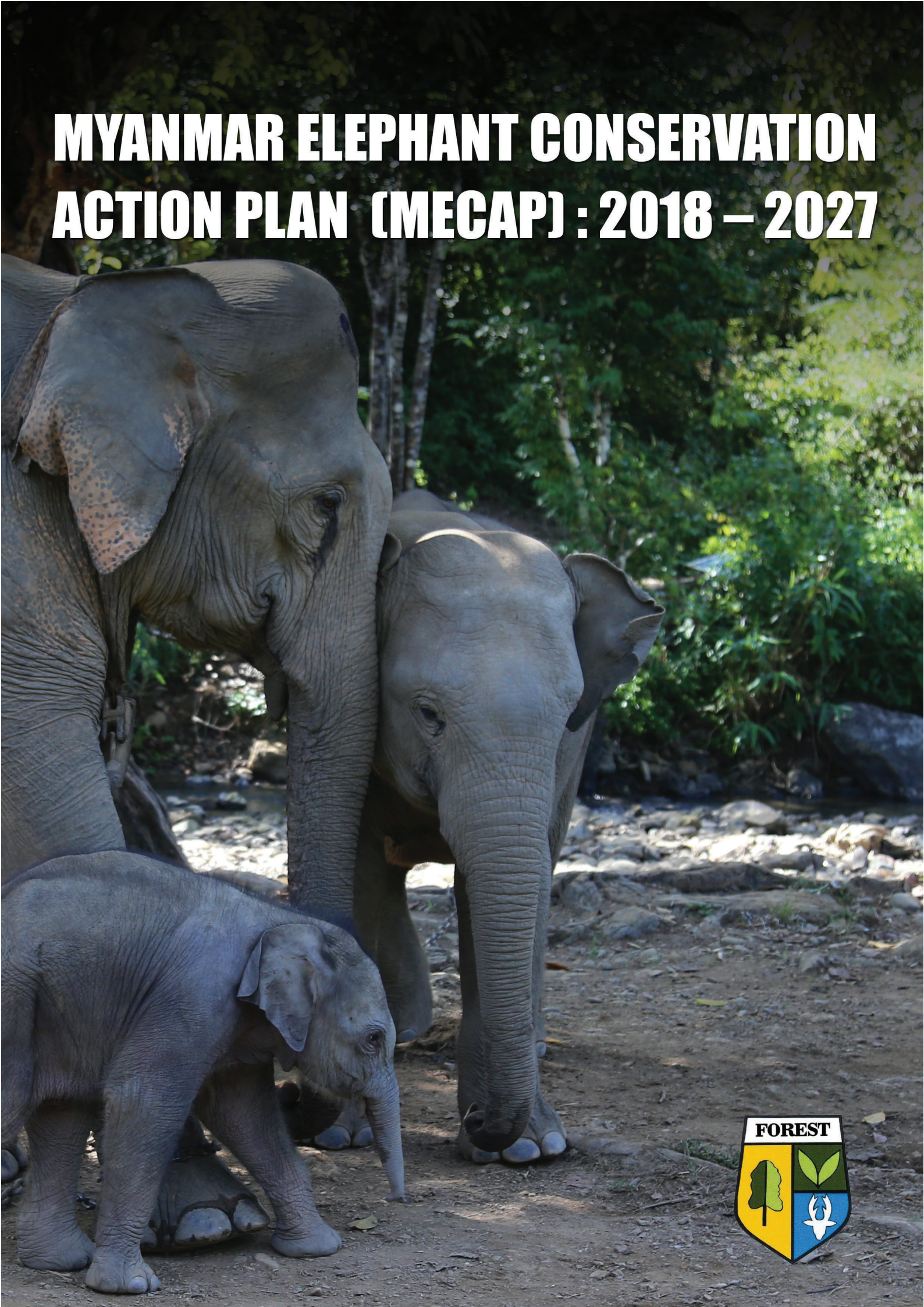
MYANMAR ELEPHANT CONSERVATION ACTION PLAN (MECAP) : 2018 – 2027



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1.0 LIST OF ABBREVIATIONS AND ACRONYMS

- ASEAN-WEN Association of Southeast Asian Nations - Wildlife Enforcement Network
- AsESG Asian Elephant Specialist Group (of the SSC)
- CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora
- CoP Conference of the Parties
- EIA Environmental Impact Assessment
- EERU Elephant Emergency Response Units
- EPU Elephant Protection Unit
- ETIS Elephant Trade Information System
- FD Forest Department
- FFI Fauna & Flora International
- GAD General Administration Department
- GIS Geographic Information System
- HEC Human–Elephant Conflict
- IEF International Elephant Foundation
- IUCN International Union for the Conservation of Nature
- LEM Law enforcement monitoring
- MER Managed Elephant Range
- MTE Myanma Timber Enterprise
- MIKE Monitoring the Illegal Killing of Elephants (a CITES program)
- MONREC Ministry of Natural Resources and Environmental Conservation
- NGO Non-Government Organization
- NWCD Nature and Wildlife Conservation Division
- NTFPs Non-timber forest products
- PA Protected area
- SSC Species Survival Commission (of IUCN)
- SI Smithsonian Institution
- SMART The acronym ‘SMART’ refers to Targets and indicates that they should be Specific, Measurable, Achievable, Realistic, and Time-bound; the acronym also means Spatial Monitoring and Reporting Tool, which is a tool developed by global conservation organizations and other stakeholders, to tackle poaching and other illegal activities
- TCM Traditional Chinese Medicines
- TSEA TRAFFIC Southeast Asia
- UNESCO United Nations Educational, Scientific and Cultural Organization
- USGS United States Geological Survey
- WCS Wildlife Conservation Society
- WWF World Wide Fund for Nature

