

The Asian Elephants (*Elephas maximus*)

The Asian elephant (*Elephas maximus*), the lone survivor of Genus *Elephas*, originated in Africa in the early Pliocene, over 5-6 million years ago and migrated to Eurasia. *Elephas maximus*, is today confined to 13 countries of Asia is believed to have descended from *Elephas hysudricus* in late Pleistocene ca 0.25 million years ago (Maglio, 1973).

Currently, three sub species are recognized taxonomically: *Elephas maximus indicus* on the Asian mainland, *Elephas maximus maximus* in Sri Lanka, and *Elephas maximus sumatranus* on the Indonesian island of Sumatra (Shoshani and Eisenberg 1982). However, recent molecular genetic studies indicate no major genetic differentiation of the Sri Lankan elephant from that of the mainland (Hartl *et al.*, 1996; Fernando & Lande, 2000; Fleischer *et al.*, 2001; Sukumar 2003) and therefore there is a theory that it should not be considered as a distinct subspecies. Borneo's elephants have traditionally been included within *Elephas maximus indicus* (Shoshani and Eisenberg 1982) or *Elephas maximus sumatranus* (Medway 1977). However, elephants in Borneo are morphologically, and behaviourally distinct from the elephants of mainland Asia (Cranbrook *et al.*, 2008). Mitochondrial DNA haplotypes (mtDNA) analysis (Fernando *et al.*, 2003; Sharma *et al.*, 2018) also confirms this and indicates that Borneo's elephants are genetically distinct from any South and Southeast Asian population and that they have been isolated for over 300,000 years. These studies may necessitate the formation of a separate subspecies *Elephas maximus borneensis*.

Status and distribution

Asian Elephants once ranged all the way from West Asia along the Iranian coast into the Indian subcontinent and eastwards into South-east Asia including the islands of Sumatra, Java, and Borneo and extended as far north as the Yangtze River in China (Olivier 1978). This former range covered over nine million km² (Sukumar 2003). Today, the species has disappeared from c 95% of its historical range (Sukumar 2006) and are extinct in West Asia, Java, and most of China. The western sub-species, *Elephas maximus asurus*, probably went extinct by 100 BC, and the main Chinese populations (sometimes referred to as *Elephas maximus rubridens*) disappeared sometime after the 14th century BC.

The current wild distribution of Asian Elephants is in 13 countries across South and Southeast Asia spread over an area of 486,800 Km² (Sukumar 2003). The species occurs in Bangladesh, Bhutan, India, Nepal, and Sri Lanka in South Asia and Cambodia, China, Indonesia (Kalimantan and Sumatra) Lao PDR, Malaysia (Peninsular Malaysia and Sabah), Myanmar, Thailand, and Vietnam in South-east Asia. A small feral population occurs in the Andaman Islands (India). All populations of Asian elephants are included in CITES (Convention on International Trade of Endangered Species of wild fauna and flora) Appendix I, and the global status of the species in the IUCN Red List is listed as Endangered (A2c; ver 3.1; Choudhury *et al.*, 2008). The Sumatran Elephants (*E. m. sumatranus*) are listed as Critically Endangered (A2c; ver 3.1; Gopala *et al.*, 2011).

Lack of reliable methods for population estimation and distribution are often challenges while designing long-term conservation strategies for elephants in Asia. The current population estimate of elephants in wild is about 45,671- 49,028 based on information from multiple sources and Range Country officials. The region also has about 14,930-15,130 elephants in captivity. Although the overall population of elephants in Asia has been by and

large stable with minor decreases over a twenty-year period, there has been drastic decreases in wild elephant numbers in Vietnam and Sumatra (Indonesia).

Country	Wild Population (min-max)	Captive Population (min-max)
Bangladesh	289-437	96
Bhutan	605-761	9
Cambodia	400-600	70
China	300	243
India	27,312	3467-3667
Indonesia- Sumatra	1724	467
Indonesia- Kalimantan	60-80	
Laos	500-600	454
Malaysia- Peninsular	1,223 – 1,677	92
Malaysia- Borneo	2,040	23
Myanmar	2000-4000	5693
Nepal	109–145	215
Sri Lanka	5879	230
Thailand	3126-3341	3783
Vietnam	104-132	88
Total (Min–Max)	45,671- 49,028	14,930-15,130

