FINAL REPORT
2015

Adopting an inclusive approach of research, capacity building, community education and outreach to conserve Western Hoolock Gibbon in Karbi Anglong under Kaziranga-Karbi Anglong landscape, Assam, India

People's Trust for Endangered Species
Worldwide Species Grant

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WORLD PATROL

Forest Deptt., KAC

people's trust for endangered species

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Final Report
1st November 2015

Submitted to: People's Trust for Endangered Species

Project start date – 31st September, 2013   **Report date –1st November, 2015**

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ACKNOWLEDGEMENTS

HIGHLIGHTS OF THE MAJOR ACCOMPLISHMENT

- A total 45 individual in 16 groups of Hoolock gibbons were directly observed and a total 185 duet calls from 19 listening posts was recorded.

- The estimated population of Hoolock gibbon in these three forest complexes under Karbi Anglong district of Assam is 140 groups and 392 individuals.

- Karbi Anglong thus constitutes about 65% of the total population of western Hoolock gibbon in Assam.

- The group size is invariably small (2.81±0.7) with lower percentage of juvenile (13.3%) and infants (15.5%) compared to adult (71.1%) indicated low recruitment rate and juvenile mortality.

- The available habitat left for gibbon in this two priority complexes is 374.46 km^2 of which 75.88 km^2 is primary habitat and 298.58 km^2 is secondary habitat.

- Habitat destruction in the form of jhoom cultivation and illegal logging was found to be single largest factor affecting the population in these forest complexes.

- Hunting in Dhansiri-Borlangfer priority forest complex and Khuriming RF results low population size.

- Altogether 67 numbers of front line forest staffs have been trained in two batches for skill development on various wildlife monitoring and management techniques at the Assam Forest School, Guwahati in the program. After successful completion of the training program each participant received one certificate.

- 67 front line staffs have been facilitated with Field kits / Field gears for patrolling like uniform, hunting shoes, cap, leech guard, rucksack bag, sleeping bag, mosquito net, windcheater jacket, torch, search light, umbrella, binocular etc for better performance.

- As a result of capacity building the morale of the staffs was high, resulting better performance.

- 20 one day long school programs covering 1383 participants, 3 three-days long intensive Hoolock gibbon field orientation camp and 5 community level education programs were organized.

- 9 villages covering 333 house-holds in the fringe areas of three forest complexes has been covered for questioner survey.

- A letter of accreditation from Additional Principal Cheif Conservator of Forest, KA.

INTRODUCTION

Western Hoolock gibbon or white-browed gibbon, *Hoolock hoolock* (Harlan, 1834) is one of the 2 species of lesser apes found in India. The species is distributed in the seven northeastern States apart from British Burma now Myanmar (Tickell, 1864), Chittagong Hill Tracts of Bangladesh (Anderson, 1878) and probably in Lao PDR (SSC, Red Data Book, IUCN, 2000. While the population of this gibbon species in Bangladesh remains <500 individuals, Myanmar and the state of Assam holds the major population (> 95%). The species is listed as 'Endangered' in the IUCN Red List of Threatened Species (Brockelan *et. al.* 2008) and 'Appendix-I of CITES. It also enjoys highest legal protection as 'Schedule-I' species under 'The Indian Wildlife (Protection) Act, 1972' amended in 2002 in India.

Gibbons live as single, territorial family groups, comprising a monogamous pair and up to four offspring. They prefer middle and upper canopy of the tropical and sub-tropical rain forests as well as moist deciduous forest.

Gibbons are mainly frugivorous. Since, fruit is a limited resource in the forest, gibbon protect their territory by producing a high-pitched '*belching growl*' vocalization call or 'song' which can be heard very clearly over a kilometer (Brockelman & Srikosomatara, 1993). Both the male and female produce loud call together called 'duet' to establish their territory by singing to each other. When one family group is singing, the other groups of the neighboring territory respond.
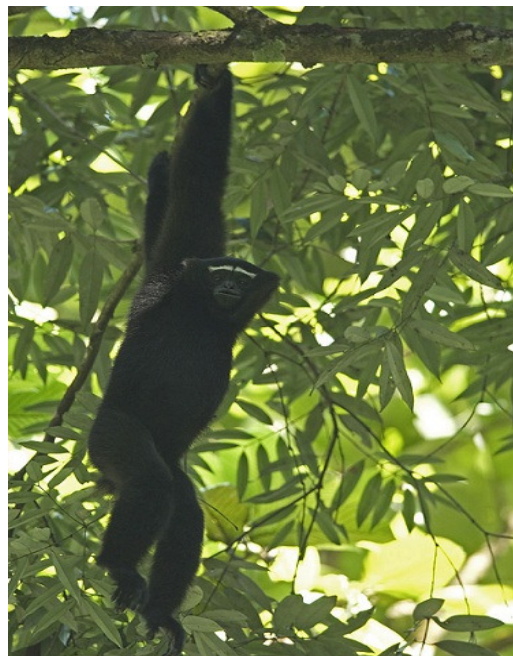
Gibbons are brachiators and to support this suspensory mode of locomotion, they require contiguity of forest canopy. Habitat disturbance in the form of canopy breakage in the forest has restricted their movement and isolated them in smaller patches, even within large forest patch.

Like other gibbon species, western Hoolock gibbons also have experienced a drastic population decline both in Assam and elsewhere in other north-eastern states of India due to rapid habitat loss and fragmentation. During last 3 – 4 decades, the population of western Hoolock gibbons in Assam declined from > 80,000 to < 5,000 individuals - a decline of more than 90% (Das *et. al*, 2009).

The state of Assam constitutes the highest population of western Hoolock Gibbon in India (> 65%). Ten priority 'conservation areas' or 'forest complexes' for western Hoolock gibbon have already been identified on the basis biological importance (BI) i.e. high primate diversity and landscape integrity (LI).

Each priority forest complex comprised cluster of wildlife sanctuaries (WLS), reserved forests (RF), District Council Reserved Forest (DCRF), proposed reserved forests (PRF) and unclassed state forest (USF) (table-1) (Das *et. al*., 2005; Das, *et. al.,* 2009). The spatial relationships between the areas of remaining forest, estimated gibbon population; conservation gaps based on the viability and representation analysis and remaining habitat blocks were used to identify these priority conservation area. These areas or forest complexes have the greatest potential for long term conservation of western Hoolock Gibbon in Assam.
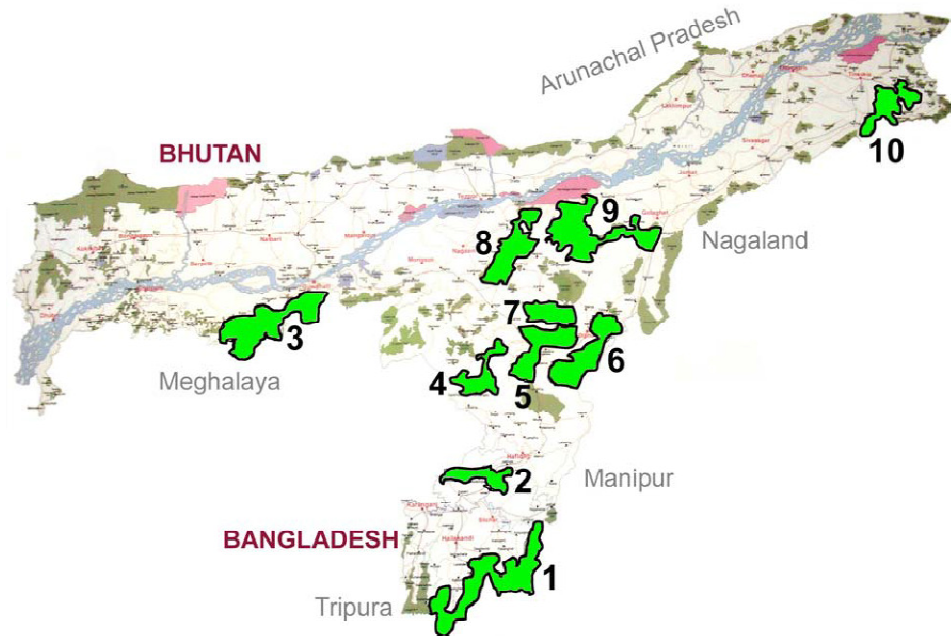
Map -1: Map showing different priority forest complex of Hoolock gibbon in Assam, India

S. No.	Districts	Priority Conservation Landscape	Area Km^2	Gibbon habitat (%)	Primate diversity
1	Cachar, Karimganj	Innerline-Katakhal-Singla Complex	1291	35%	1,2,3,4,5,6,7,8
2	Cachar & Dima Hasao	Barail-North Cachar Complex	300.0	45%	1,2,3,4,5,7,8
3	Kamrup	Rani-Garhbhanga Complex	281.0	55%	1,2,3,4,8
4	Karbi Anglong	Khurimming-Panimur-Amreng Complex	186.0	28.8%	1,2,3,4,5,8
5	Nagaon	Lumding RF	252.9	40%	1,2,3,4,8
6	Karbi Anglong	Dhansiri-Borlangfer Complex	984.0	50%	1,2,3,4,5,8
7	Karbi Anglong	Marat Longri-Patradisa-Longnit Complex	802.0	40%	1,2,3,4,5,8
8	Karbi Anglong, Nagaon	Borjuri-Jungthung-West Mikir Hills Complex.	345.0	75%	1,2,3,4,8
9	Karbi Anglong, Golaghat	Langlakso-Mikir Hils-Kalyoni Complex	1104.5	55%	1,2,3,4,5,8
10	Dibrugarh, Tinsukia	Joypur-Dirak-Upper Dehing-Dilli-Abhayapuri Complex	580.0	60%	1,2,3,4,5,8

(1- Hoolock gibbon, 2-Capped langur, 3- Assamese macaque, 4-Rheussu macaque, 5-pig-tailed macaque, 6-Phayre's leaf monkey, 7-Stump tail macaque, 8-Slow loris)

Table-1: List of priority forest complexes of Assam for Western Hoolock Gibbon showing primate diversity.

