

## Mammalian Diversity of Degraded Forest Habitats around Assam University Campus, Cachar, Assam, India, with Notes on Conservation Status

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### Abstracts

Barak valley in South Assam remains poorly investigated in terms of faunal diversity, especially mammals. This paper inventories 19 species of mammals belonging to 14 families in the degraded forests of Assam University Campus, Silchar, Assam and those maintained by the tea gardens of this area. Of these, three are in the IUCN endangered (EN) and two in vulnerable (VU) categories. The threats faced and conservation priorities are also discussed.

**Key words:** Mammalian diversity, Barak valley, conservation threats, Assam University, degraded forest.

### Introduction

The northeastern region of India, comprising the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura, can be physiographically divided into Eastern Himalaya (Sikkim and Arunachal Pradesh), Northeastern Hills (Meghalaya Plateau, Patkai-Naga Hills and Lushai Hills), and Brahmaputra and Barak Valley plains. Situated at the confluence of the Indo-Malayan and Palearctic biogeographic realms, the region contains a profusion of habitats characterized by diverse biota. India harbours a total of 417 species of mammals belonging to 48 families (Nameer, 2000, 2008), of which the northeastern region accounts for 54% of threatened mammals found in the country (Choudhury, 2006). Assam has a rich

mammalian diversity comprising 193 species of mammals belonging to 32 families, thereby representing about 60% of the country's mammalian diversity (Choudhury, 1997). Assam is located in the transitional zone between the Indian and the Indo-chinese sub-regions where many Indian species have their easternmost limit (e.g., *Axis axis*) while several other Indo-chinese species have their westernmost limit of distribution (e.g., *Tupaia belangeri*).

Faunal inventorying is one of the important tasks for precise taxon-specific and area-specific conservation efforts. Its relevance increases manifold in the light of conspicuous dearth of information about the biodiversity profile of the existing protected area network within the country (Srinivasulu *et al.*, 2004). The Barak valley

in southern Assam, covering an area of 6922 km<sup>2</sup>, has the North Cachar Hills district and the state of Meghalaya to its north; Manipur to the east; Mizoram to the south; and Tripura and the Sylhet district of Bangladesh to the west. The valley has an undulating topography characterized by low hills interspersed within wide floodplains and low-lying waterlogged areas locally called *beels*. Significant contributions are lacking on the mammalian diversity of Barak valley, although it has the Borail Wildlife Sanctuary in its north, and the Inner Line Reserve Forest, which is one of the largest reserve forests of the state of Assam covering more than 1000 km<sup>2</sup> area, in its southern fringes. The hills of Dargakona, about 20 km south of Silchar, the district headquarters of Cachar district, where the campus of Assam (Central) University is located, was once covered with dense forest dominated by *Artocarpus chama* that was almost contiguous with those of the Inner Line Reserve Forest. The University Campus still has patches of degraded forest which is home to several mammalian species that have been inventoried in the present paper.

