Bornean Elephant Action Plan for Sabah

2020-2029

Sabah Wildlife Department
Ministry of Tourism, Culture and Environment

BORNEAN ELEPHANT
ACTION PLAN FOR SABAH

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EXECUTIVE SUMMARY

The goal of this Bornean Elephant Action Plan 2020-2029 is to provide direction and guidance on the strategies, priorities and actions for elephant conservation at the state level for the period 2020-2029 (10 years). It is the continuation of a five-year State Action Plan that was published in 2012. That plan was the result of an extensive consultation process initiated during an "International Workshop on the Conservation of the Bornean Elephant in Sabah" (May 2008, Kota Kinabalu), and presented a consensus of recommendations raised by the major stakeholders involved in elephant management in the State. This previous plan gathered a total of 11 primary objectives, 11 non-site-specific actions, 11 site-specific actions and four actions related to ex-situ and captive management.

Several major achievements were reached over the lifespan of the previous plan, such as upgrading the Bornean elephant to part 1 Schedule 1 of Totally Protected Animals under the WCE 1997; the creation of more protected areas to reach about 26% of Sabah's land mass at the end of 2018; improved connectivity between several key landscapes; etc. State authorities and all partners need to be commended for their efforts.

However, the future of the Bornean elephants remains at risk, because of the recent increase of elephant killings across Sabah (as a result of human-elephant conflict (HEC) or ivory trade); the further fragmentation of the preferred elephant habitat (i.e. extreme flat lowland areas); the development of major linear infrastructure projects, such as the Pan Borneo Highway; and the lack of acceptation by various societal groups to co-exist peacefully with the elephant.

Actions being proposed in this current document intend to implement ways to secure a future for this iconic species and to allow for a smooth socio-economic development of the areas where the elephants are roaming.

Objective 1: Improve protection and halt elephant killing to reduce current levels of elephant deaths

Threat to be addressed: Poaching, illegal wildlife trade and snaring
Activity 1.1. Improve state-level coordination and legislation for elephant protection
Activity 1.2. Improve local coordination and field enforcement for elephant protection

Threat to be addressed: HEC and retribution killing
Activity 1.3. Develop landscape level strategies to mitigate HEC

Threat to be addressed: Unknown causes of elephant deaths in agricultural landscapes
Activity 1.4. Elephant Task Force to carry out a thorough analysis of the epidemiological situation

Threat to be addressed: Lack of general awareness
Activity 1.5. Encourage peaceful co-existence between all stakeholders and elephants.

Objective 2: Improve landscape connectivity and permeability

Threat to be addressed: Lack of consideration for elephant conservation and management in current land use planning and development to accommodate for elephants' ecological needs
Activity 2.1. Develop an overarching Management Plan for elephants in Sabah.

Activity 2.2. Design SOPs and BMPs for creating and managing elephant corridors at the local and regional level.

Activity 2.3. Design an integrated fencing strategy on a larger scale than the estate level.

Threat to be addressed: Need to streamline elephant conservation and management at site-level
Activity 2.4. Develop and implement site-level management strategies that are compatible with elephant viability.

Objective 3: Ensure the best ex-situ practices for elephant management and conservation

Threat to be addressed: Poor understanding of the limits and advantages of translocation
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Threat to be addressed: Increasing number of individuals living in captive situations
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Activity 4.2. Develop sustainable financing mechanisms for elephant conservation activities within the State of Sabah.

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1.1. Origin and taxonomy

The Bornean elephant (*Elephas maximus borneensis*) is considered an Evolutionary Taxonomy Unit distinct from mainland Asian elephants (Fernando et al. 2003). It is still debated today whether elephants were introduced by people or colonized the island during the Pleistocene (Shim 2000, Fernando et al. 2003, Sharma et al. 2018). However, recent genetic analyses identified a severe bottleneck between 11,000 and 18,000 years ago – at the end of the Last Glacial Maximum where land bridges connected Sundaland – strongly suggesting that elephants colonized Borneo from another part of Sundaland at this time (Sharma et al. 2018).

1.2. Legal status and protection

The Asian elephant *Elephas maximus* is Endangered on the Red List of the International Union for Conservation of Nature (IUCN 2018) and is listed on Appendix 1 of CITES (Convention of International Trade in Endangered Species of Flora and Fauna).

In Sabah, the species is totally protected under Schedule 1 of the Wildlife Conservation Enactment 1997, meaning that elephants cannot be hunted or shot under any circumstances. Killing an elephant or possessing elephant products (skull, skin, bones, tusks, etc.) is an offence under section 25 of the WCE 1997. The penalty is a minimum fine of RM50,000 and a maximum of RM250,000, plus imprisonment for no less than six months and up to five years.

1.3. Ecology and behaviour

The Bornean elephant is the smallest subspecies of the entire taxa: males range between 1.57 m – 3.64 m with an average of 2.17 m, while females are between 1.45 m – 2.26 m, with an average of 1.96 m (Wildlife Rescue Unit unpublished data) Overall, the Bornean elephant is also milder tempered than other Asian elephants (Shim 2000; Othman et al. 2013; Payne and Davies 2013).

Elephants are polygynous, and family units are led by matriarch females. Their social organization is sexually dimorphic with males leaving the family unit when they become mature. Males reunite with female groups only when they are reproductively active ("musth", see Figure 1). Usually, a family unit is composed of several females and their young, consisting of as few as 3-4 individuals, and up to 20 individuals (Sukumar 1989). The social system is dominated by fission-fusion, and it is thus possible to see large herds of more than 100 individuals together.

Elephant home ranges average 150 to 200 km^2 (Evans et al. 2020), although earlier estimates reported a home range size of 250-400 km^2 in non-fragmented landscapes and up to 600 km^2 in disturbed fragmented landscapes (Alfred et al. 2012). Elephants do not "migrate" in Sabah, but they walk over great distances. They roam over large areas that they revisit at regular times to sustain their ecological and feeding requirements and seem to move on semi-regular circuits (English et al. 2014a). Elephants are also characterized by tight social bonds that also govern their movements: these social bonds may be disrupted as a result of habitat fragmentation and human harassment.

Figure 1. Bull in musth.

Elephants prefer mostly low-lying areas where movement is relatively easy, and generally avoid steep slopes. Traditionally, the animals favour forests near rivers, valleys and flatlands with open areas for feeding. Today, they are frequently found in “low-quality” habitats dominated by grasses and bushes (Alfred et al. 2011). Their diet includes mostly monocotyledon plants from the Poaceae, Arecaceae or Musaceae families but they also consume bark, leaves and other parts of trees and climbers, notably Euphorbiaceae (English et al. 2014b). The presence of Monocotyledons (grasses) is essential to sustain the pachyderms since they revisit regularly the same area to feed on grass regrowth (English et al. 2014a). Indeed, Monocotyledons grow much faster than woody plants and offer a more regular and stable food resource than other plants. Grass is not a regular feature of mature forest, explaining the lower usage of this type of habitat by the animals, compared to grassland. However, the combination of both short-stature forest and low-lying flatlands, characteristic of degraded forests found in Eastern Sabah, produce a high-suitability habitat with more food opportunities than pristine Dipterocarp forests (Evans et al. 2018).

It is also important to note the existing correlation between wild elephants and availability of grey coloured kaolin smectite and illite clay (also known as “mud volcano”), extensively used by the animals to neutralise toxic woody vegetation in the absence of abundant Monocotyledon plants (Payne pers. com.).

1.4. Current distribution and population trends

Wild Bornean elephants only occur in the north-eastern part of the island, astride the international boundary between Malaysian Sabah and Indonesian Kalimantan.

Today, the current distribution of elephants in Sabah is a direct result of the expansion of the human population (from less than 100,000 in 1880 to about 3,700,000 in 2019) and major changes of land uses. In the past, elephants favoured flat lands, floodplains and valleys, But over the past 40 years, most low lying forests in the State were actively converted to other types of land uses (primarily agriculture) and the elephant range in Sabah was reduced by at least 60% (Gaveau et al. 2014). In addition, the current network of Forest Reserves is largely marginal and unsuitable habitat for elephants (English et al. 2014a; Evans et al. 2018). As a result, elephants increasingly rely on non-protected areas for their movements, dispersal, and food ranging activities. The idea that elephants must be retained within the Permanent Forest Reserves, that they have to stay in sub-optimal habitat and kept out of their preferred habitat is understandable from a human perspective, but not necessarily realistic.

Estimating elephant population size is difficult given non-homogeneous distribution of the animals across their very wide range and the lack of information about defecation and dung decay rates in the wild. Although no recent data is available for the total population size, not more than 1,000-1,500 individuals would be roaming across Sabah according to expert knowledge. Determining whether this number is stable or not is impossible as long as factors like birth and mortality rates, inter-birth interval, and longevity rates in the wild are not known more precisely.

Data collected from satellite tracking and other means reveal the presence of three Major Elephant Ranges (MERs) in Sabah: Lower Kinabatangan, Tabin and Central Sabah (see Figure 2). These three isolated MERs are fragmented by linear infrastructures (roads), human settlements and other man-made elements. For example, the Batu Puteh Bridge, which crosses the Kinabatangan River, has split the Kinabatangan elephants from the Central Sabah elephants (Estes et al. 2012).

