Mid Term Report

Indo-Bhutan Transboundary Tiger Monitoring in Barnadi-Jomotshangkha Forest Complex.

2017

Project Coordinator
M Firoz Ahmed, PhD, Aaranyak

Project Contact
Bibhuti Prasad Lahkar, PhD, Aaranyak

Implemented by
Aaranyak, Guwahati
Divisional Forest Officer, Udalguri, Assam
Chief Forest Officer, Jomotshankha Division, Bhutan

Supported by

21st Century Tiger
London, UK

Address for Communication
Aaranyak
13 Tayab Ali Byelane
Bishnu Rabha Path, Beltola Tiniali
Guwahati 781028, Assam, India
info@aaranyak.org
mfa.aaranyak@gmail.com
www.aaranyak.org

Contents

1. Introduction Page No.

Status of tiger- Bhutan India

TraMCA

Conservation history- Bornadi & JSW

Importance of the study- Brief about all the species captured in camera trap

2. Study Area

Khalingduwar RF

Bornodi WLS

Jomotsangkha WLS

3. Methods

Photographic capture-recapture (Camera Trapping)

4. Results

i. Efforts- Map + Table

ii. Camera Trapping Area- Map

iii. Animal Capture- summary/account of no. of individuals, no. of species captured

1. Introduction

The tiger, *Panthera tigris*, being the top predator functions as an umbrella species for the conservation of biodiversity, ecosystem functions, goods, and services in the forest systems of South and Southeast Asia. Tigers play a vital role in regulating and perpetuating ecological processes and systems. Tigers, being highly adaptable, exist in a wide range of forest types, and climatic regimes and subsist on diverse prey. Tigers have an extensive range spanning a total of 1.5 million km^2 area across Asia, within which surviving populations occur patchily and at low densities. Over the past 100 years, in Asia, tigers have lost 93% of their former range. Only 5% of the world's wild tigers continue to survive since the last century. India represents the world's greatest stronghold for the species, with an overall population of more than 2,200 individuals. Major threats to tigers are poaching that is driven by an illegal international demand for tiger parts and products, depletion of tiger prey caused by illegal bush meat consumption, and habitat loss due to the ever increasing demand for forested lands.

Status of tiger- India

Tigers were recorded to occupy 89,164 km in 2014 in India. Correction for imperfect detection of tigers resulted in a marginal increase in occupancy of 2.4 to 6% over the naïve estimate. Occupancy surveys had high detection probabilities ranging between 0.28 to 0.48. Tiger occupancy was best explained by remote undisturbed forests with good prey populations. Tiger population (excluding < 1 year cubs) was estimated to be 2226 (SE 1945-2491) in India. Amongst tiger reserves, Corbett had the largest tiger population estimated at 215 (range 169-261) tigers, four tiger reserves (including Bandipur, Nagarhole and Kaziranga) had over 100 tigers. Tiger Reserves accounted for over 60% of all the tigers in India (Status of Tigers, Co-predators & Prey in India, 2014).

Status of tiger- Bhutan

Tigers in Bhutan are a global priority for the species' conservation. With more than 72% of the country under forest cover and 51.4 percent under protected areas, Bhutan is home to a staggering 103 tigers. Tigers are thriving in Bhutan and the population here is believed to have the highest probability of long-term persistence in the world. This can be attributed to good swathes of contiguous forest habitat and prey, complimented by strong conservation leadership and religious sentiments of the Bhutanese people.

Recent use of camera trap technology in Bhutan has provided amazing insights into the cat's movement and ecology. Tigers in Bhutan can be found at a broad elevational range, starting from as low as 100m in the south to over 4000 metres in the north and what is even more magnificent is that the tigers are moving across large landscapes, unhindered and safe.

Transboundary Manas Conservation Area (TraMCA)

The Transboundary Manas Conservation Area (TraMCA) was conceptualized in 2011 and forms an important priority transboundary landscape. TraMCA covers an area of 6500 km^2 and belongs to one of the three transboundary landscapes across the Eastern Himalayas that connect Bhutan with North East India. TraMCA is a region of high biodiversity that extends along south-eastern Bhutan and northeastern India. The Indian Manas Tiger Reserve and Bhutan's Royal Manas National Park form the core of this transboundary space that is home to flagship species like tigers, elephants and rhinos. The area is also home to more than 1,500 other species of mammals, birds and vascular plants. The TraMCA constitutes an integral component of one of the global priority tiger conservation landscapes (TCL#37: Northern Forest Complex-Namdapha-Royal Manas) for securing tiger metapopulation for long term tiger conservation.