STUDY AREA

Out of ten priority forest complexes of Assam, the Karbi Anglong district of central Assam, which is an Autonomous Council (KAC) under the 'VIth Schedule' of Indian Constitution alone, comprises five priority complexes, contributing about 60% gibbon population of the State. Of these five priority complexes, Dhansiri-Borlangfer Complex (984 km^2) is one of the important forest complex prioritized for conservation of western Hoolock Gibbon in Assam. It comprises Dhansiri RF (770 km^2), Borlangfer RF (77 km^2) Daldali RF (123.6 km^2) and Tamulbari RF (13.4 km^2) (fig -1) and important elephant corridor connecting Lamding RF of Nagaon district and Itanki NP of Nagaland. The forest complex is also holds the larger population of Asian Elephants in Northeast India, as the complexes constitutes a part of Dhansiri - Lamding Elephant Reserve.
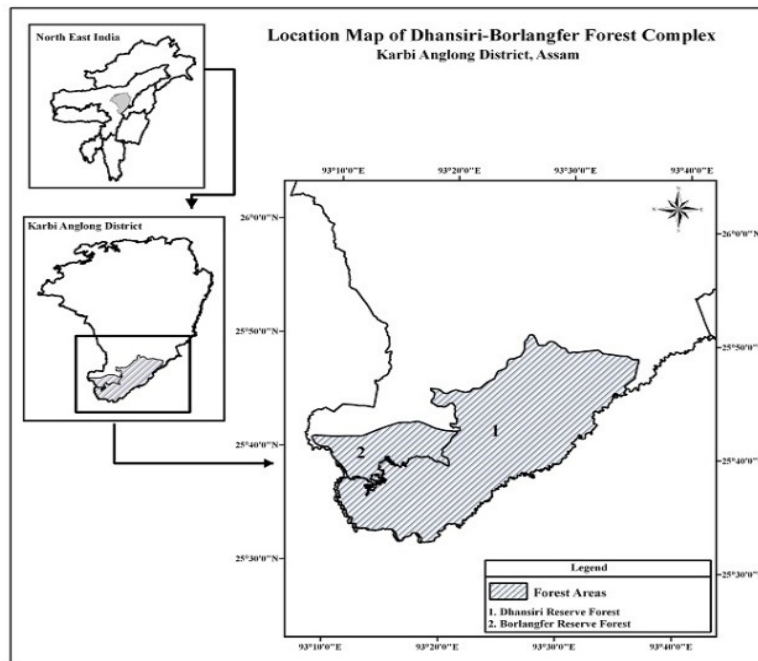
Figure - 1: Dhansiri-Borlangfer forest complex

Khurimming-Panimur-Amreng Forest Complex (186 km^2) is another important forest complex having cluster of reserved forest (RF) and proposed reserved forests (PRF) (fig-2). The complex is situated in Hamren sub division of Karbi Anglong and comprises Khurimming RF (67.9 km^2), Panimur PRF (55.3 km^2) and Amreng RF (62.8 km^2).
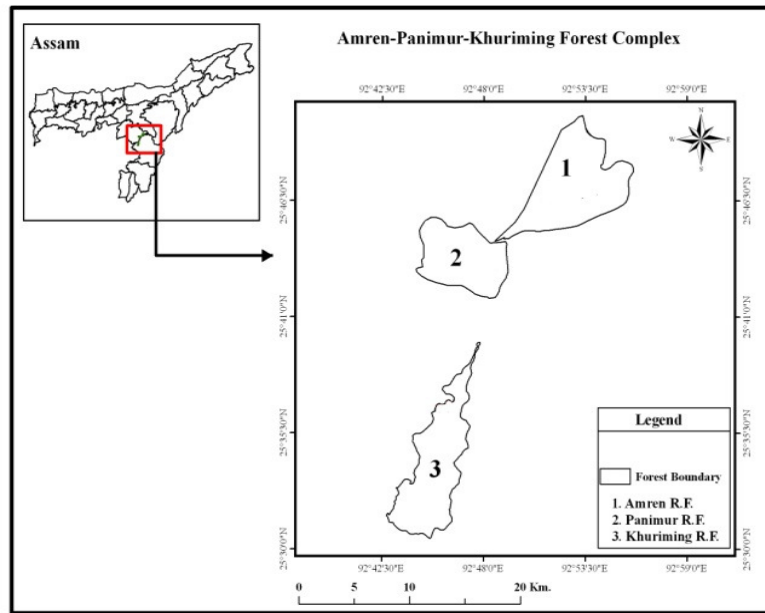
Fig- 2: Khurimming-Panimur-Amreng complex

Both the complexes have huge conservation potential, not only for gibbons, but also for other threatened species like elephant, tiger etc. They could support substantially good population of western Hoolock gibbon. But despite having huge conservation scope, all the forest complexes of Karbi Anglong Autonomous Council (KAAC) are facing enormous anthropogenic pressure ranging from severe habitat loss, encroachment, fragmentation and degradation even hunting, making the species extremely vulnerable. Since, forest being Council (KAAC) subject having separate legislation, State authority cannot interfere on it. And there is very week capacity of wildlife protection in the council. No separate wildlife wing of the forest department under the Council (KAAC) has been established till date to protect wildlife and their habitat in Karbi Anglong. Management of most of these forests and wildlife is either on ad hoc basis or depending on the crisis.

Keeping these in view and long term need of the remaining key gibbon habitat protected from further alteration, present project was initiated under the support from US Fish & Wildlife Service for a number of reasons: 1) there is a lack of information of its population and habitat status for strategy planning, 2) it is threatened by habitat loss and hunting, 3) there is weak capacity for protection, 4) and there is no awareness education among communities where it resides. This project is the follow-up action of the previous project supported by USFWS.

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PROJECT GOAL & OBJECTIVES

Goal: Conserving Dhansiri – Borlangfer and Khuriming - Panimur - Amreng forest complexes focusing on Western Hoolock Gibbons as flagship species.

Objectives

(i) *Research*: To collect baseline information on population density, habitat status and demographic status of gibbons and to identify threats in remaining two complexes e.g. Dhansiri – Borlangfer and Khurimming-Panimur-Amreng forest complexes, which covers 6 forests under these 2 complexes.

(ii) *Action Plan*: To develop site specific action plan for Hoolock gibbon in the Karbi Anglong Autonomous Council (KAAC).

(iii) *Capacity building*: To train front line forest staff of Karbi Anglong Autonomous Council (KAAC) on different techniques of wildlife monitoring to improve their skills.

(iv) To boost the morale of the staffs for better performance by facilitating field gears and equipments.

(v) *Education*: To initiate community outreach program through participatory conservation awareness and education campaign for the species. 20 one day long school education program, 5 one day long community education program, 3 three days long intensive education programs.

GIBBON POPULATION ESTIMATION

While considerable survey work has been carried out on western Hoolock gibbon in other parts of the state as well as in Northeast India and Bangladesh (Gittins, 1984; Gittins & Tilson, 1984; Choudhury, 1990; Das *et. al*., 2003; 2005; 2009), nothing has been done for Karbi Anglong district of Assam except one report, which was published based on preliminary observations (Choudhury, 2009). Owing to the fact that there is a gap of information of the species status and habitat quality, while having huge conservation potential we have undertaken a survey of both the priority complexes.

Methods

Census methods:

The survey covered all the Reserved Forests, Proposed Reserve Forests and DC RFs under Dhansiri - Borlangfer and Khurimming-Panimur-Amren forest complexes to know the population structure, densities and group composition. For this, extensive survey to know the demographic details by direct count method i.e. modified line transects method (Burnham *et al.*, 1980; Mohnot *et. al*., 1998; NRC, 1981; Srivastava *et. al.*, 2001; Struhsaker, 1975) and intensive survey to know the density to estimate the population, indirect or call count method (Brockelman & Ali, 1987; Brockelman & Srikosomatara, 1993) was used.

Data was taken only in dry season from November, 2013 to May, 2014, since singing bout is limited during rainy season. After collecting the calls, the estimated numbers of gibbon groups for each post was computed.

Results

Altogether 215 km long transect having ~ 4.5 km each was laid in both the forest complexes covering all forest and vegetation type for demographic and habitat survey.

A total of 45 individuals in 16 family groups and one lone male individuals of western Hoolock gibbon were observed during the survey. Of these, 34 individuals in 12 family

groups was observed in Dhansiri-Borlangfer forest complex and 11 individuals in 4 family groups and one lone male individuals were observed from Khurimming-Panimur-Amreng forest complex.

The overall average group size of all the forest complexes was 2.81 ± 0.7 per family groups ranging from 2 to 4 individuals (table -2). Both the forest complexes having similar group size (Dhansiri-Borlangfer forest complex 2.8±0.4 and Khurimming-Panimur-Amreng forest complex 2.8±1.0). Also, the percentage of age group (adult to juvenile and infant) varies considerably between forest complexes and from forest to forest even within the same complex.. The age sex ratios of the gibbon groups in all the three forest complexes are given in the table – 2.

Photo: Data collection by PI & Researchers

Sl. No	Landscape	Name of the Forest	Total Group	Group size	% of age composition		
					Adult	Juvenile	Infant
1	Dhansiri-Borlangfer Complex	Dhansiri RF	8	2.9±0.35	69.6%	17.4%	13.0%
2		Barlangfer RF	2	2.5±0.7	80.0%	-	20.0%
3		Tamulbari RF	-	-	-	-	-
4		Daldali RF	2	3.0±0.0	66.6%	33.3%	33.3%
Total / average				2.8±0.4	70.6%	14.7%	14.7%
5	Khuriming-Panimur-Amren Complex	Amren RF	2	2.5±1.1	80.0%	-	20.0%
6		Panimur RF	-	-	-	-	-
7		Khuriming RF	2	3 ±0.7	66.6%	16.6%	16.6%
Total / average			4	2.75±1.0	72.2%	9.1%	18.2%

Table -2: Demographic details of Hoolock gibbon groups observed during survey.

Population density:

To estimate the density of gibbons in both the forest complexes, apart from line transect method, we established 19 listing post or sites across the two forest complexes, viz. Dhansiri-Borlangfer (n = 12) and Khuriming-Panimur-Amreng (n = 7). During our study, we have attempted to cover all the RFs and PRFs under each forest complexes but due to some problem related to law and order in the bordering areas of Karbi Anglong, Assam and Nagaland in Daldali RF under Dhansiri-Borlangfer forest complex, we could not conduct our study.

We recorded 105 duet calls across 19 listening sites in both the forest complexes. We did not hear any calls from Tamulbari RF under Dhansiri Borlangfer forest complex and Panimur RF under Khuriming-Panimur-Amreng forest complex, which are heavily disturbed by human activities. We have confirmed the absence of Hoolock gibbon from these two localities from the villagers, so we discard both the RFs for our calculation. All the 19 listening post or sites (LP) are mapped in figure 3 & 4.

