Asian Elephants: 15 years of research and conservation

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Abstract. This document provides an overview of the research and conservation work that has been undertaken to date by our team at Oxford Brookes University in regard to Asian elephants. Research began in 2006, in collaboration with various NGO’s from a range of countries (Indonesia, Malaysia, Myanmar), government agencies (Indonesia, Myanmar, Thailand, Sri Lanka) and local and international universities. Four major themes are recognised throughout our research; (1) the trade in live elephants, (2) the trade in elephant ivory and other body parts, (3) elephant distribution and abundance in Northern Sumatra, and (4) the wider conservation agenda of elephant conservation in Asia. The live trade in elephants concerns both the domestic trade (Indonesia, Thailand, Sri Lanka) and the international trade (Laos, Myanmar), and has a strong welfare component that needs to be addressed. The trade in ivory is still prevalent in Myanmar, Laos and Thailand, all with strong links to China, whereas the trade in ivory in Indonesia is more localised. The distribution mapping of elephants has so far been undertaken in Aceh and North Sumatra, and we will continue within this area of research in collaboration with Universitas Syiah Kuala. With respect to the wider conservation agenda of elephant conservation in Asia, many regions and most countries face similar opportunities and challenges. Lessons learned in countries such as Myanmar, Sri Lanka and Thailand, all with substantial elephant populations, need to be employed in Indonesia to better the conservation status of elephants and improve the lives of people that live side by side with the Asian elephant.

1. Introduction

Few species face as many challenges in respect to their conservation as the Asian elephant. Elephants are the largest living land mammal, and for this reason, have attracted the attention of humans all of the world for millions of years [1]. Elephants have been depicted in mythology, religion, symbolism and cultural beliefs for many people, and both the elephant and its ivory are important in Thailand’s history and culture [2]. They seem to be loved all over the world, by people of all ages, though especially within those who’s livelihoods are not threatened by their presence. Due to this ‘popularity’, elephants have become an umbrella species; by ensuring the protection of the elephant, you indirectly protect other species living in the vast habitats they populate. Additionally, elephants are known for their role as ecosystem engineers by modifying their habitat in several ways; resetting succession of forested habitats to grasslands, digging holes to access water in droughts and being seed dispersers for numerous plant species [1]. Due to the size and intelligence of these enchanting mega fauna and their need for a large amount of space to successfully survive, trying to conserve them and their habitats has
become somewhat of an impossible task in a world where human population is expanding at an increasingly rapid rate. Human Elephant Conflict (HEC) is caused by these clashes over habitat and resources, and the trade in ivory, other elephant body parts and live animals is still prevalent, causing the decline of these animals in all their range countries.

The Asian elephant is classified into three subspecies; E. m. maximus from Sri Lanka, E. m. indicus from mainland Asia and E. m. sumatranus, confined to the island of Sumatra [3]. Formerly, elephants had a remarkable range and were widely distributed [4] but, due to anthropogenic threats, all remaining elephant species distributions are highly fragmented and restricted. In the case of the Asian elephant, the situation is critical [4]. Historically, Asian elephants ranged from west Asia, India, southeast Asia and China [5]. The Asian elephant now only remains in 13 countries, in highly restricted habitats and population estimates range between 25,000 to 45,000 [6]. The number of many remaining wild populations is unknown and therefore in reality, the true figure is probably at the lower end of the current estimate. Owing to the rate of habitat loss in their last remaining refuges and high levels of conflict with humans, this situation is set to get worse over the next few years [7], with several sub species predicted to go extinct without radical efforts being made to halt their decline.

2. Live elephant trade

The illegal international trade is a leading threat to biodiversity conservation [8]. Although historically, the major causes of the decline of Asian elephants was habitat loss, poaching for the trade in live elephants is an important factor adding to the declines of wild populations, especially in Thailand and Myanmar [9,2]. This previous work has demonstrated that Thailand is the main destination for these illegally sourced elephants from Myanmar, and since their diminished use within the logging industry in many countries, the main reason for the trade is now increasingly tourism. Thailand is prominent in this industry and has a history in smuggling of elephants from Myanmar into Thailand. This is concerning for the Myanmar population, as this is one of the last strongholds for the species in South-east Asia [10].

In 2011-2013, Professor Nijman in collaboration with TRAFFIC [2] investigated this illegal trade to document the extent to which elephants are being illegally captured, and the links between these two countries. For the study, research was undertaken along the Thai/Myanmar border to obtain information on elephant trafficking, and a total of 108 elephant tourist camps, government elephant facilities and hotels were visited (including informal interviews with mahouts) between April 2011 to November 2011, and April 2012 to March 2013 [2].

Legislation in Thailand in respect to elephants differs in respect to wild and domesticated individuals. Wild elephants are protected under the *Wild Animal Reservation and Protection Act 1992* (WARPA). This means anyone caught hunting, killing or trading in wild elephants is liable to a fine of USD 1330 and up to 4 years in prison. However, as the value of a live elephant is up to 25 times more, this does not act as a deterrent to the traffickers. Additionally, domestic elephants are governed by the *Draught Animal Act 1939*. This allows animals not to be registered until 8 years of age, which allows wild caught juveniles to be laundered into the domestic elephant population.

In Myanmar, elephants are protected under the *Elephant preservation Act 1879*, and listed as a totally protected species under the *Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law 1994*. Hunting, killing or possessing an elephant without permission from the Forestry Department is illegal, and trading and transporting elephants without permission is prohibited. If caught, this can lead to a fine of USD 52 and a prison sentence of no more than 7 years. Domesticated elephants are protected under the *Elephant Registration Act, 1951*. This requires owners to register their elephants at 3 months of age.

