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SAEON Camera Trap Study Palabora Copper. Monthly updates: August to November 2017

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Introduction

In June 2012, a network of camera traps was installed across the properties of PMC in order to monitor the use of various habitats by large herbivores. Specific objectives were:

1) To determine which large mammals utilize the rehabilitation areas of PMC, specifically the Rock Dump (Dump 4) and the Tailings Complex, and compare the community composition with that of a benchmark area (the adjacent Cleveland Game Reserve). Of particular interest was:
    a. Which indigenous herbivore species inhabit and feed on the vegetation of the rehabilitation areas?
    b. How does the overall diversity of the rehabilitation areas compare with an undisturbed, natural area?
    c. Are there any species that utilize the rehabilitation areas more intensively than the natural areas of Cleveland?

2) To determine if elephant utilize the riparian zones (of the Olifants and Selati Rivers) more intensively in Cleveland than in a neighbouring section of the Kruger National Park. This is suspected to occur as the operational areas of PMC may act as a barrier which prevents elephants from moving through these riparian areas, forcing them to double-back and thus feed in these areas more than they would naturally do.

Methods

Scout Guard SGS 560 cameras have been used throughout the study. Initially cameras with incandescent flashes were used, but these have gradually been replaced with LED flashes, as the latter consume less power. Cameras are typically place on a tree or a gum pole erected at the site, at a height of 1.5m to 2.5m above the ground and angled slightly downwards. This was judged to be the best set-up to capture any large mammals passing by as well as minimize false triggers caused by vegetation blowing in the wind. The maximum distance at which an animal will trigger a photo depends on the size of the animal, vegetation between the camera and the animal, wind speed and air temperature. However, the cameras used appear to reliably detect species as small as impala up to a distance of at least 5m. Figure 1 below shows the various locations where cameras have been established.
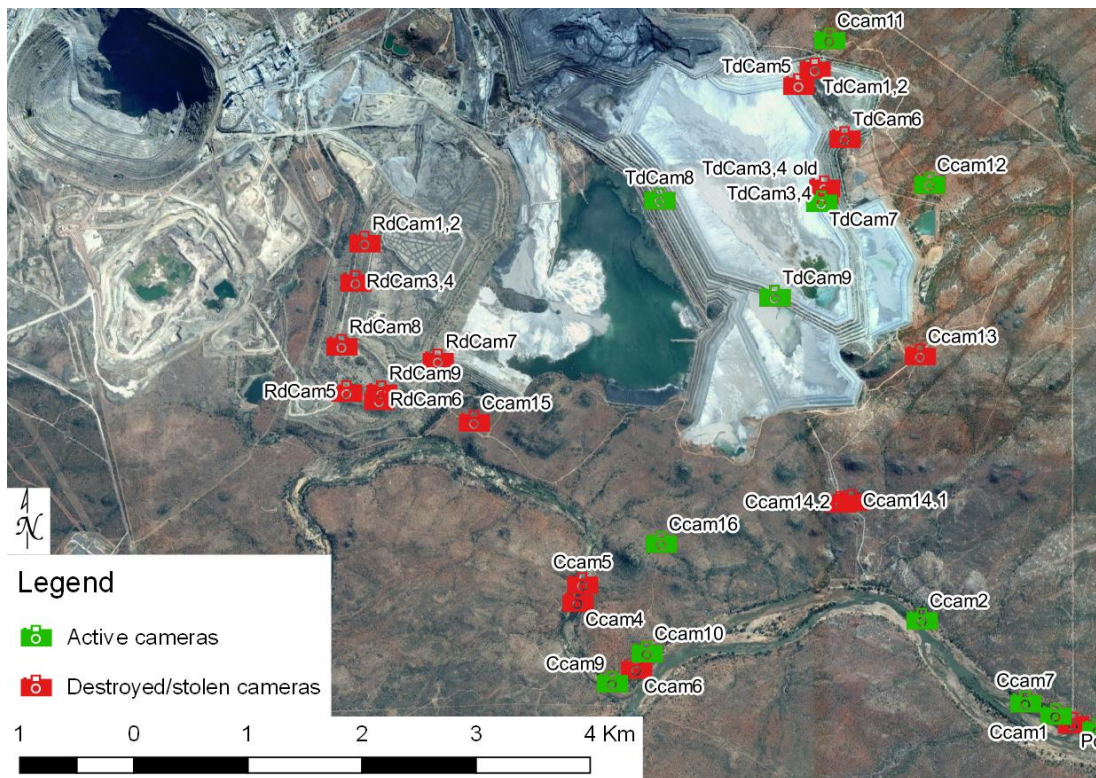
Figure 1. Locations on PMC properties where camera traps have been established since June 2012. Green symbols indicate which cameras are currently active. An additional 5 locations have also been established on the Olifants River downstream of Cleveland, within the Kruger National Park.