In the face of increasing wildlife trade, habitat loss and human wildlife conflict, continuity of joint conservation efforts is of paramount importance. Informed conservation interventions based on sound ecological knowledge shall help enhance management capabilities and gauge the efficacy of conservation actions in India (WWF, 2013). This Aaranyak project is an extension of the existing collaboration between India and Bhutan which is helping to understand the status of tigers, co-predators and prey animals in the core area of the TraMCA. The Barnadi-Jomotsankha forest complex has the potential to be another important tiger habitat and this study would greatly help the protected area managers and the governments of India and Bhutan to strengthen tiger and habitat conservation measures to the relatively unexplored eastern limit of the TraMCA.

2. Study Area

Transboundary Manas Conservation Area (TraMCA)

The TraMCA spreading across the international boundary of India and Bhutan, is a significant tiger habitat that has potential to double its tiger population within a decade. The TraMCA with an area of over 6500 sq km spans from the river Sankosh, the western boundary of Ripu reserve forest in India to the Jomotsangkha Wildlife Sanctuary in Bhutan to the east. To the south it extends to the southern boundary of the Manas Tiger reserve (MTR) in India and to the north, the northern extent of the Royal Manas National Park (RMNP) in Bhutan. The Manas National Park (MNP) in India and the RMNP in Bhutan forms the core of this extraordinary Transboundary landscape.

A combined record of the TraMCA indicate the local species composition includes more than 65 species of mammals, over 500 species of birds and more than 1000 species of plants. Key species include Tiger, Elephant, Pigmy Hog, Hispid Hare, Bengal Florican, Clouded Leopard, Common Leopard, Gaur etc.

The existing collaboration between India and Bhutan partners has helped in understanding the status of tigers, co-predators and prey animals in the principal core are of the landscape, MNP and RMNP. The joint transboundary tiger monitoring study which started in 2011 is a paradigm of a successful transboundary level conservation effort to safeguard tiger population across TraMCA.

While, transboundary tiger conservation focuses MNP-RMNP core, the present study was designed to explore the status of tigers and habitats in a new unexplored area on the eastern part of the TraMCA, the Barnadi-Jomotsankha transboundary area that has strong potential to be another core tiger habitat for the landscape.

Jomotsangkha Wildlife Sanctuary (JWS)