## Materials and methods

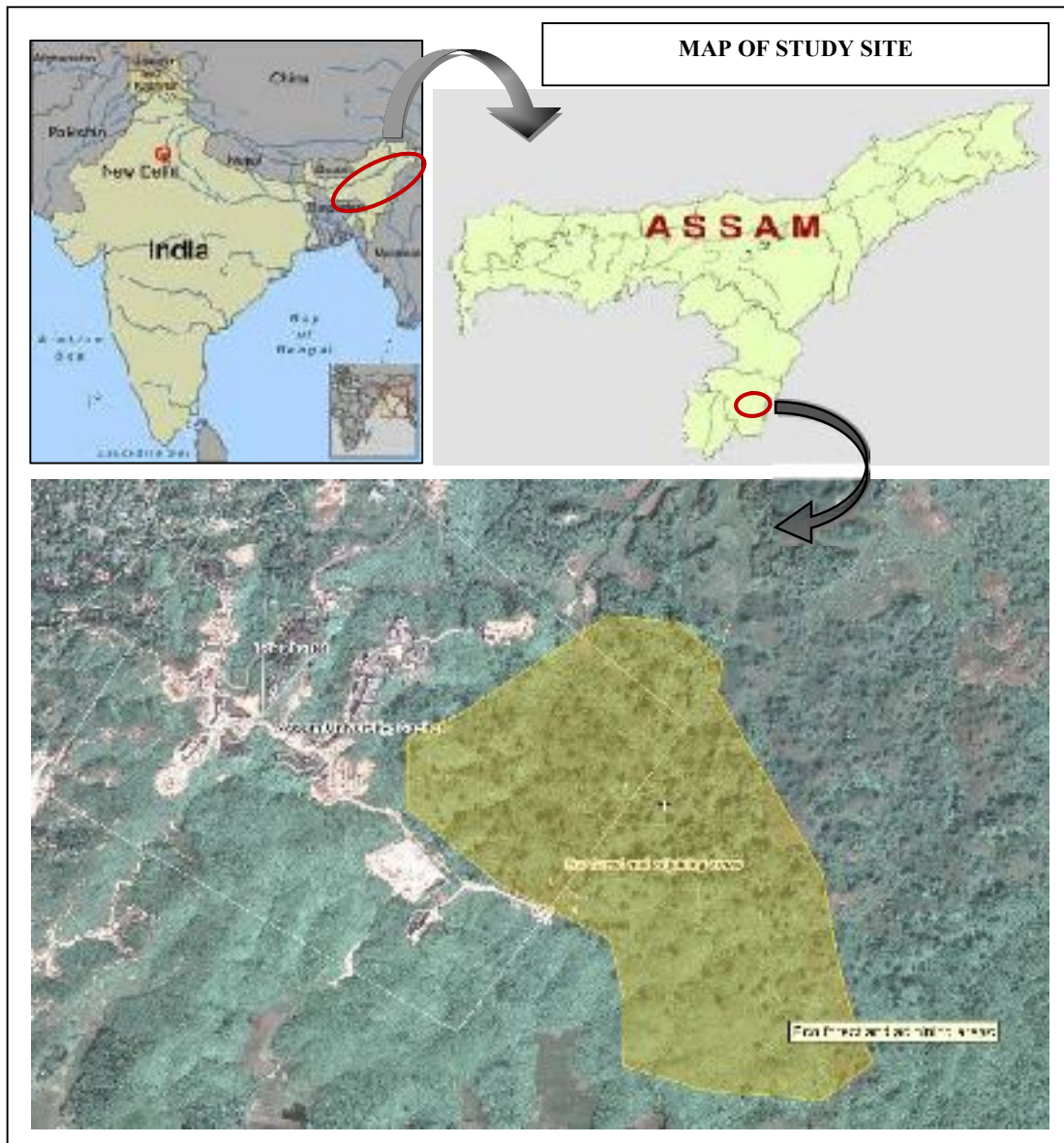
### Study area

The c 600 acre Assam University (AUS) Campus comprises low hills at an elevation of 40-60 m MSL. It has around 150 acres of forest that is contiguous with another 100-odd acres of mixed deciduous forest belonging to the Silcoorie (Dargakona) Tea Estate. While the southern part of the University campus is adjacent to the flood plain of the *Chatla Haor*, its western margin extends to the home gardens and community forests of nearby Irongmara village. The area experiences a warm,

humid climate having a mean annual rainfall of 2660 mm, most of which is received during the southwest monsoon season (May to September). The mean maximum temperature ranges from 25.4°C (January) to 32.6°C (August) and the mean minimum temperature from 11°C (January) to 25°C (August) (Das and Das, 2005).