Monthly update

For the period August to November 2017, the camera traps were active in the following locations:

Habitat:	Number of camera traps:
Riparian zone of the Olifants and Selati Rivers, within Cleveland:	5
Riparian zone of the Olifants River within KNP	3
Terrestrial areas of Cleveland	3
Terraces of the Rock Dump	0
Terraces and slopes of the Tailings Complex	4

Many of the cameras have reached the end of their life span and have been removed, while damage by elephants is an on-going problem. A number of camera traps have been lost due to theft, including all of those on the Rock Dump. Additional funds are now available to purchase new cameras and to again have at least five in each habitat type. This is planned for early 2018. However, the risk of theft on the Rock Dump, as well as some parts of Cleveland remain too high for cameras to be re-established in these areas.

Synthesis of data collected to date

Downloading the camera traps and transcribing animals present on the photos has proved to be a time-consuming process, with lag times of several months between the time that a photo is taken and the time the data is available for analysis. In addition, careful checking of data and recording of periods when the camera was not recording (due to damage or theft) is a laborious process. There is still a back-log of approximately one year of camera trap data that needs to be checked and analyzed. However, data from the time the network was established up to 1st September 2016 provides some clear patterns of usage of the various habitats on PMC by common herbivore species, and demonstrates the value continuing with the camera trap project.

Since establishment in 2012, the camera trap network has recorded 36 mammal species, as well as Ground Hornbill (a bird species of conservation concern; Table 1). These recordings confirm the use of PMC areas by a number of rare and threatened species, including African Wild Dog and White and Black Rhino. Approximately one third of the species recorded at undisturbed sites in Cleveland have also been recorded on the Rock Dump or Tailings Complex. Buffalo show a strong preference for the Rock Dump in late winter and early summer (Figure 2). Kudu and Waterbuck are generally recorded more frequently on the Rock Dump than in Cleveland, although it needs to be established if their rarity in some years is due to errors in the dataset or simply indicates that the number of camera trap locations is inadequate to monitor these species. Blue Wildebeest show a preference for the Tailings Complex, particularly the "arrow head" plateau. Impala and Elephant are recorded more frequently on the rehabilitation areas compared to the natural riparian zones, which is their preferred habitat during the dry season. Elephants do not appear to be consistently utilizing the riparian zone within Cleveland more than that within an adjacent part of KNP (Figure 3).

Table 1. Species recorded by camera traps on the along the Olifants and Selati Rivers ("Riparian"), on Cleveland ("Terrestrial"), and on the Rock Dump and Tailings Dam, between June 2012 and September 2016. Values are the mean number of animals recorded per month, averaged for between 2 and 6 camera traps. Species in bold are those for which monthly means are greater for the Rock Dump or Tailings Dam, compared to Cleveland.

