

Current Status of Asian Elephants in India

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Introduction

India holds by far the largest number of wild Asian elephants, estimated at about 26,000 to 28,000 or nearly 60% of the population of the species (Bist 2002; data from Project Elephant Directorate in 2011). *Elephas maximus* is placed in Schedule I and Part I of Indian Wildlife Protection Act (1972) conferring it the highest level of protection. Historically, the significance of the elephant in Indian culture and mythology, as well as its economic and military role in subcontinental armies, has also contributed to a remarkable level of tolerance and support of people towards its survival and conservation (Sukumar 2011). However, the resource needs of a growing human population (over 1.2 billion people: Census 2011) of a country experiencing strong economic growth, growing and dispersing elephant populations at regional scales, shrinkage and fragmentation of elephant habitat, and increasing human-elephant conflicts emphasize the urgent need for appropriate long-term policies to manage and conserve the species.

Given its long history of about 4500 years in taming the elephant (Sukumar 2011), India also presently manages 3400-3600 elephants in captivity (Bist 2002). Captive elephants have been used for a variety of purposes in India including warfare, logging, cultural and religious ceremonies, recreation in zoos, and circuses and more recently for wildlife tourism and protection of Sanctuaries and National Parks. However, with declining work due to the ban on timber logging in the country and the use of modern machinery, the traditional interest among private owners and state forest departments in managing captive elephants is diminishing. In contrast, demand for elephants in temples, which once received its animals from the state forest departments,

continues to increase with their stock getting depleted due to old-age deaths and absence of recruitment from breeding.

Wild elephants

Past distribution

The present-day distribution of elephants in India is a fraction (about 3.5%) of its former range that extended from south of Himalayas to cover the entire subcontinent with the exception of the most arid tracts about six thousand years ago (Nair *et al.* 1980; Sukumar & Santipillai 1996; Sukumar 2011).

The Kautilya *Arthashastra* (c. 300 BCE – 300 CE) records the presence of elephants in eight *gajavanas* or elephant forests north of Krishna river, including places such as Saurashtra from where it has completely disappeared (Trautmann 1982). Information on the distribution of elephants in central India is available from memoirs and writings of the Mughal emperors of the 16th and 17th centuries (Ali 1927; Sukumar 2011); these indicate that elephants were once widespread from southern Uttar Pradesh through Madhya Pradesh and Chhattisgarh from where they disappeared (though elephants have recolonized Chhattisgarh in recent times). By the late 19th century, expansion of agriculture and settlement had shrunk their distribution to the forests at the foothills of the Himalaya, east-central India, and southern India. Although, the number of wild elephants in historical times is not known, a record of the French navigator Pyrard de Laval from the period of the emperor Jahangir (early 17th century) indicates a total of about 40,000 elephants (possibly captive plus wild) within the territories of the Mughal empire and Bengal (Sukumar 2011).

Present distribution

Wild elephants are presently confined to the forested hilly tracts of four different regions: (i) the foothills of Himalayas in the north (ii) the north-eastern states (iii) the forests of east-central India, and (iv) the forested hilly tracts of Western and Eastern Ghats in southern India (Fig. 1). A small population of feral elephants exists in the Andaman Islands. A brief account of the status and distribution of elephants for the four major regions in India is given below. Population estimates for several major and smaller populations are available from independent research studies as well as from population estimation carried out every 4-5 years by the concerned government agencies; we have provided only the latter figures in this write-up in order to make valid comparisons over time and across regions.

Northeastern India: Elephant distribution in this region extends along the Himalayan foothills from

northern West Bengal eastward into the states of Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya. Some of these ranges are contiguous to Bhutan, Bangladesh and possibly Myanmar. The region is estimated to hold approximately 9000-9500 elephants, but figures from 1997, 2002 and 2007 show a decrease compared to 1978-83 and 1993 (Table 1), a likely consequence of significant loss of habitat in states such as Assam and Meghalaya. The elephants of this region are spread across 32,600 km² (Table 1, Fig. 1), but divided into perhaps as many as 14 sub-populations, with only four of them [North Bank of the Brahmaputra in Assam and Arunachal Pradesh (3250 elephants), South Bank—Eastern Areas in Assam and Arunachal (1200 elephants), South Bank—Central Areas of Kaziranga-Karbi Anglong-Nagaland (2950 elephants) and South Bank—Western Areas of Assam extending into Meghalaya (3000 elephants)] remain fairly large, over larger areas (for more details see Choudhury 1999). The elephant habitats in this region have experienced tremendous pressure from legal and