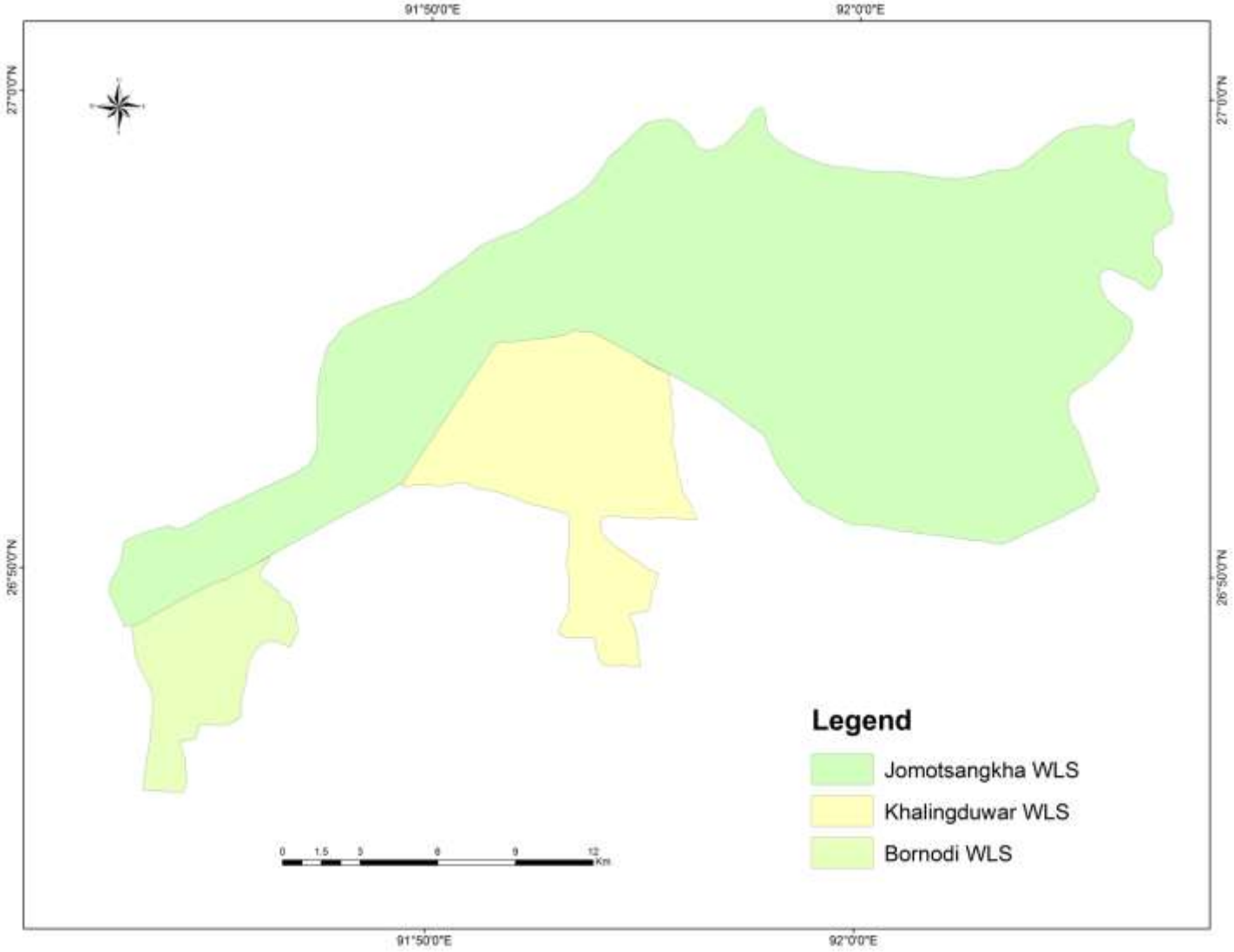
Jomotshangkha Wildlife Sanctuary (JWS) was notified in the year 1993 and was formed by merging of the Khaling Reserve (notified in 1974) and the Neoli Wildlife Reserve (notified in 1983). The Sanctuary which covers an area of 334.73 sq.km, is situated in the south easternmost part of the country and is one of the smallest Protected Area in the Country. It is bordered by the Nyera-amachhu to its west, three geogs of Samdrup Jongkhar viz. Pemathang, Martshala and Serthi Geogs to its north, West Kameng District of Arunachal Pradesh to east and the Udalguri district of Assam, India to its south. It lies between 26 48’N and 26 60’ N northing and 91 42’ E and 92 08’E easting. The Sanctuary lies in the Indo-

Malayan realm, it is a biodiversity hotspot and it houses a wide array of the endangered wildlife species such as the Royal Bengal Tiger (Panthera tigris tigris), Common Leopard (Panthera pardus), the Himalayan Black Bear (Selenarctos thibetanus), Gaur (Bos gaurus), and Asiatic Wild Elephant (Elephus maximus) and many more. The Sanctuary is said to be the only habitat for the rare and endangered Pygmy hog (Porcula salvania) and the hispid hare (Caprolagus hispidus). Till date no study was conducted on presence/absence of the critically endangered species of Pygmy Hog and Hispid Hare beside the questionnaire survey in 2014 but the rest of the species were confirmed through camera trapped images.