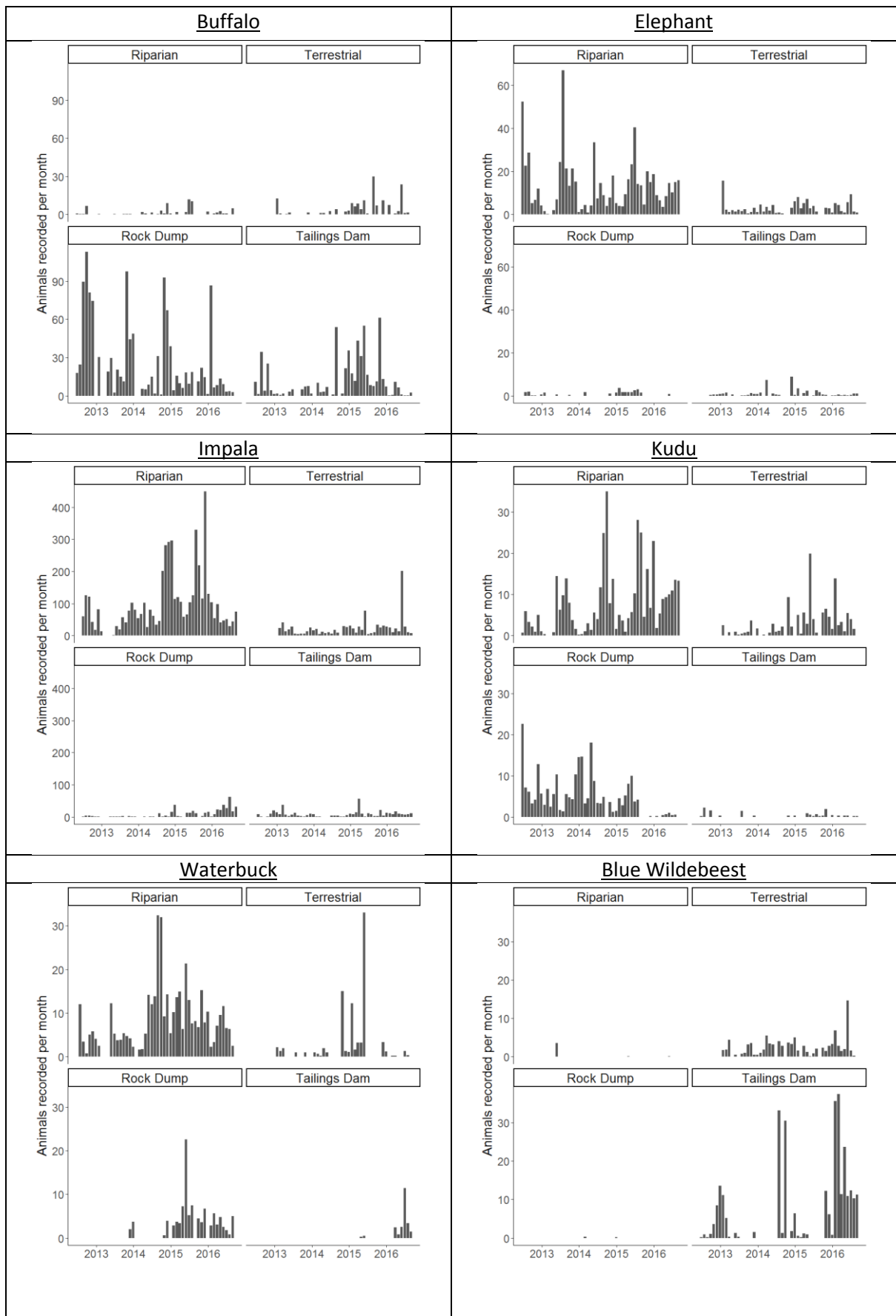|	Species	Riparian	Terrestrial	Rock Dump	Tailings Dam
1	Aardvark	NR	0.01	NR	NR
2	African Wild Cat	0.01	0.04	NR	NR
4	Baboon	13.31	1.12	0.10	0.41
5	Black Rhino	NR	NR	0.004	NR
6	Black-Backed Jackal	NR	0.06	NR	NR
7	**Blue Wildebeest**	**0.08**	**2.29**	**0.01**	**5.81**
8	**Buffalo**	**1.39**	**3.62**	**24.53**	**10.92**
9	Bushbuck	4.37	0.11	0.03	0.00
10	Cane Rat	0.03	NR	NR	NR
11	Civet	0.18	0.18	NR	0.00
12	Elephant	13.45	2.98	0.56	0.87
13	Genet	0.04	0.11	NR	NR
14	Giraffe	2.07	1.15	0.05	0.01
15	Grey Duiker	0.06	0.46	0.20	0.08
16	Ground Hornbill	NR	0.01	NR	NR
17	Hippo	2.53	0.21	0.08	0.11
18	Honey Badger	0.05	0.08	NR	NR
19	Impala	96.16	22.73	7.98	8.19
20	Klipspringer	0.00	NR	0.05	NR
21	**Kudu**	**7.77**	**2.75**	**4.71**	**0.25**
22	Leopard	0.65	0.13	0.02	0.03
23	Lion	0.02	0.07	NR	0.03
24	Mongoose	0.00	0.01	NR	NR
25	Nyala	0.27	0.01	0.03	NR
26	Porcupine	0.39	0.25	0.03	0.00
27	Scrub Hare	0.06	0.24	0.01	0.03
28	Sharpes Grysbok	0.01	0.36	NR	0.03
29	Spotted Hyena	0.12	0.57	0.02	0.33
30	Spring Hare	0.05	NR	NR	NR
31	Steenbok	0.08	0.14	0.01	0.00
32	Vervet Monkey	0.96	0.01	0.01	NR
33	Warthog	1.07	2.80	0.29	0.37
34	Waterbuck	7.90	2.04	2.04	0.45
35	White Rhino	0.004	0.004	NR	NR
36	Wild Dog	0.06	0.02	NR	0.08
37	Zebra	0.01	2.52	0.28	1.09
	TOTAL SPECIES	32	32	22	22