2.0 EXECUTIVE SUMMARY

Myanmar's importance as an elephant range State

While Myanmar's wild elephant population is relatively small at maybe 2000 individuals, a great deal of elephant habitat remains in the country. There is, therefore, a great opportunity for the country's wild elephant population to grow very significantly and become perhaps the largest in Southeast Asia—provided Myanmar's elephants and elephant habitat are well protected and managed wisely. Myanmar also has a long and proud history of managing elephants in captivity as working animals and has therefore a vast repository of knowledge about captive elephant husbandry. Finally, Myanmar is in the unique position of having many more captive elephants (some 5000) than wild elephants and this brings both challenges and opportunities. For example, some of Myanmar's captive elephants are thought to be suitable for experimental reintroduction back into the wild and Myanmar could become a world leader in such 're-wilding'.

Conservation needs of Myanmar's elephants

The primary threats to Myanmar's wild elephants are illegal killing (e.g. for ivory, skin, and other products or in retaliation for human–elephant conflict); the illegal capture of and trade in live elephants to neighbouring countries; the loss, fragmentation, and degradation of elephant habitat; and the genetic and demographic problems that result from small population size. It is clear, therefore, that the conservation of Asian Elephants in Myanmar requires:

1. Elephant habitat needs to be protected effectively and the area of secure, high-quality elephant habitat, in priority sites and landscapes, needs to be as large as possible. In other words, the elephants' habitat must not be subject to degradation, fragmentation, or loss; it does not mean that all elephant habitat has to be within protected areas *per se* (e.g. national parks or wildlife reserves) although such protected areas are a critical component of an elephant conservation strategy;
2. The elephants themselves need to be protected effectively, which will require effective control of Illegal killing, captures, and trade in elephants and their parts, especially ivory and skin, primarily through law enforcement and the proper monitoring and management of that law enforcement;
3. Effective management (reduction) of human–elephant conflict, so that such conflict is no longer a threat to elephants and their habitat

nor undermining the conservation of elephants and other species. 'No longer a threat' means human–elephant conflict is not causing population declines, range contractions, or significant reductions in elephant habitat quality;

4. Regular, reliable monitoring, using best practices, of all priority elephant populations and their habitat as well as threats and interventions to mitigate those threats. Monitoring is a vital part of adaptive management and is essential because without such monitoring it is impossible to tell whether elephant populations are declining, stable, or increasing; how they are threatened; or whether conservation interventions are effective;

5. The biology of Asian Elephants needs to be much better studied and the results used to inform conservation actions;

6. Maintenance (and where necessary restoration) of ecologically functional elephant population densities.

The Myanmar Elephant Conservation Action Plan (MECAP)

Figure 10.1: Management categories for elephant ranges in Asia (from Leimgruber et al. 2003). Three of the four largest, unfragmented elephant populations in the region were considered to lie at least partly in Myanmar.

Purpose

The Myanmar Elephant Conservation Action Plan (hereafter referred to as the MECAP) was developed to guide Government of Myanmar planners

(including politicians and civil servants), NGO staff as well as other wildlife biologists and conservationists, and civil society in their efforts to create the social, economic, and biological conditions that allow elephants to co-exist with humans in the same landscapes.

Specifically, the purpose of the MECAP is to provide a focused elephant conservation strategy for the next 10 years (2018–2027) with the overall aim of securing viable and ecologically functional elephant populations in Myanmar for the next century and beyond. Thus, a long-term vision as well as shorter-term goals are both necessary. As such, the MECAP includes 10-year goals, which are linked to 100-year goals, and an equally long-term vision for what elephant conservation should look like in Myanmar. Finally, but most importantly, the MECAP also comprises detailed implementation plans with actions, targets, and monitoring and evaluation plans.

Structure

The MECAP is formed of two essential parts. The first part is that contained in this document and comprises analyses of the main challenges facing Myanmar's elephants and **10-year strategies** for conserving them and their habitat based on those analyses. The second part, which is designed to help ensure that the MECAP is implemented in a timely and effective manner, comprises the **implementation plans**. The implementation plans are detailed 3-year action plans that will be kept up-to-date as separate, 'living documents' and which show 'who will do what where and when' and how those actions will be monitored and evaluated.

Both the overall 10-year elephant conservation strategy and the 3-year implementation plans are divided into four main themes, which are detailed in the MECAP's four core chapters and their respective implementation plans:

(1) Protection of Myanmar's wild elephants and their habitat (see Chapter 10);
(2) Mitigation of human–elephant conflict (see Chapter 11);
(3) Combatting the illegal trade in elephants and elephant body parts including ivory (see Chapter 12); and
(4) Management of captive elephants and captive–wild elephant interactions in Myanmar (see Chapter 13).