Table 1: Estimated minimum and maximum number of Asian elephants in the wild and in captivity in Asia. (Sources: Sukumar 2003, updates by IUCN SSC Asian Elephant Specialist Group in 2016 and 2018; AERSM, 2017; MoEFCC 2017; Bangladesh elephant conservation action plan 2018-27; National Elephant Survey report., Bhutan, NCD 2018:)

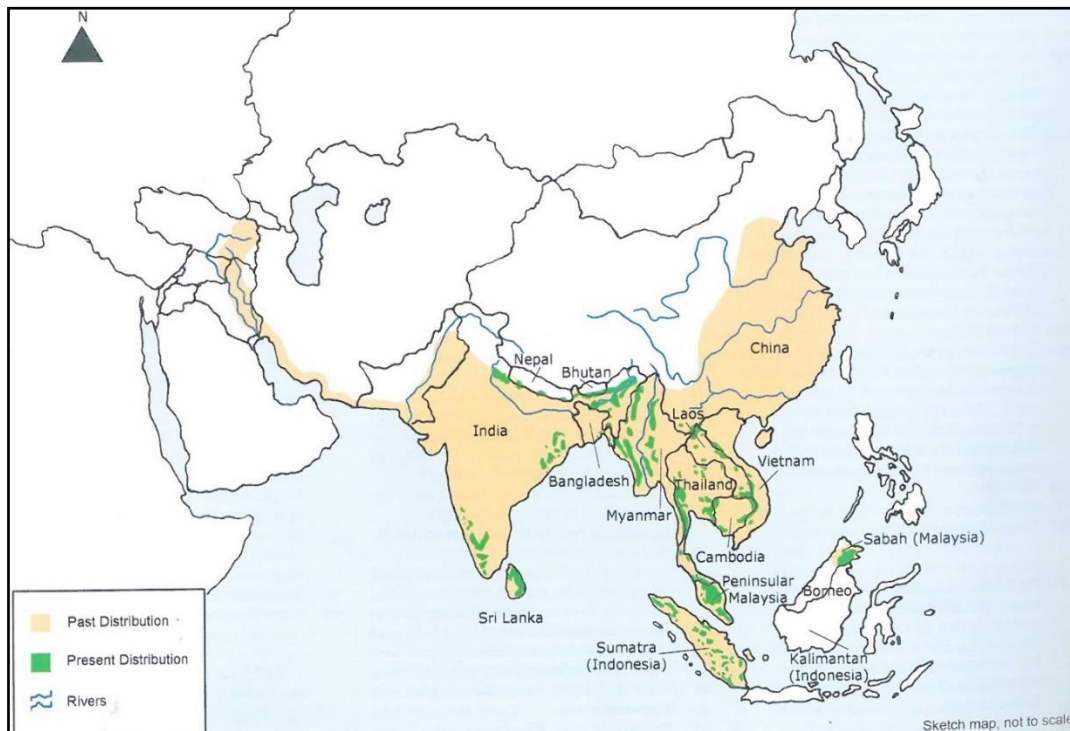


Fig: Distribution of Asian Elephants (Sukumar 2011)

India has by the largest number of elephant distributed in four major regions- southern India in the States of Tamil Nadu, Karnataka, Kerala and Andhra Pradesh (11,960 individuals), north-eastern India in the States of Assam, Arunachal Pradesh, Meghalaya, Nagaland, Tripura and North Bengal (10,139), central India in the states of south Bengal, Odisha, Jharkhand and Chhattisgarh (3128) and north-west India in the States of Uttarakhand and Uttar Pradesh (2085).

Sri Lanka has the second highest numbers of elephants, largely confined to the lowlands in the dry zone and fairly widespread in north, south, east, north-western, north-central and south-eastern Sri Lanka. A small remnant population is present in Peak Wilderness area and Sinharaja area of the wet zone of the country.

In Nepal, elephants are distributed in four isolated sub-populations and are mainly restricted to protected areas along the border with India- namely Royal Chitwan National Park, Parsa Wildlife Reserve, Royal Bardia National Park, and Royal Suklaphanta Wildlife Reserve.

In Bhutan, elephants are distributed throughout the southern belt of Bhutan along the border with India (Samtse, Chhukha, Dagana, Phibsoo Wildlife Sanctuary, Sarpang, Royal Manas National Park, Samdrupjongkhar and Jomotsangkha Wildlife Sanctuary) from elevation ranging between 100m to above 2000m (NCD, 2018).