The vegetation around the University campus represents a secondary succession status with different degrees of disturbance. The vegetation is dominated by *Artocarpus chama* and *Tetrameles nudiflora* comprising the top layer; *Ficus* sp., *Artocarpus lakoocha* and others in the middle layer; and *Neohouzeana dullooa* and saplings of *Goniothalamus*, *Cyclostomes* and *Mimosa himalayana* in the lower. Undergrowth is dominated by *Desmodium* sp., saplings of *Calamus guruba*, *Daemonorops jenkinsianus*, *Homanolena* sp and seedlings of *Artocarpus chama* besides other plant species. Disturbance in the vegetation has resulted in the growth of early successional plants like *Cromelina* sp., *Combretum* sp., *Melastoma malabathricum*, *Macaranga* sp., etc. Climbers are represented by *Mikania micrantha*, *Ipomea* sp. and scattered plants of *Pandanus* sp., *Licuala peltata*, etc. intermixed with these secondary successional plants. On more degraded sites the vegetation is represented by grass species like *Chrysopogon* sp. mixed with *Desmodium triflorum*, *Borreria hispida* and *Mimosa pudica*. Characteristic features of tropical forests like the presence of buttresses on the trees, dominance of epiphytes (ferns and orchids) strangling habit of the trees are observed in the tree species of the University Campus (Dutta *et al.*, 1998).

The study area was categorized into four habitat types- Open Forest (OF), Tea



**Figure 1.** Map of the study site (AUS Campus) and adjoining areas.

Garden (TG), Natural Forest (NF) and Degraded Forest (DF), based on the major habitat characteristics, vegetation and dominant species (Tab. 1.). Line transects were laid down in each of these habitat types and mammalian fauna which were

found along these transects were recorded by direct sightings and indirect evidences (Varman and Sukumar, 1995). The study was carried out from May, 2006 to June, 2007. The identification of the species recorded was done with the help of standard

literature (Choudhury, 1995; Choudhury 1997; Menon, 2003). Secondary information was also collected from the villagers residing around the university campus and also from the local hunters regarding the presence/absence of the mammalian species in the study area.

### Results

A total of 19 species of mammals belonging to 8 orders and 16 families were recorded during this study from the degraded forest habitats around the Assam University Campus (Tab. 2). Among them the order Primates, Carnivora and Chiroptera are the most diverse having 5 species each. Among all recorded species, 6 are included in the Schedule-I and another 7 species in the Schedule II of the Indian Wildlife (Protection) Act, 1972 (IWPA). Of these, 16% belongs to the EN, 5% to VU and 79% belongs to least concern (LC) species according to the IUCN category.

### Significant records

The conservation status of each species encountered during the study is briefly reviewed. The significant results found are discussed below. Four species of primates are recorded so far in the area.

#### **Capped Langur *Trachypithecus pileatus* (Blyth, 1834)**

Capped langur is distributed in the entire state of Assam up to an elevation of c. 1500 m. Choudhury (1997) referred to it as the subspecies *Trachypithecus pileatus pileatus*. This species was sighted twice during the study period near the village home-gardens adjoining the forest areas (Fig. 2). Exact status of this species in the valley is not known till date. Human-wildlife conflict is

the main concern over the conservation of this species.

#### **Phayre's Leaf Monkey *Trachypithecus phayrei* (Blyth, 1847)**

Phayre's leaf monkey is known to occur in three states of North East India, viz., Assam (Barak valley), Tripura and Mizoram. Only 129 individuals of this IWPA Schedule- I species have so far been recorded in the state of Assam (Bose, 2002). About 47 individuals were recorded from the forests of Assam University Campus and nearby areas (Fig. 3).

#### **Western Hoolock Gibbon *Hoolock hoolock* (Harlan, 1834)**

One pair is present in the forest adjoining the Dargakona tea estate (Fig. 4). This forest patch also extends up to the Derby tea estate towards its south.

#### **Indian Muntjac *Muntiacus muntjak* (Zimmermann, 1780)**

Muntjac is extensively hunted by the local hunters for meat and skin and is often sold in the local village markets. It is also severely affected by anthropogenic activities such as clearing of forests.

#### **Jungle Cat *Felis chaus* (Schreber, 1777)**

Found in the AUS-forest and other secondary forest habitats. Retaliatory killing by villagers against poultry predation comprises the major threat.

#### **Common Palm Civet *Paradoxurus hermaphroditus* (Pallas, 1777)**

Often found predated upon the poultry of the villagers. Retaliatory killing is the main threat to this species (Fig. 5).