The MECAP's vision and goals for elephant conservation in Myanmar

Vision

The MECAP contains, in **Chapter 7**, a 100-year, Myanmar-wide vision for

elephant conservation in the country:

'Wild elephants thrive across their current and recoverable range in Myanmar while co-existing harmoniously with people in ecologically functional landscapes'.

This vision was used by the stakeholders at the MECAP workshops to develop seven 100-year goals and a subset of thematically related 10-year goals, which are described in **Chapter 8**, and summarized here:

100-year goals

1. **Wild Asian Elephant populations are at natural densities in priority sites and landscapes**.
2. **The area of secure high-quality elephant habitat, in priority sites and landscapes, is as large as possible, and these sites and landscapes are treated as Managed Elephant Ranges (MER) and connected to other priority sites and landscapes**.
3. **Illegal killing, captures, and the trade in elephant and their parts, especially ivory, are no longer a threat to Myanmar's elephants**.
4. **Conflict between humans and elephants is no longer a threat to Asian Elephants and their habitat nor undermining the conservation of elephants and other species**.
5. **Regular, reliable monitoring, using best practices, of all priority Asian Elephant populations and their habitat as well as threats and interventions is in place**.
6. **The biology of Myanmar's elephants is well understood and being used to inform their conservation.**
7. **Myanmar's captive elephant population is well-managed, not a threat to wild elephants, and contributing to wild elephant conservation.**

10-year goals

Recognizing the need for a set of shorter term goals that the Government of Myanmar and its partners will work to meet, the long-term goals listed above were used to produce the following set of 10-year goals for the MECAP for the period, 2018–2027:

1. **Elephant numbers are at natural density or are increasing towards natural density in all priority sites and landscapes [Note: Goal 1 is an overarching goal which the other four goals will all contribute to if and when they are achieved]**
2. **Illegal killing of elephants and habitat loss, fragmentation, or degradation are not threats to the elephants in any priority site**

and landscape

3. **Illegal captures, and the trade in elephants and their parts, especially ivory, is no longer a threat to elephants in any priority site or landscape**
4. **Conflict between humans and elephants is no longer a threat to elephants and their habitat in any priority site or landscape**
5. **Best practices are demonstrably informing captive elephant management in Myanmar**

The relationship between these long-term goals, the steps needed to realize them in the short-term (three years), and the SMART targets associated with them are detailed in the implementation plans. As noted above, these implementation plans will be kept up-to-date as separate, 'living documents' to help ensure that progress with delivering the MECAP can be tracked easily by the relevant government authorities and their partners, and the MECAP is always as up-to-date as possible.

The MECAP's four main themes and summaries of their respective strategies

A short summary of the main points of the 10-year strategies presented in each of the core thematic chapters is given below, for further information please see the respective chapters. The detailed specific actions necessary to deliver the strategies are presented in the implementation plans.

Protection of Myanmar's wild elephants and their habitat

► Identify threat hotspots and develop a patrolling strategy for forest reserves and protected areas:

- ♦ Use observation data collected from field patrols to create maps showing locations of poaching incidents involving elephants, including snare and trap locations, and carcasses;
- ♦ Use observation data collected from field patrols to create maps showing locations of forest loss, illegal logging, degradation and disturbance;
- ♦ Create SMART patrol plans including locations of illegal human activity as spatial.

► Raise capacity for site-level protection:

- ♦ Develop standard operating procedures for SMART patrols that specify roles and responsibilities, and guidelines for patrol team conduct, patrol planning and procedures, data collection, data management and reporting, training and mentoring, monitoring performance and incentives, and compensation for injury or death;
- ♦ Design a training programme for frontline staff to raise capacity

for elephant and habitat protection and monitoring using standardized data collection procedures including use of Cybertracker and mobile handheld devices;
- ♦ Design a training programme for data managers to raise capacity for using SMART software to analyse and report on patrol enforcement activities;
- ♦ Design a training programme for park wardens to raise capacity for interpreting and making decisions based around information created by SMART processes.

► Upgrade ranger infrastructure in forest reserves and protected areas:
- ♦ Improve existing ranger stations and build new stations in strategic locations;
- ♦ Redeploy out-of-work elephants to Elephant Protection Units (EPUs) for use in supporting forest patrols.

► Promote collaborations and sharing of intelligence about forestry and wildlife crime between law enforcement agencies:
- ♦ Revise and upgrade the Protected Areas and Protection of Wildlife Law (2002) to enable CITES implementation.

Mitigation of human–elephant conflict

► Develop appropriate management structures and mechanisms for managing HEC:
- ♦ Implement National HEC Management Plan;
- ♦ Adopt “Local Management” and create local capacity.

► Incorporate HEC into all land use planning and development impact protocols:
- ♦ Adopt “Developer Pays” principle;
- ♦ Integrate HEC Management into all Development and Land Use Planning.