We arbitrarily assumed that all groups could be heard within a distance of 1 km from each listening post, and the total area within 1 km radius of any LP was taken as the listening area (LA). All groups that mapped within 1 km radius of an LP are used for density calculations. But we also assumed that groups that were behind hills from LP may not be audible from 1 km. So to provide a check on the reliability of these assumptions, we performed another density calculation using a listening area radius of 600 m, and all groups within 600m of any LP were also used in density determination apart from 1km radius. Groups behind hills sound more distant and many such groups 600 – 1000m away may have been considered to be farther than 1 km away, and therefore not included in the listening area.

Name of the Forest	Listening Area in respective radius		No. of Groups in respective radius		Density / sq. km in respective radius	
	1 km	600m	1 km	600m	1 km	600m
Dhansiri RF	4.5	2.17	2.30	1.87	0.51	0.86
Borlangfer RF	3.9	1.9	0.33	0.00	0.08	0.00
Mean	**4.2**	**2.02**	**1.31**	**0.93**	**0.31**	**0.46**
Amren RF	4.47	2.19	0.48	0.33	0.11	0.14
Khuriming RF	4.64	2.22	3.21	1.92	0.69	0.87
Mean	**4.55**	**2.21**	**1.85**	**1.13**	**0.41**	**0.51**

Table - 3: List of census sites with listening areas and gibbon group densities for listening radii of 1 km and 600m from the listening post.

The results of the density estimates, size of the listening area and number of groups heard of 1-km radius area as well as 600m radius area for all the forests under three forest complexes are given in the table – 3. They do not differ greatly, although the estimate using the smaller radius usually gave a slightly higher density. These densities (with standard errors of the mean) ranged from 0.00 to 0.90 groups km^{-2} (mean $\pm$ SE = 0.31 $\pm$ 0.23 groups km^{-2}) for the larger 1-km radius listening area, and from 0.00 to 1.03 groups / km^2 (mean $\pm$ SE = 0.46 $\pm$ 0.28 groups km^{-2}) for the 600m listening radius in Dhansiri-Borlangfer forest complex.
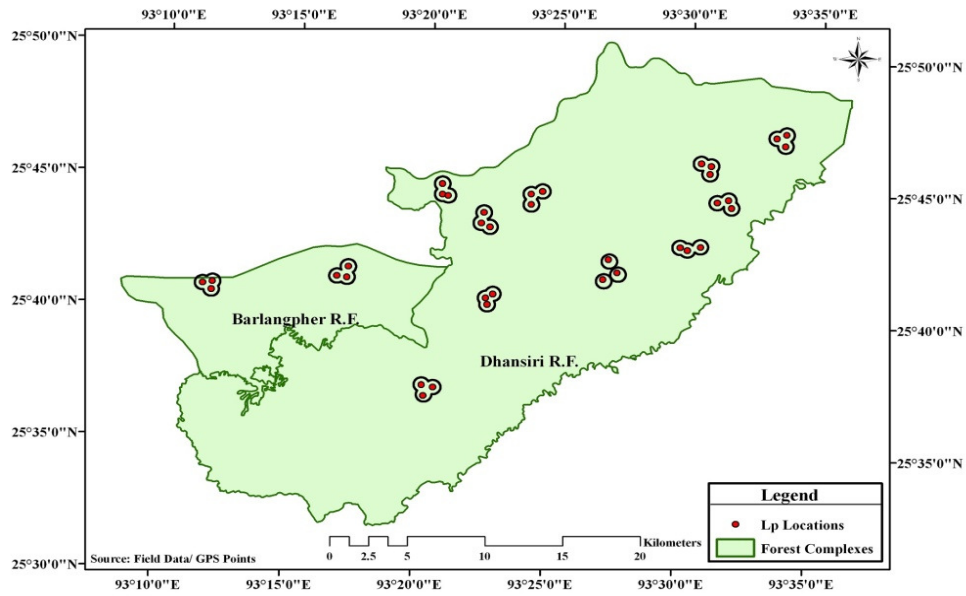
Fig - 3: Map showing census area of different forests under Dhansiri-Borlangfer forest complex with 1 km radius listening area and LP position.
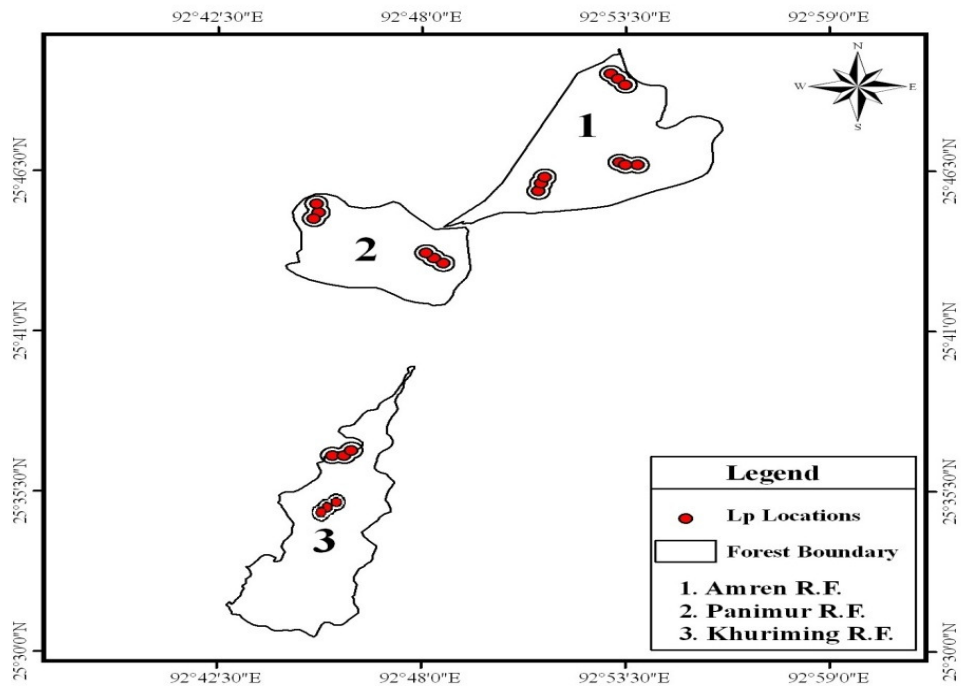

Fig - 4: Map showing census area of different forests under Khuriming - Panimur - Amreng forest complex with 1 km radius listening area and LP position.

The densities of gibbon in Khuriming-Panimur-Amreng forest complex (with standard errors of the mean) ranged from 0.00 to 0.69 groups km^{-2} (mean ± SE = 0.41 ± 0.19 groups km^{-2}) for the larger 1-km radius listening area, and from 0.00 to 0.95 groups km^{-2} (mean ± SE = 0.51 ± 0.32 groups km^{-2}) for the 600m listening radius.

Gibbon population estimation:

Based on satellite data and GIS analysis (table – 6 & 7), the available habitat of Hoolock gibbon in Dhansiri-Borlangfer forest complex is about 325.8 km^2 including primary (60.6 km$^{2)}$) and secondary habitat (285.2 km^2). The overall density of gibbon in Dhansiri-Borlangfer forest complex irrespective of habitat type is 0.31 ± 0.23 groups' km^{-2} for the larger 1-km listening radius and 0.46 o groups km^{-2} for the 600m listening radius excluding Daldali RF. But the densities varies greatly between forests, as in Dhansiri RF under Dhansiri-Borlangfer forest complex, the density if gibbon in both the listening radius yielded greater result (0.51 & 0.86 groups/ km^2) from that of Borlangfer RF (0.08 & 0.0 groups/ km^2) as well as between habitat types i.e. primary forest habitat and secondary forest habitat. On the other hand the average group size of gibbon in this forest complex is 2.8±0.4 individuals per group. Thus, considering these factors, the estimated Hoolock gibbon population in Dhansiri-Borlangfer forest complex would be between 100 to 125 groups and 300 to 350 individuals with the mean number predicted at approximately 325.

Similarly the available habitat of Hoolock gibbon in Khuriming-Panimur-Amreng forest complex is about 48.7 km^2 including primary (15.3 km$^{2)}$) and secondary habitat (33.44 km^2). The densities varies greatly between forests, as in Khuriming RF under Khuriming-Panimur-Amreng forest complex, the density of gibbon in both the listening radius yielded greater result (0.69 & 0.87 groups/ km^2) from that of Amren RF (0.11 & 0.14 groups / km^2) as well as between habitat types i.e. primary forest habitat and secondary forest habitat. From these observations, the estimated Hoolock gibbon population in Khuriming-Panimur-Amren forest complex would be between 25 to 30 groups and 70 to 84 individuals with the mean number predicted at approximately 77 individuals.

HABITAT ASSESSMENT AND MAPPING

The habitats of Hoolock gibbon in these two forest complexes of Karbi Anglong district are found to be two major types: sub tropical semi ever green and sub tropical moist deciduous forest. The deciduous forests of Karbi Anglong are intermingled with ever green trees (Choudhury, 2009). There are also patches of semi ever green forests within the deciduous biotope especially along the streams forming a mosaic. The major tree species includes: *Terminalia myriocarpa*, *Mesua ferrea*, *Artocarpus cham*, *Terminalia myriocarpa*, *Altingia excelsa*, *Ficus sp.*, *Dysoxylum gobara*, *D. procerum*, *Duabhanga sonneratoides*, *Tetrameles mudiflora*, *Dilenia scabrela*, *Bombax ceiba*, *Gmelina arborea*, *Shorea robusta* etc.

The habitats of Hoolock gibbon in entire Karbi Anglong district is under severe anthropogenic pressure resulting from traditional *jhoom* cultivation, commercial rubber, beetle nut leaf cultivation and settlement. Since Hoolock gibbons' prime habitat lays in the sub-tropical semi-evergreen and moist deciduous forest, which are heavily destroyed for jhoom cultivation and settlement irrespective of their protection or legal status as reserved forests or wildlife sanctuary. The entire semi evergreen and deciduous forest in Borlangfer RF, Tamulbari RF, Daldali RF and Dhansiri RF under Dhansiri -Borlangfer complex is affected by human activities. This loss encompasses roughly ≤ 90% of the forest habitat in some part of Dhansiri-Borlangfer complex like Tamulbari RF.

