1000kg)	253	13.89
Total carnivore events	237	
Small carnivore (<10kg)	27	11.39
Medium carnivore (10-20kg)	105	44.30
Large carnivore (>20kg)	105	44.30
Total mammal species	36	-
Total prey species	24	-
Total carnivore species	12	-

When comparing the first dry season camera trap survey to the first wet season camera trap survey, it is evident that over 500 more photographs were captured during the wet season even though there were less trap nights (Table 2). Interestingly, during the wet season less carnivore capture events were recorded, but more prey capture events were recorded (Table 2). The observed change in the capture events between the two seasons can be expected, as the wet season coincides with the lambing season of Selati's most abundant prey species, the impala. The decrease in carnivore capture events could partly be due to the fact that two adult lionesses were removed from the reserve at the end of last year (2016), after the first dry season sampling period. Additionally one of the lionesses had 2 cubs in October last year (2016) and so during the time of our wet season sampling period the lioness would not have been particularly mobile because of the safety of her young cubs.

During both sampling events 36 mammal species were recorded, however during the wet season two new prey species were recorded; Sharpe’s grysbok and mountain reedbuck, and two less carnivore species were recorded; cheetah and white-tailed mongoose (Table 2). Both Sharpe’s grysbok and mountain reedbuck occur on Selati at very low densities and so it is not a surprise that they were not recorded during the dry season sampling period. White-tailed mongoose have very small home ranges, which our camera trap survey is not designed for and so therefore it is not unusual that this species was not recorded during the wet season sampling period. Additionally, there is only one male cheetah present on the reserve at the moment and so it is not unexpected that he was not captured during the wet season sampling period. It is for reasons such as these, that the camera trap survey will take place over two dry season and two wet seasons so that accurate capture events of both prey and carnivore species can be recorded.