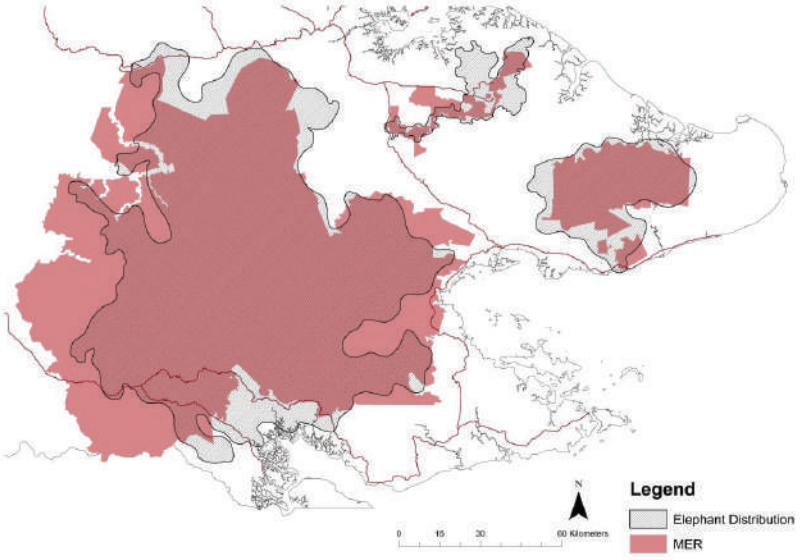

Figure 2. Elephant distribution in Sabah.

1.5. Major Threats

1.5.1. Habitat loss and fragmentation

One of the major issues for elephants in Sabah results from past, current and planned land conversion to various uses without considering areas that are regularly used by these large-ranging animals during their movements. Although Sabah still retains about 50% of its land mass under forest cover, the network of protected and unprotected forests is increasingly fragmented, and elephants increasingly rely on non-protected areas for their movements and dispersal, and for food (Gaveau et al. 2014, Evans et al. 2018). Linear human infrastructures (roads, electrical fences, drains) and other man-made infrastructures are also impacting movements by constraining or facilitating them (Leimbruger et al. 2003). Elephant movements are faster close to main sealed roads and slower along gravel roads with less traffic (Evans et al. 2020). Natural events such as flooding also constrain elephant range in floodplain areas, such as in Kinabatangan (Estes et al. 2012).

1.5.2. Elephant deaths

Over the past decade, the number of elephant deaths recorded by the state authorities has increased in Sabah, with at least 131 records of killed elephants since 2010 (Figure 3). However, it is difficult to correlate the increase of reported cases to the actual number of deaths as long as we do not know whether the reported increase is reflecting a better detection rate of elephant deaths or not; whether the ratio of recorded to unrecorded deaths is constant or not; and what the proportion of unrecorded deaths is.

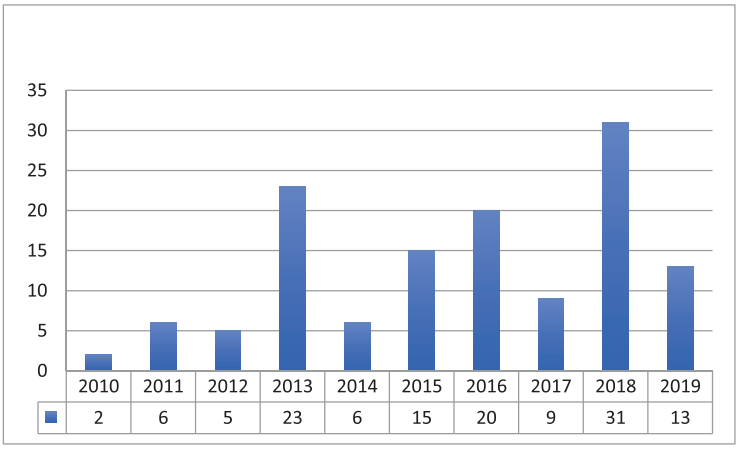

Figure 3. Graph showing the yearly number of elephant deaths reported to the Sabah Wildlife Department (2019 data cover only the first four months of the year).

The drastic increase of reported elephant deaths has five overall causes:

1.5.2.2. Human-Elephant Conflicts (HEC) and retribution killing

Elephants are increasingly using human-dominated landscapes and by doing so, are responsible for damaging people's crops and belongings. Currently, the management of HEC in Sabah is best described as *ad hoc*, with a great emphasis put on translocation of

elephants who are removed from the immediate locations of HEC and released in nearby forest reserves (see below). Many crop owners are encouraged to erect electrical fences to keep the elephants away from the plantation ("segregation" approach). However, by stopping elephant movements and preventing the animals from having access to some of their favoured feeding grounds, fences tend to create more problems and conflicts in the long-term (see below).

Home-made guns or poison are often used during bouts of retribution killing as a mitigation and retaliation measure. This type of killing mostly occurs when conflict incidents happen repeatedly and when people face a lack of technical knowledge and resources to reduce HECs. Many animals show signs of injuries caused by firearms and every year several individuals die as a result of retribution shooting incidents.

Elephants are also a common by-catch of snares and pitfall traps that are set up by plantation workers and villagers to catch small ungulates (e.g. wild boars and deer). Snares do not cause an immediate mortal danger to the elephants since many elephants have been recorded to survive with snares on their feet or trunk. However, these animals will suffer until the snare disappears; they will walk slowly, feed less, or even die of infection from the snare wounds.

1.5.2.2. Hunting

Some poachers are using shotguns to kill elephants because of the ivory trade. In 2018 for example, three males were found dead without tusks (see Figure 4): the post-mortem examination showed that they had been shot. In July 2019, the Indonesian authorities arrested a person who was smuggling 10 tusks originating from Sabah. Available data indicate that elephant poaching for ivory is rampant and this will have a negative impact on the viability of the elephant meta-population in the State.

Figure 4. Bull poached for its tusks in an oil palm plantation in Central Sabah.

1.5.2.3. Poisoning

Poisoning can be intentional in conflict situations, and sometimes unintentional. Either way, it is a growing threat to elephant survival, especially for herds roaming within plantations. Elephants spend an increasing amount of time in oil palm plantations where they are exposed to a wide spectrum of chemicals used by growers. Some of these chemicals could be potentially toxic in the medium to long term and result in progressive poisoning of the animals.

1.5.2.4. Accidental deaths

In 2016, five elephants were found dead in a mud pool and two individuals that were rescued at the time had to be euthanized later. The mud pool was an abandoned quarry pit previously used by a timber company. Collision with vehicles (lorries) can also lead to serious injuries and subsequent deaths (two cases in the past five years).

1.5.2.5. Disease

Tuberculosis and elephant endotheliotrophic herpesvirus (EEHV) are potential causes of mortality, although the importance of this threat for the survival of elephant populations in Sabah still needs to be established.

1.5.3. Management issues, lack of resources and poor coordination

The priority for the Malaysian government is to stimulate economic growth by developing high-impact socioeconomic projects. However, land use change decisions are vastly taken without considering key traditional elephant ranging areas and feeding grounds.

In Sabah, the state government has a goal to fully gazette 30% of its landmass as Totally Protected Areas (or TPAs). But the extension of the protected area's network is not coupled with the increase of human resources allocated to their protection and management, which overall remain insufficient (Hezri & Hasan 2006). With small operational budgets, and limited human and technical resources, conservation agencies are not effectively able to manage, protect and preserve the environment and wildlife in Sabah. Unless concerted efforts are made to reinforce local capacities and address funding gaps, these issues will continue to be obstacles to achieving effective conservation and management of the elephant and other species (see other SAPs).

On the ground, the rather poor coordination and communication between government agencies, NGOs, or industry players (smallholders and large industrial estates) add to the complexity and highly fractured landscape that is becoming unsuitable for elephants. For example, electrical fences are erected by landowners without considering neighbouring estates and traditional elephant routes. Once the elephants enter plantation areas, they roam within a maze of fences, which inhibits their return to nearby forests and worsens the damage they cause to property.

1.5.4. Lack of general awareness

Unlike the Indian elephant *Elephas maximus indicus*, the Bornean elephant seems to have a less significant role in the history, culture, religion, mythology, folklore and even politics in Sabah (Othman et al. 2019). It is difficult to harness people's support for conserving elephants while they fear the species and continue to consider it as a pest and, recently, a source of conflicts. Raising tolerance of the presence of elephants with the general public is important. A small brief survey carried out with 38 people in the districts of Lahad Datu, Tawau and Tongod, revealed that the majority of the respondents were unsure about the potential benefits

of living with elephants, with the exception of attracting tourism (N. Othman unpubl. data). Similarly, in oil palm plantations, people are resentful of elephants when their presence results in reduced daily wages because workers are afraid to go to work.

Raising tolerance about elephants in Sabah and about the needs to co-exist with the pachyderms is key to ensure the long-term viability of the last remaining populations of Bornean elephants.

1.5.5. Poor understanding of several key scientific questions

Although elephants are a major iconic species in Sabah, relatively little is known about them. First, it is difficult to determine their number precisely. This lack of information is explained by the difficulties encountered in the field, the significant human and financial resources needed to conduct these surveys. The lack of proper monitoring of their population makes it difficult to infer the viability of the species over the long-term and to develop effective management plans.

Although elephant movements are regularly documented with radio-satellite technology (see Figure 5), underlying reasons of these movement patterns are still poorly understood. For example, soil composition and clay availability, spatial memory of the matriarch or group leaders, social cohesion and its disruption by external factors, or changes of alimentary resources are all factors that need to be better investigated to design adequate management strategies.

Figure 5. Elephant female set up with a satellite collar in the Lower Kinabatangan.

