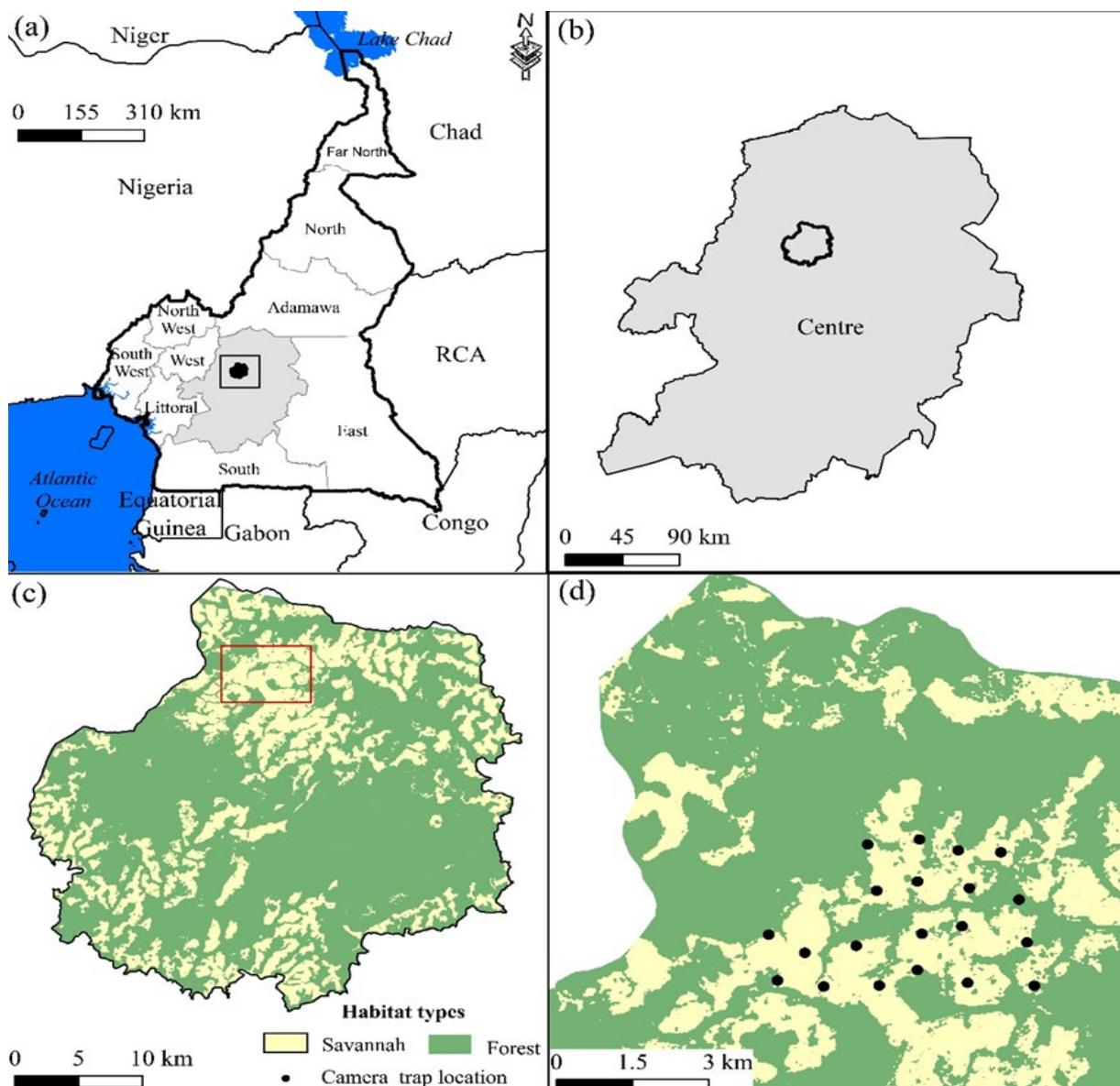


## Project Update: June 2022

**Goal:** We seek to gather more information about the giant pangolin (*Smutsia gigantea*) ecology by investigating the niche overlap with and the armadillo (*Orycteropus afer*) and seasonal variation in activity

### Survey design

Between February 19 and 23 May 2022, we installed 20 camera traps to monitor potential locations of the giant pangolin in Mpem et Djim National Park (Fig. 2). We used this survey approach in 2018 to successfully document both giant pangolin and armadillo in the MDNP (Simo et al in prep). Camera traps were deployed following a systematic placement whereby each camera trap station was separated from the neighbouring one by a minimum distance of 1 km (Fig. 1). Deployment was made so as to cover 1 month in the dry season (from 19/02.2022 to 19/03/2022) and 1 month in the rainy season (from 20/03/2022 to 20/04/2022).



Map of the study area showing the location of camera-traps in the Mpem et Djim.