Altogether 430 vegetation sample plots were taken at each 500m intervals and at the Hoolock gibbon encounter point during survey of 215 km long transect. Data on habitat quality (within the existing forest and not the actual forest boundary) showed that almost 30.6% of the area of Dhansiri-Borlangfer complex has less than 20% canopy cover, 37.5% of the area of Borjuri-Jungthung-West Mikir Hills complex has less than 25% canopy cover, while 45.4% area of Khuriming-Panimur-Amreng complex has less than 20% canopy cover (table – 6). Data also indicate that Dhansiri-Borlangfer complex have 44.4% area with moderate (≤50%) canopy cover which constitute the secondary habitat and 25% area with good canopy cover (≥50%) or closed canopy cover which constitute the primary habitat of gibbon. While in Khuriming -Panimur-Amreng complex 36.6% area have moderate canopy

cover (≤50%) and only 18.2% area with good canopy cover (≥50) that constitutes the primary habitat of gibbon.

Forest Complex	Forest	Percentage of canopy cover		
		1-20%	20 – 50%	>50 – 90%
Dhansiri - Borlangfer	Dhansiri RF	37.8	43.2	18.9
	Borlangfer RF	56.3	31.3	12.5
	Tamulbari WLS	27.1	39.6	33.3
	Daldali RF	8.3	75.0	16.7
Khuriming – Panimur - Amreng	Khuriming RF	19.4	38.9	41.7
	Panimur RF	74.0	25.7	0.00
	Amren RF	42.9	45.8	19.0

1 - Sample plots are vegetation sample units taken during survey.

Table - 4: The number of vegetation sample plots, percentage of each canopy cover class in different forests.

For habitat analysis and mapping, we procured recent satellite images of IRS P LISS-III for both Dhansiri-Borlangfer and Khuriming-Panimur-Amreng forest complexes and analyzed it in GIS environment to get the actual picture of vegetation cover in these two complexes. Based on ground truthing survey we classified the six types of landscape elements (LSE) from these three forest complexes under Karbi Anglong district. The Physical Landscape Elements are (i) Semi ever green forest, (ii) Moist mixed deciduous forest, (iii) Scrub forest (jhoom abandoned, (iv) Degraded forest, (v) Agricultural land with shifting (jhoom) cultivation within notified forest and (vi) water bodies. All these landscape elements are spatially well distributed all over these parts of Dhansiri-Borlangfer and Khuriming-Panimur-Amren gforest complexes (Fig- 6 & 7).

Most of the semi evergreen forest lies in the Dhansiri RF under Dhansiri-Borlangfer forest complex and Khuriming RF under Khuriming-Panimur-Amreng forest complex. These patches have substantial value in Hoolock gibbon conservation since it forms the ideal habitat of Hoolock gibbon and most of the groups were found from these areas.
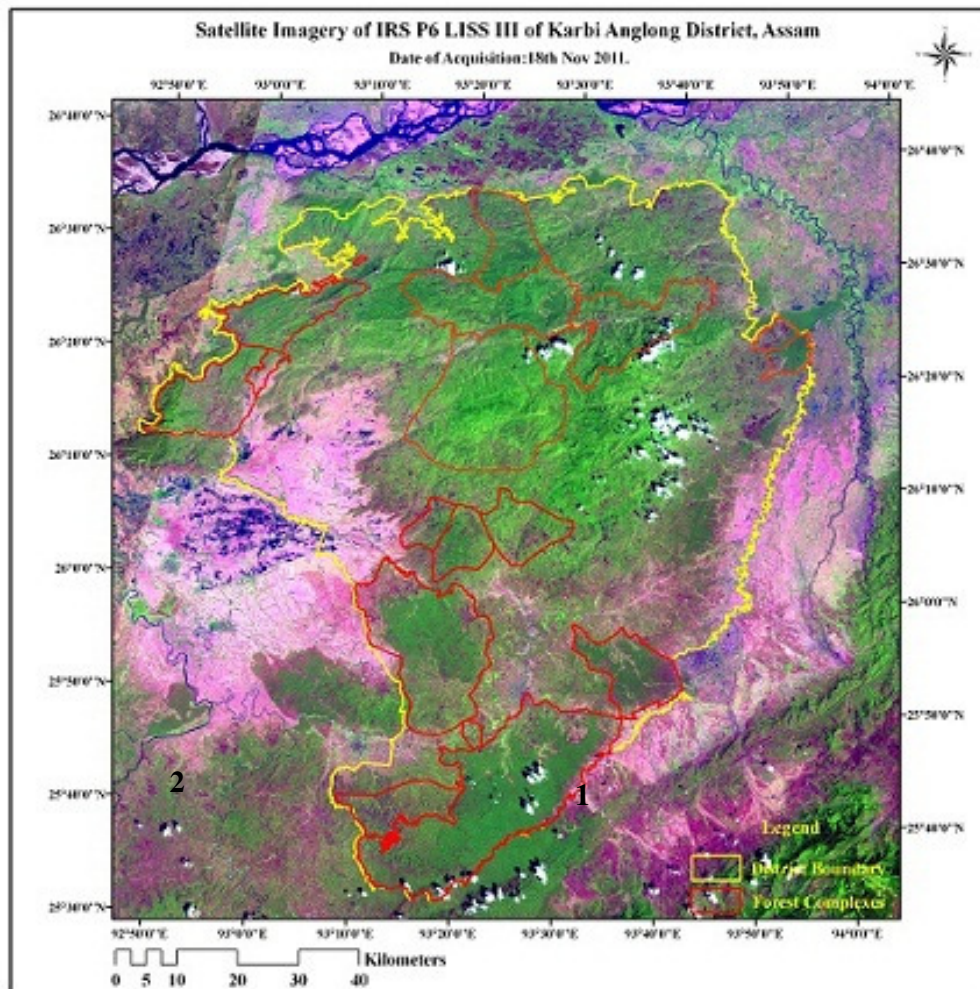
Fig-5: Satellite images of all forest complexes under Karbi Anglong district showing the forest cover and different land use pattern.

We estimate the available gibbon habitat from satellite data. Figure 5, 6 & 7 and table – 5 & 6 shows the current status and land use pattern of different forests as well as encroachment areas within the gibbon habitat in these two forest complexes. These data also tally with our vegetation sample data, which indicate that only 38.3% of the total vegetation cover under Dhansiri-Borlangfer forest complex excluding Daldali RF constitutes the gibbon habitat. From these satellite images and from our survey, we calculated the habitat available to gibbon in Dhansiri - Borlangfer forest complex is about 325.7 km^2 of which 60.6 km^2 is dense forest that constitutes the primary habitat having ≥50% canopy cover and 265.12 km^2 is the secondary forest of Hoolock gibbon having moderate canopy cover (≤50%).

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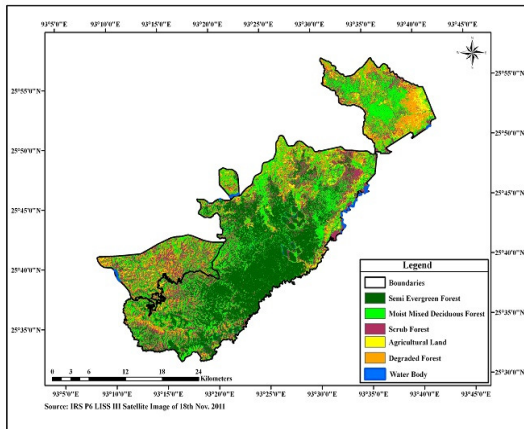
Fig-6:   Forest cover of Hoolock gibbon habitat in
Dhansiri-Borlangfer complex (November,
2011)

Land use	Sq. km	%
Semi Ever green	276.4	28.1%
Moist Deciduous	258.1	26.2%
Scrub/Jhoom (abandoned)	166.6	16.9%
Degraded forest	83.25	8.5%
Agricultural land	13.3	1.4%
Water body	50.0	5.1%

Table-5: Forest cover of Hoolock gibbon habitat in
Dhansiri -Borlangfer complex
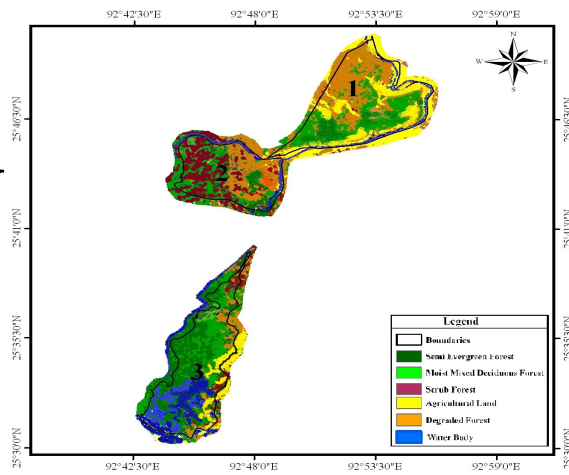
Fig-7:   Forest cover of Hoolock gibbon habitat in
Khuriming-Panimur-Amreng   complex
(November, 2011)

Land use	Sq. km	%
Semi Ever green	26.8	14.4%
Moist Deciduous	47.1	25.3%
Scrub/Jhoom (abandoned)	5.7	3.1%
Degraded forest	24.0	12.9%
Agricultural land	21.5	11.6%
Water body	19.1	10.3%

Table-7: Forest cover of Hoolock gibbon habitat
in Khuriming-Panimur-Amreng complex

Similarly, in Khuriming-Panimur-Amreng forest complex, only 26.2% of total vegetation cover have attributed to gibbon habitat. From this satellite image and from our survey, we have calculated the available habitat of gibbon in Khuriming-Panimur-Amreng forest complex is about 48.72 km^2 of which only 15.28 km^2 is dense forest that constitutes the prime habitat having ≥50% canopy cover and 33.44 km^2 is the secondary forest of Hoolock gibbon having moderate canopy cover (≤50%).

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QUESTIONEIR SURVEY

To know the socio economic condition and forest dependency of communitites residing in and around the forests of Dhansiri-Borlangfer forest complex, we conducted household survey in the fringe areas of the forest complexes. Altogather 220 house hold samples were collected from Dhansiri-Borlangfer forest complex of which, 91% of them collect firewood from forest for personal use while 22.7% were found to be collecting firewood for commercial purpose. 75.5% household in the sample area found to be practice jhoom cultivation and the avarage area of jhoom cultivation per family is about 1.74 acre of land. We also found that peoples in fringe areas also depend on forest for fodder (80%) and house hold materials (95%). Hunting and trapping found to be important factor the forest complex which may have resulted low population density along with poaching for local consumption as well as for international trade. In this regard, Dhansiri-Barlangfer forest complex considered to be the major corridor for poachers.