Figure 2. Camera trap recordings from along the Olifants and Selati Rivers within Cleveland ("Riparian"), on Cleveland ("Terrestrial"), and on the Rock Dump and Tailings Dam, for the most common herbivore species of the area. Bars show the total number of animals recorded per month, averaged for between 2 and 5 camera traps operating in each habitat type.
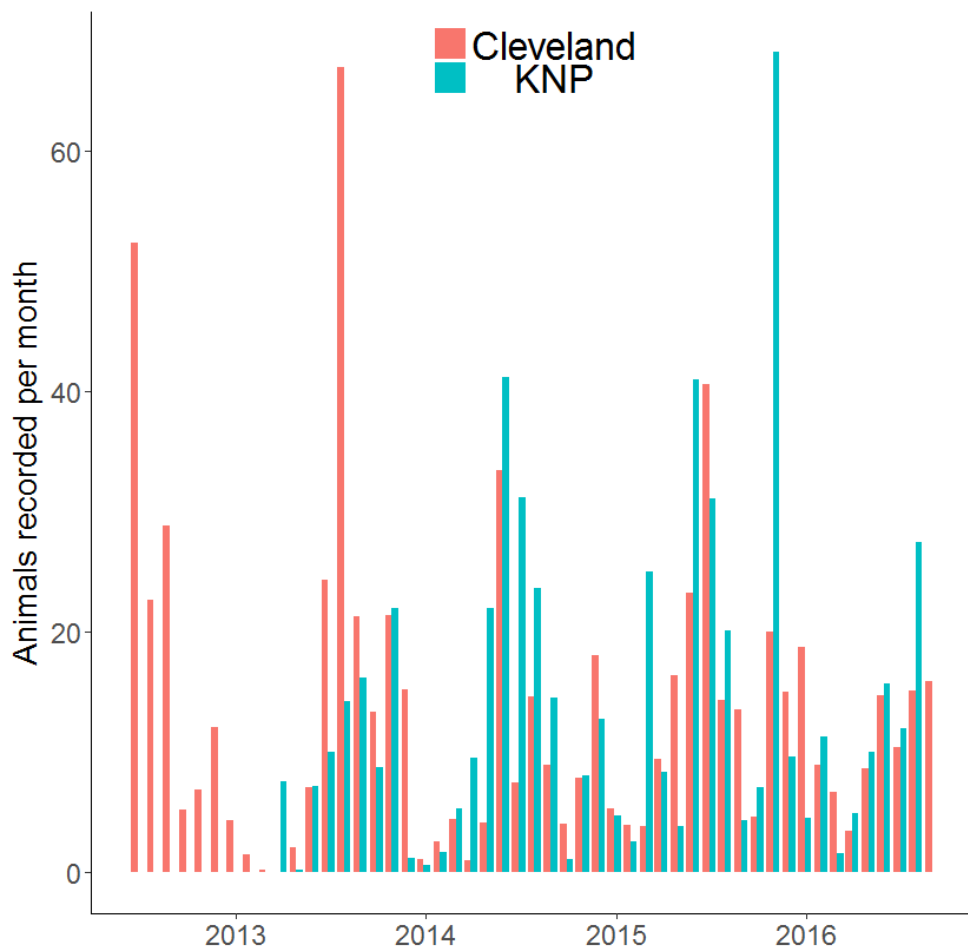
Figure 3. Mean monthly numbers of Elephant recorded by five camera traps located along the Olifants and Selati Rivers in Cleveland versus five located downstream along the Olifants River In the Kruger National Park (KNP). The cameras in KNP were only established in June 2013.