National Park, the habitat covers (forest vs savannah). Habitat type was mapped using a supervised classification approach in ERDAS IMAGINE 2014 and ArcGIS 10.6

### Camera trap deployment

The deployment of cameras was made following the protocol for medium to large sized mammals (Ahumada et al., 2011; Bruce et al., 2018). Camera traps were strapped to trees or on poles, perpendicular to pangolin targeted locations at a distance of 3.5 to 4 m with the aim of obtaining full-body lateral images of animals passing in front (Fig. 3). Cameras were set on photo and video mode. Those set on photo mode were programmed to take three consecutive photos for each trigger event with the lower delay between consecutive trigger whilst camera set on video mode were programmed to take a 15-second video with no delay between consecutive triggers.



Figure 3: (a) installation of a camera trap on a tree to monitor a potential giant pangolin / armadillo location (b) crawling test to check correct functioning and correct angling of camera traps.

Potential locations for the deployment of camera-traps include feeding sites that were mostly termite mounds and living burrow that were holes duck on the ground with a diameter ranging from 40 to 70 cm (fig. 4)



Figure 4: (a) targeted locations chosen for the placement of camera-traps (a) termite nest (b) living burrow.

## Results:

### Sampling effort

The survey accumulated a total of 1016 camera trap days, with camera trap days calculated as the total number of 24-hour periods in which each camera was operational. Two camera traps were burned by the fire and four malfunctioned. The survey recorded 30 mammal species belonging to six orders and 13 families (See Appendix 2)

### Niche partitioning between Giant pangolin and Aardvark

We recorded a total of three giant pangolin at three different sites and 13 aardvark detection at seven different sites. Aardvark co-occurred at all stations where the giant pangolin was recorded. Giant pangolin and aardvark were recorded at one living burrow just 2 days apart. Both species were photographed visiting (entering and exiting) the burrow, but they remained only a few seconds in the burrow and left the site afterward. Both species were also photographed at the same termite mound 3 days apart. While the aardvark only inspected the termite mound and left, the giant pangolin was seen entering a burrow that was situated at the basis of the termite mound. We did not obtain sufficient detection of both species to elaborate on their cohabitation, but they seem to display a moderate spatial and temporal separation.



Figure: Giant pangolin and aardvark visiting the same burrow two days apart



Figure: Giant pangolin and aardvark visiting the termite mound three days apart

### Seasonal variation in activity

We obtained too few records to say anything on the seasonal variation in the detection of the giant pangolin. However, the three independent events recorded occurred after return of the first rains in March 2022, probably coinciding with high activity of termites. All recorded event occurred during the night time which is in line with the species ecology.

### Appendix: Photos of other recorded wildlife species



Left: Defassa waterbuck. Right: Kob



Left: Male Bushbuck. Right: African civet



Left: Warthog. Right: Savannah Buffalo



Left: Blotched genet. Right: Serval inspecting a giant pangolin/aardvark burrow



Giant pangolin and Aardvark visiting the same burrow

## Appendix 2: List of species recorded

Species names	Number of events	Trapping rate
<i>Atherurus africanus</i>	34	1,38
<i>Atilax paludinosus</i>	13	0,53
<i>Bdeogale nigripes</i>	1	0,04
<i>Cephalophus callipygus</i>	26	1,05
<i>Cephalophus dorsalis</i>	2	0,08
<i>Cephalophus rufilatus</i>	3	0,12
<i>Cephalophus silvicultor</i>	4	0,16
<i>Cercocebus agilis</i>	29	1,17
<i>Civettictis civetta</i>	7	0,28
<i>Cricetomys emini</i>	14	0,57
<i>Funiscirus pyropus</i>	1	0,04
<i>Funisciurus pyrropus</i>	1	0,04

<i>Genetta cristata</i>	1	0,04
<i>Genetta maculata</i>	16	0,65
<i>Genetta servalina</i>	24	0,97
<i>Herpestes naso</i>	18	0,73
<i>Herpestes sanguineus</i>	1	0,04
<i>Kobus ellipsiprymnus</i>	7	0,28
<i>Kobus kob</i>	1	0,04
<i>Leptailurus serval</i>	2	0,08
<i>Nandinia binotata</i>	37	1,5
<i>Orycteropus afer</i>	13	0,53
<i>Papio anubis</i>	2	0,08
<i>Phacochoerus aethiopicus</i>	1	0,04
<i>Phataginus tricuspis</i>	3	0,12
<i>Philantomba monticola</i>	105	4,25
<i>Poiana richardsonii</i>	4	0,16
<i>Potamochoerus porcus</i>	3	0,12
<i>Protoxerus stangeri</i>	1	0,04
<i>Smutsia gigantea</i>	3	0,12
<i>Syncerus caffer</i>	6	0,24
<i>Thryonomys swinderianus</i>	2	0,08
<i>Tragelaphus spekii</i>	5	0,2



Survey team at the entrance of Mpem et Djim National Park