Item	Seret Signar Village	Thomas Timun village	Seret Tisso village	Srmen Hanse village	Tokbi Arthemlang soi village
Sample size (n)	69	46	15	79	11
~ Member/family	6.6	5.5	6	6.02	4.3
~ No. of House/family	1.6	1.5	1.75	1.7	1.18
Profession	Cultivation	Cultivation	Cultivation	Cultivation	Cultivation
~ Firewood collection/family	31 kg	26 kg	23 kg	22 kg	22 kg
Firewood selling %	65.3%	0	0	0	45.4%
NTFP collection %	100%	100%	100%	100%	100%
Bush meat consumption %	100%	100%	100%	100%	100%
Poaching for commercial %	7.5%	8.7%	0	4%	0
Hunting %	100%	8.7%	26%	100%	100%
Trapping %	100%	100%	100%	100%	100%
Jhoom Cultivation %	100%	76%	60%	43.6%	100%
~ Area of Jhoom/family	2.24 Acre	1.36 Acre	1.4 Acre	1.68 Acre	2 Acre

Table -8: Results of questioner survey showing the forest dependency and hunting pressure under Dhansiri - Borlangfer forest complex.

Altogather 111 house hold samples were collected from Khuriming-Panimur -Amren forest complex of which, 85% of them collect firewood from forest for personal use while 12.7% were found to be collecting firewood for commercial purpose. 29.4% household in the sample area found to be practice jhoom cultivation and the avarage area of jhoom cultivation per family is about 0.59 acre of land. We also found that peoples in fringe areas also depend on forest for fodder (100%) and house hold materials (100%). Hunting and trapping found to be important factor the forest complex which may have resulted low population density along with poaching for local consumption.

Item	Langmeipi, Rongkimi, Pidong	Arnamteplong	Chingchi	Charchim
Sample size (n)	35	35	6	35
~ Member/family	7.0	5.42	3.66	5.22
~ No. of House/family	1.4	1.25	1	1.14
Profession	Cultivator	Cultivator	Cultivator	Cultivator
~ Firewood collection/family	29.25	24.88	24.96	23.40
Firewood selling %	0	0	0	0
NTFP collection %	100 %	100 %	100 %	100 %
Bush meat consumption %	100 %	100 %	100 %	100 %
Poaching for commercial %	0	0	0	0
Hunting %	17.14	37.14	20	57.14
Trapping %	0	14.28	50	25.71
Jhoom Cultivation %	100 %	0.97 %	100 %	0.97 %
~ Area of Jhoom/family	2.17	2.05	3.26	2.41

Table-9: Results of questioner survey showing the forest dependency and hunting pressure in Khuriming-Panimur-Amreng Forest complex.

DISCUSSION

Western Hoolock gibbon seems to be one of the most wide ranging lesser ape species, which is not only successfully adapted to tropical and sub-tropical forest ecosystem of South and Southeast Asia but also in diverse topographic conditions. Due to its specialist feeding and brilliant locomotory habits, the species need closed canopy cover for brachiatory mode of transport. But in certain areas the taxon reported to adjust even in the secondary and human altered habitats. So, it is not entirely surprising when the taxa of this genus reported from moderate to open canopy forest patches surviving and reproducing successfully.

Present study recorded 45 individuals in 16 family groups and 105 call bouts from two important forest complexes of Assam prioritized for long term conservation of western Hoolock gibbon. The average group size (2.81 ± 0.7) and average density (0.71 ± 0.32 groups / km^2) is invariably low in all the three complexes although size, composition and density vary from forest to forest depending on the structure and quality of habitat. The smaller group size of 2.81 ± 0.7 individuals per group, with lower percentage of infants (15.5%) and juvenile (13.3%) compared to adult (71.1%) indicates low recruitment rate and high juvenile mortality. Cross section analysis of each forest complex suggested that, the ratio of adult to immature in Dhansiri-Borlangfer forest complex (1 : 0.41) and Khuriming-Panimur-Amren complex (1 : 0.37) is invariably low, which depict lower recruitment rate in both the forest complex. Although, the scenario of Dhansiri RF alone is comparatively better (1 : 0.44) than other forests under this forest complex, but is invariably low in comparison to other habitat of Hoolock gibbon elsewhere in Assam and North east India (Das *et. al*., 2009). This might be attributed to open canopy structure of the habitat. The hypothesis that reproduction and group size in the more open and deciduous forest like Borlangfer RF or Amren RF are lower than those in the more optimal, moister forest and should be further tested. In Siamang gibbon, O'Brien *et al*. (2003) found that habitat quality can affect infant and juvenile survival.

The estimated population of western Hoolock gibbon in Dhansiri-Borlangfer forest complex is between 100 to 125 groups and 280 to 350 individuals with the mean number predicted at approximately 315 (excluding solitary individuals) and the total area of gibbon habitat as 325.8 km^2. Similarly, the estimated population of western Hoolock gibbon in

Khuriming-Panimur-Amren forest complex is between 25 to 30 groups and 70 to 84 individuals with the mean number predicted at approximately 77 individuals and the total area of gibbon habitat as 48.8 km^2. Thus from these observations, we estimate the population of Hoolock gibbon in both the forest complexes of Karbi Anglong, Assam would be 140 groups and 392 individuals in 374.46 km^2 of available habitat.

Our calculation assumed that gibbon densities are equal across all areas of appropriate habitat while, in fact, Hoolock densities are higher in some forest type than others. In Dhansiri-Borlangfer forest complex, despite having more closed canopy forest (60.6 km^2) than Khuriming-Panimur-Amren complex (15.3 km^2), density is considerably low resulting overall low population size. So the area of intact forest is not a good predictor of Hoolock numbers in this region. This might be attributed to the fact that in certain areas under Dhansiri - Borlangfer complex has hunting pressure, particularly areas bordering Nagaland and need to be addressed properly.

Habitat on the other hand was much shrink, degraded qualitatively resulting small gibbon population. Thus for any long term conservation initiatives, it is imperative, therefore to have, information on suitable habitats of gibbon. Data on vegetation sampling suggested that, the suitable or prime habitat of gibbon in terms of quality i.e. more than 50% canopy cover was converted considerably in to moderate forest and open forest area. The qualitative degradation of habitat in terms of canopy cover conversion was evident in all the three forest complexes, where these changes were visible (fig- 6 & 7; table - 5 & 6) and affects on the gibbon density and group structure. The anthropogenic pressures have resulted not only the in an overall decrease in the amount of suitable habitat, but also in discontinuities in the distribution of the remaining intact habitats. This suggests that, widespread gibbon population in the past are now cutoff in to small size and split in many small populations within a large area.

The remote sensing data on habitat indicates that the Dhansiri-Borlangfer forest complex having a total area of 325.72 km^2 as gibbon habitat of which 60.6 km^2 is relatively closed canopy, semi evergreen and moist deciduous forest that is suitable for Hoolock gibbon and considered to be the primary habitat and 265.12 km^2 as moderate canopy or secondary habitat. Khuriming-Panimur-Amren complex on the other hand has only 15.28 km^2 of relatively closed canopy of semi evergreen and moist mixed deciduous forest considered to

be the primary habitat and 33.44 km^2 as moderate canopy or secondary habitat and the total area of gibbon habitat is 48.72 km^2. Thus from these observations, we estimate the available habitat of Hoolock gibbon in both the forest complexes of Karbi Anglong, Assam would be 374.44 km^2.

Data on socio-economic survey suggests that 76% house hold in the fringe areas cultivate about 1.7 acre of land as jhoom cultivation. This might have causes cascade of effects through the loss of important feeding and sleeping trees and breakage of canopy highways, which can lead to population fragmentation, increased mortality, reduced reproductive outputs, increased risk of disease transmission and demographic instability. Although the local Karbi tribe does not kill gibbons but other tribes like Kuki and tribes from Nagaland often come across and hunt gibbon along with other primate. Low population density in RF under Dhansiri-Borlangfer forest complex and Khuriming RF under Khuriming-Panimur-Amren forest complex despite having closed canopy forest is due to easy access of poacher. Bush meat consumption is another big as 66.9% local tribes hunt and consumed bush meat ranging from wild boar, deer, porcupine, pangolin and even primates, while 2.3% population involved in poaching and commercial trade of wild animals.

So, to maintain a viable gibbon population in these priority forest complexes and to reduce further habitat fragmentation and protection of existing habitat, special integrated management strategy involving communities on board should be implemented. Since, maintenance of adequate population size and management of larger landscapes is essential to ensure the long-term persistence of Hoolock gibbon in the state

CONSERVATION ACTION PLAN

One of the objectives of the current project is to prepare a Conservation Action Plan for Hoolock gibbon in Karbi Anglong. For that, a draft action plan was prepared after holding a multi stake holder 'Strategic Planning Workshop on Hoolock gibbon Conservation' after compiling all data generated from field and from the minutes and recommendations of the workshop. A release ceremony was organized on 22nd October 2014 at Diphu by Primate Research Centre NE India (PRC) in collaboration with Forest Department, Karbi Anglong, which was attended by Mr. J. Singnar, Executive Member (EM), Forest, Karbi Anglong Autonomous Council as Chief Guest. The ceremony was also attended by senior forest officials of KAAC like, Dr. Abhijit Rabha, Addl. PCCF, KA, Mr. Jaysing Bey, DFO, East Karbi Anglong Division, Mr. Jaganath Rongpi, DFO, Karbi Anglong West Division, Mr. R.S. Ingti, DFO, Silviculture Division and many others.

Speaking to the occasion, Mr. Singnar, EM also lauded the effort of PRC and said that only concerted efforts from every corner can protect the forest and wildlife in Karbi Anglong as forest department alone cannot protect it. He also emphasized the need to have separate wildlife division and manpower for proper management. In his speech, Dr. Abhijit Rabha, Addl. PPCF thanked the organizer PRC for their effort and said that this will certainly help in prioritizing management strategies to protect Hoolock gibbon in their natural habitat.

Photo: Hoolock gibbon Action Plan being released by EM, Forest, KA and other Forest Officers.

The draft plan was circulated among different stakeholders including IUCN SSA (Section of Small Ape) and other gibbon experts for review and comments. After compiling all comments and suggestion 'A Conservation Action Plan of Hoolock gibbon in Karbi Anglong, Assam' is now under the process of publication. Once published, the action plan will be submitted to the policymakers from national, state and council and all stake holders for implementation.