Barnadi Wildlife Sanctuary (BWS)

The Barnadi Wildlife Sanctuary (WLS) is an integral part of Manas Tiger Reserve (MTR). The sanctuary is located in the northwestern part of the district of Udalguiri under Bodoland Territorial Autonomous District (BTAD). The geographical extension of the sanctuary is from 91° 42’ E to 91° 47’E longitudes and from 26° 45’ N to 26° 52’ N latitudes. The total area of the sanctuary is 26.22 km2. Earlier the sanctuary was known as Barnadi Reserve Forest and was notified vide Govt. notification GFR. 145/42 dated 25/4/42. Later on in the year 1980, it was upgraded into a Wildlife Sanctuary vide Govt. notification FRW. 14/80/11 dated 22/8/80. The average annual rainfall in the sanctuary is between 2000-2300 mm and average temperature in winter season is 8°c that rises up to 37 °c in summer. Relative humidity varies from 60-95%.

Fig-1: Study area map of Jomotsangkha, Khalingduwar and Bornodi WLS.



3. Methodology

Grid based non-invasive close capture-recapture method was used to estimate the abundance/ density of tigers and co-predators:

Camera Trapping

We used camera trapping under photographic close capture-recapture framework as suggested by NTCA (National Tiger conservation Authority). The camera trapping study was conducted across the landscape covering an area of 311 sq km area. We gridded the entire sampling area into 4 sq km (2x2) grid cell. Camera trap points were selected based on cues such as presence of carnivore and herbivore sign (scats, scrapes, scent deposits, tracks, hoof marks, pellet, dung etc.) and intersections of trails. All the cameras were kept operational for 24 hours a day for minimum 52 days. Each day (24 h) was therefore defined as a sampling occasion. All camera units were mounted on trees, on poles or in steel cages made specifically for the cameras. The cameras were shifted 100-200 m from the original location to avoid trap shyness.

4. Results

Table summarizing camera trapping efforts in the forest complexes of Barnadi-Jomotshankha WLS (Indo-Bhutan).

Catagories	***JWS***	***Khalingduar***	***Barnadi***	***Total***
Total camera stations	***42***	***9***	***6***	***57***
Total camera trapped used	***85***	***20***	***13***	***118***
Camera lost	***3***	***3***	***2***	***8***
Minimum trapping area	***~198 sq km***	***~15 sq km***	***~10 sq km***	***~311 sq km***
Total trap day	***3740***	***411***	***331***	***4482***