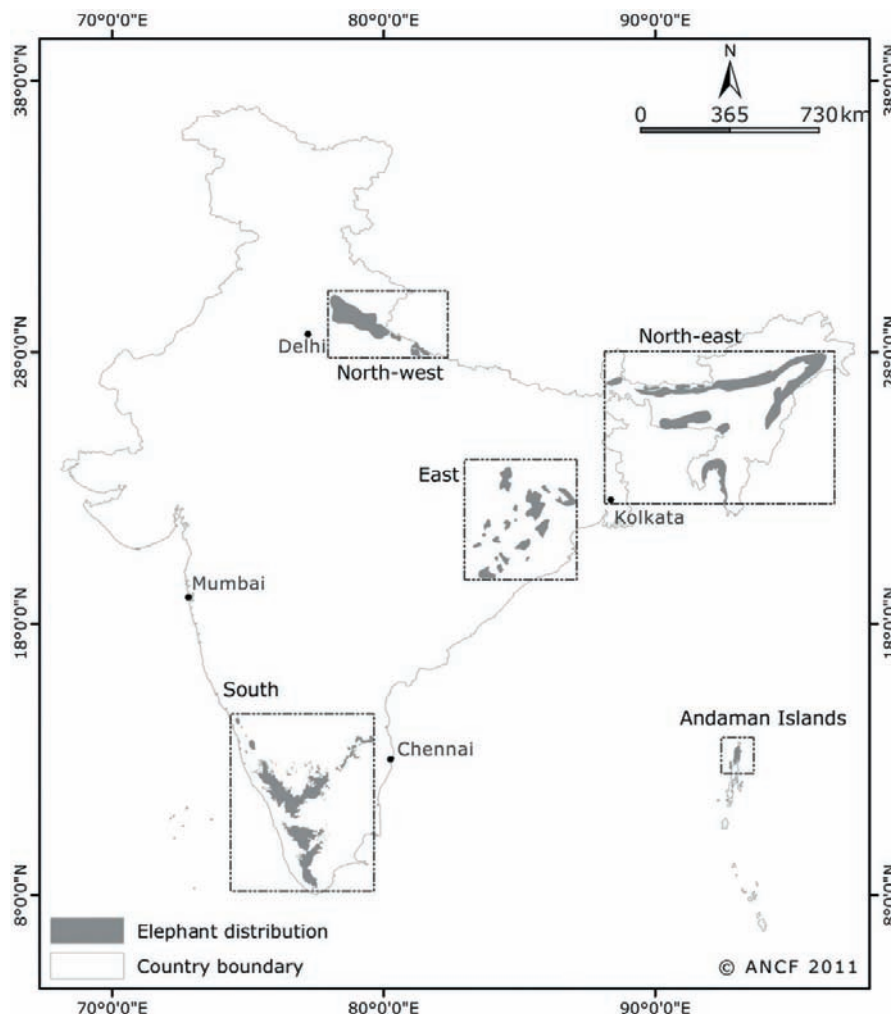


Figure 1. Map showing the regional distribution of Asian elephant in India.

Table 1. Estimates of regional wild elephant numbers in India.

| Region | Habitat [km ²] | # corridors ^a | 1978-83 ^b | 1993 ^c | 1997 ^c | 2002 ^c | 2007 ^c |
|-----------------|----------------------------|--------------------------|----------------------|-------------------|-------------------|-------------------|-------------------|
| Northeastern | 41,000 | 36 | 10,273 | 11,027 | 9482 | 9243 | 9330 |
| Northern | 5,500 | 12 | 525 | 875 | 1200 | 1667 | 1726 |
| East-central | 23,500 | 20 | 2310 | 2314 | 2444 | 2649 | 2633 |
| South | 39,500 | 20 | 6450 | 11,353 | 12,716 | 12,814 | 14,005 |
| Andaman Islands | 500 | - | ? | 35 | 35 | 40 | ? |
| Grand total | 110,000 | 88 | 19,558 | 25,604 | 25,877 | 26,413 | 27,694 |

^aCorridors based on the list provided in Menon *et al.* 2005.

^bTotal count method, North-east: Lahiri-Choudhury 1980, IUCN North-east India Task Force 1981; North-west: Singh 1978; East: Shahi 1980, South: Nair *et al.* 1980.

^cSynchronized elephant census (sample block count method), Project Elephant website, Bist 2002.

illegal logging, shifting cultivation, monoculture plantations and encroachments. Within a span of 10 years (between 1991 and 1999) elephant habitat to the tune of over 3000 km² was lost from Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram and Nagaland (Bist 2002) due to encroachment and deforestation. The prospects for the conservation of elephant in the northeastern India are seriously affected by habitat loss, fragmentation and increasing human–elephant conflict.