The Assam Tribune

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RN-1127/57 TECH/GH – 103/2012-2014, VOL. 76, NO. 287, GUWAHATI, FRIDAY, OCTOBER 24, 2014, Pages 20   Price Rs. 6.00

Karbi Anglong accounts for 65% of total hoolock gibbon population in State

STAFF REPORTER

GUWAHATI, Oct 23 – Karbi Anglong accounts for 65 per cent of the total population of the endangered hoolock gibbon in the State. This gibbon population is distributed in five forest complexes in Karbi Anglong, prioritized for long-term conservation of the only ape found in India.

This was revealed in the 'Hoolock Gibbon Population and Habitat Estimation' report prepared by the Primate Research Centre NE India (PRC), Guwahati. The report was formally laid at a function organized at Diphu by PRC in collaboration with the Forest Department, Karbi Anglong on Wednesday.

A draft 'Conservation Action Plan of Hoolock Gibbon in Karbi Anglong' was released at the function. On the occasion, PRC with support from US Fish and Wildlife Services provided an all-terrain Tata Xenon vehicle to the Forest Department in an attempt to improve the capacity of the North Karbi Anglong Wildlife Sanctuary.

The sanctuary – situated just opposite to the world famous Kaziranga

National Park – has habitat contiguity with Kaziranga, and is crucial to the wellbeing of Kaziranga's famed wildlife. Wild animals from the Park including elephants, rhinos, buffaloes, deer, etc., use to take refuge in the highlands of the sanctuary in large numbers during the annual floods.

Dr Jihosuo Biswas, coordinator, Primate Research Centre NE India, gave an account of the conservation scope and challenges with special reference to hoolock gibbon and tiger conservation in Karbi Anglong. He emphasized on the need of establishing a separate wildlife wing of Karbi Anglong Forest Department to look after the management issue of the wildlife.

In his speech, Dr Abhijit Rabha, Additional PPCF, Karbi Anglong, thanked the PRC for its effort and said that it would give a boost to the morale of the frontline forest staff. He also lauded the organization and the supporting agency for extending their assistance.

Singnar, Executive Member (EM), Forest, Karbi Anglong Autonomous Council, stressed the need for concerted efforts from every quarter to protect forest and wildlife in Karbi Anglong, as the Forest Department alone was not in a position to do the job. He emphasized on having a separate wildlife division and manpower for proper management.

The vehicle was provided to the Haldibari Beat which is proposed for the separate wildlife range of North Karbi Anglong Wildlife Sanctuary to enhance mobility for protection.

The flag-off ceremony for the presentation of the all-terrain vehicle was attended, among others, by senior forest officials of KAAC including Jaysing Bey, DFO, East Karbi Anglong Division; Jaganath Rongpi, DFO, Karbi Anglong West Division; and RS Ingti, DFO, Silviculture Division.

CONSERVATION EDUCATION CAMPAIGN

A mass awareness campaign was carried out in the fringe villages of - Borlangfer forest complex under Karbi Anglong district of Assam to bring about awareness about the importance of the forest and Hoolock gibbon conservation and the role of local communities in conservation of the forest resources. Our objective was to protect and promote the Western Hoolock Gibbon by teaching students and community members an active learning methodology for creating interest and affection for WHG using a whole gamut of teaching techniques. For that we used a manual featuring Hoolock Gibbon called Help(ing) Hoolock Gibbon Hang on! It was developed by Zoo Outreach Organization, India in collaboration with Wildlife Conservation Society, USA. It has five units viz., Introduction and evaluation methods; introduction to South Asia's only lesser apes; Hoolock Gibbon in our culture; Understanding and acting and; understanding species problems and solutions. Apart from the manual, 12 different educational items, like posters, packets, musk, stickers, were given to each participant. In addition to this, all participants received other items of related teaching literature. The program has two phases – (i) one day long program, which was short term in nature and (ii) three days long nature camp in the vicinity of Gibbon bearing PA.

Awareness campaign at School level:

For school level awareness campaign different teaching modules adopted in the Hoolock Gibbon (Hang on) and Teachers for Tiger Manual of WCS/ZOO were used apart from direct deliberation of interactive lecture. Different audio visual aids like slide projector, LCD projector, sound system etc were used during the program. Resource persons were also invited for these school programs and students interacted with the speakers.

Total of 20 schools from fringe areas of Dhansiri-Borlangfer, Borjuri-Jungthung-West Mikir Hills and Khuriming-Panimur-Amren forest complexes comprising 1383 participants were covered during the education campaign (table – 10). These one day long programs were organized in the school premises during the school hours. For which necessary arrangements were made in consultation with the school Head Master / Mistress. In the school level awareness campaign, the general components were:

a) A preliminary session of introduction and conveying the objectives of the program.

b) Distribution of education materials like sticker, pamphlet, poster etc.

c) Lecture on biodiversity, role of animal and plant on ecosystem and the importance of forest and wildlife and Hoolock gibbon conservation.

d) Demonstration of different facts and figure of Hoolock gibbon and different ecological models.

e) Screening of wildlife films.

f) Light refreshment and appraisal.

Sl no	Name of the School	Male Student	Female Student	No. of Teacher
1	DALDALI RAIJAUDISA L.P. SCHOOL	15	18	2
2	KATHALGURI NEPALI BASTI ENGLISH L P SCHOOL	22	22	3
3	DHANSIRI BENGALI L P SCHOOL	21	22	2
4	DHANSIRI JUNIOR BASIC L P SCHOOL	22	23	3
5	DHANSIRI ME SCHOOL	39	37	6
6	BHETAGAON ENGLISH LP SCHOOL	43	48	3
7	DHANSIRI HIGH SCHOOL	44	34	11
8	DHANSIRI ENGLISH EVEREST SCHOOL	34	35	7
9	KHRIST JAYANTI SCHOOL	42	54	4
10	DHANSIRI ENGLISH HIGH SCHOOL	52	64	5
11	MORNING STAR ENGLISH LP SCHOOL	21	19	2
12	LITTLE FLOWER SCHOOL	21	26	3
13	NIGTHTNGLE ENGLISH HIGH SCHOOL	35	43	4
14	MOHENDIJUA ME SCHOOL	33	38	4
15	RUI-IKPI LP SCHOOL	35	55	4
16	DONGKA CHINGTHU HIGH SCHOOL	48	21	5
17	DENTAGHAT ENGLISH SCHOOL	50	40	3
18	SAMELANGSO HIGH SCHOOL	25	22	3
19	ST FRANCIS D. ASSISI HIGH SCHOOL	19	13	4
20	RANGSINA ME SCHOOL	18	8	3

Table - 10: List of school and student participants in awareness campaign.

Photo: Different participatory activities performed during school education and awareness programs.

Photo: School education and awareness programs.

Three days long Education Camp for senior level students:

Apart from one day long school program, 3 numbers of three days long in-house nature orientation camp was organized, two at Guijan, Dibru Saikhowa NP and one at Kohora, Kaziranga NP. Participants from Christ Jyoti school, Nightingale English School and Sermont Academy were participated. The camp had a capacity of 30 participants each. The participants were brought to the venue by train or by bus. Details of the camp are given below.

The inaugural functions were followed by animal sound-off activity as an icebreaker, followed by assessment methods. In these assessment methods we introduced concept maps or brain mapping and attitudinal survey techniques. Participants made individual concept maps on the subject of Hoolock Gibbon or Biodiversity as a whole. In order to highlight the plight of the Hoolock Gibbon, a special lecture by our field biologist was arranged. Also, special lectures on Dibru-Saikhowa National Park and Kaziranga National Park were also given.

It is important that student understand present distribution details of any animals they study in context with conservation, so they were directed to study historical and current distribution maps of Hoolock Gibbon. Towards the end of first day, different indoor and outdoor activities like HELP, Habitat Ecology, Learning Program, Observation games were performed from the manual.

Photo: Inaugural function

Photo: Ice breaking game: Animal sound off

Photo: Assessment through concept mapping activities

Photo: Power presentation on Dibru-Saikhowa NP & Hoolock gibbon

Photo: Observation game & group presentation

Hoolock Gibbon behavior was the first event of the second day program and was introduced to the participants through an activity named Hoolock behavior. This is a most interesting activity where the participants were taken out of doors and taught to compare themselves with Hoolock gibbon to understand its behavior, brachiating, jumping, walking, eating, etc. Next we took primates in culture. Teams came up with many stories, songs and movies, names of places featuring primates and competed with one another using raucous shouts and whoops of laughter.

Role playing is very effective in changing attitudes. Roles are assigned to participants who play advertising executives, zoo architects, song writers, artists, acrobats, TV crew. A participant who facilitates very serious conservation actions was amazed at the effectiveness of role playing. The same participant wrote that Role Play, for instance, made me empathize with the compulsions of politicians, forest officials, tribal etc. in ways I hadn't in the past. This leads to a willingness to negotiate rather than confront which seems to be the driving force of conservation today. This is one of the most powerful objectives we try to achieve with this training. An activity called Resource roundup was also carried out.

Mini dramas were the most dynamic activity and it created much interaction within the group. The participants were divided into smaller groups and they were assigned drama topics such as poaching, locomotion/communication, habitat loss, parental care and courtship etc. which was staged in the last evening.

Photo: Activity on behavior and adaptation

Photo: Activity on resource round up

Photo: Gibbon in culture & group presentation

Day three started with a demonstration of census techniques of Hoolock gibbon. Later the participants were taken to Borajan - Bherjan – Podumoni WLS / North Karbi Anglong WLS to observe Hoolock gibbon in the morning session and Dibru – Saikhowa NP / Kaziranga NP for field trip in afternoon session. The most interesting activity of the day was the Citizens Debate and drama, which was centered on a proposed rehabilitation package for people residing within Hollongapara Gibbon Wildlife Sanctuary. At the end of the last day a drama of hunting and logging was staged by participants. Participants came away with an understanding of these processes.

In the workshops participants were taught methods for using the education materials supplied to them. At the end of the workshop participants made personal written commitments to take up two projects that they could carry out in the next 6 months. A post workshop assessment and an evaluation using a concept map were conducted in each workshop.