In Bangladesh, the elephants are mainly restricted in south-eastern part of the country and restricted to forests in Chittagong, Chittagong Hill tracts and Cox's bazar areas. The elephant habitat in Cox bazar has been severely impacted by the rehabilitation of Rohingya refugees from Rakhaine area of Myanmar and clearing of almost 6000 acres of forest land to rehabilitate them.

The elephant population in Vietnam is facing a very big threat as their numbers have declined to about 100 animals from an estimated 1,500 – 2,000 in the 1980s. Elephants are currently distributed in three main regions of Vietnam, namely the Nghe An and adjoining areas in northern Vietnam, Quang Nam area in central Vietnam and Dak Lak Province and adjoining areas in southern Vietnam. Within each region the population is further fragmented into several isolated small groups of elephants (ranging between 1-80 elephants).

Another population of concern is in Sumatra (Indonesia) where the elephant was once widespread, but now survives only in highly fragmented populations. In the mid-1980s, 44 discrete elephant populations (with a population of about 2800 to 4800 elephants) were known to exist in Sumatra's eight provinces scattered from Aceh in the north to Lampung in the south. (Blouch and Haryanto, 1984; Blouch and Simbolon, 1985.). However, by 2003, only three of Lampung's 12 populations were extant (Hedges *et al.*, 2005). A 2009 survey of nine forest blocks in Riau that had counted elephant herds only two years earlier revealed that six herds had gone extinct (Desai and Samsuardi 2009). Over 69% of potential Sumatran elephant habitat has been lost within just one generation (the last 25 years), and much of the remaining forest cover is in blocks smaller than 250km², which are too small to contain viable elephant populations (Gopala et al., 2013). The current elephant population is estimated to be about 1724 individuals (AERSM, 2017).

In Myanmar, the elephant has wide but highly fragmented distribution. The main areas of elephant abundance are in i) southeast - Bilaktaung/Tenasserim Elephant Range, ii) central - Bago Yoma Elephant Range, iii) east - Shan Plateau Elephant Range, iv) southwest - Arakan Yoma Elephant Range and v) north - Myitkyina/Upper Chindwin (MECAP 2018).

The elephants in Thailand are distributed in 69 Protected areas, mainly in the mountains along the border with Myanmar and smaller fragmented populations occupying the southern peninsular. Almost 80% of the elephants are found in Western Forest complex (FC), Kheang Krachan FC, Dong Prayayen-Khao Yai FC, Phu-Kheio Nam Nao FC and Eastern FC.

In Cambodia, two largest elephant populations are located in the eastern plains of Mondulkiri province and the Cardamom and Elephant Mountains in southwest (Greater Cardamoms Landscape -GCL). There are smaller trans-boundary populations along the northern border with Lao PDR in Preah Vihear and Ratanakiri provinces, small population in Samlaut district, western Battambang province (trans-boundary population shared with Thailand) and few other small populations.

In Lao PDR, elephants occur in many small fragmented populations. The two important populations are - Xaignaboli Province west of the Mekong and the Nakai Plateau.

In China, elephants are extinct from most parts of the country and are now confined to small population in Yunnan where the species survives in three administrative units of Xishuangbanna, Simao, and Lincang.

In Peninsular Malaysia, the species is still widely distributed in the States of Pahang, Perak, Johor, Kelantan, Terengganu, Kedah, and Negeri Sembilan. Taman Negara National Park holds the largest population. In Malaysia Borneo, the species occurs in the lowlands of the north-eastern part of the island in Sabah and adjacent parts of Kalimantan (occur only in the Upper Sembakung river in Tindung district). In Sabah, they occur in forested areas in the south, centre, and east of the State in the districts of Kinabatangan, Sandakan, Beluran, Lahad Datu, Tawau, and Pensiangan, largely confined to Lower Kinabatangan, north Kinabatangan, central Sabah, Tabin and Ulu Kalumpang ranges.

Major Threats and conservation challenges

The major threats to Asian elephant continue to be habitat loss and fragmentation, human elephant conflict, and poaching and illegal trade of elephants (Leimgruber *et al.*, 2003; Sukumar, 2003; Sukumar 2006, Sukumar *et al.*, 2016, Hedges, 2006, Menon *et al.*, 2017, AERSM, 2017).

