

# Abundance and distribution of Clouded Leopard in Royal Manas National Park

A detail Project Report



Tshewang Jaimo  
Royal Manas National Park  
Gelephu

April 25, 2016



## Background of the study

The Royal Manas National Park is identified as the one of the hotspots for wild felids. Eight of the eleven wild cat species found in Bhutan occur in the park indicating about 72% of the diversity. While the occurrence of those wild cats are confirmed through sign and pictorial evidences, study on individuals cats has not been conducted and distribution and populations status remained unknown. Except for Royal Bengal Tigers, the abundance and distribution of any co-predators are poorly studied in the park and elsewhere in Bhutan. This limitation has lead to poor management planning of medium size cats, thereby rendering them vulnerable to rapid habitat destruction and poaching.

The camera trap survey was conducted to assess the Abundance and distribution of clouded leopard (*Neofelis nebulosa*) in Royal Manas National Park. In 45 days of camera trapping, with total of 5175 trap nights, only 20 stations could capture the photographs of this cat species. The capture probability is only 17.4 %. The distributions are found across the study area with abundance more in Gomphu Range, the northern part of the park. The preferred habitat is edge of grasslands (meadows and shrubs) and woodlands.

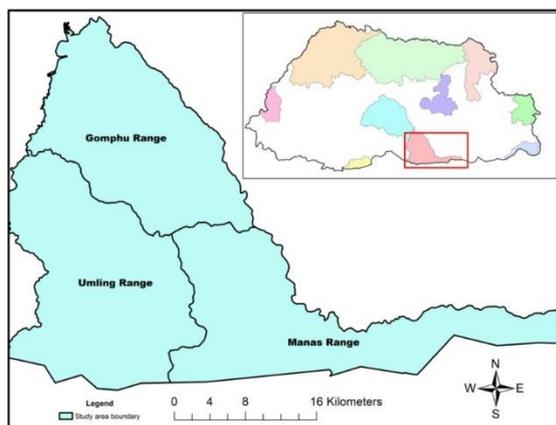
## Objectives

In general the project aims to generate baseline information on the clouded leopard in Royal Manas National Park with two specific objectives:

1. To understand the distribution pattern of species within the park area across different vegetation zones
2. To assess the abundance of species across three ranges as well as in comparison to other cat species found in the park.

## Study area

The 1057 km<sup>2</sup> Royal Manas National Park (see map below) lies on the border of the Manas National Park in the Assam state of India. Located with the junction of Indo-Gangetic and Indo-Malayan bio geographical realms, this park is home to rich floral and faunal diversity such as Royal Bengal Tiger, clouded leopard and many other cat species. The other large mammals include Asian elephant, gaur and water buffalo. Together with Manas National Park in India, the study area forms one of the largest areas for tiger conservation in South Asia expanding its habitat from the subtropical plains to the temperate forests.



**Map 1. The study area - Royal Manas National Park**

## Material and methods

The camera traps (Cuddyback, Non-Typical Inc., Wisconsin, USA; Panthera Camera Trap V<sub>3</sub>, Panthera, USA; and Bushnell camera trap, Bushnell Outdoor products, California, UK) were set up in 115 locations covering three ranges in Royal Manas National Park from May 2015 to January 2016. A pair of camera placed in a 2.5 x 2.5 km grid cell was distributed in the entire park areas of 1057 km<sup>2</sup>. The camera locations within the grid cell was selected in a way that covers entire sample areas and ensuring 100 percent chances for animal being photographed. Most of the camera traps were put on prominent paths and animal trails using the prior knowledge of sign survey conducted by the park to ensure maximum chances of photographing the shy and nocturnal animals.