Photo: Citizen Debate – a role play

Photo: Drama on Habitat loss & hunting

Photo: Group photo of the participants

CAPACITY BUILDING

To improve the skills and provide basic knowledge of wildlife monitoring techniques and management, 67 numbers of front line forest staffs belonging to four forest division viz. East KA, West KA, Hamren and Working Plan division were trained. For that two training programs were organized at Assam Forest School, Jalukbari, Guwahati in close collaboration with Karbi Anglong Forest Department and Assam Forest Department.

First program was organized from 6th April to 12th April, 2015, where 30 numbers of front line staffs from Karbi Anglong participated. Second program was organized from 20th April to 26th April, 2015, where 37 numbers of front line staffs from Karbi Anglong participated. At the end of each program, a valedictory ceremony was organized and certificates were distributed among the participants.

A vast array of subjects of wildlife monitoring including census and monitoring of tiger, elephant, rhino, primate, Hoolock gibbon, ungulates, small mammals, birds, amphibian and reptiles, butterflies were taught by respective experts of the subject with field demonstration. Some practical orientation related to day to day challenges on wildlife crime control, anti poaching patrol, SMART patrolling, offence report, GPS handling, sustainable livelihood of the fringe communities and wildlife rescue and rehabilitation were also taught and discussed.

Photo: Experts delivering lecture in the class during skill development training

Photo: Training programs of front line forest staffs of KA

Photo: Certificate was distributed among staffs after the completion of training program

The Assam Tribune

Wildlife training for Karbi Anglong forest staff

TIMES NEWS NETWORK

Guwahati: Wildlife experts have called for long-term conservation in Karbi Anglong, a hilly district in the state rich in biodiversity, through capacity building of forest staff in wildlife monitoring and management techniques.

Karbi Anglong has a contiguous landscape with world heritage site Kaziranga National Park. One of the crucial roles played by Karbi Anglong is that its highlands provide shelter to wildlife from Kaziranga during floods. The district is also a high priority area for long-

> Thirty frontline staff from four forest divisions of Karbi Anglong were trained by experts in latest technologies on wildlife monitoring and management

term conservation of the Western Hoolock gibbon, one of the two species of lesser-known apes found in the northeast.

A recent survey conducted by the Primate Research Centre NE India (PRCNE), found 4,630 Western Hoolock gibbon in Karbi Anglong, which accounts for almost 65 per cent of its population in the state. The district also has two elephant reserves.

Keeping the importance of long-term conservation management in mind, 30 frontline staff from four forest divisions of Karbi Anglong were trained by wildlife experts in the latest technologies on wildlife monitoring and management here recently. The PRCNE in association with the forest department and Karbi Anglong Autonomous Council organized the week-long training with support from US Fish & Wildlife Services and People's Trust for Endangered Species.

PRCNE coordinator Jihosuo Biswas said the training was meant for the capacity building of many of the frontline staff who are unaware of the many components of wildlife monitoring and management techniques. The objective is to make conservation in the district more efficacious.

He added that there was a need to establish a separate wildlife wing in Karbi Anglong to look after the management issue of wildlife and manpower in the district.

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Training on wildlife monitoring

STAFF REPORTER

GUWAHATI, April 19 - A week-long training programme on 'Field Techniques on Wildlife Monitoring & Management' was held at Assam Forest School, Jalukbari, recently.

The training programme was organised by the Primate Research Centre NE India (PRC), Guwahati, in collaboration with Forest Department, Karbi Anglong Autonomous Council and with support from US Fish & Wildlife Services and People's Trust for Endangered Species for the frontline forest staff of Karbi Anglong on wildlife management and to improve skill.

Karbi Anglong is situated just opposite the world-famous Kaziranga National Park and is having habitat contiguity. Wild animals from Kaziranga including elephant, rhino, buffalo, deer, etc., take refuge in the highlands of Karbi Anglong during the annual floods. Karbi Anglong also houses five priority areas out of ten in Assam, prioritized for long-term conservation of the Western Hoolock gibbon - one of the two species of lesser apes found in North-east India. In a recent census, PRC-NE estimated 4;630 individuals of Western Hoolock gibbon from Karbi Anglong which accounts for 65 per cent of its population in the State.

Moreover, Karbi Anglong also houses two Elephant Reserves. The training for frontline staff on wildlife monitoring and management was for the first time in Karbi Anglong.

Thirty frontline forest staff from four forest divisions of Karbi Anglong (East Division, West Division, Hamren Division and Protection Division) participated in the training. A vast array of subjects of wildlife monitoring including census and monitoring of tiger, elephant, rhino, primate, Hoolock gibbon, ungulates, small mammals, birds, amphibian and reptiles, butterflies were taught by the experts with field demonstration.

Some practical orientation-related to day-to-day challenges on wildlife crime control, anti-poaching patrol, SMART patrolling, offence report, GPS handling, sustainable livelihood of the fringe communities and wildlife rescue and rehabilitation were also taught and discussed.

PRC-NE distributed a set of field kits containing uniform, hunting shoes, cap, rucksack bag, sleeping bag, mosquito net, jacket, rain gear, torch light, search light, and binocular among the participants to improve their capacity and to boost their morale for better performance.

In the programme, Dr Jihosuo Biswas, coordinator, PRC-NE, described the conservation scope and challenges with special reference to wildlife and Hoolock gibbon conservation in Karbi Anglong.

"This is the first time such an initiative is being taken. The forest staffs who actually work in the field are unaware about the various components of wildlife monitoring and management techniques and this is why the training programme is being conceptualized," he said.

In this connection, a kit distribution ceremony was organised at Assam Forest School, Jalukbari on the last day, which was chaired by wildlife activist Jaynal Abedin. The ceremony was attended among others by Dr Jayanta Das, Wildlife Areas Development & Welfare Trust.

FACILITATING FIELD KITS & GEARS

To boost the morale of the front line forest staffs of Karbi Anglong for better performance, field kits containing uniform, hunting shoes, shocks, cap, rucksack bag, sleeping bag, jacket, mosquito net, rain gear, torch, search light and binocular was distributed to 67 number of front line forest staffs of Karbi Anglong after successful completion of training program. In this connection a kit distribution ceremony was organized where Mr. Mohan Chandra Malakar, Retired PCCF (Wildlife) of Assam presided the meeting and attended by Dr. Abhijit Rava, Addl. PCCF, Karbi Anglong as chief guest. The ceremony was attended by Mr. Ritesh Kumar Bhattacharjee, retired CF, Mr. Jaynal Abedin, a renowned wildlife activist of Assam and other dignitaries.

In his speech, Mr. Malakar, former PCCF (WL) lauded the effort of PRC and said that only concerted efforts from every corner can protect the forest and wildlife in Karbi Anglong as forest department alone cannot protect it. While Dr. Abhijit Rava thanked the organizer PRC for their effort and said that this will certainly boost the morale of the front line forest officials. He also lauded the organizer and supporting agency for extending their support which is long awaited. He called for the all out effort to the forest official to protect wildlife. Speaking to the occasion, Mr. Bhattacharjee also lauded the effort of PRC and said that only concerted efforts from every corner can protect the forest and wildlife in Karbi Anglong as forest department alone cannot protect it.

Photo: 67 numbers of field kits were distributed among forest stffs of Karbi Anglong

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ACTIVITIES TO BE CARRIED OUT IN FUTURE

1. Long term gibbon population monitoring.

2. Capacity building cum training of remaining front line forest staffs.

3. Facilitating field kits and field gears to remaining front line forest staff of Karbi Anglong.

4. Refresher course for previously trained staffs with legal orientation and arm handling training.

5. Infrastructure development and capacity building of forest staff, patrolling equipments and maintenance.

6. Mass scale Community education and Outreach program.

7. Initiation of community base conservation program addressing livelihood issue.

Appendix – I

Addl. Principal Chief Conservator of Forest, KA's letter of accreditation:

KARBI ANGLONG AUTONOMOUS COUNCIL
OFFICE OF THE ADDL. PRINCIPAL CHIEF CONSERVATOR OF FORESTS::KARBI ANGLONG
D I P H U.

Letter No. Addl. PCCF/KA/Wildlife/2014-15/   502   Dated 30/6 /2015.

To,

Dr. Jihosuo Biswas, Ph.D.,
Primate Research Centre North East India
House No. 4, Ananda Nagar,
Byelane No. 3, Pandu, Guwahati-781012,
Assam, India.

Sub:-   Permanence of Research activities regarding Primates in the landscape of Karbi Anglong an elsewhere in the state of Assam.

Dr. J. Biswas,

I must congratulate you for the excellent fad work during the project period in the district of Karbi Anglong.

Some very wonderful findings marked your project works that to show how important the landscape under my control as regards to the population density of the Western Hoolock gibbon to vis-à-vis the North East India Scenario.

But, I urge you not to stop. So, please come up with a good proposal and together, find a funding agency to further the cause of research on primate on the landscape scale.

Yours faithfully,

(Dr. Abhijit Rabha, Ph.D. IFS)
Addl. Principal Chief Conservator of Forests,
Karbi Anglong::Diphu.

Memo No. Addl. PCCF/KA/Wildlife/2014-15/   Dated   / /2015.

Copy to the Principal Chief Conservator of Forests (Wildlife), Assam, Basistha, Guwahati-29 for kind information. This refer to his permission letter O.O. No. 006, Dated 29/03/2014.

Addl. Principal Chief Conservator of Forests,
Karbi Anglong::Diphu.

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Appendix – II

Field Techniques for Wildlife Monitoring & Management
Venue - Assam Forest School, Jalukbari, GHY -14
Details of the classes

a. Day -1 : Arrival
b. Day -2 : Integration and Biodiversity of the area, Importance of the Area
c. Day -3 : Wildlife Census & Monitoring Techniques for Tiger, Elephant, Rhino and Primates
d. Day -4 : Wildlife Census & Monitoring for birds, reptiles, amphibians, butter flies and ungulates
e. Day -5 : Habitat assessment and mapping
f. Day -6 : Wildlife Crime, Laws and Anti-poaching
g. Day -7 : Wildlife management. Valedictory, Field kit & certificate distribution
h. Day -8 : Departure

1st Training program on Field Techniques for Wildlife Monitoring & Management from 5th April, 2015 to 12th April, 2015.