2 DISTRIBUTION AND SITE DESCRIPTION

Three major meta-populations of elephants are found in Sabah.

2.1. Lower Kinabatangan Range (approximately 400 km^2)

The Lower Kinabatangan is a floodplain characterized by an overall low elevation and limited slope. This range consists of highly degraded forests that are mostly located along the Kinabatangan River, including freshwater swamp forests, secondary dryland forest, limestone outcrops and oxbow lakes. Most of these forests are fully protected (27,000 ha as the "Lower Kinabatangan Wildlife Sanctuary; about 15,000 ha as "Virgin Jungle Forest Reserves"), while another privately-owned and heavily fragmented 10,000 ha of land is still covered with forest (Abram et al. 2014). About 90% of the original forest in this region has been converted to oil palm plantations, reducing the habitat available for the elephants and cutting through their home ranges, therefore increasing HECs. Although not precisely known, the population estimation indicated that there were approximately 200 individuals in the late nineties. Although no accurate figure is currently available on the size of the Kinabatangan population, current increases in killing is resulting in a noticeable size reduction of Lower Kinabatangan.

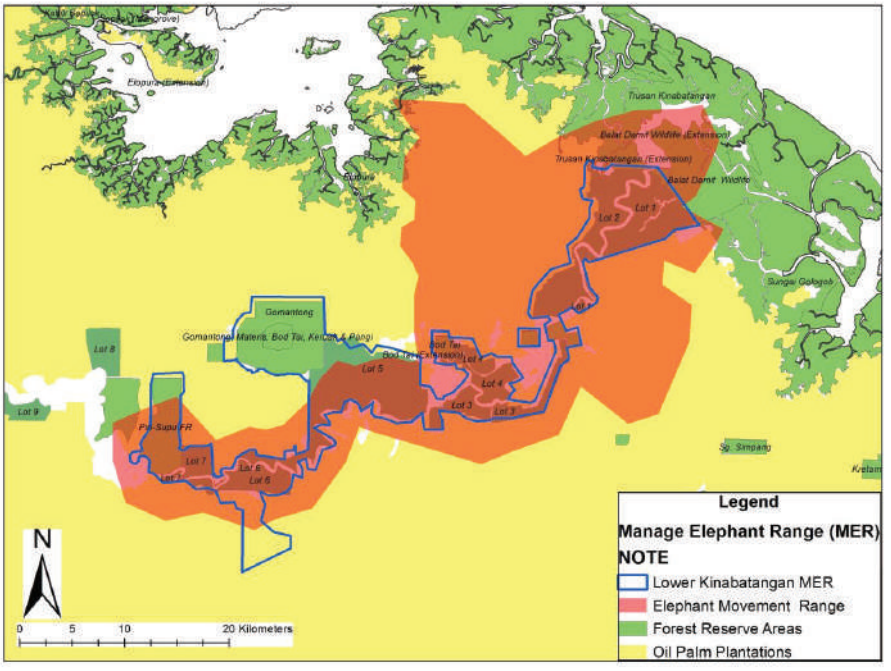

Figure 6. Distribution of the Bornean elephant in the Lower Kinabatangan Managed Elephant Range (©DGFC).

The area used by this population is increasingly including the vast oil palm landscape that is surrounding the network of protected and fragmented forests. This population is isolated from the extensive forest blocks of the "Central Sabah Range" by the Batu Puteh bridge and the highway linking Sandakan to Lahad Datu, which, since the early 2000s has proven to be an

impassable barrier for elephant movements. The Lower Kinabatangan Range is also isolated from the Tabin Elephant Range because of plantations, villages and linear infrastructures that were developed in between these two forested areas.

2.2. Central Sabah Range (more than 10,000 km^2)

This range consists of a mosaic of commercial forest reserves exploited for timber under sustainable practices (such as Deramakot and Segaliud-Lokan, Kalabakan, parts of Gunung Rara), fully protected Class 1 Forest Reserves (Ulu Segama, Malua, northern and eastern Kuamut, Tangkulap, part of Gunung Rara) and Conservation Areas (DaMai complex), plantations (mostly rubber, acacia and oil palm) and land occupied and used by villages. Several herds are roaming this MER, which is home to the highest number of elephants in Sabah.

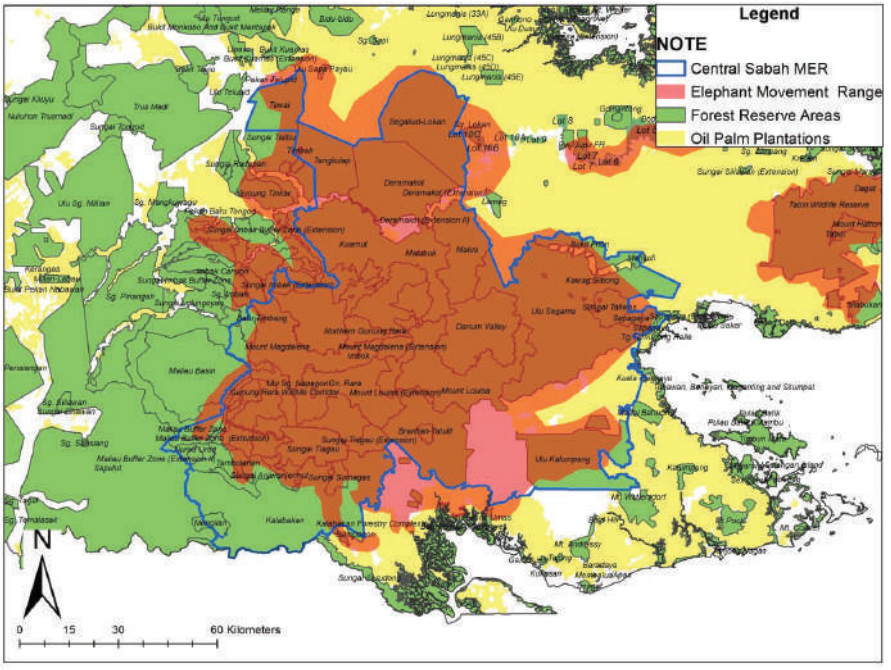

Figure 7. Distribution of the Bornean elephant in Central Sabah Managed Elephant Range (©DGFC).

Elephants are more abundant in their most favoured habitat (flat lowlands rich in Monocotyledons and salt licks), which covers the eastern part of the range: Deramakot, Segama, Malua, Danum, Segaliud-Lokan, Tangkulap and Gunung Rara Forest Reserves. Satellite data show that elephants can cross the 70 m wide Kinabatangan River, confirming that their home ranges span the river, and that only one "population" is using this range.

A small population of elephants still occurs between the transboundary areas of southern Sabah (FMU 25) and northern Kalimantan, prominently along the Sibuda and Agison rivers, and

efforts are being taken to secure the transboundary corridor area through the Heart of Borneo (HoB) initiative.

2.3. Tabin Range (approximately 1,200 km^2)

This range consists of parts of Tabin Wildlife Reserve, which is covered with lowland and hill dipterocarp forests, and with swamp forests in the eastern parts of the Reserve, Kulamba FR and Silabukan FR. In the late 2000's the population was estimated to be approximately 350 individuals (Alfred et al. 2010). Except for a tiny corridor of degraded forests stretching along the Segama River that links Tabin Wildlife Reserve with Kuala Segama FR and Kulamba FR, the Tabin WR is surrounded by oil palm plantations. This situation results in conflicts with agriculture at the edges of the reserve. However, it is very likely that some bulls can still migrate through plantations and disperse into Kulamba FR and maybe Lower Kinabatangan. Elephants also move between Tabin and Silabukan FR frequently, crossing oil palm plantations and sometimes villages or even the suburbs of Lahad Datu.

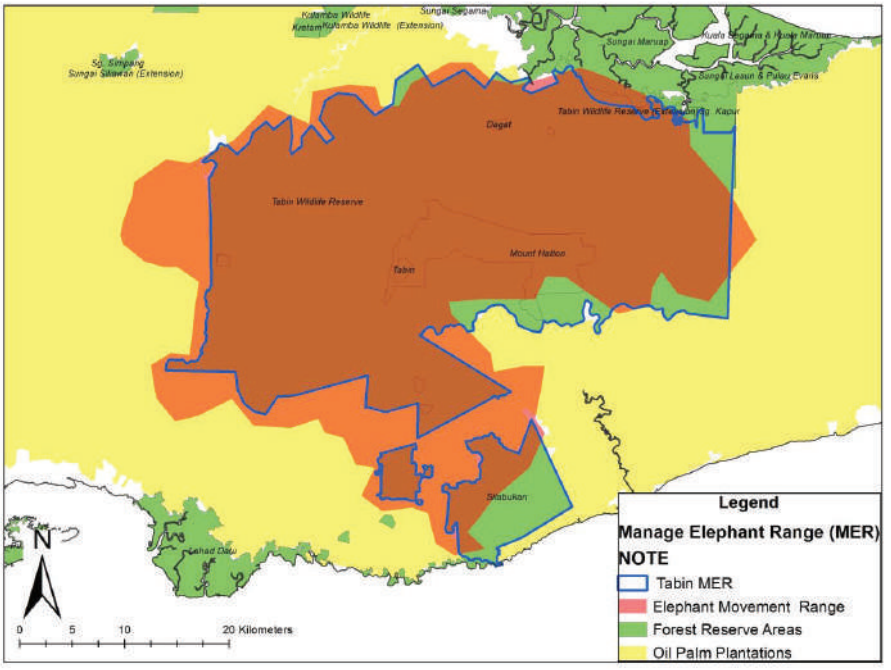

Figure 8. Distribution of the Bornean elephant in the Tabin Managed Elephant Range (©DGFC).