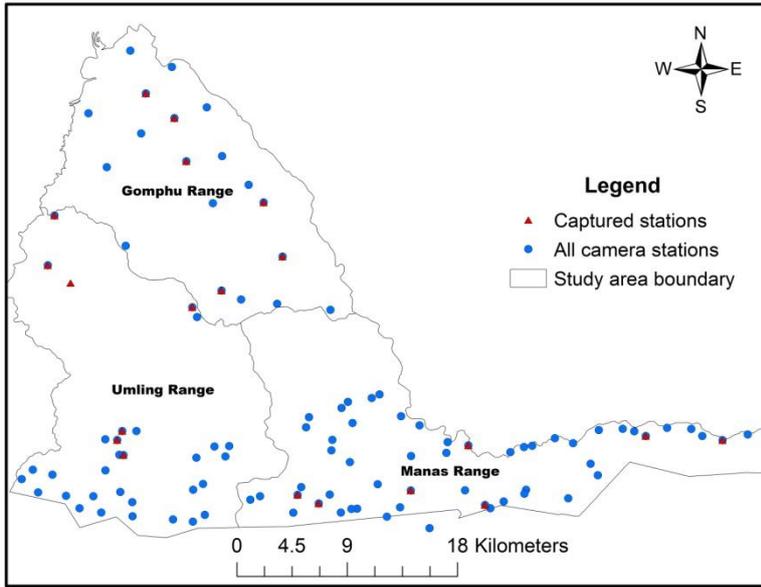


Picture 1 & 2. Installing camera traps in the field

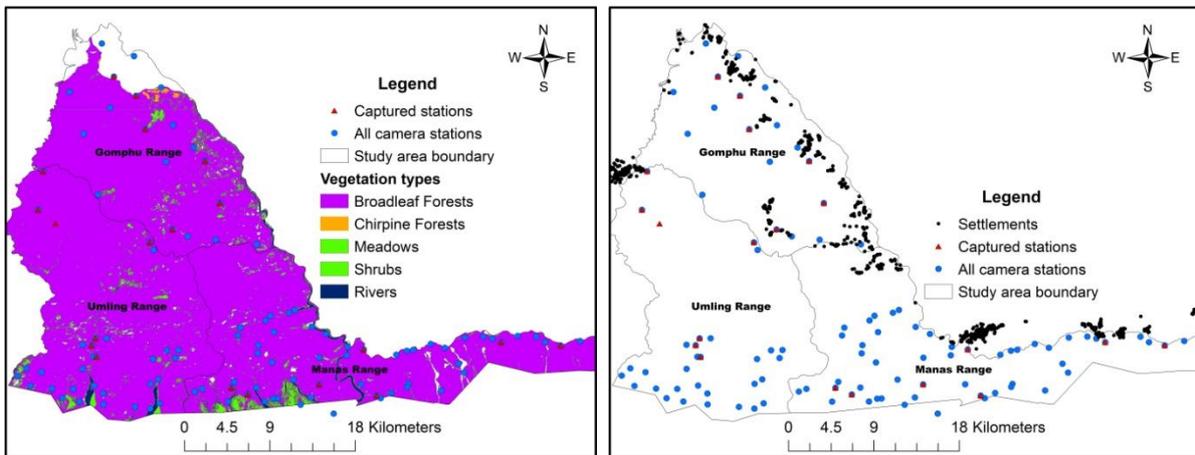
## Result and discussions

### *1. Distribution of clouded leopard in Royal Manas National Park*

The photographic capture from the camera trap shows that the clouded leopards are distributed across whole park areas which has altitude range of 97 to 2740 meters above the sea level (see map 2). The literature suggest that this species can go up to an elevation of 3000 meters indicating that the entire park areas if the disturbances are absent could be potential habitat for them. The distribution patterns at the different elevation ranges and vegetation types suggest that they prefer areas where the undergrowth (meadows and shrubs) overlap with the woody trees (see map 3). Most of the captures are also recorded at the fringe of settlements (though not very close like common leopards) (see map 4). In general, they are seldom known to occur along the river banks and edges of villages but this could be an adaptation based on the food availability and forest conditions.



Map 2. The camera trap stations and capture stations of clouded leopard



Map 3 & 4. Clouded leopard distribution patterns in the study area

## 2. Abundance

The photographic rates calculated for each range indicated that the abundance of clouded leopard is highest in Gomphu Range and lowest in Umling Range (see table 1). The Number of days required for one event is 13 days in Gomphu and 354 days in Umling. This indicates that their abundance is high in elevation above 1000 meters. The study on six cat species in RMNP also shows that the photographic rate of clouded leopard is lowest amongst other large and medium cats (Tiger and common leopard).

