

Current Status of Asian Elephants in Borneo

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Introduction

The origin of the Bornean elephant is still very controversial, despite the publication of a genetic study by Fernando *et al.* (2003) indicating the distinctiveness of the Bornean elephant and its derivation from Sundaic stock. The authors suggested independent evolution of the Bornean elephant for some 300,000 years since a postulated Pleistocene colonization and recognized it as native to Borneo and as a separate Evolutionary Significant Unit. Based on the lack of genetic variability and fossil evidence in Borneo the theory that elephants sent to Sulu at the end of the 14th century as a gift between royal personages, proliferated on the island and subsequently provided the founder members of the existing population of northeast Borneo has been revisited (Cranbrook *et al.* 2008). While the conclusion by Fernando *et al.* (2003) was based on the absence of a source population on the mainland, Cranbrook *et al.* (2008) suggest that the source could have been the now extinct Javan elephant. Nevertheless, the debate on the origin of the Bornean elephant should not lead us astray from the fact that it is unique and that it deserves conservation efforts. Bornean elephants have many distinctive characters such as smaller size, larger ears, straight tusks, long tail that reaches to the ground and may also show some behavioural differences.

In Sabah, elephants are protected under the Wildlife Conservation Enactment (WCE) 1997. Under the listing, they can only be killed with a license issued by the Director of the Sabah Wildlife Department in specified instances such as to avoid human deaths due to serious Human and Elephant Conflict incidents (Section 26(1)

WCE 1997). For killing an elephant illegally the penalty is a fine of 50,000 Ringgit (US\$15,625) or imprisonment for five years or both. However, during the recent Sabah Wildlife Colloquium Conference in January 2012, the status of Sabah's Bornean pygmy elephant will be upgraded to Part 1 of Schedule 1 of the Totally Protected Animals under the Wildlife Conservation Enactment 1997 of the State.

Wild elephants

Past and current distribution

Wild elephants only occur in the north-eastern part of Borneo, mainly in Sabah extending over to a small area across the international boundary between Malaysian Sabah and Indonesian Kalimantan. In Sabah itself, they occur in forested areas in the south, centre and east of the State. They prefer low-lying areas where movement is relatively easy, and generally avoid steep slopes. Forests near rivers, with open areas for feeding as well as secluded areas where they can retreat during the day, are generally preferred.

The range of wild elephants in Sabah and Kalimantan seems to have expanded very little in the past 100 years despite access to suitable habitat elsewhere on Borneo. Borneo's soil tends to be young, leached and infertile, and there is speculation that the distribution of wild elephants on the island may be limited by the occurrence of natural mineral resources (Davies & Payne 1982). Figure 1 shows the past and current distribution of elephants in Borneo. The latest elephant distribution (2011) is shown in the confirmed range in the map.