In the long-term, for both the Kinabatangan and the Tabin Ranges, the isolation of these populations will result in a lower population fitness and genetic diversity, making them more vulnerable to natural or man-made catastrophes (Goossens et al. 2016).

3 NON SITE-SPECIFIC PRIORITY ACTIONS

Results of the Scientific Forum "Finding Solutions for Human Wildlife Conflicts".

At the end of 2018, the Sabah Wildlife Department organized a Scientific Forum that brought together key scientific organizations and actors active in biodiversity management and conservation in Sabah to brainstorm about "Finding Solutions for Human Wildlife Conflicts". The overall consensus was toward creating enabling conditions for a land-sharing approach, i.e. design management strategies for people and wildlife to co-exist peacefully. Most of the discussion was related to elephant management, and many ideas discussed and agreed upon by the participants can provide a frame for this SAP.

- *Fencing:* fencing forest reserves to retain elephant herds within the network of protected areas is not an option. Indeed, elephants are a large-roaming species and need large territories to fulfil their ecological needs. Often the herds venture out of the forest reserves to look for food: they would break through fences during their movements. Fencing would worsen the current fragmentation process and their cost would be prohibitive. A more relevant question to ask would be "under what circumstances could fencing work or not?". For example, there is no need to fence permanently mature palm oil plantations. In the contrary only blocks planted with palms below eight years of age could be protected with temporary fences (see action).
- *Habitat management:* Improving the landscape in terms of elephant management requires a combination of approaches. As a short-term option, planting grass (monocotyledons) and maintaining grassland areas could enhance food availability locally. In the long-term and at a wider scale, corridors of natural habitat must be created to facilitate elephant movements across the landscape.
- *Translocation:* capture and translocation of elephants disturb the cohesion of the remaining herds that have not been captured, while translocated individuals present elevated levels of stress hormones and display different movement patterns. We need to understand better the medium- and long-term consequences of translocation on the overall elephant population as a potential management tool. If co-existence with wildlife is a goal, translocation should only be used as the last resort solution, when everything else has failed.
- *Compensation:* Many species, including elephants, are responsible for damages in plantations, but these damages have not been quantified yet: we need to better quantify damages, their socio-economic costs and to understand what species is responsible for what type of damages. This information is needed to develop any potential compensation scheme. The compensation approach could mitigate some damages but need further thinking. However, instead of compensating, we could also give positive incentives for people to coexist with wildlife.

OBJECTIVE 1: Improve protection and halt elephant killing to reduce current levels of elephant deaths

Rationale: although it is not known whether the existing elephant population in Sabah can sustain the current rate of killing, being a fully protected species, all necessary efforts must be deployed to halt the current rate of elephant killing.

- **Threat to be addressed: Poaching, illegal wildlife trade and snaring**

Activity 1.1. Improve state-level coordination and legislation for elephant protection

Action 1.1.1. Establish an Elephant Task Force (ETF) under the MTCE of Sabah.

- This Elephant Task Force will be chaired by the Permanent State Secretary and will comprise a limited number of elephant experts active in Sabah;
- The Task Force will be in charge of coordinating efforts about elephant conservation and informing the government about the ground situation;
- This Task Force could merge with the proposed "Endangered Species Conservation Unit" that was proposed to be created to monitor all Action Plans developed for terrestrial, totally protected, species in Sabah;
- The Task Force will develop a functional platform to obtain regular reports about the situation in the field regarding elephant injuries, poisoning or deaths;
- The Task Force will provide manpower and expertise to monitor the implementation of the Action Plan, prepare annual reports and mid-term reviews

Timeline:	1 year
Priority:	High
Lead Agencies:	MTCE, SWD
Partners:	NGOs, SFD, Research Institutions (DGFC, UMS), International experts (IUCN SSC Asian Elephant Specialist Group, etc.)
Monitoring:	ETF is created. The Action Plan is implemented and reviewed after five years

Action 1.1.2. Revise the WCE 1997 to reinforce its scope and outcomes and to minimize the current pressure on elephants and other protected species.

Timeline:	5 years
Priority:	Medium
Lead Agencies:	SWD
Partners:	Legal judicial system
Monitoring:	Enactment is revised

Action 1.1.3. Reinforce protection measures, patrolling efforts and the prosecution process to achieve a target of zero elephant killing in Sabah. Improve custom procedures at the border between Kalimantan and Sabah.

Timeline:	Immediate
Priority:	High
Lead Agencies:	Custom Department
Partners:	SWD, State agencies

Monitoring: Number of cases of smuggling

Action 1.1.4. Pursue capacity building of the Environmental Court to prosecute poachers and people involved in illegal trade activities and ensure maximum penalties.

Timeline: 5 years
Priority: Medium
Lead Agencies: Sabah Environmental Court; judiciary system
Partners: SWD, State agencies
Monitoring: Number of judges properly trained, and number of cases successfully prosecuted

Action 1.1.5. Pay rewards to valid informants leading to arrest and prosecution of poachers.

Timeline: Immediate
Priority: High
Lead Agencies: ETF
Partners: SWD, State agencies
Monitoring: Number of rewards paid and resulting prosecutions

Activity 1.2. Improve local coordination and field enforcement for elephant protection

Action 1.2.1. Organize an anti-poaching Task Force in each District to standardize enforcement operations across elephant ranges and increase the capacity of various enforcement units.

- In each District, an anti-poaching task force will gather members of the police, army and other enforcement agencies, as well as NGOs and other relevant players to coordinate anti-poaching efforts;
- Increase the capacity of State agencies in enforcement operations: PROTECT (SFD); Mobile Enforcement Unit (SWD); DaMai Enforcement Patrols; Sabah Parks; other ground partners;
- Generalize the use of the same reporting methodology (Spatial Monitoring and Reporting Tool: SMART Conservation software) by all enforcement groups;
- Ensure that a specific enforcement plan is included in all FMUs and major oil palm estates across Sabah, and that every estate holder has the resources to implement these strategies. This strategy will incorporate systematic control at each estate gate and increased security at each access point to forests and private plantations (like preventing frauds about duplicating licenses for example);
- Take necessary steps within FMUs and oil palm estates to remove all sites that could injure or kill elephants: unused mud pools and wells must be filled in or cordoned off so animals cannot fall into them, etc.

Timeline: Immediate
Priority: High
Lead Agencies: DO, SWD, SFD, Enforcement agencies
Partners: HWWs, NGOs, DGFC, industry
Monitoring: Number of elephant killings, number of prosecutions

Action 1.2.2. Improve the efficiency of the Honorary Wildlife Warden (HWW) network.

- Establish a better communication and regular reporting system between different groups;
- Reinforce human capacities of HWWs with regular training sessions.

Timeline:	Continuous
Priority:	Medium
Lead Agencies:	SWD
Partners:	HWWs, NGOs, Industry, and Communities
Monitoring:	Number of trained and active HWWs, number of joint patrols

Action 1.2.3. Adopt and enforce a zero-snaring policy in Sabah.

Since elephants are frequently victims of these illegal practices, joint operations need to be conducted to do a thorough sweep in hotspot areas.

Timeline:	Immediate
Priority:	High
Lead Agencies:	Anti-poaching Task Forces
Partners:	State agencies, NGOs, HWWs, Industry players
Monitoring:	Number of patrols and snares removed; number of elephants reported with snares

❖ **Threat to be addressed: HEC and retribution killing**

Rationale: HECs lead to a lack of support from stakeholders toward elephant conservation. It can also lead to elephant killing or people's death. It is urgent to develop and implement efficient ways to minimize conflicts with elephants and to promote a more peaceful co-existence between people and elephants in non-protected areas.

Activity 1.3. Develop landscape level strategies to mitigate HEC

Action 1.3.1. Develop SOPs for HEC mitigation techniques.

- Develop and provide a set of guidelines for private shareholders to report HECs;
- Develop SOPs and "Best Management Practices" for conflict mitigation;
- Socialise these SOPs by producing education materials and organising targeted training sessions.

Timeline:	1-5 years
Priority:	High
Lead Agencies:	SWD, UMS, NGOs
Partners:	State agencies, oil palm industry
Monitoring:	Production and socialisation of SOPs to mitigate conflicts

Action 1.3.2. Develop and support "Community Elephant Ranger Teams" (CERTs) in villages affected by HECs.

- Based on the successful model developed in Lower Kinabatangan, train and support teams of local villagers who will become in charge of mitigating HECs in their own communities;
- Provide technical and financial support to the CERTs.

Timeline:	1-5 years
Priority:	High
Lead Agencies:	SWD, NGOs
Partners:	State agencies, communities
Monitoring:	number of fully operational CERT, and level of conflicts in community areas

Action 1.3.3. Perform a thorough socioeconomic analysis of HECs.

- Carry out interview surveys with local communities and other stakeholders to better quantify the real (*vs* perceived) costs and the real extent of the problem: people's perception and aspirations, recent land-use changes, real damages (*vs* perceived) in various scenario (different crops, different development stages, different management approaches);
- Assess and document efficiency of various techniques used by various stakeholders to mitigate HECs.