Day	8.00-9.00	Theme	10.00-11.00	11.00-11.30	11.30-12.30	12.30-1.45	1.45-2.45	2.45-3.45	3.45-4.00	4.00-5.00	8.00-9.00
Day-1 05.04.15			Arrival				Lunch			Arrival	DINNER
Day – 2 06.04.15	BREAKFAST	Inaugural & Biodiversity	Inaugural session	Tea & Evaluation	Introduction to the course and rules & regulation of AFS Dr. J. Biswas & Mr. D.K. Das	Lunch	Biodiversity of Eastern Himalayas Prof. P.C. Bhattacharjee, GU	Climate change & its impact on Biodiversity Dr. Alka Bhargav, CCF	Tea	Biodiversity Assessment and Monitoring Dr. Jayanta Das, WWT	DINNER
Day – 3 07.04.15	BREAKFAST	Wildlife Monitoring & Census Techniques	Tiger Census Techniques Dr. A. Rava, Adl. PCCF	Tea & Evaluation	Elephant Census Techniques Mr. Bhupen Talukdar, DCF	Lunch	Rhino Census Techniques Mr. C.R. Bhobra, CF	Gibbon / Primate Census Techniques Dr. Jihosuo Biswas, PRC	Tea	Ungulates Monitoring & Census Techniques Ms. Alolika Sinha, WII	DINNER
Day – 4 08.04.15	BREAKFAST	Wildlife Monitoring & Census Techniques	Bird Monitoring & Census Techniques Prof. P.C. Bhattacharjee, GU	Tea & Evaluation	Butterfly Diversity & Monitoring Techniques Prof. Jatin Kalita, GU	Lunch	Tracks & Sign for Biodiversity Assessment & Monitoring Dr. Nabajit Das, BH College	Amphibians and Reptiles Monitoring Techniques Mr. Sammjjal Saharia, Wild Trail	Tea	Small Population & its future challenges Dr. Jihosuo Biswas, PRC	DINNER
Day – 5 09.04.15	BREAKFAST	Habitat Assessment & Mapping	Vegetation Sampling Techniques Dr. Pranab Bujarbarua, Handique College	Tea & Evaluation	Habitat Management Dr. Pranjal Bezbaruah, Grasshooper	Lunch	Use of GPS & Field work D Mr. Kulen Sinha, AFS	Habitat Mapping Dr. Pranjit Srama, Darrang College	Tea	Field work- Using GPS & Group Presentation Mr. Kulen Sinha, AFS	DINNER
Day – 6 10.04.15	BREAKFAST	Wildlife Crime, Laws and Anti-poaching	Anti-poaching Patrols Mr. Ritesh Bhatta, CF (Rtd)	Tea & Evaluation	Anti-poaching Patrols Continue Mr. Ritesh Bhatta, CF (Rtd)	Lunch	Offence Report Preparation Mr. C.R. Bhobra, CF	Wildlife Laws Dr. Gopal Chetry	Tea	Problem solving on Wildlife Crime (GD) Mr. P.S. Das, DCF	DINNER
Day – 7 11.04.15	BREAKFAST	Adaptive Management & Closing ceremony	Eco Development & Sustainable livelihood Dr. Pijush Dutta, TISS	Tea & Evaluation	Rescue & Rehabilitation Dr. Rathin Barman, WTI	Lunch	Evaluation	Valedictory	Tea	Field Kits & Certificate distribution	DINNER
Day – 8 12.04.15	BREAKFAST		Departure								

2nd Training program on Field Techniques for Wildlife Monitoring & Management from 19th April, 2015 to 26th April, 2015.

Day	8.00-9.00	Theme	10.00-11.00	11.00-11.30	11.30-12.30	12.30-1.45	1.45-2.45	2.45-3.45	3.45-4.00	4.00-5.00	8.00-9.00
Day-1 19.04.15		Arrival					Lunch			Arrival	DINNER
Day – 2 20.04.15	BREAKFAST	Inaugural & Biodiversity	Inaugural session	Tea & Evaluation	Introduction to the course and rules & regulation of AFS Dr. J. Biswas & Mr. D.K. Das	Lunch	Biodiversity of Eastern Himalayas Prof. P.C. Bhattacharjee, Gauhati University	Climate change & its impact on Biodiversity Dr. Alka Bhargav, CCF	Tea	Biodiversity Assessment and Monitoring Dr. Jayanta Das, WWT	DINNER
Day – 3 21.04.15	BREAKFAST	Wildlife Monitoring & Census Techniques	Tiger Census Techniques Dr. A. Rava, Adl. PCCF	Tea & Evaluation	Elephant Census Techniques Mr. Bhupen Talukdar, DCF(Rtd)	Lunch	Rhino Census Techniques Mr. C.R. Bhobra, CF	Gibbon / Primate Census Techniques Dr. Jihosuo Biswas, PRC	Tea	Ungulates Monitoring & Census Techniques Ms. Alolika Sinha, WII	DINNER
Day – 4 22.04.15	BREAKFAST	Wildlife Monitoring & Census Techniques	Bird Monitoring & Census Techniques Joynal Abedin, Dibru Saikhowa Conservation Society	Tea & Evaluation	Butterfly Diversity & Monitoring Techniques Prof. Jatin Kalita, Gauhati University	Lunch	Tracks & Sign for Biodiversity Assessment & Monitoring Dr. Nabajit Das, BH College	Amphibians and Reptiles Monitoring Techniques Mr. Sammjjal Saharia, Wild Trail	Tea	Small Population & its future challenges Dr. Jihosuo Biswas, PRC	DINNER
Day – 5 23.04.15	BREAKFAST	Habitat Assessment & Mapping	Vegetation Sampling Techniques Dr. Pranab Bujarbarua, Handique College	Tea & Evaluation	Habitat Management Dr. Pranjal Bezbaruah, Grasshooper	Lunch	Use of GPS & Field work D Mr. Kulen Sinha, AFS	Habitat Mapping Dr. Pranjit Srama, Darrang College	Tea	Field work- Using GPS & Group Presentation Mr. Kulen Sinha, AFS	DINNER
Day – 6 24.04.15	BREAKFAST	Wildlife Crime, Laws and Anti-poaching	Anti-poaching Patrols Mr. Ritesh Bhatta, CF (Rtd)	Tea & Evaluation	Anti-poaching Patrols Continue Mr. Ritesh Bhatta, CF (Rtd)	Lunch	Offence Report Preparation Mr. C.R. Bhobra, CF	Wildlife Laws Dr. Gopal Chetry	Tea	Problem solving on Wildlife Crime (GD) Mr. P.S. Das, DCF	DINNER
Day – 7 25.04.15	BREAKFAST	Adaptive Management & Closing ceremony	Eco Development & Sustainable livelihood Dr. Pijush Dutta, TISS	Tea & Evaluation	Rescue & Rehabilitation Dr. Rathin Barman, WTI	Lunch	Evaluation	Valedictory	Tea	Field Kits & Certificate distribution	DINNER
Day – 8 26.04.15	BREAKFAST					Departure					

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Appendix - III

List of Front line Forest staffs who will be participating the training programs:

Sl. No.	Division	Range	Name of the staff	Rank
1	KA East Division	Western Range	Mr. Sanjoy Engti	Fr I
2		Western Range	Mr. Bikram Teron	Fr I
3		Western Range	Mr. Admond Terang	Fr I
4		Protection Range	Mr. Babu Ram Kro	Fr I
5		Eastern Range	Mr. Sarnelip Hanse	Fr I
6		Eastern Range	Mr. Ashim Rongphar	Fr I
s7		Central Range	Mr. Welson Rongphar	Fr I
8		Central Range	Mr. Mongal Timung	Fr I
9		North Western Range	Mr. Don Bora	Fr I
10		North Western Range	Mr. Jagat basumatary	Fr I
11		North Eastern Range	Mr. Suna Singh Timung	Fr I
12		Northern Range	Mr. Babu Ram Bey	Fr I
		Northern Range	Mr. Bmal Teron	Fr I
13		Northern Range	Mr. Loren Phangcho	Fr I
14		Northern Range	Mr. Parasar Saikia	Fr I
15		Northern Range	Mr. Prosenjit Killing	Fr I
16	Working Plan	Working Plan	Mr. Bimal Bey	Fr I
17		Working Plan	Mr. Bijon Teron	Fr I
18		Working Plan	Mr. Putu Koch	Fr I
19		Working Plan	Mr. Renon Kro	Fr I
20		Working Plan	Mr. Dimbaswar Bora	Fr I

21		Working Plan	Mr. Reshamlal Bhusal	Fr I
22		Working Plan	Mr. Sikari Rongpi	Fr I
23		Working Plan	Mr. Joysing Timung	Fr I
24		Working Plan	Mr. Bikram Teron	Fr I
25		Working Plan	Mr. Manik Tisso	Fr I
26			Mr. Dorsing Timung	Fr I
27			Mr. Longbiram Tisso	Fr I
28			Mr. Krishna Rongphar	Fr I
29			Mr. Buddha Narzary	Fr I
30			Mr. H. Bhattacharjee	Fr I
31			Mr. Biju Rongpi	Fr I
32			Mr. Ranji Engti	Fr I
33			Mr.Nokjeer Hanse	Fr I
34			Mr. Sunsing Timung	FG
35			Mr. Jitsing Rongpi	FG
36			Mr. Ramesh Terang	FG
37	West Division		Mr. Chamsing Timung	FG
38			Mr. Khorsing Engti	FG
39			Mr. Putul Borah	FG
40			Mr. S.J. Gogoi	FG
41			Mr. B.R. Rongphar	FG
42			Mr. Bishnu Bora	FG
43			Mr. Ritu Rajbonshi	FG
44			Mr. Rajib Ahmed	FG
45			Mr. Nirmal Rabha	FG

46			Mr. Deben Teron	FG
47			Mr. Ajoy Hanse	FG
48			Mr. Sing Hanse	FG
49			Mr. Marsonly Hanse	FG
50			Mr. Surya Rongpi	FG
51			Mr. Khiram Bey	FG
52			Mr. Dirchumai Rongpi	FG
53			Mr. Devid Rongpi	FG
54			Mr. Burasing Hanse	FG
55			Mr. Sikari Kramsa	FG
56			Mr. Harsing Teron	Fr I
57			Mr. Someswar Tokbi	Fr I
58			Mr. Harsong Kramsa	Fr I
59			Mr. Raju Ronghang	Fr I
60	Hamren Division		Mr. Swagat Baruah	Fr I
61			Mr. Telesfor Kerkatta	Fr I
62			Mr. Mukut Teron	Fr I
63			Mr. Khorsing Teron	FG
64			Mr. Malik Rongpi	FG
65			Mr. Urmiki Timung	FG
66			Mr. Depensing Terang	FG
67			Mr. Robiram Terang	FG