

## Conservation Status of Asian Elephants in Southern Assam, India

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**Abstract.** Since time immemorial, the Asian elephant has been an integral part of Indian civilization, religion and culture. However, due to habitat destruction and fragmentation, domestication, illegal trade for ivory and human-elephant conflicts, its population is under threat. Seasonal migrations for suitable habitats lead to occasional venturing into crop fields and human habitations, thereby causing conflicts with human. Two such fragmented populations (totalling nine individuals) persist in the southern Assam of northeast India. The present article provides a description of the status of the Asian elephant and its habitat in southern Assam, with special emphasis on threats and conservation.

### Introduction

The Asian elephant *Elephas maximus* is found in 13 countries across Asia, with India being home to the largest number of individuals of the species (Fernando & Pastorini 2011). Elephants have been an integral part of Indian culture for centuries. They are associated with religions and cultural heritage, playing an important role in the country's history (Lahiri Choudhury 1989). It was known that in the early 17<sup>th</sup> century, Mughal Emperor Jahangir had 113,000 captive elephants throughout his empire (Porter *et al.* 2016), which gives us a rough idea of the then population of these mammals in the wild.

Within India, wild elephants are distributed in 23 states with southern and north-eastern India accounting for the most abundant populations (Perinchey 2017). The state of Assam in northeast India is recognised as a key conservation region for Asian elephants (Stracey 1963; Gee 1964; Santiapillai & Jackson 1990; Choudhury 1991; Bist 2002) supporting a sizeable population of the species (Department of Environment & Forests, Government of Assam 2017).

This paper is focused on reviewing the status and distribution of elephant populations, as well as that of their habitats and migratory corridors in southern Assam. Based on the review, we

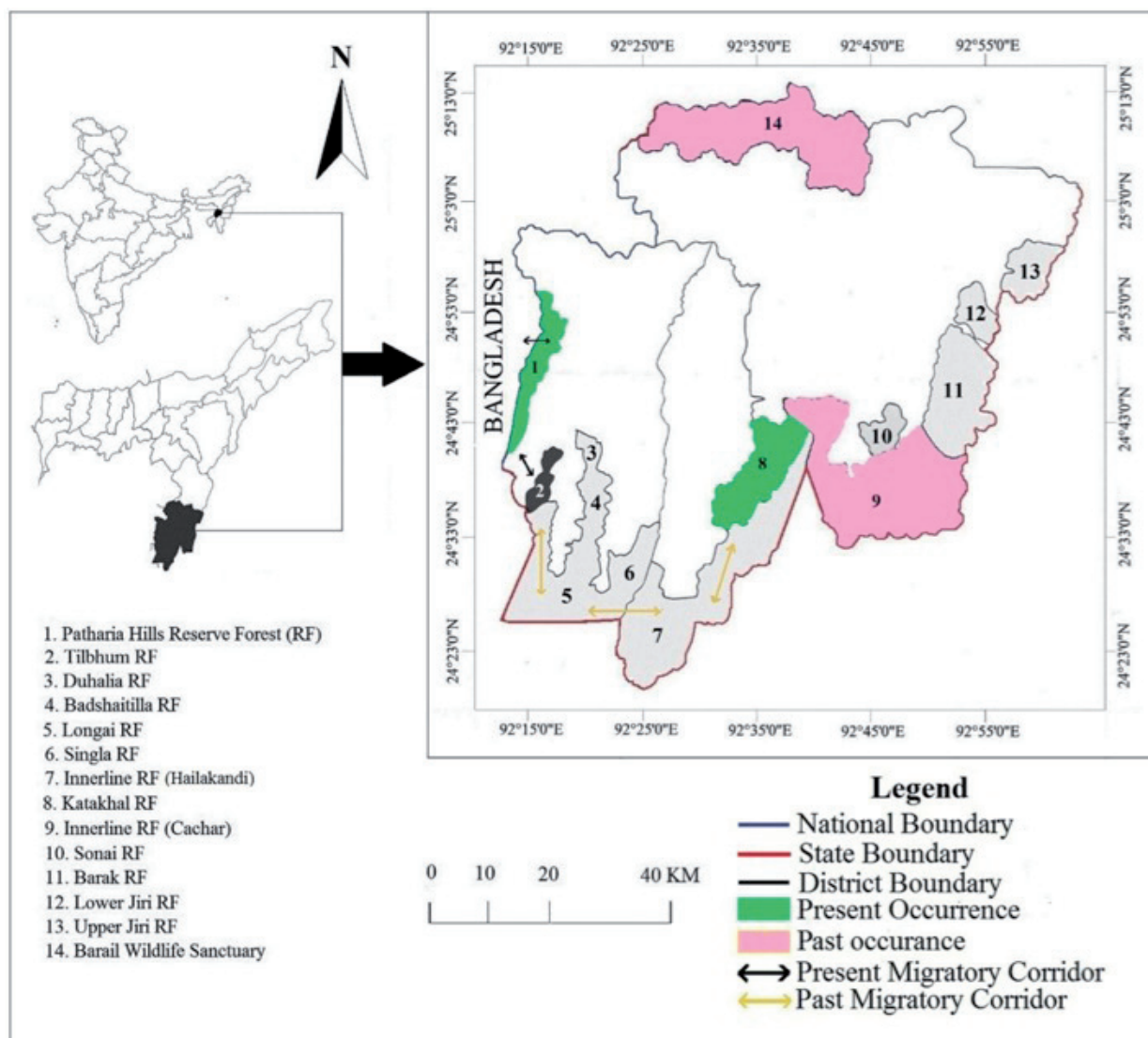
suggest some measures that need to be taken up immediately for their conservation.