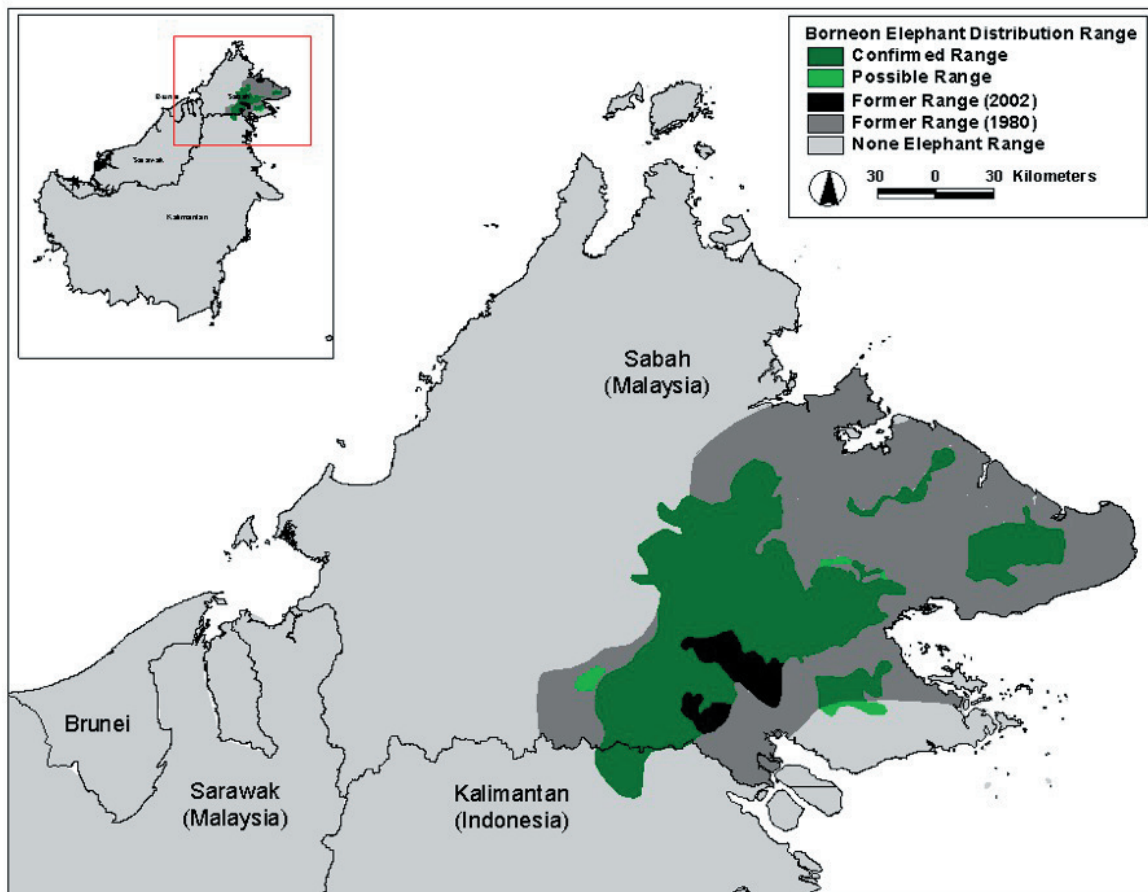


Figure 1. Past and current distribution of Bornean elephant in Sabah (Alfred *et al.* 2010).

In the early 1980's Davies & Payne (1982) suggested that Sabah's wild elephant population numbered between 500 – 2000 animals. In 2002, Ambu *et al.* provided estimates based on habitat availability between 1127 and 1623 individuals distributed in five major Managed Elephant Ranges and a couple of isolated populations. Alfred *et al.* (2010) based on line transect surveys conducted in all the major elephant ranges and monitoring dung decay rates, estimated the total number of elephants in Sabah to be around 2040 individuals with a range of 1184 to 3652. The number of individuals in Kalimantan is

estimated to be less than 20, with approximately 0.1 elephants/km² (Alfred *et al.* 2009). Table 1 and Figure 2 show the estimated elephant density and population in each survey range.

Elephant density in each forest reserve

The upper catchment of Ulu Segama Forest Reserve (Fitch) has the highest density of elephants (3.69 elephants/km²), followed by the Danum Valley Conservation Area (DVCA) with 2.35 elephants/km². As habitat has been converted to agriculture (oil palm and industrial

Table 1. Elephant density and population in the Managed Elephant Ranges (Alfred *et al.* 2010).

No	Survey Site	Density [elephants/km ²]	Number of elephants	95% CI	
				Lower	Upper
1	Tabin Range	0.60	342	152	774
2	Lower Kinabatangan Range	2.15	298	152	581
3	Central Forest of Sabah (Ulu Segama, Danum Valley, Gunung Rara and Kalabakan)	1.18	1132	748	1713
4	North Kinabatangan Range (Deramakot, Tangkulap, Segaliud Lokan)	0.56	258	131	511
5	Ulu Kalumpang Range	0.12	10	1	73

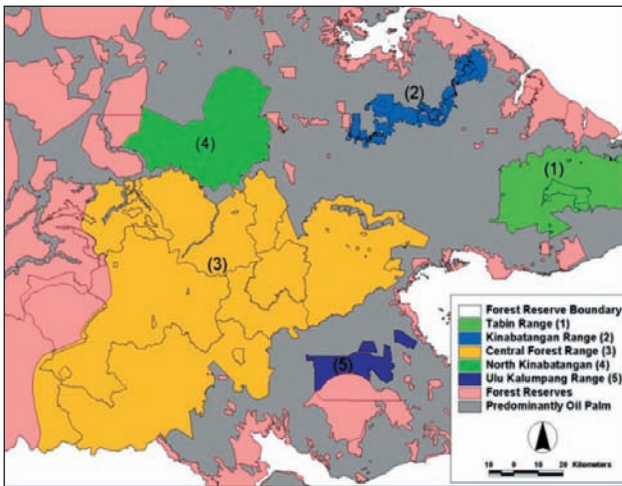


Figure 2. Location of key managed elephant ranges in Sabah (Alfred *et al.* 2010).