**Table 1.** Habitat types in the study area

Patch title	Patch details	Information source
Open forest (OF)	Highly disturbed patch with different species of herbs, shrubs and other secondary vegetation.	Dutta <i>et al.</i> (1998)
Tea garden (TG)	Predominance of tea bushes along with shade trees. Extensive use of pesticides is a major threat affecting the whole patch.	Personal observation
Natural forest (Eco-Forest) (NF)	Mature forest, slightly disturbed by anthropogenic activity. Disturbance in the vegetation has resulted in the growth of early successional plants.	Dutta <i>et al.</i> (1998)
Degraded forest (DF)	Highly disturbed patches around human habitation. Abundance of planted tree species.	Dutta <i>et al.</i> (1998)

**Table 2.** Checklist of mammalian fauna of Assam University campus, Silchar.

Species	Scientific name	Occurrence	IUCN Status	WPA status/ Remarks
<b>Order: PRIMATES</b>				
<b>Family: Cercopithecidae</b>				
Rhesus Macaque	<i>Macaca mulatta</i> (Zimmermann, 1780)	OF, TG, NF, DF	LC	WPA-II, fairly common in the study site, close interactions with human habitats.
Capped Langur	<i>Trachypithecus pileatus</i> (Blyth, 1834)	NF, DF	EN	WPA-I, Its recorded in the southern and eastern part of the Assam University
Phayre's Leaf Monkey	<i>Trachypithecus phayrei</i> (Blyth, 1847)	NF, DF, TG	EN	WPA-I, all together 3 troops and 1 all-male -band is recorded along with one new distribution range behind Jalenga Tea estate in a Jayantia village.
<b>Family: Hylobatidae</b>				
Western Hoolock Gibbon	<i>Hoolock hoolock</i> (Harlan, 1834)	NF	EN	WPA-I, One pair sometimes visits the forest adjoining to the Durgakona tea estate.
<b>Order: ARTIODACTYLA</b>				
<b>Family: Cervidae</b>				
Indian Muntjac	<i>Muntiacus muntjak</i> (Zimmermann, 1780)	NF	LC	WPA-III, Hunted by the local hunters for meat and skin.
<b>Family: Suidae</b>				
Wild Pig/ Wild Boar	<i>Sus scrofa</i> (Linnaeus, 1758)	NF	LC	WPA-III, Sometime raid crop and vegetables in the nearby village home gardens.
<b>Order: CARNIVORA</b>				
Indian Fox/Bengal Fox	<i>Vulpes bengalensis</i> (Shaw, 1800)	DF	LC	WPA-II, Common in the eco-forest and nearby villages.
<b>Family: Felidae</b>				
Jungle Cat	<i>Felis chaus</i> (Schreber, 1777)	NF, DF	LC	WPA-II, Found in the Eco-forest and other secondary forest habitats. Retaliatory killed by villagers against poultry predation.

Contd....

Table 2-Contd....

<b>Family: Herpestidae</b>					
Indian Grey Mongoose	<i>Herpestes edwardsii</i> (Geoffroy Saint-Hilaire, 1818)	DF	LC	NA, Found in the villages also semi-domesticated by some of the villagers.	
<b>Family: Viverridae</b>					
Common Palm Civet	<i>Paradoxurus hermaphroditus</i> (Pallas, 1777)	DF, NF	LC	WPA-II, Often found in predating upon the poultry of the villagers. Retaliatory killing is the main threat to this species.	
<b>Order: PHOLIDOTA</b>					
<b>Family: Manidae</b>					
Chinese Pangolin	<i>Manis pentadactyla</i> (Linnaeus, 1758)	DF, NF	LC		WPA-I
<b>Order: RODENTIA</b>					
<b>Family: Hystricidae</b>					
Himalayan Crestless Porcupine.	<i>Hystrix brachyura</i> (Linnaeus, 1758)	DF, NF	VU		WPA-II
<b>Family: Sciuridae</b>					
Orange Bellied Himalayan Squirrel	<i>Dremomy lokriah</i> (Hodgson, 1836)	TG, NF	LC		NA
Hoary Bellied Himalayan Squirrel	<i>Callosciurus pygerythrus</i> (I. Geoffroy Saint Hilaire, 1833)	DF	LC		NA
<b>Family: Muridae</b>					
Common House Rat	<i>Rattus rattus</i> (Linnaeus, 1758)	DF, OF	LC		NA
<b>Order: CHIROPTERA</b>					
<b>Family: Pteropodidae</b>					
Indian Fruit Bat	<i>Pteropus giganteus</i> (Brunnich, 1782)	DF	LC		
Fulvous fruit Bat	<i>Rousettus leschenaultii</i> (Desmarest, 1820)	DF	LC		
Indian Pipistrelle	<i>Pipistrellus coromandra</i> (Gray, 1838)	DF	LC		
<b>Order: SHORICOMORPHA</b>					
<b>INSECTIVORA</b>					
<b>Family: Soricidae</b>					
House Shrew	<i>Suncus murinus</i> (Linnaeus, 1766)	DF, OF	LC		