### Methods

#### *Study area*

The southern part of Assam comprises Karimganj, Hailakandi, and Cachar Districts, together known as Barak valley. The valley is surrounded by the N.C. Hills district of Assam and the Jaintia Hills district of Meghalaya on the north, Manipur on the east, Mizoram on the south, and Tripura and Sylhet District of Bangladesh on the west. The total area of Barak valley is 6922 km<sup>2</sup>, of which Cachar District alone covers 54.7%, while Karimganj and Hailakandi Districts cover 26.1% and 19.2% respectively (Fig. 1).

Topography of the valley is composed of high hills, low lands and level plains. The valley is almost shut in by the hill ranges on the north, east and south, which occupy a considerable portion of the valley's area. The river Barak flows through the plains of the valley. Forests cover accounts for more than one-third of the valley's total land area (Department of Environment & Forests, Government of Assam 2017). These forests support a wide range of flora and fauna (Choudhury 2013). However, mass scale deforestation in recent years have resulted in the



**Figure 1.** Map of the study area.

decline of forest cover and wildlife, and have even led to the extinction of several species. Wild Asian elephants are also facing local extinction (Talukdar & Choudhury 2017b).

#### *Data collection*

The study was carried out using a literature survey as well as conducting semi-structure interviews with the forest staffs, hunters and villagers who regularly visit the forest for non-timber forest products. Since, the forest cover in the study area is heavily fragmented, and because the respondents regularly visit the forest, their responses about the small elephant population was considered as realistic. Participatory rural appraisals as well as interaction with wildlife experts were also done to validate the findings.

## **Results**

### *Population status*

A small fragmented herd of Asian elephant occurs in the study area with only two herds known to exist throughout southern Assam (Choudhury 1999).