tree plantations), it appears that there has been an increase in elephant habitat utilisation including elephant density, in the remaining habitat in the northern part of DVCA and upper catchment of Ulu Segama Forest Reserve (Fig. 3).

Lower Kinabatangan Wildlife Reserve, 2.15 elephants/km² (Fig. 4). Sukumar (2003) suggested that the viability of the habitat is still good if an equilibrium density of the elephant is ranged between 0.5-1.5 elephants/km². Based on this suggestion, Lower Kinabatangan range may not be a viable habitat for the elephants since the density in this area is 2.15 elephants/km².

In North Kinabatangan Range, Tangkulap Forest Reserve has a density at 1.26 elephants/km², Deramakot Forest Reserve has a density at 0.86

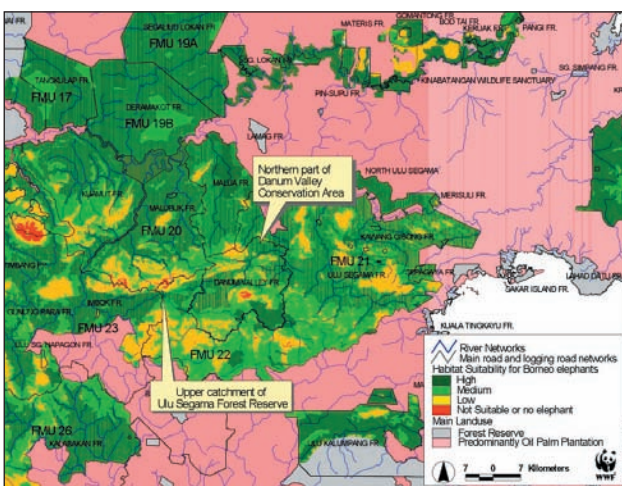


Figure 3. Key habitat for elephants in Upper Ulu Segama Malua and Danum Valley Conservation Area (Alfred *et al.* 2010).

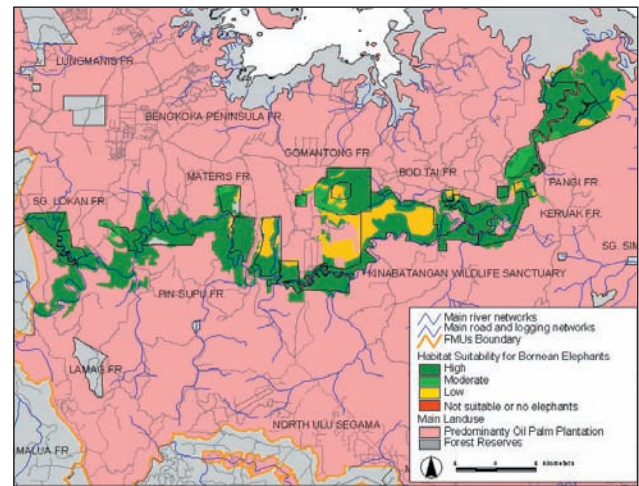


Figure 4. Key habitat for elephants in Lower Kinabatangan (Alfred *et al.* 2010).

elephants/km², while Segaliud Lokan Forest Reserve has a density at 1.41 elephants/km². The key habitat for the elephant in North Kinabatangan Range is shown in Figure 5.

Malua Forest Reserve, which is contiguous to Kuamut Forest Reserve and Malubuk Virgin Jungle Reserve has a density of 1.41 elephants/km². In 1997, the elephant density in Malua Forest Reserve was calculated at 0.79 elephants/km² (Boonratana 1997). The increase of the density of elephants in Malua may be due to logging activities in the adjacent forest reserves (namely Kuamut Forest Reserve and within Malua Forest Reserve itself). This argument is supported by the evidence that elephant groups moved outside Malua range into the oil palm plantations during the survey period (Fig. 6).