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

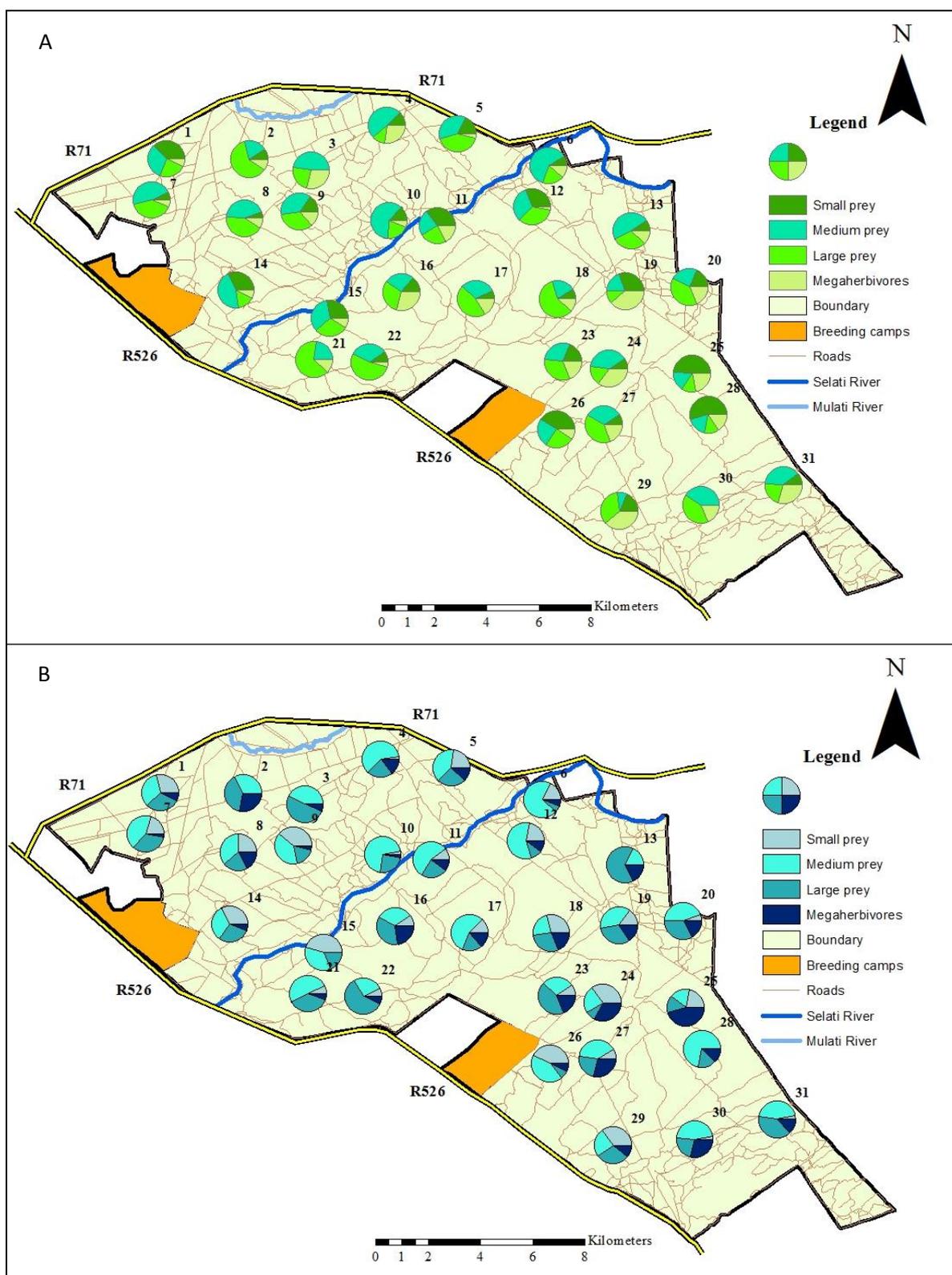
	Dry season		Wet season	
	(8th June to 7 <sup>th</sup> Aug 2016)		(5 <sup>th</sup> Jan to 7 <sup>th</sup> March 2017)	
	n	%	n	%
No. trapping nights	1805	-	1709	-
Total no.images captured	3458	-	4031	-
Total prey events	1660	100	1821	100
Small prey (<30kg)	277	16.69	257	14.11
Medium prey (30-90kg)	586	35.30	810	44.48
Large prey (>90kg)	532	32.05	501	27.51
Megaherbivores (>1000kg)	265	15.96	253	13.89
Total carnivore events	306	100	237	100
Small carnivore (<10kg)	19	6.21	27	11.39
Medium carnivore (10-20kg)	118	38.56	105	44.30
Large carnivore (>20kg)	169	55.23	105	44.30
Total mammal species	36	-	36	-
Total prey species	22	-	24	-
Total carnivore species	14	-	12	-

As with the dry season photographs, prey species were captured throughout the reserve during the wet season, with medium sized prey having the highest percentage of captures (Figure 2). During the dry season, three camera sites did not record any carnivore species, whereas during the wet season, seven camera sites did not record any carnivore species (Figure 3). Interestingly, two camera sites (15 and 26) did not record any carnivore species during both the dry and wet sampling periods (Figure 3).