ii. Camera Trapping Area- Map

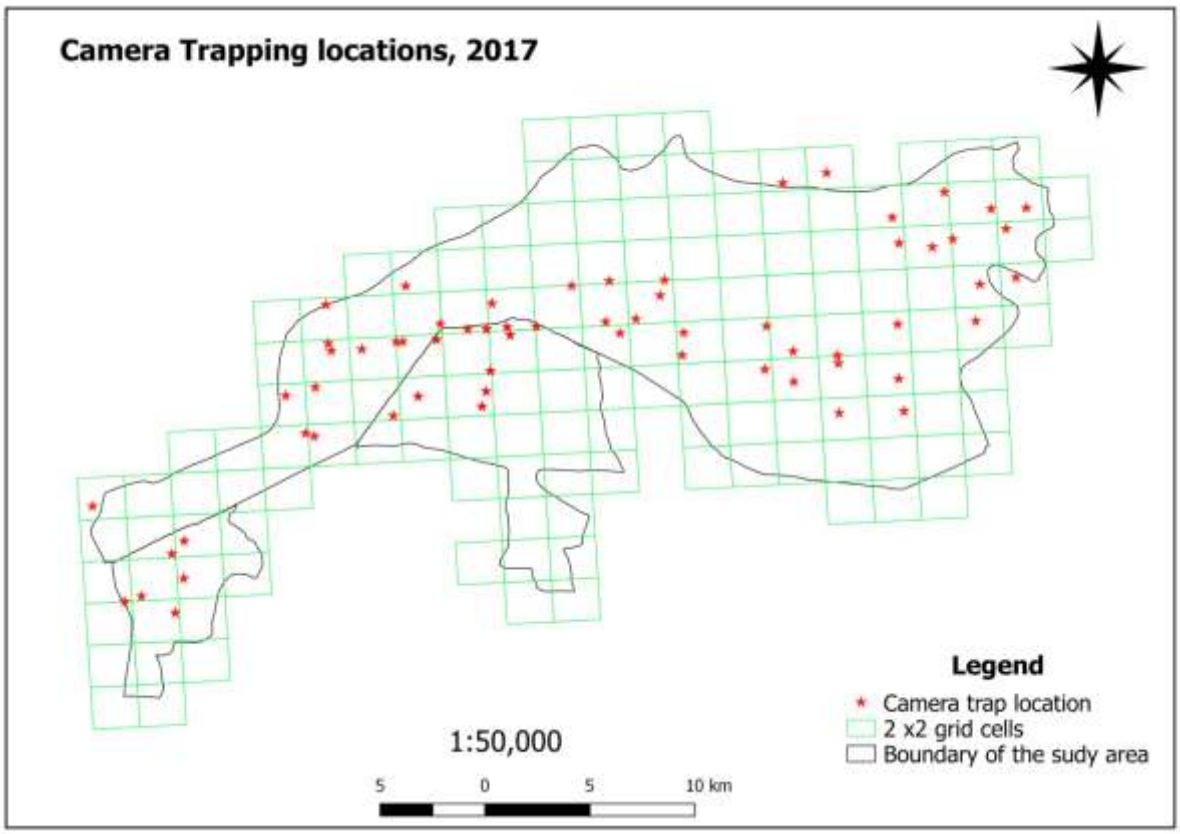


Fig-2: Map showing the trap location (star marks) spread across the study area (2017)

iii. Species Capture- Summary

The total number of species captured during the camera trapping exercise in the study area was 41. The total number in Jomotsangkha WLS, Bornodi WLS and Khalingduwar RF was 18, 14 and 9 respectively. The list of species captured in all the three protected areas is given in Table 4.2.

Sl#	Species (Common Name)	Species (Scientific Name)	JSW	Khaling duar	Barnadi
1	Elephant	*Elephas maximus*	✓	✓	✓
2	Sambar	*Rusa unicolor*	✓	✓	✓
3	Gaur	*Bos gaurus*	✓	✓	✓
4	Wild Pig	*Sus scrofa*	✓	✓	✓
5	Barking deer	*Muntiacus muntjak*	✓	✓	✓
6	Hog deer	*Axis porcinus*	x	✓	✓
7	Himalayan Serow	*Capricornis thar*	✓	x	x
8	Goral	*Naemorhedus goral*	✓	x	x
9	Clouded leopard	*Neofelis nebulosa*	✓	x	x
10	Leopard cat	*Prionailurus bengalensis*	✓	x	✓
11	Marbled cat	*Pardofelis marmorata*	✓	x	x
12	Golden cat	*Catopuma temminckii*	✓	x	x
13	Leopard	*Panthera pardus*	✓	x	✓
14	Jungle cat	*Felis chaus*	x	x	✓
15	Wild dog	*Cuon alpinus*	✓	x	x
16	Himalayan black bear	*Ursus thibetanus*	✓	x	x
17	Binturong	*Arctictis binturong*	x	✓	x

18	Large Indian civet	*Viverra zibetha*	x	✓	x
19	Small Indian civet	*Viverricula indica*	✓	x	x
20	Asian palm civet	*Paradoxurus hermaphroditus*	✓	✓	x
21	Himalayan palm civet	*Paguma larvata*	✓	x	x
22	Crab eating mongoose	*Herpestes urva*	✓	x	✓
23	Yellow throated marten	*Martes flavigula*	x	✓	x
24	Himalayan crestless porcupine	*Hystrix brachyura*	✓	x	x
25	Brush tailed porcupine	*Atherurus macrourus*	✓	✓	x
26	Capped langur	*Trachypithecus pileatus*	✓	x	x
27	Large toothed ferret badger	*Melogale personata*	✓	x	x
28	Pangolin	*Manis pentadactyla*	✓	x	x

Future Plan:

During this study, the team could not record tiger in the study area. However, this exercise has helped in identifying the most suitable areas in the PAs and plan for a second session starting December 2017. Both the India and Bhutan team has gained immense experience with the first session and determined to achieve more using the experience in the upcoming session.

The study also has helped in mapping the distribution of prey animals of tigers as well as disturbances in the area. This will lead to more focused field exercise in the coming session.

Activity Photographs

A leopard captured in camera trap.

A female Samabar photographed.

Team of Forest staff and Aaranyak Biologist during field visit.

A team of Forest staff of Bhutan setting up a camera trap.