Table 1. The clouded leopard photographed under three ranges in RMNP

Range	No. of events	Photographic rate	No. of days required for 1 event	Total trap nights
Gomphu	85	0.0756	13.235	1125
Manas	30	0.0247	40.500	1215
Umling	8	0.0028	354.375	2835

The overall photographic rate of clouded leopard in RMNP is 0.023 which indicates that the abundance is very low. While the records from the SMART data base of the park have recorded zero poaching cases of this species for past five years, the exact causes for its low density is beyond the scope of this project.

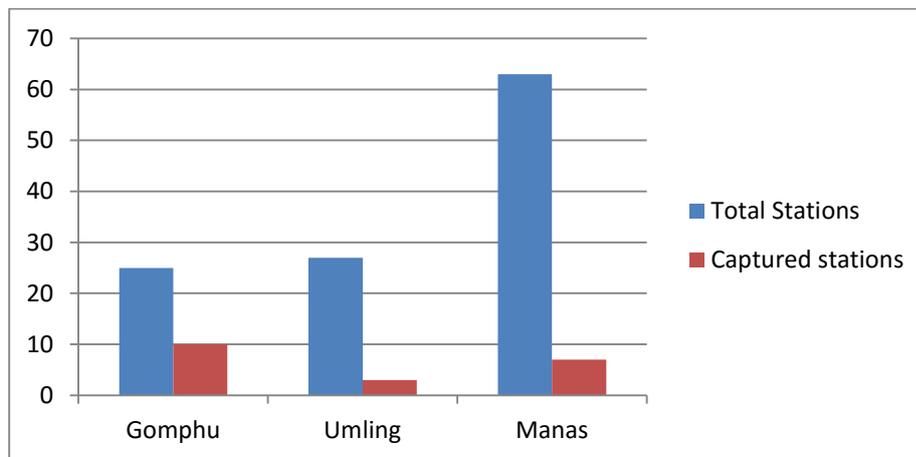


Figure 1. The total camera stations against capture stations for clouded leopard.

### Recommendations

Based on the observation made through this short term study, the following recommendation are made for the park management of Royal Manas National Park to consider in their management planning:

1. The annual monitoring of this species using the camera trap along with the Tiger is recommended owing to its low density. The photograph repository could be maintained for long term monitoring of the species.
2. The population assessment of this species might be necessary to come up with the conservation strategy to protect its habitat in the long run.

Some pictures from the study



## **Acknowledgement**

I would like to acknowledge following organizations and individuals for their contributions for this study:

1. The Rufford Small Grant Foundation, UK for funding the project and giving me opportunity to take up the project.
2. The Park manager and staff of Royal Manas National Park for their logistic support and permission to conduct study in the park
3. My referees (Mr. Wangchuk Dorji, Mrs. Deki Wangmo and Mr. Jigme Dorji) for their support and guidance during the research work starting from the proposal stage.
4. Mrs. Singye Wangmo for her help and guidance in the data collection and analysis
5. All the field staff and local guides who has contributed to this project

## **Bibliography**

Borah, J., Sharma, T., Das, D., Rabha, N., Kakati, N., Basumatary, A., Ahmed, MF., & Vattakaven, J., 2013, Abundance and density estimates for common leopard *Panthera pardus* and clouded leopard *Neofelis nebulosa* in Manas National Park, Assam, India, Fauna and Flora International, Oryx, p. 1-7.

Cheng, E., Dorzang, K., Kelley, MJ., Assessing distribution and abundance of three small felid species in Royal Manas National Park, Bhutan, A case study.

RMNP, 2014. Field report on mammals of Royal Manas National Park, Royal Manas National Park, Gelephu.

RMNP, 2015. Conservation Management Plan, Royal Manas National Park (July 2015-June 2020), Royal Manas national Park, Gelephu.

Tempa, T., Mark, HL. MI L L S, S., Wangchuk, TR., Norbu, N., Wangchuk, T., Nidup, T., Wangchuk, D., Wangdi, Y., & Dorji, T., Royal Manas National Park, Bhutan: a hot spot for wild felids, available at <http://journals.cambridge.org>.

Wangchuk, T., Thinley, P., Tshering, K., Tshering, C., Yonten, D., Pema, P., 2004, A field guide to Mammals of Bhutan, Royal Government of Bhutan, Thimphu.