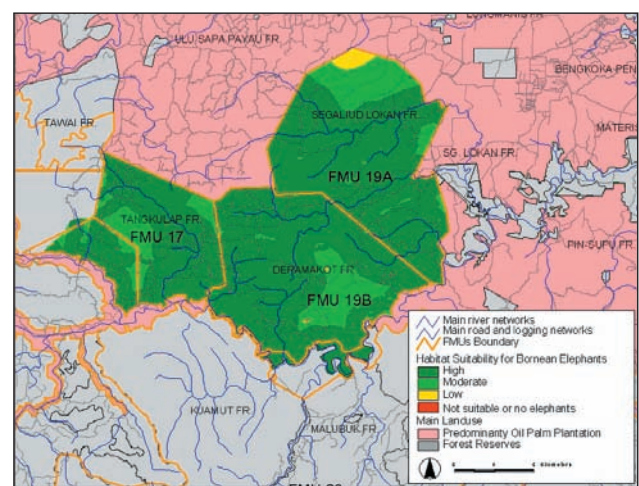


Figure 5. Key habitat for Bornean elephants in North Kinabatangan (Alfred *et al.* 2010).

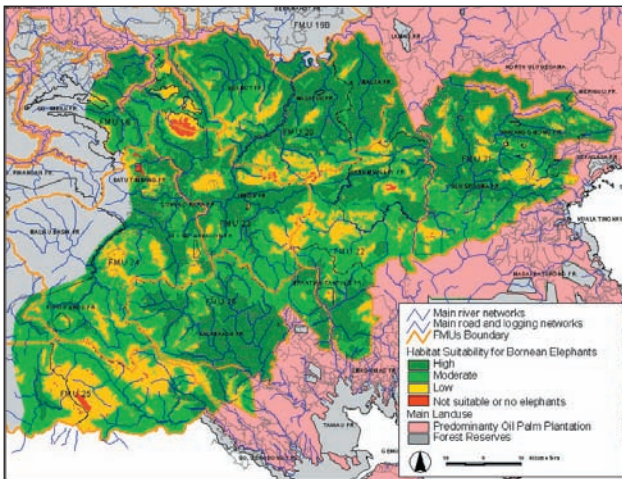


Figure 6. Elephant habitat in the central forests of Sabah (Kuamut-Malubuk and Kalabakan-Sapulut-Maliau Ranges) (Alfred *et al.* 2010).

Ulu Kalumpang Forest Reserve and Kalabakan-Sapulut-Maliau Range have the lowest density of elephants, at 0.12 and 0.28 elephants/km² respectively. Boonratana (1997) estimated at least 0.01 elephants/km² in Kalabakan Forest Reserve. This indicates that the elephant density has increased with loss of key habitat due to conversion to large-scale plantation. Elephants are now absent from the main Kalabakan Forest Reserve, especially in the Benta Wawasan oil palm area as from 2002-2005 key habitat has been destroyed.

Given the abundance of the elephants in each forest range, the issue of habitat viability for the elephants needs to be addressed. There are three major habitat attributes, namely size, integrity and quality that have to be considered

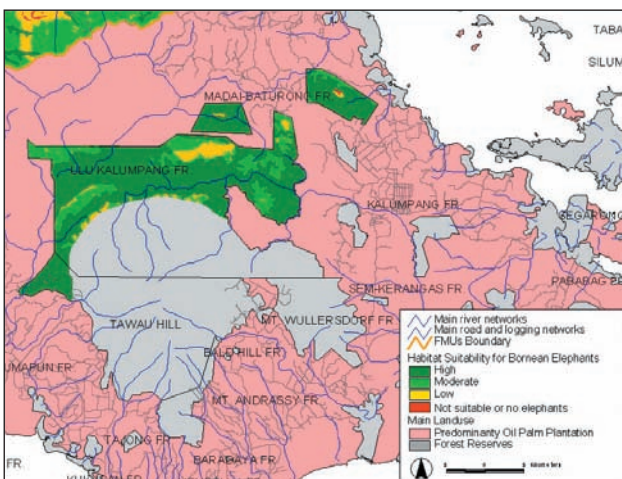


Figure 7. Key habitat for Bornean elephants in Ulu Kalumpang Range (Alfred *et al.* 2010).

for the conservation of the elephant population. Elephants could be seen regularly in the Lower Kinabatangan River due to the limited extent of suitable habitat in the Lower Kinabatangan range. Linking suitable habitat patches with forest corridors will improve the habitat viability. The other forest habitat ranges (i) Tabin range, (ii) North Kinabatangan range, (iii) Central forest range and (iv) Ulu Kalumpang range are considered viable as they are. Figure 8 shows the location of the key forest corridors that need to be maintained or re-established.