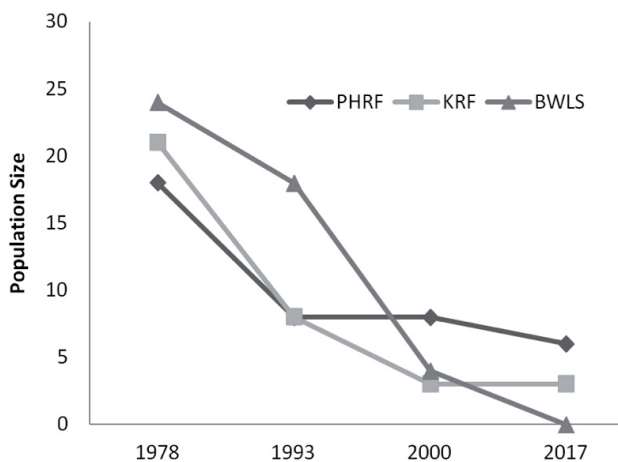
A study by Talukdar and Choudhury (2017b) encountered seven individuals in the Patharia Hills Reserve Forest (RF) (Fig. 2) and all individuals were females (six adults, one sub-adult). Presently, six female elephants are living in Patharia Hills RF as one elephant died due to electrocution on August 6, 2017. In 1978, 18 elephants were reported from this RF, which declined to eight in 1993 (Choudhury 1999).



**Figure 2.** Elephants of Patharia Hills RF returning from the paddy fields to the forest, passing through a tea garden.

The other RF, which harbours elephants in southern Assam, is Katakhal. Population size is small in the Katakhal RF and no human-elephant conflict has been recorded till date. The forest is fragmented, and based on interviews with forest authorities and experts we believe that there are three individuals in Katakhal RF (one adult female, one sub-adult male, one juvenile). In 1978, 21 individuals were recorded from Katakhal RF (Choudhury 1999), which was higher than Patharia Hills RF, but in 1988, only 6–8 individuals were found (Fig. 3). Capturing and domestication is believed to be the main reason for such drastic decline in the population (Choudhury 1991).

Elephants have been extirpated from Cachar during the last decade of 20<sup>th</sup> century (Choudhury



**Figure 3.** Population trend of elephants in Patharia Hill RF (PHRF), Katakhal RF (KRF) and Barail Wildlife Sanctuary (BWLS).

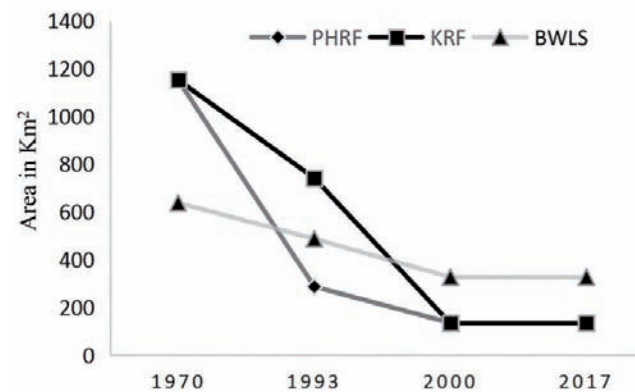
2001). A sizable number of elephants were surviving in Barail Wildlife Sanctuary (BWLS), but these too were exterminated from the area due to various threats (Choudhury 2001). In 1993, 18 individuals were encountered by the Department of Environment and Forests, Assam, which reduced to four elephants in 1998. Since 2001, no elephants have been found in the BWLS.

#### *Habitat status*

Throughout the entire southern Assam range, elephant habitats are declining (Fig. 4). Choudhury (1999) reported that during 1970's, elephants in the region used a 1151.8 km<sup>2</sup> corridor that covered Patharia Hills RF (116.5 km<sup>2</sup>), Tilbhum RF (18.5 km<sup>2</sup>), Longai RF (151.4 km<sup>2</sup>), Singla RF (124.3 km<sup>2</sup>), Inner line RF (608.6 km<sup>2</sup>) and Katakhal RF (132.6 km<sup>2</sup>) (Fig. 1).

With the passage of time, anthropogenic pressures have increased manifold in the form of human habitation, tea estate establishment, sugar cane cultivation, poaching and other activities, all of which have delimited the migration of elephants. As a result, it was found in 1990 that the aforementioned elephant habitat is limited to 286.4 km<sup>2</sup> (i.e., 75.1% reduction), covering Patharia Hills RF, Tilbhum RF, and occasionally, Longai RF.