EN= Endangered, VU=Vulnerable, LC= Least concern, DD= Data deficient, WPA= Wildlife (protection) act, DF= Degraded forest, TG= Tea garden, OF= Open forest, NF= Natural forest, NA= Not applicable.

**Chinese Pangolin *Manis pentadactyla* (Linnaeus, 1758)**

Among the mammals of Assam University this species is facing the most severe threat from the local people and hunters (Fig. 6). Very often it is captured from the forests of the study area for the purpose of

consumption of its meat and medicinal use of its various parts.

**Himalayan Crestless Porcupine *Hystrix brachyura* (Linnaeus, 1758)**

This nocturnal species is occasionally found in the study area. It is often regarded as a





**Figure 2.** Capped Langur *Trachypithecus pileatus* (Photo: K. Mazumdar)



**Figure 3.** Phayre's Leaf Langur *Trachypithecus phayrei* (Photo: K. Mazumdar)



**Figure 4.** Western Hoolock Gibbon *Hoolock hoolock* (Photo: R. Soud)



**Figure 5.** Common Palm Civet *Paradoxurus hermaphrodites* killed by villagers because of retaliatory causes (Photo: R. Soud)



**Figure 6.** Chinese Pangolin *Manis pentadactyla* (Photo: R. Soud)



**Figure 7.** Orange Bellied Himalayan Squirrel *Dremomys lokriah* (Photo: K. Mazumdar)

crop raider in the surrounding villages of eco-forest and also hunted for its meat.

**Orange-Bellied Himalayan Squirrel  
*Dremomys lokriah* (Hodgson, 1836)**

On 13<sup>th</sup> March, 2006, during the course of a field study trip to the Ecoforest we had sighted an Orange-Bellied Himalayan Squirrel *Dremomys lokriah* (Fig. 7) in the outskirts of the western boundary of the AUS forest bordering Dargakona tea estate (Soud *et al.*, 2010).

**Discussion**

The mammalian species still surviving in this area are facing an acute problem of habitat fragmentation. Fragmentation of habitat is considered to be the most significant threat to the survival of mammals, particularly the primates in Northeast India (Srivastava, 2006). Though certain species can survive in disturbed habitats, the long-term consequences on their reproduction and survival are not known. Since forest loss is the principal threat to the mammals and other fauna in this area, habitat protection has to be given highest conservation priority. Primates, which are one of the most adaptive mammalian groups, are also finding it difficult to persist in the study area. Strict prevention of further extraction of fuel wood and indiscriminate collection of NTFPs by the village people and illegal cutting of timber by outsiders, therefore, needs to be implemented with priority. Canopy bridges or corridors may be established to link up the small fragmented pockets of habitat. This could help in the conservation of the scattered troops of monkeys and reduce man-animal conflict with species like the *Rhesus macaque*. Conservation education could also be very

effective for making people understand the value of wildlife. The tea garden labour communities residing in this area have a rich tradition of offering community protection to plants and animals through small sacred groves called 'thans' (Gupta and Guha, 2002). They could, therefore, be encouraged to further this tradition to conserve the rich biodiversity of their land.

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