Timeline:	1-5 years
Priority:	Medium
Lead Agencies:	ETF, SWD, UMS, NGOs
Partners:	State agencies, oil palm industry
Monitoring:	Production of quantitative information about the costs of HEC

❖ **Threat to be addressed: unknown causes of elephant deaths in agricultural landscapes**

Rationale: Over the past few years, unexplained elephant deaths have been increasingly reported within agricultural landscapes. Underlying reasons for this situation must be investigated urgently.

Activity 1.4. ETF to carry out a thorough analysis of the epidemiological situation

- Compile and analyse all data collected by SWD (and other partners) about recent elephant deaths;
- Collaborate with national and international experts to determine the exact causes of elephant deaths (natural or not);
- Identify and collaborate with national and international laboratories that can screen chemicals that could be responsible for elephant deaths;
- Review all chemicals that are currently used in plantations and other areas used by elephants, and that could potentially be harmful to the animals, and be responsible of voluntary or involuntary poisoning;

- Upon identification of the major causes of elephant deaths, design and implement a set of actions that will minimize elephant exposure to these factors through adequate policy framework;
- Develop an epidemiologic network to monitor the sanitary situation on the ground, to collect and store samples from dead elephants in various scenarios (different crops, different development stages, different management approaches), and quantify the real (*vs* perceived) costs;
- Better assess the potential threat of diseases.

Timeline:	Immediate
Priority:	High
Lead Agencies:	ETF, SWD, palm oil industry
Partners:	NGOs, DGFC, State agencies, field partners
Monitoring:	Reasons responsible for elephant deaths are identified and mitigation actions are proposed

❖ **Threat to be addressed: Lack of general awareness**

Activity 1.5. Encourage peaceful co-existence between all stakeholders and elephants

***Rationale*:** The species is attracting increasing levels of interest, both nationally and internationally. Outside of fully protected areas, their future in Sabah will very much depend on how people will accept sharing the landscape with the pachyderm. Actions presented below intend to encourage human-elephant co-existence in landscapes encompassing protected and non-protected areas.

Action 1.5.1. Ensure that all plantation owners, managers and developers are aware of the current legislation on the elephant and its fully protected status, and that they are also aware of ways and means to coexist peacefully with the elephants.

- Develop education tools about elephants and other species (see other SAPs) and disseminate user-friendly brochures listing all wildlife laws pertaining to the protection and the sustainable management of elephants and their natural habitat;
- Design and disseminate practical SOPs and BMPs to show how to achieve peaceful co-existence between people and elephants on the ground, and how damages can be prevented or minimized;
- Ensure that these SOPs and BMPs are encapsulated in internationally recognized global standards and legally required certification schemes (MSPO) for further dissemination;
- A special emphasis will be given to reach out to communities that have been experiencing HECs recently.

Timeline:	5-10 years
Priority:	High
Lead Agencies:	SWD, Palm oil industry, NGOs, Certification bodies
Partners:	State agencies, communities
Monitoring:	Behavioural change and improve acceptation of co-existence

Action 1.5.2. Develop guidelines for elephant watching.

Rationale: We need to give special attention to better manage tourism activities in places where tourism can become a nuisance to elephants' well-being because of close human proximity (such as in Lower Kinabatangan and other popular tourist sites).

- Develop and enforce simple guidelines for responsible wildlife watching activities in key visitation sites to deter inappropriate tourist behaviours, and minimize risks to human and animal safety;
- Improve competences of professional guides about basic elephant ecology and conservation needs, so they become a reliable source of information for visiting tourists.

Timeline:	5 years
Priority:	Low
Lead Agencies:	MTCE, tourism industry
Partners:	UMS, NGOs, SWD
Monitoring:	Production of guidelines

Action 1.5.3. Develop state-wide awareness campaigns about elephants and their habitat.

Rationale: The Bornean elephant is a symbol of Sabah's unique fauna and a national treasure: the species is attracting increasing levels of interest, both nationally and internationally.

- Increase and promote communication and public awareness, and publicise the conservation needs of the elephant in local, national and international media;
- Develop and incorporate an official syllabus about elephants (and all other RTE fully protected in Sabah) to be included in the national education curriculum;
- Make the international "World Elephant Day" celebrated on 12th of August every year, a major state-wide event;
- Innovate and establish Environmental and Education Centres at "Lok Kawi Wildlife Park" and at the "Bornean Elephant Rescue Centre", since these two facilities are the only ones to detain captive animals in Sabah to welcome visitors.

Timeline:	Continuous
Priority:	Medium
Lead Agencies:	Education Department, SWD, NGOs
Partners:	SEEN, State agencies, private industry
Monitoring:	Behavioural changes

Objective 2: Improve landscape connectivity and permeability

Rationale: Elephants are a wide-ranging species; their management needs to be conceived at the meta-population level (*i.e.* all herds and individuals that are occupying a cohesive geographic unit) and at the scale of an entire landscape (or macro-scale).

In the larger landscape, scientifically based, regional land-use planning is needed to delineate zones of interaction around protected forests and their surroundings, encompassing hydrological, ecological and socio-economic interactions. Ideally, the core protected areas will remain connected to other areas of forest that could be used sustainably for (commercial) timber extraction. The design of such living landscapes must be approached across the whole landscape as well as at the site level.

- **Threat to be addressed: lack of consideration for elephant conservation and management in current land use planning**

Activity 2.1. Develop an overarching Management Plan for elephants in Sabah

Rationale: Today, more than 26% of Sabah's land mass is fully protected and about 50% is retained under permanent forest cover. However, most forests are fragmented and disconnected by man-made features, explaining why the three recognized MERs in Sabah are isolated from one another. Using movement data, it is necessary to identify where "elephant corridors" need to be established or maintained to recreate animals' broken home ranges. This will minimize the impacts of genetic isolation and will contribute to reduce HECs.

Action 2.1.1. Analyse all elephant movement data available within and outside the PFE to produce maps showing the ideal location of "elephant corridors".

Action 2.1.2. Identify precisely the location of "elephant corridors" to improve connectivity across the entire landscape and support elephant meta-population.

Action 2.1.3. Develop and disseminate the overarching management plan for the three MERs that will identify the major land-use decisions to be taken to improve landscape connectivity.

Timeline:	1-5 years
Priority:	High
Lead Agencies:	ETF, MTCE, SWD,
Partners:	NGOs, State agencies, DGFC, private industry
Monitoring:	Production of the overarching Management Plan

Activity 2.2. Design SOPs and BMPs for creating and managing elephant corridors at the local and regional level

Action 2.2.1. List all intervention activities needed to develop and manage these elephant corridors, including the need for reforestation, fencing and other mitigation activities.

Timeline:	5 years
Priority:	Medium
Lead Agencies:	SWD, ETF, NGOs

Partners: State agencies, private industry, DGFC
Monitoring: Production of SOPs

Activity 2.3. Design an integrated fencing strategy on a larger scale than the estate level

Rationale: Too often, landowners are erecting electrical fences to protect their own estate without considering the situation outside of their boundaries. This situation creates blockades and prevents elephant access to their preferred feeding grounds, resulting in increased conflict situations.

The state authorities should determine where electric fences need to be placed for elephant movement control, not landowners. The development of this strategy will involve communication and collaboration between estate managers, NGOs and state authorities of each district where elephants are found.

Timeline: Immediate
Priority: High
Lead Agencies: SWD, ETF
Partners: State agencies, NGOs, private industry
Monitoring: Production of integrated fencing strategies

- **Threat to be addressed: need to streamline elephant conservation and management at the site-level**

Rationale: Two strategies are essential to ensure the long-term viability of Bornean elephants in Sabah:

- Presence of large, connected, strictly protected forests where poaching will be efficiently controlled (see objectives 1 and 2);
- Development of management practices in non–protected areas that are compatible with elephant survival.

Activity 2.4 Develop and implement site-level management strategies that are compatible with elephant viability

Action 2.4.1. Ensure that all Environmental Impact Assessments are considering this SAP and the needs for elephant conservation across the State.

- Prior to any conversion of natural habitat that is part of the elephant range, a "Special Environmental Impact Assessment" (SEIA) needs to be developed. This SEIA will detail all recommendations that must be implemented on the ground by the project proponent to minimize conflicts with elephants;
- Early engagement with EPD and relevant agencies as well as project contractors when large development programmes have the potential to further fragment MERs and be responsible for increased HECs (case of the Pan Borneo Highway for example);
- Socialize the Sabah Structural Plan to relevant agencies especially if infrastructure development goes through Environmental Sensitive Areas in elephant habitat;
- Proactively provide technical inputs to Town and Regional Planning Department (TRPD) and relevant agencies when major infrastructures that bisect elephant habitat are planned.

Timeline:	Continuous
Priority:	High
Lead Agencies:	EPD, TRPD
Partners:	State agencies (SFD, SWD), NGOs, Consulting companies, project developers and proponents
Monitoring:	Mitigation activities proposed within the SEIA frame

Activity 2.5. Improve habitat suitability for elephants at the landscape level

Action 2.5.1. Implement best forest management practices compatible with elephant survival.