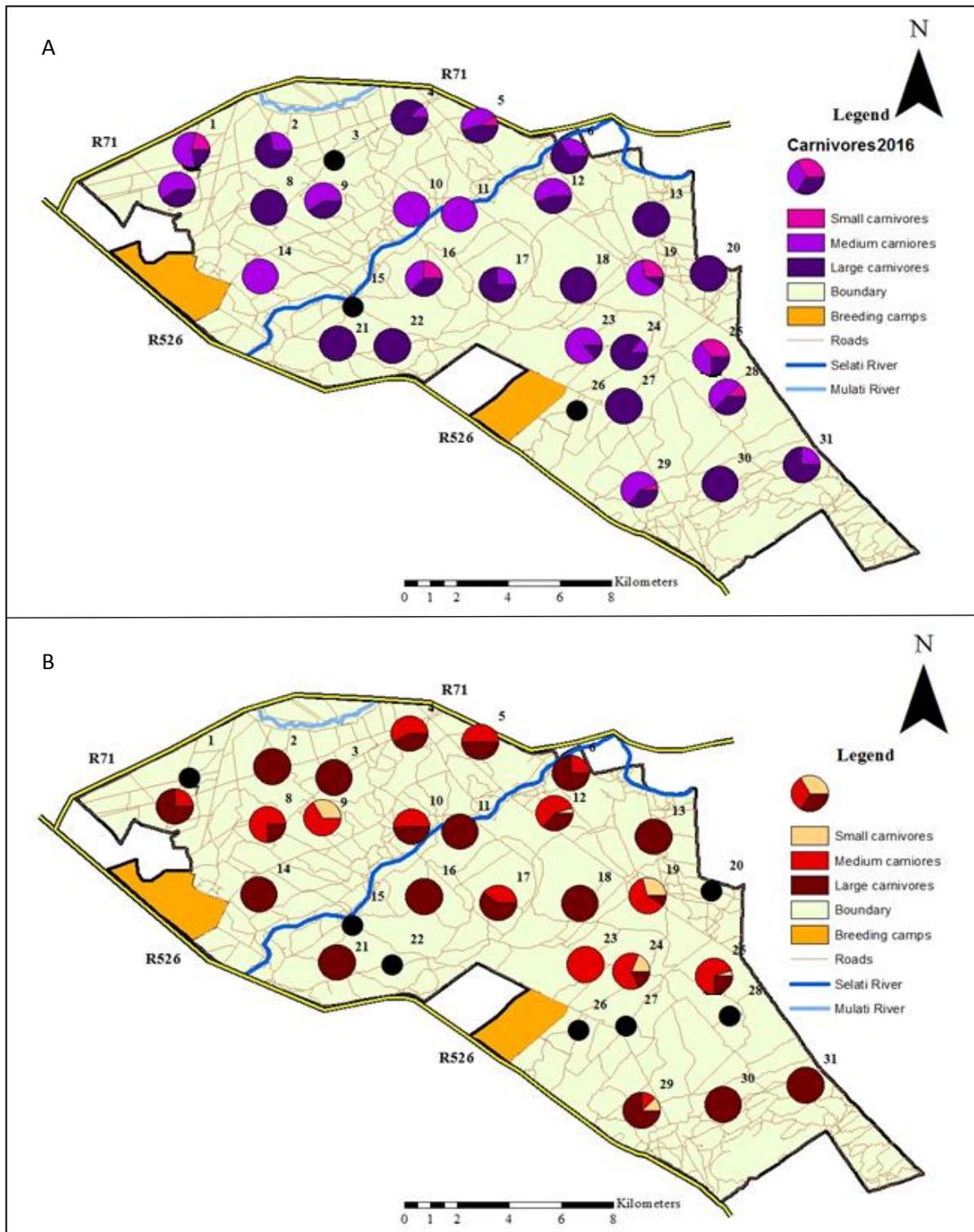
At sites where carnivores were captured, eight sites captured only large carnivores during the dry season, whereas during the wet season 10 sites captured only large carnivores (Figure 2). Camera sites 11, 13, 21 and 30 captured only large carnivores during both the dry and wet sampling periods (Figure 3). Interestingly, at the four camera sites which only captured large carnivores, either large or medium (or both) sized prey had the most number of capture events (Figure 2). This could show that the large carnivores on Selati are utilising areas of the reserve which are high in resources (food), and this is to be expected as large carnivores are both morphologically and behaviourally adapted to kill medium and large sized prey. During the dry season, three sites captured only medium carnivores, whereas during the wet season it was only one site (Figure 3). During both sampling periods no sites captured only small carnivores (Figure 3).

Results from the dry season showed that at sites where small carnivores were captured, there were always more medium carnivores than large carnivores (Figure 3). This was similar to the wet season sampling period except for one site (29), where large carnivores were recorded more than compared to medium carnivores (Figure 2). Once again this could indicate that large carnivores are influencing the spatial dynamics of smaller carnivores through intra-guild competition. During the dry season one camera site in the north (Site 2) and one camera site in the south (Site 29) captured more carnivore events than prey events. During the wet season, however, only one camera site in the centre of the reserve (Site 19) captured more carnivore events than prey events (Figure 4). Our results could therefore, indicate that there are seasonal effects on the spatial patterns of both the prey and carnivore species on Selati.