At present elephants are using 135.0 km<sup>2</sup> of habitat combining Patharia Hills RF, and occasionally Tilbhum RF (88.3% reduction from 1970). The area between the Patharia Hills RF and Tilbhum



**Figure 4.** Elephant habitat loss in Patharia Hill RF (PHRF), Katakhal RF (KRF) and Barail Wildlife Sanctuary (BWLS).

RF is under serious threat, leading to human-elephant conflict (Talukdar & Choudhury 2017a).

During the 1970's, elephants of Katakhal RF used to traverse the same corridors from northwest Singla RF to parts of Mizoram. Around 1990's, elephants used 741.2 km<sup>2</sup> habitat (i.e. 35.7% reduced) from Katakhal RF to north-west Singla and parts of Mizoram. Presently, elephants use 132.6 km<sup>2</sup> habitats (i.e. 88.5% reduced from 1970) within the Katakhal RF. No human-elephant conflict has been found in the area. However, due to lack of awareness and conservative actions, the RFs are being over exploited.

Barail Wildlife Sanctuary (BWLS) of Cachar, Assam is contiguous with the Narphuh RF I, Narphuh RF II and Saipung RF of Megalaya. Elephants had a long corridor from BWLS to those RFs through North Cachar RF (Choudhury 1999). These corridors comprised about 637.7 km<sup>2</sup> of habitat in 1970, which was limited to 487.3 km<sup>2</sup> in 1993 (i.e., 23.6% reduction). In 2000, the same corridor was restricted to 326.2 km<sup>2</sup> (i.e., 48.8% reduction from 1970) and after that no elephants were seen in BWLS (Choudhury 2001). The elephant of Narphuh RF and Saipung RF occasionally migrate (especially in winter season) to both North Cachar and Katigorah areas of Cachar District.

## **Discussion**

With the decline of elephant habitat, their population sizes are clearly expected to go down. Our review provides preliminary indication that the same issue is likely to play an equal damaging role in southern Assam. Increasing threats such as habitat fragmentation and encroachment impact both forage availability and movement of elephants, and also push them closer to humans, increasing risks to the species from predation and conflict.

Common threats to wildlife in the region include habitat loss and fragmentation, barriers to wildlife movement due to fences at the India–Bangladesh boundary, encroachment and poaching (Choudhury 2001, 2004, 2013; Talukdar & Choudhury 2017a).

## *Habitat loss and fragmentation*

Habitat loss and fragmentation is one of the main threats to wildlife in tropical countries, especially in North-east India (Srivastava 2006; Talukdar & Choudhury 2017a). Increasing population, modernization and globalization have led to increased demands for land. Forest encroachment for human settlement and agricultural extension has caused shrinkage of wildlife habitats in southern Assam. Before the 1970's, many forests from the study areas were converted to agricultural land. Human population density in the study area is much higher (543 per km<sup>2</sup>) than overall India's population density (382 per km<sup>2</sup>). Another important aspect for habitat loss and fragmentation in the region is due to large-scale immigration of people from Bangladesh due to religious violence, and settlement in many government owned area including nearby lakes, river and forests.

## *Trans-border fence*

Both the Patharia Hills and Narpuh RF share an international border with Bangladesh. Narpuh RF is nearer to Chittagong areas of Bangladesh where the habitat is not favourable for elephants to thrive. The Bangladesh side of Patharia Hills RF is more than 100 km<sup>2</sup> (Choudhury 2004). Elephants of Patharia Hills RF migrate to both sides of the RF and use forest habitats of both the countries. Barbed fence on the trans-border acts as barrier for migration of elephants, but it was observed that elephants here use small streams to cross the border.

Habitat on the Bangladesh side of Patharia Hills RF is better than that on the Indian side. Thus, elephants prefer to stay maximum time in Bangladesh side of the RF, and come to the Indian side of the border between November and February every year. This season coincides with the paddy harvesting period and hence human-elephant conflict occurs mostly in the area. Human-elephant conflict takes the form of crop raiding, damage to property, and even human deaths are not uncommon (Talukdar & Choudhury 2017a).