- Review guidelines for silviculture treatments to retain elephant foods in treated areas: silviculture treatments often result in the destruction of large climbers and pioneer plant species that are elephant food;
- When necessary, establish and/or maintain grassland to support grazers and browsers, such as the Bornean elephant and Bornean banteng.
- Areas that ensure the connectivity of already assigned HCVF and other wildlife conservation compartments/areas as mentioned in FMP need to be designated on maps and on the ground;
- Keep all "High Priority Areas for Elephant Conservation in CFR" under Natural Forest Management;
- Remove all potential sites within FMUs that could injure or kill elephants: unused mud pools and wells, etc.
- Sustain and improve pastures on abandoned logging roads and log stumping sites;
- Promote growth of grass in selected areas along larger rivers;
- Retain climbing bamboo thickets within the ranges of elephants;
- Ensure that every FMU holder has the in-house capacity to monitor, manage and protect wildlife (including elephants) properly.

Timeline:	Continuous
Priority:	High
Lead Agencies:	SFD, SF, FMU holders, contractors
Partners:	SWD, NGOs,
Monitoring:	Auditing during certification process (FSC)

Action 2.5.2. Ensure that all FMP and OPMP have detailed and specific management measures that need to be undertaken to sustain and protect elephants in respective estates.

- Review guidelines for HCV management, including maintenance and silviculture treatments (see above);
- Design Elephant Corridors across estates (see above) and associated SOPs for managing these areas;

Action 2.5.3. Support the current efforts of cross-sectorial Jurisdictional Approach for the oil palm and timber industry in Sabah.

- Support the goals of certifying the entire oil palm production and remove all potential sites within plantations that could injure or kill elephants: unused mud pools and wells, chemical discharges, etc.

Timeline:	Continuous
Priority:	High
Lead Agencies:	ETF, Private industry, SWD, NGOs
Partners:	RSPO, MSPO, estate holders
Monitoring:	Auditing during certification process

Objective 3: Ensure the best ex-situ practices for elephant management and conservation

- **Threat to be addressed: poor understanding of the limits and advantages of translocation**

Activity 3.1: Re-assess the function of capture and translocation as a possible conservation tool

Rationale: Translocation is often perceived by governments and the public as an efficient conservation tool. However, limited research has been carried out and published on the post-release movements of translocated elephants in Malaysia (but see for Peninsular Malaysia: Stuwe et al. 1998). Elephant capture and translocation is part of the toolbox for HECs. Often, communities or estate managers request that the SWD "take care of the problem" and translocate elephants to another place. Elephant capture and translocation is a costly endeavour in terms of human and financial resources. It is also a difficult task and can endanger the animal's life. Although translocation is perceived as a potential conservation tool, the limits and constraints of this approach need to be acknowledged: challenges to identify suitable release sites, uncertainty about survival rate and failure of this management approach to foster co-existence with wildlife.
In Sabah, males tend to move over wider ranges than females and to come back to the capture site more often. Elephants in other Asian countries show variable responses to translocations: in Sri Lanka for example, "homers" returned to the capture site, "wanderers' ranged on a wider range and "settlers" established a new home range where they have been moved (Fernando et al. 2012). Overall and across the Asian elephant range, translocation seems to worsen and propagate HEC and increase elephant mortality. Since translocation results are difficult to predict and are often negative, it is reasonable to question its use as a conservation tool (Fernando et al. 2012).

Action 3.1.1. Develop criteria and guidelines, including SOPs, for translocating elephants.

These guidelines should allow for the SWD and partners involved in translocation/rescue to assess a situation and to decide when and where the animals should be "rescued" and translocated, bearing in mind that translocation should be the last option to consider, when other approaches have not been successful. These guidelines should be practical and should consider all elements pertaining to the decision to translocate or not.

Timeline:	Immediate
Priority:	High
Lead Agencies:	SWD,
Partners:	NGOs, DGFC
Monitoring:	Production of SOPs

Action 3.1.2. Build capacity within the SWD and WRU to address and resolve conflict situations rather than just displacing the animal from its home.

Timeline:	1-5 years
Priority:	High

Lead Agencies: SWD
Partners: NGOs
Monitoring: Acquired skills and competences to resolve conflicts without translocation

- **Threat to be addressed: increasing number of individuals living in captive situations**

Activity 3.2. Improve ex-situ management of captive elephants

***Rationale*:** Considering that an increasing number of animals are rescued and kept in captive conditions in Sabah, ex-situ management of these animals needs to be optimized to reach international standards for captive elephant management.

Action 3.2.1. Prepare a Position Statement (Cabinet Paper) about the possibility of exporting rescued elephants that cannot be released into the wild.

Timeline: Immediate
Priority: High
Lead Agencies: ETF, MTCE, SWD
Partners: NGOs
Monitoring: Production of the position statement and endorsement by the cabinet

Action 3.2.2. Develop and implement a Management Plan for captive elephants in Sabah, including precise BMPs, SOPs and guidelines for husbandry and care of captive elephants, enrichment and conditioning, clinical and quarantine procedures, diet and feeding regime, record keeping etc. up to international standards.

Timeline: 1-5 years
Priority: Medium
Lead Agencies: SWD
Partners: NGOs
Monitoring: Management Plan produced and followed

Action 3.2.3. Need to reinforce capacities of staff in charge of captive elephants to implement best practices for ex-situ management.

- Engage with international groups that have recognized expertise about captive elephant management to train staff in charge of captive elephants in Sabah through on-site visits, exchange programmes and any other means available.

Timeline: 1-5 years
Priority: Medium
Lead Agencies: SWD
Partners: NGOs
Monitoring: Training delivered and improved management skills

Action 3.2.4. To adopt the recommendations from the 1st Asian EEHV Strategy Meeting by Asian EEHV Working Group to prevent Elephant Endotheliotropic Herpesvirus (EEHV) among captive elephants.

- To build capacity and increase awareness and education of EEHV amongst elephant care staff in Asia including keepers (mahouts), veterinarians, and government officials.
- To develop region-specific medical protocols, "standard operating procedures" that outline routine monitoring, rapid and accurate detection, and appropriate treatment of EEHV-associated disease.
- To closely collaborate, both within the region and internationally, to identify and implement research projects to continue advancing the understanding of EEHV.

Timeline:	2 years
Priority:	Medium
Lead Agencies:	SWD, WRU
Partners:	NGOs, Asian EEHV Working Group
Monitoring:	Medical protocols and standard operating procedures are developed

Objective 4: Monitor and predict elephant population trends

❖ **Threat to be addressed: poor monitoring of elephant conservation status**

Activity 4.1. Ensure regular monitoring of the elephant status in Sabah

Action 4.1.1. Regular monitoring of elephant population trends and threat levels.

- Evaluate the effectiveness of various management practices on elephant status by conducting regular elephant surveys in the three MERs. These surveys will use a combination of conventional survey techniques (citizen-science type of approach) with the use of the latest modelling approaches;
- Implement a long-term satellite collaring project on a sufficient number of individuals to assess their routes and post translocation movements;
- Building up the capacity of young Malaysians in elephant scientific research to apply their knowledge to the management of elephant populations in Sabah.

Timeline:	Continuous
Priority:	Medium
Lead Agencies:	SWD, SFD, UMS, SaBC
Partners:	NGOs, DGFC
Monitoring:	Population trends

Action 4.1.2. Identify suitable research questions to design land sharing plan approach for a landscape dominated by human activities, and to promote peaceful coexistence between people and elephants.

- Identify questions that will inform and improve current management practices:
    - Elephant socio-ecology within agricultural landscapes;
    - Elephant diet in plantations and exploited forests;
    - Extent and types of damages created by elephants outside of protected areas;
    - Possible sources of intoxication and poisoning of elephants living in human-dominated landscapes;
    - Impact of linear fences and roads on elephant travel, socio-ecology and long-term survival;
    - Post translocation monitoring.

Timeline:	5-10 years
Priority:	Low
Lead Agencies:	SWD, SFD, UMS, SaBC
Partners:	NGOs, DGFC, WRU
Monitoring:	Research projects carried out on elephants in Sabah, scientific papers

Activity 4.2. Ensure that this SAP is known from all state agencies in charge of initiating large development projects and land use changes

***Rationale*:** Sabah is developing fast. New agriculture or linear (roads, fences) developments will create bottlenecks that will further fragment the elephant meta-population and increase HECs. One such linear project is the "Pan Borneo Highway". By engaging early in the

discussion with relevant agencies and bodies, most of these shortcomings can be avoided or mitigated.

Action 4.2.1. Ensure that this SAP is known by all development agencies in Sabah.

Activity 4.3: Set up an Endangered Species Conservation Unit (ESCU)

Rationale*:* Implementing the various SAPs recently developed for several fully protected species and enforcing wildlife laws in Sabah require concerted efforts between all relevant partners. The Endangered Species Conservation Unit will provide human resources and expertise to monitor the implementation of these plans, meet with the different stakeholders and prepare the documents needed to monitor the delivery of these Plans. ESCU will be in charge of evaluating, assessing and implementing all action plans that are already available for several totally protected species in Sabah (orangutan, banteng, proboscis monkey, Sunda clouded leopard, Malayan sun bear); and developing policies and plans for other threatened species that are of interest to the State.

Action 4.3.1. The ESCU is set up and operational (see other SAPs).

Activity 4.4: Develop sustainable financing mechanisms for elephant conservation activities within Sabah

- Investigate new ways and involve a wide range of partners to support elephant management and conservation in Sabah:
    - Private companies: "Corporate Social Responsibility", conservation levies and other subsidies;
    - State and Federal governments: conservation levies and subsidies (HoB, REDD+, GEF, MPOB, etc.);
    - Local NGOs and other groups: sale of elephant-friendly products, state-wide campaigns, etc.
    - International community: grants and other donations.