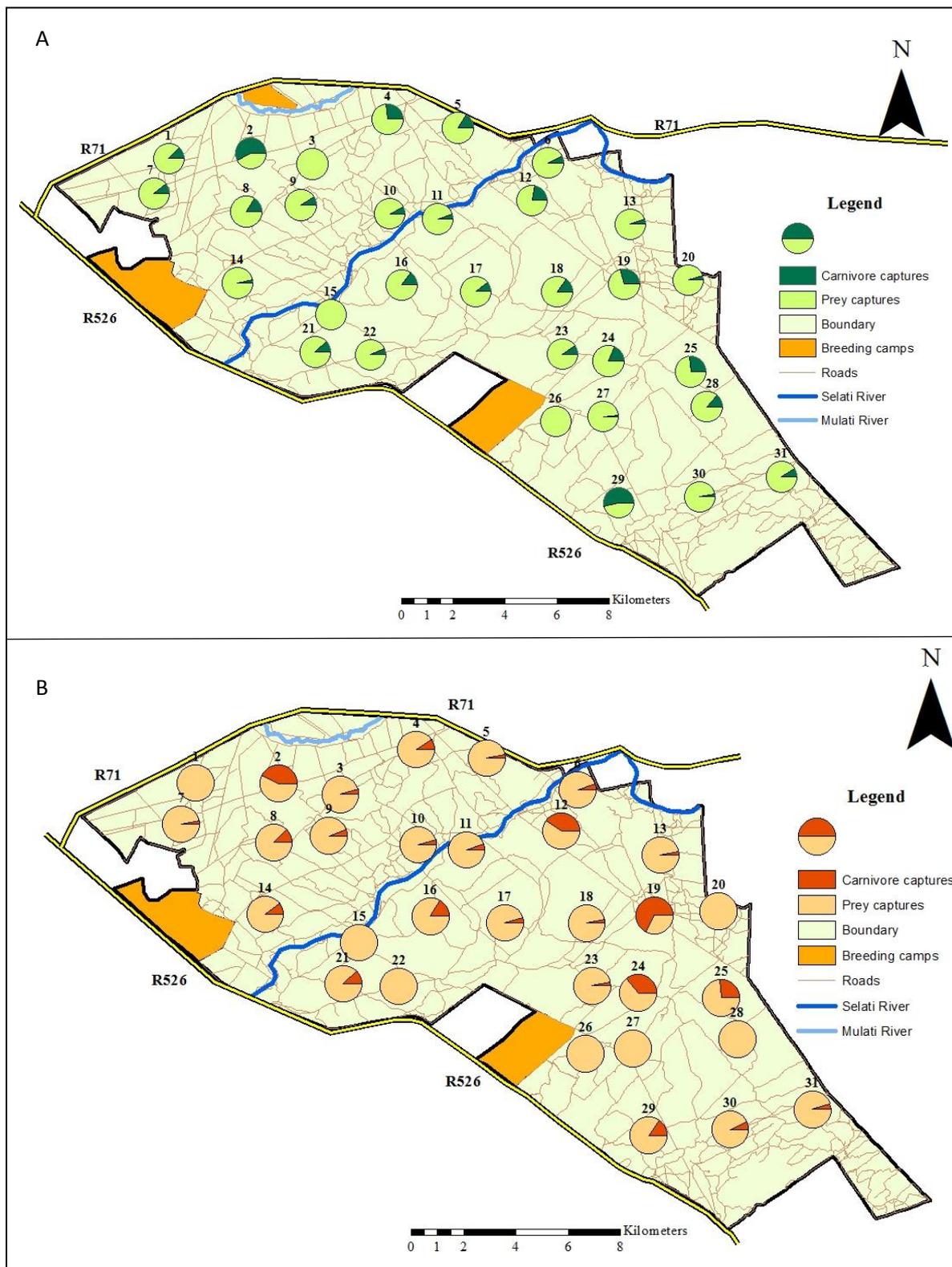
The camera trap surveys seem to be producing very interesting and promising results, with regards to trying to understand carnivore intra-guild competition, but more in depth statistical analyses are needed in order to determine how space and resources are being utilised and partitioned on the reserve.



**Figure 2:** Total capture events of small, medium and large prey species including megaherbivore species at each of the 31 camera trap sites during the first dry season (A) and wet season (B) sampling periods in Selati Game Reserve.