Northern India: The elephant range is spread in a west-east direction along the foothill forests and floodplains of the Himalaya in the states of Uttarakhand and Uttar Pradesh, partly adjoining Nepal. The region is presently believed to support about 1700 elephants and the numbers have shown an increasing trend over the years (Table 1). Rajaji and Corbett National Parks and Lansdowne Forest Division are the important elephant habitats of this region (Singh 1978). Prior to independence, the range of the elephant was probably contiguous along the *terai-bhabbar* tract from the river Yamuna in the west to the river Sharda in the east. Post-independent large scale developmental projects in the form of irrigation and power generation projects, expansion of human settlement and cultivation along the major rivers, and introduction of monoculture forest and commercial plantations have fragmented the habitat apart from creating bottlenecks to elephant movement at about a dozen locations (Johnsingh *et al.* 1990; Singh 1995).

East-central India: The elephants of eastern India are distributed over 23,500 km² mostly in the Chota Nagpur plateau across the states of Orissa and parts of Jharkhand (Shahi & Chowdhury

1986; Sar & Varma 2004). Since 1986 some of these elephants have also been moving into neighbouring states, in particular to southern West Bengal, Chhattisgarh and, more recently, to northeastern Andhra Pradesh, where they are in serious conflict with people. Recent estimates (Synchronized Elephant Census 2002 and 2007) place the figure at around 2650 elephants (Table 1), with elephants of Orissa constituting over 70% of them (1860 elephants) followed by Jharkhand (624 elephants), Chhattisgarh (122 elephants) and southern West Bengal (25 elephants resident). The elephant habitats of this region are a diffused mosaic of natural forest, often degraded or fragmented, village forest, as well as cultivation and mining. Large-scale mining for minerals such as iron, manganese and chromate is the single largest threat to the conservation of elephants in northern Orissa and southern Jharkhand. The most viable habitat and population of this region is undoubtedly the Mayurbhanj Elephant Reserve (that includes the Simlipal Tiger Reserve) in Orissa, while other sizeable populations are also found in the Mahanadi and Sambalpur Elephant Reserves of the same state, as well as the isolated Palamau Tiger Reserve in Jharkhand where elephants were introduced by the rajah of Sarguja during the early 20th century.

Southern India: The elephants in southern India range over forested hilly tracts of the Western Ghats and its adjacent Eastern Ghats in the states of Karnataka, Kerala and Tamil Nadu, and more recently in a small area of Andhra Pradesh, Maharashtra and Goa. Their distribution has shrunk to within the Ghats owing to increase in human population and its resultant opening of new land for the expansion of agriculture,

commercial plantations, and hydroelectric and irrigation dams (Sukumar 1989). At present, elephants are found in five major landscapes in southern India as follows:

- Uttara Kannada and crestline of the ghats, mainly in the forests of Dandeli as the important elephant habitat with approximately 40-50 elephants that includes a few elephants that move into Maharashtra and Goa.
- The Malnad plateau, in particular the Bhadra Wildlife Sanctuary, to the east of the ghats holds an isolated population of about 250 elephants.
- The Brahmagiri–Nilgiri–Wyanad–Mysore landscape with the Nagarahole, Bandipur, Wyanad and Mudumalai complex of reserves harbours one of the highest elephant densities (about 2 individuals/km²) in Asia, followed by significant numbers in the Biligirirangans and the hilly tract along the Cauvery river of the Eastern Ghats. This landscape is estimated to support over 8800 elephants. A small population of elephants that dispersed from here in the 1980s now ranges as scattered groups over isolated hills to the east in Andhra Pradesh and Tamil Nadu.
- Anamalai–Nelliampathy–High Ranges landscape with Anamalai, Parambikulam, Malayattur and Vazahchal Forest Divisions being the most important elephant habitats supporting over 3000 elephants, includes ca. 225 isolated elephants in Idukki Sanctuary and Kothamangalam Forest Division.
- Periyar–Agasthyamalai landscape with Periyar, Ranni, and Srivilliputhur as the most



Wild elephants in Corbett National Park
Photo by A. Christy Williams

important elephant habitats harbouring nearly 2000 elephants including ca. 250 elephants isolated to the south of Shenkota pass in the Agasthyamalai hills.

In total about 14,000 elephants (Synchronized Elephant Census 2007, Table 1) are found in southern India, with over one-fourth of the habitat being Protected Areas and signs of growing numbers in some populations (Baskaran *et al.* 2007). This population has great conservation significance for the species.