In Myanmar, the wild elephants are caught using pit fall traps. Young elephants are now more valued, as they have a greater appeal to tourists and hence more valuable, and it was reported that automatic weapons are used to kill the protective members of the herd. ‘Tame’ elephants are used to pull the elephants from the pit fall traps and the young are then transported to Thai/Myanmar border areas. It is here that they are mentally broken and prepared for training. ‘This capture and training’
highlight many welfare implications, though this aside, many wild individuals are potentially killed for just one juvenile therefore contributing to decline of wild populations. [10] stated capturing 100 individuals a year would lead to the extinction of Myanmar’s wild elephant population in less than 30 years.

This study found as many as 81 wild elephants had been illegally captured for sale in the tourist industry in Thailand. All but 4 were captured in Myanmar. However, this represents the known trade; the actual trade could be higher. This number does also not include elephants that may have been killed during the capture process, suggesting the true impact of this live elephant trade on wild elephant populations is much greater. There is a strong need to develop stronger laws and more robust systems to prevent poaching and trade and phasing out elephant tourism to safeguard this already endangered species.

3. Ivory trade and trade in elephant parts
The illegal trade in ivory and other Asian elephant parts (bones, skin, tails) remains widespread today, with Asia being the major market for both legal and illegal ivory and other products. The ivory trade and demand from rapid economic growth in the 1970’s and 1980’s led to rampant poaching and the serious decline of both Asian and African elephants in range countries [11]. In 2006, TRAFFIC [9] surveyed 14 markets in Myanmar and three border markets in Thailand and China. Research reported 9000 pieces of ivory and 16 whole tusks for sale, representing approximately 116 bull elephants. This trade continues to be a major cause of decline for wild Asian elephant populations. The observed and reported levels of cross-border trade show that effective law enforcement is lacking, and this illegal trade is carried out with very minimal risk of detection.

The illegal trade in ivory from Myanmar is also carried out in substantial quantities, and in 2002 it was reported that the largest illegal movement of tusks from wild Asian elephants was trade from Myanmar to Thailand [12] To date, Thailand still has one of the largest ivory industries in the world, exceeded only by China.

Even with international laws enforced, this local and regional demand in Asia is sufficient to adversely affect elephant populations, especially due to the low number of males with tusks and other products in demand which include tail hair, tails, molars, bones, meat and skin.

Therefore, an International ban on ivory will not completely resolve the poaching crisis in Asia. To reduce poaching, we need to improve field-based protection, tighten international borders amongst range states, and curb illegal trade within country. TRAFFIC alongside researchers continue to work on this issue.

4. Elephant distribution and population status in North Sumatra
The major limitation in elephant conservation within the North of Sumatra is the significant lack of data on wild elephant populations, their ecology, ranging behaviour and population dynamics. Although recent work has been conducted in the south determining wild elephant population status has been conducted using non-invasive genotyping [13] such a significant attempt has not been made here, due to several factors including cost, permits and size of the area. In 2010, Ente Rood in collaboration with Dr Abdullah Abdullah [14] identified elephant habitat use within the Ulu Masin protected forest using presence only modelling. [14] found elephants were mainly confined to closed canopy forests, and population survival was significantly reduced in areas with little forest cover, therefore fragmentation and forest loss was significantly contributing to their decline.

Sumatra’s elephants have drastically declined within the last 20 years, with a population estimate declining from ~3500 individuals to an estimated 1724 individuals. Due to recent DNA dung sampling, southern populations have been accurately estimated a population of ~247 individuals in Way Kambas National Park (Wildlife Conservation Society, 2010), and 104 individuals in the Bukit Tigapulu landscape [13]. In 2016, Forum Konservasi Leuser (FKL), an in-country NGO, identified and mapped elephant distribution in Aceh province based on sightings from their patrols, and discovered there is no longer a contiguous tract of elephant habitat from north to south and instead,
two separate areas containing elephants remain. This ‘separation’ may have huge impacts on the remaining elephant populations by limiting elephant movements, and reducing genetic diversity leading to unviable populations that are functionally extinct. This separation also fragments the habitat and brings elephants into close contact with humans. Aceh has a serious issue of conflict involving elephants, and these unmitigated conflict incidences are having drastic effects. Between 2012-2015, 36 elephants were found dead in Aceh due to poisoning, electrocution and man-made traps (pers comms.) and more recently in 2017, a further 3 elephants were found dead through human elephant conflict by local Indonesian communities.

5. Future research to the conservation of the Sumatran elephant

To prevent the extinction of the Sumatran elephant and their tropical forest habitat, the most important steps are; (1) reduce deforestation in elephant habitat to provide adequate areas required for their survival, (2) allow them to fulfil their ecological role in viable populations, and (3) halt illegal killing of elephants [15]. To achieve these goals, governments need to produce policies to protect elephants and put these into practice. Up to date information on the availability of elephant habitat and connectivity, and the distribution of Sumatra’s last remaining elephants will be essential for effective conservation planning. Identifying areas of high-level conflict and reducing illegal activities within these areas are of crucial importance to mitigate conflict and therefore decrease illegal killings. Research planned to be undertaken beginning in December 2019 in collaboration with Dr Abdullah Abdullah and Universitas Syiah Kuala aims to contribute some fundamental knowledge on these issues, to help towards securing a future for these globally important species. This will be achieved by;

1. Identifying elephant distribution and habitat use within the Leuser Ecosystem
2. Undertaking HEC within Aceh and North Sumatra, with the intention of conducting training workshops for local communities, obtaining funds to develop conflict strategies and producing a management strategy.
3. Continued research into the illegal trade in elephants across Asia

6. References

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