► Support local communities affected by HEC:
- ♦ Reduce human fatalities;
- ♦ Conduct public education and awareness campaigns;
- ♦ Institutionalize and promote appropriate compensation and insurance schemes.

► Promote effective HEC monitoring and mitigation methods and develop and disseminate Standard Operating Procedures:
- ♦ Develop and promote the use of standardized data collection methods for monitoring HEC
- ♦ Assess the effectiveness of HEC mitigation methods and promote effective methods as appropriate;
- ♦ Promote effective HEC mitigation methods and develop and disseminate Standard Operating Procedures;

- ♦ Expand and develop the national HEC database.

► Conduct research to improve the effectiveness of HEC mitigation methods:

- ♦ Conduct research on HEC and elephant biology and behaviour.

Combatting the illegal trade in elephants and elephant body parts including ivory in Myanmar

► Review and where necessary strengthen legislation:

- ♦ Conduct a review of all relevant current legislation to identify gaps, weaknesses, and 'loopholes';
- ♦ Revise or add to as necessary relevant current legislation informed by the review.

► Strengthen law enforcement capacity and effectiveness:

- ♦ Increase staff numbers, improve funding, and build human capacity through training, exchange visits and the like, with all these activities informed by appropriate needs analyses;
- ♦ Improve very significantly the equipment to scan and check cargo at ports and border crossings, and to make the necessary interdictions.
- ♦ Improve data-collection methods and information-sharing, again informed by specific needs analyses;
- ♦ Improve inter-agency collaboration within Myanmar as well as internationally;
- ♦ Ensure the judiciary treats wildlife crime as a serious crime.

► Report on seizures and confiscations of ivory and other elephant specimens (in compliance with CITES Resolution Conf. 10.10 (Rev. CoP17)):

- ♦ Provide information on seizures and confiscations of ivory or other elephant specimens in the prescribed formats either to the CITES Secretariat or directly to ETIS.

► Follow CITES's requirements for domestic ivory markets (in compliance with CITES Resolution Conf. 10.10 (Rev CoP17)):

- ♦ Close domestic ivory markets if possible, otherwise follow CITES's requirements for domestic trade in ivory and prohibit all unregulated domestic sale of ivory (raw or worked);
- ♦ Enforce compulsory trade controls over raw ivory;
- ♦ Ensure the registration of all importers, manufacturers, wholesalers, and retailers dealing in raw, semi-worked, and worked ivory products.
- ♦ Introduce and enforce recording and inspection procedures to enable the CITES Management Authority and other appropriate government agencies to monitor the flow of ivory within Myanmar;

- ♦ Ensure offenders are prosecuted, and deterrent penalties handed-down especially for repeat offenders;
- ♦ Disseminate public awareness materials, particularly in retail outlets, informing tourists and other non-nationals that they should not purchase ivory in cases where it is illegal for them to import it into their home countries.

► Ensure secure management of ivory stockpiles in Myanmar:

- ♦ Ensure all government-held stockpiles of ivory and, where possible, privately held stockpiles of ivory within Myanmar are secure and the ivory cannot re-enter the illegal trade, either national or international;
- ♦ Maintain an inventory of government-held stockpiles of ivory and, where possible, of significant privately held stockpiles of ivory within Myanmar, and inform the CITES Secretariat of the level of this stock each year.

► Strengthen measures to combat the Illegal trade in live elephants:

- ♦ Ensure compliance with CITES Resolution Conf. 10.10 (Rev. CoP17), which recommends that all elephant range States have in place legislative, regulatory, enforcement, or other measures to prevent illegal trade in live elephants;
- ♦ Enhance collaborative mechanisms aimed at more effectively combating cross-border trafficking in wild elephants and other wildlife from Myanmar into Thailand and China. As part of this process, relevant enforcement agencies from all these countries.

Management of captive elephants and captive–wild elephant interactions in Myanmar

► Develop a unified reporting and data management system for the entire captive elephant population in Myanmar.

► Conduct an assessment of the suitability of alternative employment for Myanmar's captive elephants.

► Develop detailed recommendations for managing elephants in all approved activities (e.g. patrolling, transport, tourism, and reintroduction programs).

► Assess whether there is a need to maintain the current numbers of captive elephants in Myanmar or whether to reduce the numbers through controlled breeding (contraception), re-introductions, and other appropriate means.

► Identify and meet the training needs of Myanmar nationals in captive elephant biology and management

Ensuring effective implementation and monitoring of the MECAP

A National Coordination Committee (NCC) for the MECAP will be created to oversee and promote implementation of the MECAP and, especially, its 3-year implementation plans.

The NCC will be set-up by the Forestry Department and co-chaired by the Director General of the Forestry Department and the Managing Director of Myanma Timber Enterprise. Membership of the NCC be constituted so as to ensure broad participation by representatives from other government committees and departments. The NCC will meet two times per year. The NCC will also hold regular broad stakeholder meetings as necessary in order to promote implementation of the MECAP.