Island Population: There are 40 feral elephants in Andaman and Nicobar Islands (Synchronized Elephant Census 2002) confined to Diglipur Forest Division in North Andaman and the Interview Island Sanctuary (Sivaganesan & Kumar 1995). These elephants were taken from mainland for timber extraction and abandoned by the company in 1962 (Sivaganesan & Kumar 1994).

Threats in country to elephant conservation

Habitat loss and threat of further fragmentation are perhaps the most important threats to the conservation of elephants in the country. Many of the existing corridors are threatened by infrastructure development in a rapidly growing economy, being susceptible to activities such as construction of new roads and railway lines or expansion of existing ones (as in the northeast), tourism infrastructure (as to the east of Corbett National Park in the north), mining (as in Keonjhar and Saranda districts in the east-central region) and demand for large dams (as in the south). To give an example from one such threat, about 44 elephants have died in direct collision with trains across the country over a period of five years (2006-2011).

Fragmentation, loss and degradation of habitat, combined with increasing elephant populations at places (and cessation of elephant captures), has escalated elephant-human conflicts in the country with resulting manslaughter, damage to cultivated crops and property. Added to the chronic conflict prevalent at places is the phenomenon of dispersing elephant clans since the early 1980s in practically every region that

sharply increases conflict between elephants and people who have not experienced elephants in their midst for decades or centuries.

From 1998 to 2001 there were 900 human deaths due to elephant attacks in the country, an average of about 250-300 people per year that has since increased to over 400 deaths in 2010. With such a huge loss of life, apart from loss of crops, the government presently spends a substantial proportion of its conservation budget in compensatory payments (or ex-gratia payments as they are officially termed). In spite of this people have retaliated against raiding elephants by poisoning or electrocuting them; during 2006-2011 at least 200 elephants died in this fashion.

Illegal captures of wild elephant calves for trade of captive elephants are reported to take place in a few places in the northeast along the Assam-Arunachal and Assam-Nagaland border.

Ivory poaching has been one of the major threats to conservation of elephants in the country. The threat to tusked male elephants began to assume serious proportions in southern India during the 1970s and accentuated during the 80s and 90s resulting in the most skewed sex ratios in Asia. In Periyar Tiger Reserve, for instance, the adult male:female ratio skewed to about 1:100 by the 1990s (Ramakrishnan *et al.* 1998), a situation that improved to about 1:60 by 2005 (Arivazagan & Sukumar 2005). The impact of ivory poaching is also reflected on skewed sub-adult and juvenile sex ratios in many populations of the south. Over the past decade, ivory poaching has been most visible in the east-central state of Orissa but the extent and impact have not been fully evaluated.

Elephant management and HEC mitigation

Although the state forest departments had been managing elephant-human conflicts through several means such as barriers, captures and drives, the launch of Project Elephant in 1991-92 by the Indian government provided enhanced and a more steady source of financial resources and an action plan to address this problem. Compensatory (or ex-gratia) payments have been the mainstay of providing solace to people who

have lost their crops, property or kin to elephant depredation and attacks. State forest departments have also been active in putting up barriers along the forest-agriculture boundary in order to prevent elephants from moving outside their natural range into cultivated areas. The use of ditches or trenches as a barrier has only met with limited success as these fail completely in areas of high rainfall. When used in conjunction with the high-voltage electric fence it seems to be more effective in dry zones with hard soil. Electric fences are the other common barriers used widely across the country; the success of such fences has again been limited at many places because of problems in satisfactory maintenance. When fences are privately owned or when local communities are involved in fence maintenance the success rate is usually much higher. West Bengal has used anti-depredation squads, equipped with a vehicle for rapid response, lights, and guns, with reasonable success in the northern sector to drive elephants entering paddy fields and tea gardens, but here again there is no guarantee of absolute success.

In recent years, the state governments in southern India have successfully utilized a large section of the tribal population for effective control of ivory poaching in Protected Areas and outside. The anti-poaching squads also perform additional functions including driving of crop raiding elephants (anti-depredation squads) and as firewatchers. A network of camps has been set up at strategic locations, manned by local tribals and headed by a permanent staff of the department. They are connected through a wireless network and provided food supplies and arms for protection.

The increasing dispersal of elephant herds or clans, as well as solitary bulls, into newer habitats has brought fresh challenges to management. States have experimented with elephant drives (as in Tamil Nadu during the 1980s) as well as capture and either maintenance in captivity (as with a large number of bulls in Karnataka since about 1987) or the occasional relocation (that has usually failed, the most recent examples being two bull elephants captured in Hassan district and relocated to Bandipur, a distance of over 150 km, in Karnataka). The occasional “rogue” elephant,

usually a bull, that has killed several people or is on the rampage has also been killed as a control measure.