Loss and fragmentation of habitat is perhaps the most important factor impacting elephant populations in most range countries in Asia. Rapid change in land-use across range states has resulted in shrinkage and fragmentation of habitat such that the natural range has declined from 9 million km² in the distant past to about 486,800 Km² now (Sukumar 2003). Elephants in Asia inhabits regions which also has large human population which is growing at a rate of 0.5- 1.5% per annum. The spread of human settlements, plantations, industry, farming, mining and linear infrastructures (roads, railway lines, irrigation canals, power lines, pipelines) have all fragmented the elephant habitat and squeezed the elephant populations into ever-decreasing pockets of forests surrounded by humans and have blocked traditional migratory routes (Santiapillai & Jackson, 1990; Leimgruber *et al.*, 2003; Sukumar 1989, 2003 & 2006; Hedges, 2006, Menon *et al.*, 2017). This has increased the human-elephant conflict across its range of distribution in Asia. More than 600 humans and 450 elephant death reported every year

in Asia. In India alone, around 400-450 people lose their lives due to human elephant conflict and around 100 elephants are killed in retaliation to the damage they cause to human life and property. Similarly, around 250-275 elephants and almost 90-100 humans lose their lives every year in Sri Lanka.

Apart from retaliatory killing of elephants, mortality of elephants has also been reported due to train hit mostly in India and Sri Lanka and elephant mortality by road hits largely in Malaysia and Thailand. In India alone, about 305 elephants have died due to train hits between 1987 and December 2018 of which more than 2/3rd death reported from Assam and West Bengal (Singh *et al.*, 2001, Menon *et al.* 2003, Sarma *et al.*, 2006). In Sri Lanka, about 14 elephants have died due to train hit in 10 months in 2018 (till Oct 2018) and seven elephant deaths reported by train hit in 2017.

In addition to loss of human life and retaliatory killing of elephants, the range states also suffer great loss due to crop depredation and loss of property by elephants. Crops consumed or damaged by elephants include a variety of cereals and millets, sugar cane, palms (e.g. coconut and oil palm), and many vegetables and fruits (Sukumar, 1989). In India, the governments paid an average of US\$ 4552,700 per year for crop loss and property damage between 2010-2017 as ex-gratia support. However, this is a very fraction of what the farmer losses due to elephants.

Poaching is another major threat to elephants in Asia, although reliable estimates of the number of elephants killed and the quantities of ivory and other body parts collected and traded are scarce (Sukumar *et al.*, 1998; Milliken, 2005). Although it was traditionally believed that poaching is a relatively minor threat to Asian elephant because some males and all females lack tusks (Dawson and Blackburn, 1991; Sukumar, 1989, but in reality Asian elephants are poached not only for ivory but for a variety of other products (including meat and skin) and is acknowledged as a threat to the long-term survival of some Asian elephant populations (e.g. Kemf and Santiapillai, 2000; Menon, 2002).

The selective poaching of tuskers for ivory has progressively skewed the sex ratio in several Asian elephant populations. This affects the genetic variation in such populations and may result in interbreeding impacting population (Sukumar *et al.*, 1998; Sukumar, 2003). Large-scale hunting of elephants for ivory, bushmeat, hides, and other products has reduced their populations significantly over a wide area from Myanmar, Vietnam to Indonesia (Menon *et al.*, 1997; Duckworth and Hedges, 1998; Kemf and Santiapillai, 2000; Martin and Stiles, 2002; Menon, 2002; Hedges *et al.*, 2005, Elephant Family, 2018).

The emerging trade of skin is now a major concern and largely reported from southeast Asia. Although the trade of elephant skin has been going on for over a decade but since 2014, there has been increase in poaching and trade /sales with main source of elephant skin being Myanmar and the products being produced are beads / pendants, skin pieces, powder. These are manufactured in Myanmar, Laos, China and the by-products being elephant trunks, a delicacy (Elephant Family, 2018). The trade could result in indiscriminate killing of elephants of both sexes threatening fragile elephant population in the region.

Apart from this a large number of captive elephants exists in range countries and lack of standardized elephant registration system has further provided cover for illicit trade in elephants and their body parts, including ivory and this needs to be addressed through appropriate registration systems and monitoring protocols for these captive populations.

Apart from above threats, some of the other concerns for elephant conservation in Asia includes lack of reliable method for population estimation, lack of specific elephant conservation/

management policies in most range States, lack of viable and well tested solution specifically on mitigating human-elephant conflict and lack of trans-boundary cooperation among range countries, limited monitoring mechanism to assess effectiveness of conservation initiatives and techniques, limited resources to undertake conservation and lack of captive breeding facilities (AERSM, 2017 and IUCN AsESG meeting, 2018).

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