Project Update: October 2019

Introduction

Pangolins in general are notoriously challenging to detect and to monitor even with advanced methods like camera trapping. They are primarily nocturnal with the exception of the black-bellied pangolin which is diurnal/nocturnal (Jonathan et al., 2013; Ingram, Willcox & Challender, 2019). Pangolins are solitary and naturally occur at very low density and, combined with their overexploitation to fuel the international market in pangolin scales and whole animal mostly use in Asian country for traditional medicine, has resulted in these animals being so rare and difficult to detect in the wild (Willcox et al., 2019).

Three pangolin species occur in Cameroon, the giant pangolin, the white-bellied pangolin and the black-bellied pangolin. The giant pangolin is a fossorial species living in burrows whilst the black-bellied pangolin is arboreal and white-bellied pangolin a semi-arboreal species making their detection with camera traps a difficult task and as a result no standardised monitoring method is available for these species. The white bellied pangolin is the most common pangolin species in Cameroon as is regularly observed in wild meat market. We then took the reasonable assumption that local people may be skilled in locating and capturing this animal in the wild. We used a combination of local ecological knowledge approach using a questionnaire survey to assess the various locations usually targeted by hunters to capture the white-bellied pangolin in the wild (Simo et al., in prep) and a pilot camera trap study in Deng Deng National Park to confirm the local people's declaration (Simo et al., in prep).

Among the different locations listed by local people and which we monitored with camera traps, the assumed white bellied pangolin feeding signs located on dead wood and dead fallen logs where the two areas that provided regular detections, the other location provided only occasional photographs. This location is well described in Simo et al in prep. Here we installed 30 camera traps in the forest area of Mpem et Djim National Park, MpDNP including 15 on dead fallen logs (hereafter, logs) and 15 on feeding signs situated on dead wood (hereafter non-logs). The objectives of this survey were to document the white-bellied pangolin presence in the forest area of MpDNP and assess the suitable location for the camera trap placement ensuring the white-bellied pangolin monitoring in the forest with moderated survey effort and the associated trapping rate.

Camera-traps recovering from the forest area in Mpem et Djim National Park

The camera traps installed between May and June 2019 were all recovered from September 6th to 9th for a total of 90 days for each camera trap. None of them had been damaged by animals or by humans.

Western boundary of the Mpem et Djim National Park (river May), October 2019. © Ghislain FOPA.

Camera trap recovery in the forest area of Mpem et Djim National Park. © Ghislain FOPA.

Pangolin presence in the forest area of Mpem et Djim National Park

Smaller pangolin

The white-bellied pangolin presence was confirmed in MpDNP using camera traps. No evidence was obtained for the black-bellied pangolin on the locations used to monitor the white-bellied pangolin.

White bellied monitoring

Thirty camera traps have been established in the forest area of the MpDNP on the assumed white-bellied pangolin pathway and signs of activity. Sites chosen for the white-bellied pangolin monitoring in the wild include feeding sites located on dead trunks and fallen logs. The criteria guiding camera traps establishment in one or other targeted location are well described in Simo et al in prep.

Figure 1: white bellied pangolin captured on a feeding site in Mpem et Djim National Park.

Figure 2: White bellied pangolin obtained on feeding sites located on dead trunk.

Figure 3: White-bellied pangolin photograph obtained on logs.

Trapping rate

Both camera traps deployed in feeding sites located on dead trunk and on fallen logs performed well to detect the white-bellied pangolin in MpDNP however, fallen logs were the best targeted areas in this that they exhibited the best trapping rate and they also allows the detection of the white-bellied pangolin within 2 days of camera trap deployment. We included in this study as an "event" consecutive detections of obvious different species and we applied a pre-filtering interval of ≥60 min to separate image sequence from the same species to ensure independence of species events(Tobler *et al.*, 2008; Amin *et al.*, 2015). We accumulated a total survey effort of 2635 camera nights including 1357 on logs and 1278 on non-logs (table 1). The results will be better presented and discussed with consideration to the camera trap placement strategies and cover land in Simo et al in prep. However, we recommend deploying camera traps on logs for the white-bellied pangolin monitoring in the wild.

Table1: Number of independent events per targeted location

Target location	Number of camera sites	Surveys effort	Number of sites detected	N° independent events	Trapping rate
Logs	15	1357	15	108	7.9
Non logs	15	1278	8	28	2.34
Total	30	2635	23	136	5.23

Giant pangolin monitoring in the forest area

Ten camera traps have been established in the forest area of the MpDNP during this same period on the assumed giant pangolin signs of activity. No active burrow was recorded in the forest area. This was attributed to the fact that the aardvark *Orycteropus afer* who is believed to be the one digging the burrow was not detected in the forest area of the MpDNP though being known to occur ubiquitously in all biomes except deserts (Skinner and Smithers, 1990). The giant pangolin presence was confirmed in the forest area of MpDNP. In addition, with the previous photographs we provided in gallery forests, and in savannah area, this species was detected in all cover land of the MpDNP. Giant pangolin is believed to occur primarily in lowland tropical moist and swamp forest (Walterman *et al.*, 2013). We hypothesis that in MDNP, giant pangolin mostly relies on aardvark burrows all distributed in the savannah part of MpDNP for nesting and used the gallery forest and forest habitat to forage. This observation is better discussed in Simo et al. in prep with supporting data from prey availability and water courses distribution.

Figure 3: Giant pangolin photograph in the forest area of Mpem et Djim Nation Park, Cameroon

Next step of the project is the final report compilation.

Acknowledgment:

Thank you to the Rufford Foundation for providing us with financial support to carry out this research. We are also very grateful to the conservator of Mpem et Djim National Park M. Bissek Jean Pierre for assistance and support in conducting this research. We Thank the Zoological Society of London ZSL, Cameroon for assistance with additional camera-traps. We acknowledge Galandi Bertin, Ndjibe Issa, Ngomane Lazard, Ngoura Jean Bosco and Ngomane Pierre for help in the field.

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