The NCC will be supported by a MECAP Advisory Group, which will be formed of representatives of NGOs, INGOs, university staff, and others involved in helping the Government of Myanmar implement the MECAP. The MECAP Advisory Group will meet for a day or two before each meeting of the NCC in order to prepare materials for the NCC meeting and, especially, summary reports on implementation of the 3-year MECAP implementation plans on protection of wild elephants and their habitat; mitigation of human–elephant conflict; combating illegal trade in elephants and elephant parts; and the management of captive elephants and captive-wild elephant interactions.

3.0 FOREWORD

The Myanmar Elephant Conservation Action Plan (MECAP) was produced through contributions and analysis from many experienced stakeholders who have worked on elephant conservation and management in Myanmar for many years, in some cases for several decades. The development of the MECAP was also strengthened by contributions from a number of elephant experts from countries and organisations who have worked on relevant issues outside of Myanmar.

A major concern for Myanmar's elephants is the displacement of elephants from their habitat, due to unsustainable forest extraction or conversion to plantations. The MECAP includes the concept of Managed Elephant Ranges (MERs) in which viable populations of elephants will be able to live in harmony with humans, through the effective implementation of land-use planning and other programs to minimise threats to both the humans and the elephants who will share these landscapes.

There are many threats to wild elephants in Myanmar. These threats range from the direct threat from poachers, the retaliatory killings due to human–elephant conflicts, and loss of food resources and mating opportunities which result from fragmentation of elephant ranges and the loss of corridors through infrastructure development and forest conversion. Countering these threats needs a serious commitment to keep our elephants safe in perpetuity, an effort which will need the best efforts not only of the Forest Department but also strong commitment and collaboration with government agencies managing Myanmar's land and other natural resources and planning Myanmar's economic development. In addition, successful implementation of the MECAP will require Myanmar to further develop effective relationships with its neighbouring countries in order to reduce the trade in elephants and elephant parts including ivory and skin, which is a major threat to our elephants.

Myanmar still has large expanses of elephant habitat and due to the historic use of elephants in forestry and other industries, there is an unusually strong bond between Myanmar's elephants and its people. Due to the long history of using captive elephants in forest operations, and more generally as familiar helpers in remote areas for heavy tasks now performed by machines, we now have around 5000 captive elephants whose future needs to be planned for as a matter of urgency. The MECAP describes several opportunities for managing these elephants, and their owners, but this is indeed a major challenge that will require creative solutions from many stakeholders.

We intend to have the MECAP fully implemented, it is our responsibility to our elephants and to the people of Myanmar. Policies and laws are just words on paper, if they are not fully implemented or complied with. We must all realize

that wild elephants are ecologically, culturally, and symbolically significant for Myanmar and will continue to be so for our future generation. Time for action is short, but we owe it to history and future generations to show that we took responsibility for our elephants and other wildlife through carrying out the actions and recommendations of the MECAP.

Ohn Win
Minister
Ministry of Natural Resources and Environmental Conservation
Union of Myanmar
January, 2018

4.0 PREFACE

The Myanmar Elephant Conservation Action Plan (MECAP) forms part of the Government of Myanmar's strategic approach towards protecting wildlife and biodiversity in Myanmar. The elephant is a culturally important icon and Myanmar has a strong role to play in conservation of Asian Elephants.

As Myanmar develops, the management of our natural resources needs to be carefully managed and NWCD will use strategic documents like the MECAP to guide national and regional decision-making and ensure that conservation and development are in balance. The conservation of our elephants is an immensely challenging task, but we consider our responsibility to succeed in this task to be a vital duty on behalf of the nation.

As will be evident from the vision, goals, and interventions detailed in this MECAP, it is clear that the task ahead is one which will need excellent technical abilities, inter-agency cooperation and support, and understanding from the people. We will seek the best training and find the resources necessary to enable all partners in this enterprise to engage effectively, monitor progress, and disseminate information to the public. We hope that the good cooperation with stakeholders which has been demonstrated in the workshops which helped to develop the MECAP will continue to assist in driving its implementation.

Dr. Nyi Nyi Kyaw
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January, 2018

5.0 ACKNOWLEDGEMENTS

This Action Plan was formulated after various meetings, discussions, and workshops. The process began with an inaugural workshop in January 2015 organized by the Wildlife Conservation Society (WCS) on behalf of NWCD, continued through July 2016 with the human–elephant conflict workshop organized by the Smithsonian Institution (SI) and WWF on behalf of NWCD, and culminated in a multi-party stakeholder workshop in Nay Pyi Taw in January 2017 organized by WCS, again on behalf of NWCD. These workshops were attended by NWCD staff, Forestry Department, and Myanma Timber Enterprise (MTE) staff, and elephant biologists, conservationists, and donors including representatives from Elephant Family, Fauna & Flora International (FFI), International Elephant Foundation (IEF), SI, TRAFFIC, WCS, and WWF. Notes and ideas were taken from these meetings and workshops and re-worked into this final document. The main contributing authors to the MECAP, were, in alphabetical order, Simon Hedges (WCS), Peter Leimgruber (SI), Antony Lynam (WCS), Daw Khyne U Mar (Sheffield University), Heidi Riddle (IEF), U Win Naing Thaw (NWCD-FD), and Martin Tyson (WCS). Other key contributors included Nick Cox (WWF), Christy Williams (WWF), Tom Milliken (TRAFFIC), Vincent Nijman (Oxford Brookes University), Christie Sampson (SI), Melissa Songer (SI), Aung Myo Chit (SI), Nilanga Jayasinghe (WWF), John Roberts (Golden Triangle Asian Elephant Foundation), Monica Wrobel (Elephant Family), U Saw Htun (WCS), Alex Diment (WCS), Mark Grindley (FFI), and Paing Soe (WWF). All the contributors and other stakeholders are thanked for their efforts on behalf of Myanmar's elephants.