Four of the five main elephant populations in Borneo have less than 1000 individuals. Only the central forest range supports an elephant population of more than 1000 individuals. For elephant conservation in Sabah it is necessary to protect all five key populations and to address where possible, limitations to the growth of these populations particularly where habitat is the limiting factor.

Key threats

1. Habitat loss and fragmentation

In Sabah, the primary threat to the Bornean elephant is the loss and degradation of continuous forests. Over the last 40 years, Sabah has lost about 40% of its forest cover, which has been converted to plantations and human settlements. In the 1980-90s, large tracts of these forests were divided into 'Forest Management Units' (FMUs) of around 1000 km² each, which were

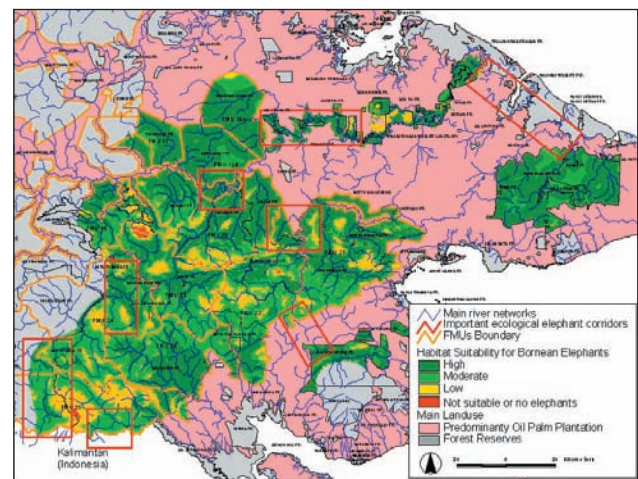


Figure 8. Key forest corridors needed within the managed elephant range (Alfred *et al.* 2010).

leased for up to 100 years, to be managed for sustainable wood production. However, years of unsustainable logging before the 1990s had taken their toll, making many of these big concessions commercially unviable in the short to medium term. Therefore, some of the FMU concessionaires have been converting part of their holdings into wood or oil palm plantations. The conversion of forests to plantations remains the biggest threat to elephants with the current rate at 4000 to 8000 ha per year, because plantations cannot provide the types and amounts of food necessary to sustain breeding populations of elephants.

Apart from habitat loss due to conversion of natural forests to plantations (Fig. 9), other threats include habitat fragmentation and increase in human presence close to forest blocks when oil palm plantations come into operation. This rapid increase in human population causes greater small-scale encroachments and increased elephant-human conflict.

2. Low genetic diversity

A recent genetic study found extremely low genetic diversity in the Bornean elephant population and significant genetic differentiation between currently demographically isolated populations (Goossens, pers. comm.). These results suggest the desirability of re-establishing gene flow between some populations if an increase of inbreeding and a loss of fitness are to be avoided.

3. HEC, illegal killing and illegal trade

Current annual loss of elephants in Borneo from HEC is around 10-16 annually with an increasing trend (Fig. 10). Approximately 1-2 human deaths are reported annually. The extent of oil palm destroyed by elephants is around 300-



Figure 9. Habitat loss due to plantation.



Figure 10. Elephant caught by snares.

500 ha per month. Although poaching was not a serious problem in the past (see Tuuga 1992), recent reduction of elephant populations in Ulu Kalumpang area might indicate the contrary.

Occasional incidents of illegal killing (shooting, poisoning) do occur but these are usually related to the intrusion of elephants into oil palm plantations where they can cause extensive damage. Moreover, snare traps set catch wild mammals for meat pose a risk to elephants, especially in the forest patches bordering oil palm plantations, such as in the Kinabatangan floodplain. It is estimated that 20% of resident elephants have sustained injuries from snares set illegally in the forest by oil palm workers for wild boar and deer. Public awareness, but most importantly, awareness campaigns in oil palm estates are needed to stop such illegal activities.