4 SITE-SPECIFIC PRIORITY ACTIONS

Three Managed Elephant Ranges are recognized in Sabah. In the current situation, these three MERs are completely isolated from one another. Managing these MERs needs to consider a few key priorities:

- Consider elephant ecological needs: large roaming animals that favour flat lowland areas, that need large quantities of Monocotyledons as food sources, and their distribution/movements are correlated with the presence of salt licks and other mineral deposits;
- Recreate and ensure safe connectivity between the various elephant herds roaming across the three MERs;
- Identify sources and causes of HECs, quantify their impact and identify ways to mitigate conflicts to improve the acceptance of the land-sharing concept for a peaceful co-existence between people and elephants;
- Stop all elephant killings.

For each MER, maps presenting an "elephant zonation" could be prepared and made available for each District: Text Box 2.

Text Box 2: Zoning the landscape for elephant management.

In several elephant range countries, a zoning was designed to ease the management of the species at the landscape level. A similar approach could be used for Sabah where three zones would be recognized:

1) **Elephant Conservation Zone:** areas that are part of large tracts of contiguous natural habitat supporting high densities of elephants, with minimal human use areas, low interface between forest and human use areas, low human densities, and high levels of connectivity to similar habitats. In this zone, the emphasis would be on maintaining habitat integrity through protection of existing corridors, and mitigation of possible elephant-human conflicts.
2) **Elephant-human Co-existence Zone:** human-dominated areas where all efforts need to be deployed for elephant and people to co-exist peacefully.
3) **Elephant Removal Area:** areas where the viability of the elephant groups is in serious doubt and elephant presence is deemed dangerous for people safety. In this case, elephants need to be captured and translocated.

LOWER KINABATANGAN RANGE

The critical threats in Lower Kinabatangan Range include:

- Fragmentation of the entire landscape as a result of linear structures (roads or fences). The lack of cohesion and collaboration between stakeholders when establishing fences or other passive protection devices, create more bottlenecks (fences, drains, etc.) and prevent elephant travel within their home ranges;
- HECs and retaliation measures;
- Increased poisoning events (involuntary or not);
- Possible harassment by tourism activities.

Action 1: Prevent any process that would further fragment the habitat of the elephant population:

- Include all remaining forests on state land adjacent to LKWS into the LKWS;
- Advocate for State Government abandonment of the 2007 Sabah Development Corridor plan to extend a road from Sukau to Sabahat, including the abandonment of plans for a new cross-Kinabatangan bridge;
- Review of the Pan Borneo Highway project to minimize the fragmentation between the Lower Kinabatangan MER and the other two MERs;
- Identification of major bottlenecks for elephant movements and potential ways to mitigate these:
    - Creation of an "Elephant Corridor" in Sukau area;
    - Creation of an "Elephant Corridor" in Batu Puteh area to link together the Lower Kinabatangan and Central Sabah MERs;
    - Creation of an "Elephant Corridor" between Lot 1 of the LKWS/Segama wetlands and Kulamba/Tabin to link the Lower Kinabatangan and Tabin MERs.

Timeline:	10 years
Priority:	High
Lead Agencies:	State government
Partners:	SWD, SFD, NGOs, DGFC, landowners
Monitoring:	Decision by the government to abandon the road project as proposed in the Sabah development Corridor; number of functional corridors created and used by elephants

Action 2: Instigate a moratorium on new oil palm development within 100 m on both sides of the Kinabatangan River.

Timeline:	10 years
Priority:	High
Lead Agencies:	State government
Partners:	SWD, SFD, DID, DO, oil palm industry, communities
Monitoring:	Extent of land reclaimed and used by elephants along riverbanks

Action 3: Develop an integrated electric fencing strategy for all stakeholders active in the area (smallholders and communities, large estates, state agencies, NGOs and other groups).

Timeline:	10 years
Priority:	High
Lead Agencies:	ETF, SWD
Partners:	SFD, NGOs, oil palm industry, communities
Monitoring:	Production of the Strategy and implementation

Action 4: Enforce guidelines for wildlife watching along the river.

Timeline:	5 years
Priority:	Medium
Lead Agencies:	ETF, MTCE
Partners:	SWD, SFD, tour industry, communities
Monitoring:	Production of recommendations and implementation

TABIN RANGE

The critical threats in Tabin Range include:

- Total isolation of the herd within TWR by plantations leading to potential genetic isolation and scarcity of food resources;
- HECs and retaliatory killing;
- Poaching;
- Possible harassment by tourism activities.

Action 1: Improve landscape connectivity to link the population living in Tabin to the nearby Silabukan and Kulamba forest reserves, and in the long-term with the two MERs (Central forest and Kinabatangan).

Timeline:	10 years
Priority:	High
Lead Agencies:	State government
Partners:	SWD, SFD, NGOs, landowners
Monitoring:	Number of functional corridors created and used by elephants

Action 2: Develop an integrated electric fencing strategy for all stakeholders active in the area (smallholders and communities, large estates, state agencies, NGOs and other groups).

Timeline:	10 years
Priority:	High
Lead Agencies:	ETF, SWD
Partners:	SFD, NGOs, oil palm industry, communities
Monitoring:	Production of the Strategy and implementation

Action 3: Identify sites for habitat enrichment. Planting of Monocotyledons in identified sites.

Timeline:	5-10 years
Priority:	Medium
Lead Agencies:	SFD
Partners:	SWD, NGOs, oil palm industry, communities
Monitoring:	Size of areas being planted and elephant use

Action 4: **Create, train and support teams of "Community Elephant Rangers" in villages affected by HECs to mitigate conflicts peacefully.**

Timeline:	1-5 years
Priority:	high
Lead Agencies:	SWD
Partners:	NGOs, communities
Monitoring:	Number of teams being created and community behavioural changes

Action 5: **Reinforce the capacity of HWWs to support law enforcement agencies in the area.**

Timeline:	5 years
Priority:	High
Lead Agencies:	Anti-poaching Task Force, DO, SWD, SFD
Partners:	Other enforcement state agencies, NGOs, communities
Monitoring:	Number of functional teams of HWW and prosecution cases

Action 6: Develop and enforce guidelines for wildlife viewing in Tabin WR.

Timeline:	5 years
Priority:	Medium
Lead Agencies:	ETF, MTCE
Partners:	SWD, SFD, tour industry, communities
Monitoring:	Production of recommendations and implementation

Action 7: **Conduct joint anti-snaring operations with relevant enforcement agencies to remove snares in hotspot areas.**

Timeline:	Continuous
Priority:	High
Lead Agencies:	Anti-poaching Task Force, DO, SWD, SFD
Partners:	Other enforcement state agencies, NGOs, communities
Monitoring:	Number of patrols, snares being dismantled and elephant victims

Action 8: Carry out elephant collaring to better understand elephant movements.

Timeline:	5 years
Priority:	Medium
Lead Agencies:	SWD, SFD, NGOs, DGFC
Partners:	Private industry
Monitoring:	Number of elephants collared, data collected and analysed

Action 9: **Conduct regular human-elephant conflict working group meetings with government and plantation stakeholders to jointly develop landscape level mitigation options.**

Timeline:	1-5 years
Priority:	High
Lead Agencies:	Anti-poaching Task Force, DO, SWD, SFD
Partners:	NGOs, communities, private industry
Monitoring:	Creation of the Working Group, development and implementation of the strategy

CENTRAL SABAH RANGE

The critical threats in Central Sabah Range include:

- Rapid changes in the current landscape (including mosaic planting);
- HECs and retaliatory killings;
- Poaching;
- Lack of holistic and comprehensive land-use planning resulting in intense fragmentation for the area that would consider the needs for elephant conservation in the area;
- Planned expansion of the Pan Borneo Highway through Tawai Forest Reserve and Kalabakan-Sapulut area;
- Snares set up around forests bordering plantations.

Action 1: **Develop and promote transboundary collaboration with Indonesia for management of the elephants crossing the border, possibly through the Heart of Borneo Initiative.**

Action 2: **Identify all bottlenecks created by the Pan Borneo Highway or any other development project that will jeopardize elephant connectivity and propose adequate mitigation measures.**

Action 3: **Create, train and support teams of "Community Elephant Rangers" in villages affected by HECs to mitigate conflicts peacefully.**

Action 4: **Create teams of HWWs who will support law enforcement agencies in the area.**

Action 5: Create a Task Force for each District that will comprise representatives of state agencies (SFD, SWD, Sabah Parks, Police, Army), local communities (HWW), NGOs and private sector that will oversee monitoring and protecting elephants in hotspot areas.

Action 6: **Conduct joint anti-snaring operations with relevant enforcement agencies to remove snares in hotspot areas.**

Timeline:	Continuous
Priority:	High
Lead Agencies:	Anti-poaching Task Force, DO, SWD, SFD
Partners:	Other enforcement state agencies, NGOs, communities
Monitoring:	Number of patrols, snares being dismantled and elephant victims

Action 7: Carry out elephant collaring to better understand elephant movements.

Timeline:	5 years
Priority:	Medium
Lead Agencies:	SWD, SFD, NGOs, DGFC
Partners:	Private industry
Monitoring:	Number of elephants collared, data collected and analysed

Action 8: **Conduct regular human-elephant conflict working group meetings with government and plantation stakeholders to jointly develop landscape level mitigation options.**

Timeline:	1-5 years
Priority:	High
Lead Agencies:	Anti-poaching Task Force, DO, SWD, SFD
Partners:	NGOs, communities, private industry
Monitoring:	Creation of the Working Group, development and implementation of the strategy

5 IMPLEMENTATION, MONITORING, EVALUATION AND BUDGET

5.1. BEAP implementation

This is a 10-year action plan (2020-2029). In order for this plan to achieve its ultimate objective of securing the future of the Bornean elephant in Sabah, all recommendations should be evaluated by SWD and endorsed by the Sabah State Cabinet.