Project Elephant firmly introduced the concept of landscape-level planning for the conservation and management of a long-ranging animal such as the elephant. Some success has been achieved with respect to strengthening elephant corridors, especially in the states of Karnataka and Kerala, with the help of Non-government organizations. Much more needs to be done in the direction of integrated land use and developmental planning at landscape level, that is also sensitive to local social and economic issues, in order to achieve long-term conservation of the species. A second task force appointed by the Indian government addressed some of these issues in more detail in 2010 (Rangarajan *et al.* 2010).

Captive elephants

Captive elephants were maintained in the thousands, mainly in the armies of rulers of the subcontinent, in ancient times (Bist 2002; Sukumar 1989; Sukumar 2011). The historical records indicate that peaks in captive elephant management (or more specifically war elephants) were reached during the Mauryan period in 3rd century BC and the Mughal period in early 17th century. Large numbers of elephants were captured for this purpose. For example within the time span of about one century (1868-1980) records indicate that 30,000–50,000 wild elephants were captured, especially in the northeast of the country (Sukumar 1989). The official estimate of the current numbers of captive elephants is between 3467–3667 animals (Project Elephant Directorate 2000).

Reduction in captive numbers could be attributed to many factors, including modernization in forestry operations leading to the use of machines and changed lifestyle, consequent redundancy of elephants, legal statutes banning capture of wild elephants and limited work opportunities for elephants with increased cost of maintenance.

Captive elephants kept in India can be classified based on ownership type (government-owned or

private) and on the predominant work performed by the elephants. This may help in identifying ownership such as circus (owned by private companies or individuals, and the elephants used for performing before an audience), forest camps (owned by the government, maintained near forest areas), ownership by private individuals (such animals may or may not be used for work), travel-begging (either owned by private individuals/institutions, elephants used mainly for travelling and begging in cities), temples (owned by religious institutions, state run/private organizations) and zoological gardens (owned by the government, elephants may/may not be used for work).

The form of management of captive elephants varies widely with forest camp elephants kept in natural surroundings, allowed some degree of free ranging with access to a water body, and usually provided a mixture of natural fodder and supplementary food in the form of cooked grain (as in Tamil Nadu). Some privately owned elephants in states such as Assam and Kerala are fortunate to be kept on natural flooring but others are kept on concrete floors or made to walk on



“Thechikkottu Kavu Ramachandran” in Kerala
Photo by Marshal C. Radhakrishnan

asphalted roads for long periods. They are also usually stall fed. Zoo and circus elephants are kept in restricted spaces on a combination of hard and natural flooring, and either permanent or temporary shelters. Temple elephants are usually confined to shelters inside the temple premises and stall-fed. All captive elephants have some form of restraint such as ropes and chains. Veterinary care is usually best provided in government-owned forest camps and zoos, though more limited care may also be available to other elephants.

Interactions among captive and wild elephants are possible only where captive elephants are maintained in a natural environment such as forest camps. Most forest camp elephants are allowed to free-range in the forest during the night or for at least 4-6 hours when the chances of interacting with wild elephants are high. Indeed, most of the captive born elephants in forest camps are the result of mating of wild bulls with captive cows. Forest camp elephants also have the opportunity for social interactions among themselves and bonds among cow elephants and their offspring often resemble those among wild elephants.

Predominant activity of captive elephants depends on the form of management under which they are kept. Forest camp elephants are used for patrolling, tourist rides, as koonkies in conflict mitigation operations, and forestry-related work. Elephants owned by private individuals or institutions use them in religious/celebratory functions, tourist rides, and timber work. Some privately owned elephants are also used for begging money from public, and hired for weddings/celebratory functions. Apart from participation in temple rituals and processions, temple elephants are tethered within the premises, bless the public and perform temple-related rituals. Elephants in zoos are used for tourist rides, fodder collection and other activities, while circus elephants are used for performing to an audience.

Except for a few sporadic illegal capture incidents reported primarily from north-east Indian states, at present, legal capture of wild elephants is practiced only as a mitigation measure for human-elephant conflict.

In a study of nearly 800 captive elephants (carried out jointly by the Asian Nature Conservation Foundation and Compassion Unlimited Plus Action; Varma *et al.* 2008a, 2008b and 2008c), 21% were captive born. The high rates of breeding were in forest camps as well as zoos across the country, while some breeding also occurred among elephants owned by private individuals or institutions and temples.

As per Indian law, ownership certificate is mandatory for all captive elephants and micro-chipping has been introduced to facilitate this process. A sample of 1545 elephants covering 13 different states and 6 different management regimes suggests that 44% of captive elephants have ownership certificates and 48% captive elephants have been implanted with microchips.

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