### Encroachment

Encroachment is common to all of the RFs in southern Assam besides over-utilization of resources. Lack of awareness among people, and absence of strong action by the forest department are the main reasons behind the encroachment. Encroachment in one hand leads to decline of habitats, while on the other, increases plantation of monoculture crops such as rubber and areca nut.

### Illegal capture

Illegal capture can be ranked among the biggest factors for decline of Asian elephants in the region (Choudhury 1999). In 1977–1978, 11 elephants of Katakhal RF were illegally captured and domesticated from the north-eastern part of Singla RF (Choudhury 1999). It indicates that illegal capture might be a silent factor that is contributing to the decline of the species in southern Assam.

### Other threats

The hitherto not mentioned factors that may have led to the reduction in population size and habitat quality of Asian elephants include illegal timber logging, initiation of oil and natural gas exploration in Patharia Hills RF, and developmental activities in and around all the RFs.

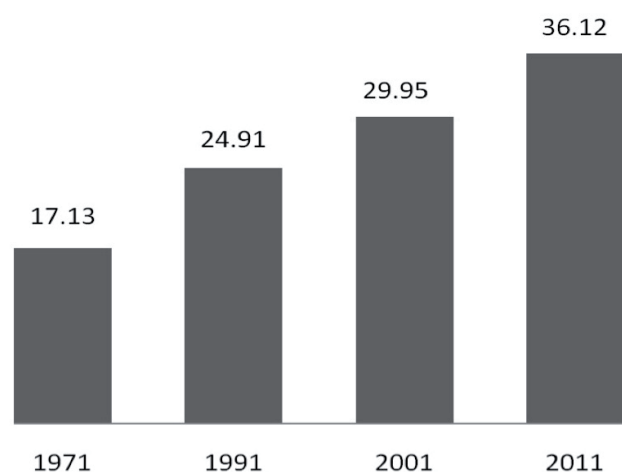
Human population has been increasing continuously (Fig. 5) and subsequently increasing threats on forest and habitats. Once upon a time, all the RFs of Barak valley were used by different herds of elephants (Choudhury 2013). However, presently only two isolated herds are found in two separate RFs (Fig. 1). Small herd of Katakhal RF is on the line of extirpation due to serious anthropogenic pressures. Secondly, in Patharia Hills RF all the individuals are females and there is no other viable elephant population nearby (in Bangladesh or Mizoram or other RFs) through which these two micro populations can exchange their gene pool. It is also difficult to connect the elephant habitats in the two RFs due to human disturbance.

In Patharia Hill RF although elephant population is declining, yet the habitat is somewhat conducive for the survival of elephants. Elephant density is comparatively less in this RF (Talukdar & Choudhury 2017a). Through interviewing the forest staffs and mahouts (elephant keepers) it has been gathered that there is sufficient fodder to support more number of elephants. However, the anthropogenic pressures in the area have to be prevented, which is the need of hour. With a view to conserve the largest terrestrial mammal in the area, current research offers following recommendations:

- To provide complete protection of remaining elephant habitat in the area, including their migratory corridor.
- Upgrading of the Patharia Hills RF into a Wildlife Sanctuary in order to offer better protection of wildlife of the area in general, and elephants in particular.
- Both the countries (India and Bangladesh) may take joint initiatives to protect both sides of Patharia Hills RF in order to conserve Asian elephants, since similar initiatives have already been taken up for conservation of the spectacled leaf monkey (*Trachypithecus phayrei*) in the same area.

### Conclusion

Southern Assam harbours great mammal diversity (Choudhury 2013) but its elephants are currently under severe threat. Our review



**Figure 5.** Decadal growth of human population in lakh (100,000).

suggests that Asian elephants were once widespread in the forests of southern Assam and its adjoining areas. However, with the reduction and degradation of forest cover and quality, the habitat of the species and the population has gone down greatly. Presently, the species is isolated in only two RFs. The conservation of elephants in the region thus deserves sincere attention. Most importantly, Patharia Hills RF needs to be declared a Wildlife Sanctuary in order to protect elephants and other species from growing threats. India and Bangladesh can also jointly initiate steps to conserve Asian elephants in this trans-border habitat.

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