The implementation of the BEAP remains the responsibility of SWD. However, assistance from other relevant government departments such as SFD, SF and SP will be provided.

It is proposed that a SPECIES ACTION PLAN COMMITTEE led by Ministry of Tourism, Culture and Environment is created, consisting of members from relevant NGOs, research institutions and government departments that will assess the implementation for each species action plan (Bornean elephant, Bornean orangutan, proboscis monkey, Sunda clouded leopard, Bornean banteng and any future action plans (sun bear, Sunda pangolin,…)). The relevant NGOs in Sabah are namely: HUTAN, LEAP, WWF-Malaysia, SET, PACOS and others. The relevant research institutions in Sabah are namely: UMS, SEAARP and DGFC. The relevant government departments in Sabah are namely: SFD, SF, SP, SLSD, DID, MAFI.

5.2. BEAP monitoring and evaluation

On a yearly basis, an overview and analysis of progress will be produced by SWD and circulated to the relevant government departments and stakeholders. A mid-term review will be carried out at the end of 2024 (five years) by SWD with the assistance of the main stakeholders. The plan will be fully reviewed and rewritten at the end of 2029 (10 years). SWD will be assisted by the ENDANGERED SPECIES CONSERVATION UNIT that will be set up in 2020, providing that funding is obtained.

5.3. BEAP budget

Enforcement unit	RM 20,000,000 for 10 years
Endangered Species Conservation Unit	RM 10,000,000 for 10 years
Ground survey and habitat mapping	RM 1,000,000 for 2 years
Epidemiological survey of the wild population	RM 2,000,000 for 2 years

LIST OF ACRONYMS

BEAP	Bornean Elephant Action Plan
BMP	Best Management Practice
CERT	Community Elephant Ranger Team
CFR	Commercial Forest Reserve
DaMaI	Danum Valley-Maliau Basin-Imbak Canyon
DGFC	Danau Girang Field Centre
DID	Department of Irrigation and Drainage
DO	District Office
EEHV	Elephant Endotheliotropic Herpes Virus
EPD	Environment Protection Department
EIA	Environmental Impact Assessment
ESCU	Endangered Species Conservation Unit
ETF	Elephant Task Force
FMP	Forest Management Plan
FMU	Forest Management Unit
FR	Forest Reserve
FSC	Forest Stewardship Council
GEF	Global Environment Facility
HCVF	High Conservation Value Forest
HoB	Heart of Borneo
HEC	Human Elephant Conflict
HWW	Honorary Wildlife Warden
ITP	Industrial Tree Plantation
JKR	Jabatan Kerja Raya (Malaysian Public Works Department)
KOCP	Kinabatangan Orang-utan Conservation Programme
LEAP	Land Empowerment Animals People
LKWS	Lower Kinabatangan Wildlife Sanctuary
MAFI	Ministry of Agriculture and Food Industries
MER	Managed Elephant Range
MPOB	Malaysian Palm Oil Board
MSPO	Malaysian Sustainable Palm Oil
MTCE	Ministry of Tourism, Culture and Environment
OPMP	Oil Plam Management Plan
OPP	Oil Palm Plantation
PFE	Permanent Forest Estate
REDD	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RTE	Rare Threatened Endangered
RSPO	Roundtable on Sustainable Palm Oil
SaBC	Sabah Biodiversity Centre
SAP	State Action Plan
SEAARP	South East Asia Rainforest Research Partnership
SEEN	Sabah Environmental Education Network
SEIA	Special Environmental Impact Assessment
SET	Sabah Environmental Trust
SF	Sabah Foundation
SFD	Sabah Forestry Department
SFMLA	Sustainable Forest Management Licence Agreement

SLSD	Sabah Lands and Surveys Department
SMART	Spatial Monitoring and Reporting Tool
SOP	Standard Operating Procedure
SP	Sabah Parks
SWD	Sabah Wildlife Department
TPA	Totally Protected Area
TRPD	Town and Regional Planning Department
TWR	Tabin Wildlife Reserve
UMS	Universiti Malaysia Sabah
WCE	Wildlife Conservation Enactment
WRU	Wildlife Rescue Unit

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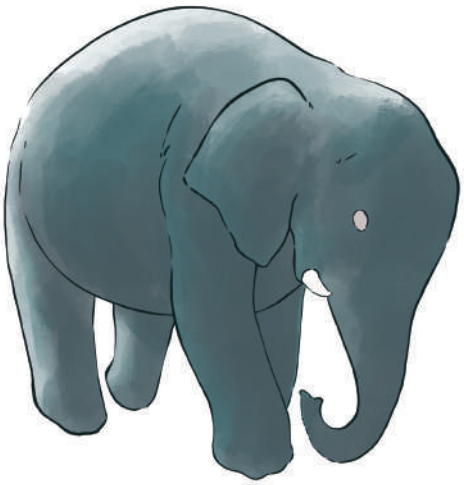
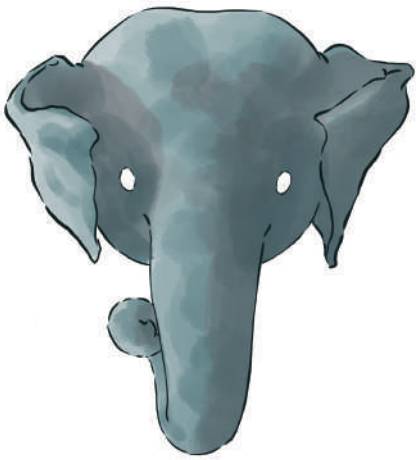
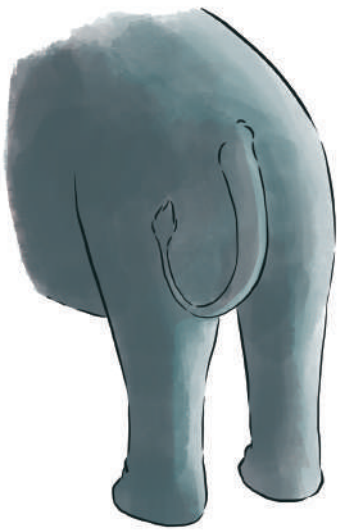
RELAXED



HEAD DOWN
EATING OR GRAZING

EAR RELAXED OR
FLAPPING

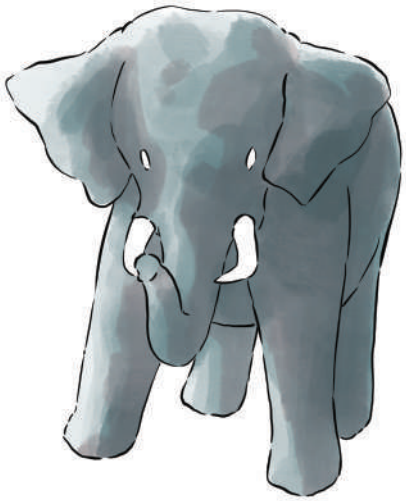




TAIL RELAXED OR
WAGGING

ALERT

HEADS UP, SCANNING



STANDING STILL

VOCALISING

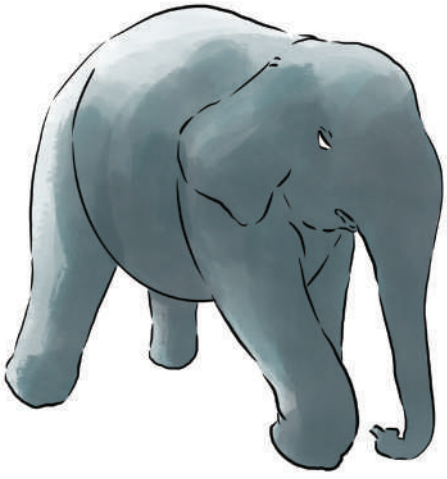
EARS OUT

SUCKING THE
END OF TRUNK
(NERVOUS)

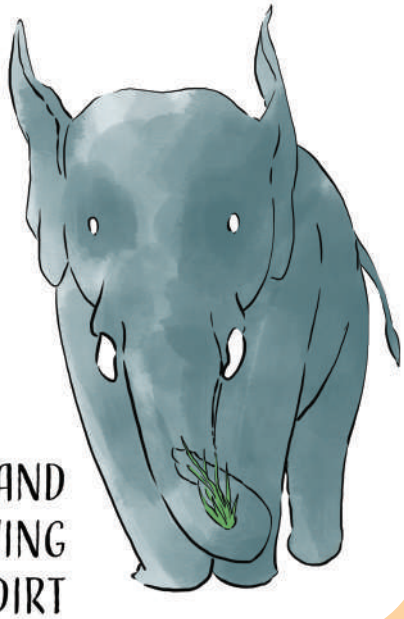
AGITATED/ANXIOUS

TAIL STIFF AND STRAIGHT OUT

FOOT SCRAPE



TRUNK HITTING THE GROUND



GRABBING AND THROWING GRASS OR DIRT

AGGRESSIVE

MOCK OR
FULL CHARGE

ADULTS
FIGHTING

NOTE

Partners:

Danau Girang Field Centre

Kinabatangan Orang-utan Conservation Programme

Project Seratu Aatai