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6.0 INTRODUCTION

6.1 Why do elephants need to be saved?

6.1.1 Overview of the status and conservation needs of elephants in Asia

6.1.1.1 Inclusion in CITES Appendices and the IUCN Red List of Threatened Species

The Asian Elephant (*Elephas maximus*) has been included in CITES Appendix I since 1975. Listing in Appendix I effectively bans all international commercial trade in a species and its products (such as ivory) among Parties to the Convention. Asian Elephants are also listed as Endangered (A2c; ver 3.1) in the 2016 IUCN Red List of Threatened Species (Choudhury et al. 2008). The rationale behind the endangered status is an inferred population size reduction of at least 50% over the last three generations, based on a reduction in the species' area of occupancy and the quality of its habitat. Although there are few accurate data on historical population size, from what is known about trends in habitat loss or degradation and other threats including poaching, an overall population decline of at least 50% over the last three generations (estimated to be 60–75 years, based on a generation time estimated to be 20–25 years) seems realistic. In addition, Sumatran elephants (*E. m. sumatranus*) are listed as Critically Endangered in the IUCN Red List (Gopala et al. 2011).

6.1.1.2 Geographic range

Asian Elephants formerly ranged from West Asia along the Iranian coast into the Indian subcontinent, eastwards into Southeast Asia, including Sumatra, Java, and Borneo, and into China at least as far as the Yangtze-Kiang rivers. This former range covered over 9 million km² (Sukumar 2003). Asian Elephants have been extinct in West Asia, Java, and most of China for several hundred years. Even within its surviving range in South and Southeast Asia, the species has been in retreat for hundreds if not thousands of years, and generally survives only in highly fragmented populations (Olivier 1978a; Sukumar 2003; Blake & Hedges 2004). Asian Elephants still occur in isolated populations in 13 range States, with an approximate total range area of 878,639 km² (data from WCS/WWF/AsESG mapping and strategic planning workshops in 2008; Figure 5.1), which represents only about 10% of the 8,613,003 km² historical range for the species as defined by Santiapillai and Jackson (1990). Thus about 90% of the species' historical range has been lost. Asian Elephants now occur in Bangladesh, Bhutan, India, Nepal, and Sri Lanka in South Asia and Cambodia, China, Indonesia (Kalimantan and Sumatra), the Lao People's Democratic Republic, Malaysia (Peninsular Malaysia and Sabah), Myanmar, Thailand, and Viet Nam in Southeast Asia. Feral populations occur on some of the Andaman Islands (India) and perhaps in Borneo (see Section 6.1).

6.1.1.3 Population size and trend

The most recent 'estimate' for the global population size of the Asian Elephant was 41,410 to 52,345 animals (Sukumar 2003; Table 5.1). The estimated population size for each country according to Sukumar (2003) is shown in Table 5.2. More recent data on the status of Asian Elephants in the 13 range States were summarized by the AsESG in 2008 (Choudhury et al. 2008) and have been updated for inclusion as Table 5.3.

Blake and Hedges (2004) and Hedges (2006) argue that the oft-repeated global population 'estimate' of about 40,000 to 50,000 Asian Elephants is no more than a crude guess, which has been accepted little-changed for a quarter of a century (see Table 5.1). They further argue that, with very few exceptions, all that is really known about the status of Asian Elephants is the location of some (probably most) populations, in some cases with a crude idea of relative abundance. For large parts of the species' range, the location of the populations, or indeed whether they are still extant, remains unknown. Differences of opinion regarding the status of Asian Elephants are due in part to the difficulty in counting elephants in dense vegetation in difficult terrain, different (and sometimes inappropriate) survey techniques being used in different places, and a too-widely held belief that population monitoring is unimportant. Nevertheless, whatever the error margins, it appears almost certain that over 50% of the remaining wild Asian Elephants occur in India.

The overall trend of the Asian Elephant population has been downwards, probably for centuries. This remains the case in most parts of its range, but is especially true in most of the countries of Southeast Asia. Within India, there is evidence that the large population in the Western Ghats in the south of the country has been increasing in recent years due to improved conservation effectiveness (Karanth pers comm.).

6.1.1.4 Threats to Asian Elephants and the species' conservation needs[1]

Overview of the threats to Asian Elephants

The greatest threats to Asian Elephants are habitat loss, fragmentation, and degradation (a reduction in habitat quality); illegal killing (e.g. for ivory, skin, teeth and other products or in retaliation for human–elephant conflict); and the genetic and demographic problems that result from small population size and isolation (Leimgruber et al. 2003; Sukumar 2003; Hedges 2006; Choudhury et al. 2008).