**Figure 3:** Total capture events of small, medium and large carnivore species at each of the 31 camera trap sites during the first dry season (A) and wet season (B) sampling periods in Selati Game Reserve.



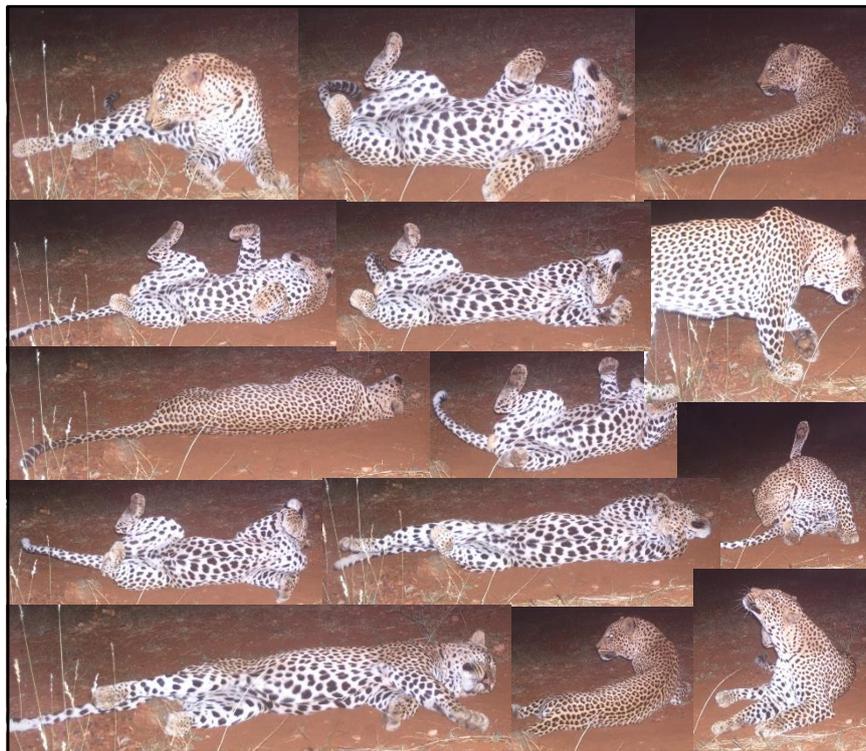
**Figure 4: Comparison of total capture events of prey and carnivore species at each of the 31 camera trap sites in Selati Game Reserve during the first dry season sampling period (A) and first wet season sampling period (B).**



**Figure 5:** Photographs of small (A - serval), medium (B - caracal) and large carnivores (C - lion) captured on camera traps in Selati Game Reserve.

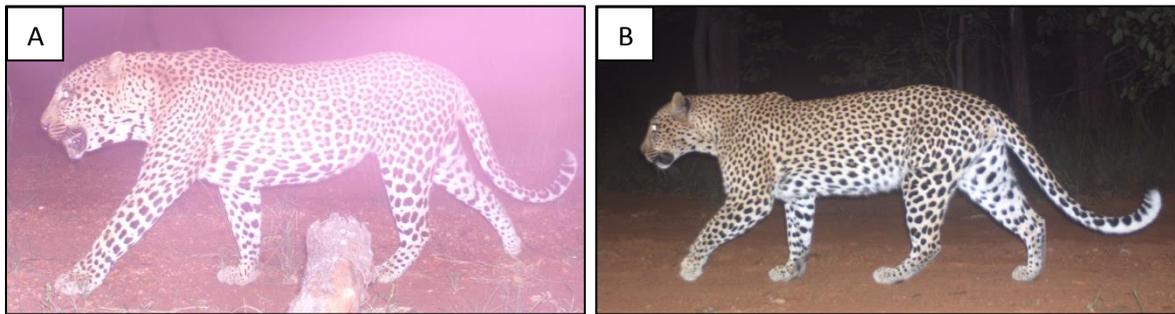
### Leopard

A total of 36 leopard photographs were captured throughout the first wet season camera trap survey, of which 14 photographs were of the same individual male playing in front of camera site 16 between 01:44 and 04:27 on the morning of the 11<sup>th</sup> February 2017 (Figure 6).