In terms of illegal trade, there is not much data available in Sabah. However, on April 30, 2009, one pair of elephant tusks was seized in Nunukan (Indonesia) from a Malaysian citizen from Tawau.

4. Poor public awareness

Lack of knowledge and appreciation is an indirect threat to the Borneo elephant's long-term conservation. Therefore, the Sabah State Government and its relevant departments as well

as local and international NGOs and scientists need to tackle public ignorance, increase their awareness and change their attitudes towards conservation.

In situ conservation efforts

In situ conservation efforts cover all areas designated as “Managed Elephant Range” (MER). Areas with at least 50 breeding elephants (translating into a total population of 125-150 elephants) are declared as MERs. Currently declared MERs include Lower Kinabatangan Range, North Kinabatangan Range, Tabin Range and Central Forest Range. Further investigation will be needed in Ulu Kalumpang in terms of whether the elephant population is connected to the one in Ulu Segama of Kalabakan Forest Reserve.

The responsible agency for implementing the elephant conservation efforts is Sabah Wildlife Department, with support from other government agencies (Sabah Forestry Dept., Sabah Foundation and Sabah Park), and relevant NGOs.

In order to reduce human and elephant conflicts, several management measures were implemented through the establishment of electric fencing, driving away problem elephants and establishing a translocation programme. Culling is only practiced by the Sabah Wildlife Department when human life is threatened in accordance with the 1997 Wildlife Enactment.

The recent Elephant Action Plan (2012-2016) developed by Sabah Wildlife Department with support from relevant NGOs, aims to:

- Investigate and ensure all key and necessary measures to maintain or re-establish connectivity within and between the key MERs and initiate specific protection for critical corridor habitats.
- Increase the value of the forest (through forest restoration and REDD program) in the MER. This is to ensure the key habitat for elephants will not be converted into other landuse.
- Ensure that every management plan designed for any natural forest or plantation with elephants should be in line with the

recommendations developed in the State Elephant Action Plan. This is to ensure that key corridor and habitat for the elephant is the forest management unit will be excised from any other forest conversion activities.

- Upgrade the status of the Bornean elephant to Schedule 1 of Totally Protected Species in Sabah. This is to ensure that no license shall be given to kill this species, and higher penalty could be imposed to those who are involved in killing this species.
- Support the creation of the “Bornean Elephant Conservation Alliance” (BECA) as a venue encouraging collaboration and communication between all partners involved in elephant management in the State.
- Promote responsible production of palm oil and oil palm products.
- Carry out, before 2013, a Population Habitat and Viability Analysis (PHVA) for the whole Sabah elephant population in order to estimate its extinction risk.
- Carry out regular monitoring and surveys in all four managed elephant ranges and build up a comprehensive database on elephant population trends in Sabah.
- Increase and promote communication and public awareness, and publicize the conservation needs of elephants in local, national and international media. Awareness campaigns targeted toward the general public, with a focus on schools and rural areas, are also crucial throughout the State, with an emphasis in the east coast.
- Promote zero poaching/killing through strict law enforcement and synchronized awareness programs.
- Engage with the oil palms estates surrounding the Managed Elephant Ranges to mitigate conflicts and to address illegal activities such as logging and poaching within and around the MERs.

Captive elephants

Ex-Situ conservation of the Bornean elephant would play an important role in the management of small fragmented groups of elephants outside the managed elephant ranges, when translocation is not an option.

Currently, 14 elephants are kept in Lok Kawi Wildlife Park, for conservation education and public awareness purposes. These elephants do not interact with other wild populations. However, they are managed as a group, which allows them to interact with each other in captivity. Most of these elephants were rescued from the oil palm plantations. So far, 3 elephant calves were born in the Lok Kawi Zoo, since the zoo was established 6-7 years ago. The Sabah Wildlife Department is also looking at the possibility of providing some elephants to zoos outside Sabah for global awareness of the plight of the Bornean elephant, as tourism ambassadors of Sabah and for captive breeding purposes.

In the near future, the Sabah Wildlife Department plans to set up an Elephant Rescue Center where injured elephants can be treated and then translocated back into the wild and orphaned baby elephants can be housed and taken care of.

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