Asian Elephants live in the region of the world with the densest human population, which continues to grow at a rate of between 1–3% per year. Because elephants require much larger areas of natural habitat than most other terrestrial mammals in Asia, they are one of the first species to suffer the consequences of habitat fragmentation and destruction. This loss of habitat leads in turn to increasing conflicts between humans and elephants when elephants eat or trample crops, and injure or kill people. Hundreds of people and elephants are killed annually as a result of such conflicts. The long-term future of elephants outside protected areas, as well as in some protected areas, is therefore inextricably linked to mitigating human–elephant conflicts, and this is one of the largest conservation challenges in Asia today (Sukumar 1992, 2003; Hedges 2006).

It has been argued that poaching is a relatively minor threat to Asian Elephants because some males and all females lack tusks. However, the reality is that elephants are poached for a variety of other products (including meat and leather) in addition to ivory, and poaching is now acknowledged as a threat to the long-term survival of some Asian Elephant populations, especially those in Myanmar. Reliable estimates of the number of Asian Elephants killed illegally and the quantities of ivory and other body parts collected and traded are scarce (Sukumar et al. 1998; Milliken 2005) but do exist for Myanmar from official records. It is also important to note that selective removal of tuskers has several implications for the affected populations: sex ratios obviously become highly female biased, genetic variation is reduced, and fecundity and recruitment may decline (Sukumar et al. 1998; Sukumar 2003).

An additional threat to Asian Elephants is the illegal international trade in live wild-caught elephants, particularly for the tourist trade in Thailand. For example, it is known that elephants have been smuggled out of Myanmar into Thailand, including 240 smuggled into Thailand in an 18-month period (Shepherd & Nijman 2008), which suggests the threat is significant at least for the Myanmar population (see Chapter 12).

Finally, while not a threat as such, it is important to recognize that the current paucity of basic knowledge about the biology of Asian Elephants often hinders effective conservation of the species.

Overview of the species' conservation needs

Considering the threats summarized above, it is clear that the conservation of Asian Elephants requires:

1. Elephant habitat to be protected effectively and the area of secure high-quality elephant habitat, in priority sites and landscapes, to be as large as possible. Elephant habitat protected effectively here means that the animals' habitat is not subject to degradation, fragmentation, or loss; it does not mean that all elephant habitat has to be within protected areas per se (e.g. national parks or wildlife reserves) although such protected areas are a critical component of an Asian Elephant conservation strategy.
2. The elephants themselves to be protected effectively, which will require effective control of illegal killing, captures, and trade in Asian Elephants and their parts, especially ivory, primarily through law enforcement and the proper monitoring and management of that law enforcement.
3. Effective management (reduction) of human–elephant conflict, so that such conflict is no longer a threat to Asian Elephants and their habitat nor undermining the conservation of elephants and other species. 'No longer a threat' means human–elephant conflict is not causing population declines, range contractions, or significant reductions in elephant habitat quality.
4. Regular, reliable monitoring, using best practices, of all priority Asian Elephant populations and their habitat as well as threats and interventions. Monitoring is a vital part of adaptive management and is essential because without such monitoring it is impossible to tell whether Asian Elephant populations are declining, stable, or increasing; how they are threatened; or whether conservation interventions are effective.
5. The biology of Asian Elephants needs to be much better studied and the results used to inform conservation actions.
6. Maintenance (and where necessary restoration) of ecologically functional elephant population densities. It is here assumed that ecologically functional densities result in populations that are larger than minimum viable populations and that such populations also preserve the entire range of normal social and behavioural interactions.

6.1.2 The importance of wild elephants

Asian Elephants are the largest living land animals in Asia and are an icon of the wild and of humans' interactions with nature (e.g. they are both worshipped as Gods and tamed and used as working animals). It has been said that one can start from Ganesha (the Hindu elephant-headed deity) and work from there in an unbroken line to almost any aspect of Indian culture; similar observations could be made about the role of elephants in the cultures of many other countries in Asia; e.g., the white elephant which is a state symbol and revered as a blessing in Myanmar. In addition, Asian Elephants are obvious channels for people to express their love for and fascination with nature: one only has to think of the number of children's books and toys with elephant themes, the passions roused by the ivory trade debate, or the number of people volunteering at elephant 'orphanages' in Thailand and Sri Lanka.

Asian Elephants have tremendous economic importance as a result of human–elephant conflict and its effect on human food security (negative) and by providing a major draw for tourists (positive).

Asian Elephants can and do fulfil an obvious 'flagship' role because the significant conservation effort they attract (e.g. anti-poaching patrols) helps conserve many other species for which it is more difficult to raise funds (even if it is difficult to quantify the actual beneficial impact this role provides).