**Figure 6:** The 14 photographs of the same male leopard playing in front of camera site 16.

The individual markings of leopard are asymmetrical, therefore the photographs were split into left- (n = 16) and right-hand side (n = 7) photographs. From the left-hand side photographs 10 individuals were positively identified, of which only four were recaptured individuals (male = 1, female = 2, unknown = 1; Figure 7). Additionally, five of the 10 identified individuals were males, two were females and the sex of three individuals was unknown (Figure 7).



**Figure 7:** Photograph of a recaptured male leopard (A) and a recaptured female leopard (B) in Selati Game Reserve from left-hand side photographs captured during the wet season sampling period.

From the right-hand side photographs seven individual leopards were identified, of which two were sub-adults (Figure 8B). Only one of the seven leopards identified was a recaptured individual and it was the same individual as from the left-hand side photographs (Selati had a full identity profile for the male Figure 8A). Additionally, three of the seven identified individuals were males, no females were identified and the sex of four individuals was unknown.



**Figure 8:** Photographs of a recaptured male leopard (A, same male as in Figure 7A) and two sub-adult leopards (B) in Selati Game Reserve from right-hand side photographs captured during the wet season sampling period.

### Spotted hyena

A total of 81 spotted hyena photographs were captured throughout the first wet season camera trap survey. From these photographs, a total of 15 photographs were classified as being photographs of 'unidentifiable' individuals because they were either partial images or of poor quality (e.g. overexposed or individual too far away from camera (Figure 7)). The individual markings of spotted hyenas are asymmetrical, therefore the remaining photographs were split into left- (n = 34) and right-hand side (n = 32) photographs. Similarly to the first dry season sampling period, the left-hand side photographs made up the majority of the photographs, therefore they were used to identify individual spotted hyenas. A total of 25 individual spotted hyenas were identified, of which 14 individuals were recaptures (Figure 8) and the remaining 11 were new individuals (Figure 9).



**Figure 7:** Examples of poor quality photographs captured of spotted hyena during the camera trap survey.



**Figure 8:** Three of the 14 recaptured individually identified spotted hyenas from the first wet season camera trap survey.



**Figure 9:** Three of the newly identified spotted hyenas from the first wet season camera trap survey.

**Scat collection:**

Very few carnivore scats were collected throughout the wet season sampling period. Reasons for this could be because, during the wet season the grasses are much denser and the ability to notice scats deposited alongside the road is reduced.

**Kill sites:**

**Table 3:** Lion kill site information located at GPS fixes on Selati Game Reserve

Animal ID	Date*	S	E	Kill		
				Species	Sex	Age
Mfuti	27/02/2017	-23.962085	30.733315	Waterbuck	M	A
Mburri and Dela	01/03/2017	-23.955766	30.737670	Porcupine	U	A
Mfuti	02/03/2017	-23.979611	30.738426	Kudu	M	A

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

**Table 4:** Leopard kill site information located at GPS fixes on Selati Game Reserve

Animal ID	Date*	S	E	Kill			
				Species	Sex	Age	Comments
LF1	19/02/2017	-23.972393	30.655273	Cape grysbok?	M	A	Collected hair and jaw bones

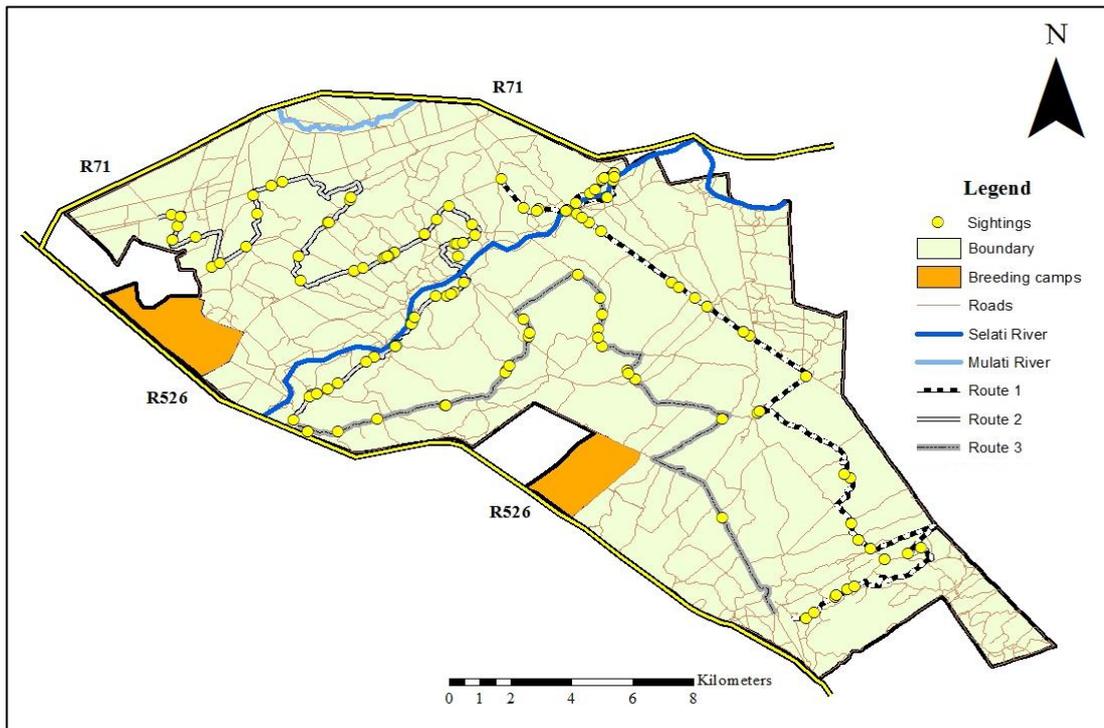
\*Date represents the date the kill was made and not located

### **Road-trip count:**

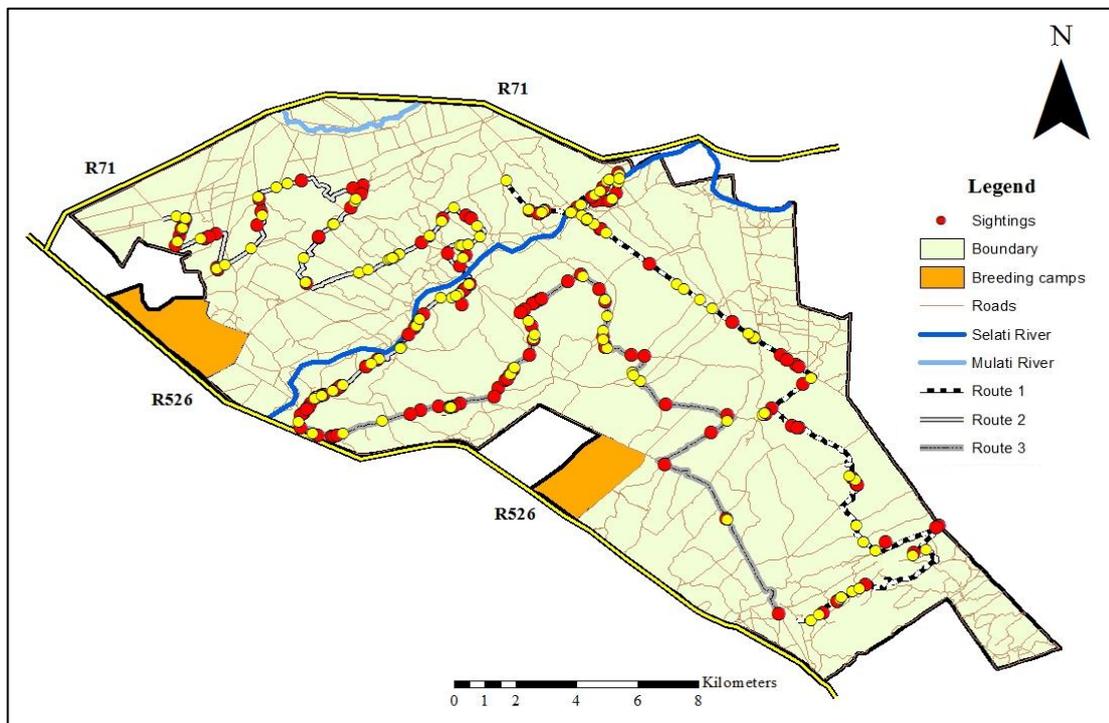
The same three transect routes from the dry season, were each driven (by the same two observers) twice over a period of nine days (13<sup>th</sup> February to 21<sup>st</sup> February 2017). All animal counts were made in the early morning between 06h00 and 09h45. Once an animal or animals were located the following details were recorded: the distance of the animal or herd from the road (used a rangefinder), GPS co-ordinates, the direction from the line of movement of the vehicle, the species, age, sex and total number.

Although, animals were sighted along all three of the routes during the wet season, Route 3 had by far the least number of sightings (Figure 10). During the dry season, however, Route 3 (eastern parts of the reserve) produced the greatest number of sightings (Figure 10). During the wet season Route 2 (north-eastern parts of the reserve) was the route which produced the greatest number of sightings (Figure 11). Once again, as was the case with the dry season sampling period, very few sightings were made in the south of the reserve (Figure 10 & 11) and a great proportion of the sightings were made along the river (Figure 10 & 11). Although, a total of 11 mammal species were identified during both sampling periods the species composition differed. The wet season sampling period had sightings of nyala and elephant, whereas the dry season did not and the dry season had sightings of sable and white rhino, whereas the dry season did not (Figure 12). During both sampling periods, however, impala made up the majority of the sightings for both sampling periods (Figure 12).

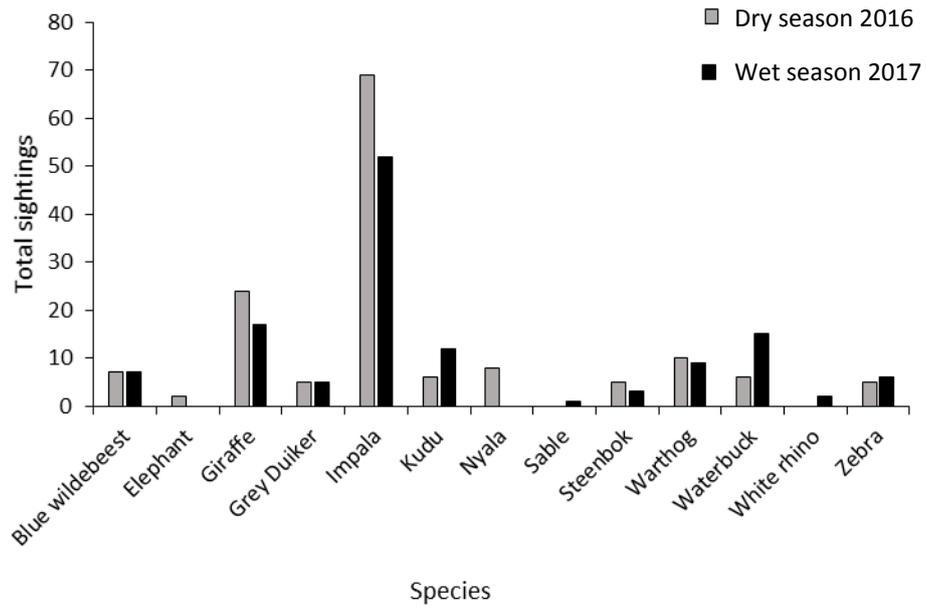
As with the camera trap survey, the road strip count surveys could provide evidence of seasonal effects of the spatial distribution of prey species throughout Selati Game Reserve.



**Figure 10:** Map depicting where sightings of animals were counted along the three road-strip routes during the wet season sampling period.



**Figure 11:** Map depicting where sightings of animals were counted along the three road-strip routes for both the dry season of 2016 (7<sup>th</sup> June to 8<sup>th</sup> Aug) and wet season of 2017 (5<sup>th</sup> Jan to 7<sup>th</sup> March).



**Figure 12:** Total number of sightings for each species for the road-strip count surveys from both the dry season on 2016 (7<sup>th</sup> June to 8<sup>th</sup> Aug) and wet season of 2017 (5<sup>th</sup> Jan to 7<sup>th</sup> March).