Finally, Asian Elephants play many important biological roles. For example, their role in ecosystem function includes acting as 'ecosystem engineers' by creating a network of trails through forests, maintaining clearings, keeping saltlicks open and the like. They also play a major role in grassland/scrub/forest dynamics and nutrient cycles (e.g. as a result of producing on average 16–18 large dung-piles per 24-hours). Asian Elephants probably play a major seed dispersal and seed predation role too, albeit one that is probably rather less significant than that played by African elephants. For these and related reasons (especially the fact that they need very large areas) conserving elephants – if by that we mean (as we should) conserving elephants at natural densities – helps us conserve whole ecosystems and the myriads of species and species interactions contained within those ecosystems. Asian Elephants are also of tremendous evolutionary significance: they belong to a monotypic genus and are the only extant member of the order Proboscidea and family Elephantidae in Asia – there is no other animal similar to the elephant in Asia. Asian Elephants are also more closely related to the extinct *Mammuthus* (mammoth) than to the extant African *Loxodonta* (Corbet & Hill 1992). Thus, it can be argued that conserving Asian Elephants helps conserve more of the 'tree of life' than, say, conserving a species from a genus containing many other species.

In conclusion, there is no doubt that the Asian Elephant's 'iconic' nature helps to attract the substantial international support from governments, the

public, NGOs, international treaties, corporations, and private donors that is necessary for effective conservation.

6.1.3 Ethical reasons for conserving elephants

All living things deserve our respect. However, because of the elephants' intelligence, complex social lives, and apparent ability to feel emotions, they belong to a small group of species (e.g. elephants, great apes, and whales) for which the ethical reasons for species conservation are particularly powerful.

6.2 What is covered by this Action Plan

This Action Plan covers Myanmar and all its regions, states, and divisions. The Action Plan focuses on the conservation of wild elephants and on the management and welfare of captive elephants in elephant camps. Captive elephants make up roughly 80% of the total elephant population in Myanmar, with wild elephants the remaining 20%.

Captive elephants are often referred to as domestic elephants but this is a misnomer. As Kurt and Mar (2003) and others have argued, so-called domestic elephants are not domestic animals in the same way that dairy cattle, for example, are domestic animals. Perhaps the most important difference is that they are not selectively bred for particular characteristics as is the case with cattle, sheep, or horses for example (Clutton-Brock 1981; Price 1984; Clutton-Brock 1992). Indeed, most captive Asian Elephants are wild-caught, and many of the elephants born in captivity in the range states were sired by wild males (Kurt & Mar 2003). Domestic elephants should therefore be thought of as captive wild animals and treated as such.

Within the Asian range states there are elephant populations in timber camps that are reported to be self-sustaining or growing (e.g. Sukumar et al. 1997; Taylor & Poole 1998), but historically captive populations have been a drain on wild populations and continue to be in some areas, notably Myanmar (e.g. Shepherd 2002; Leimgruber et al. 2008). While in Indonesia large numbers of elephants were removed from the wild and taken to Elephant Training Centres (Hedges et al. 2005; Hedges et al. 2006; Mikota et al. 2008).

Another serious concern is that ivory from captive elephants (e.g. from trimmed tusks) finds its way onto the markets. For example, Thai law allows trade in ivory from captive Asian Elephants and this loophole is being exploited by dealers. As a result, tens of thousands of ivory products of doubtful origin are continuously and openly for sale throughout Thailand (Milliken 2004) and along the Myanmar - China border (Shepherd and Nijman 2008). Captive elephants and details of their tusks should therefore be registered with the appropriate government authorities to prevent such

abuses. Indeed, the urgent need for all captive Asian Elephant populations to be properly registered has long been recognized, not just to prevent the 'laundering' of illegal ivory but to protect captive elephants from abuse and to facilitate better management (Lair 2002).

Captive elephants have provided ready subjects for study, and many of these studies have provided valuable insights into the basic biology of Loxodonta and Elephas that have benefited wild elephants (see examples in Riddle et al. 2003). In a similar vein, captive elephants have allowed biologists and veterinarians to develop and practice techniques in ways that would be impossible with wild elephants. For example, the discovery of infrasonic communication in captive elephants has suggested new ways of counting forest elephants using their calls (Payne et al. 2003). Experiments with captive elephants have allowed comparisons between DNA extracted from the blood and feces of the same animals, and these have shown that reliable non-invasive genotyping of individuals is possible (Fernando et al. 2003b). Fecal DNA can therefore be used by biologists to answer important questions about the genetic viability of small elephant populations or to count elephants using the powerful techniques of capture–recapture statistics (Eggert et al. 2003; Ahlering et al. 2011; Hedges et al. 2013).

In the range States, captive elephants have been used to chase crop-raiding wild elephants, to patrol protected areas, and for ecotourism including elephant-back wildlife-watching (Santiapillai & Jackson 1990). Wild-caught captive elephants have been used to study defecation rates of elephants foraging freely on natural diets in wild elephant habitat, and this information has been used to help biologists count wild elephants in forests by allowing them to convert estimates of dung abundance into estimates of elephant abundance (Hedges et al. 2005). Methods to determine the age of wild elephants from dung dimensions have also been developed using captive elephants held in camps in the range States (e.g. Reilly 2002).

Finally, the existence of large numbers of captive wild-caught elephants in Asia raises the possibility that these animals could be returned to the wild, perhaps in areas where wild elephant populations have been lost. However, there are risks associated with such reintroductions. For example, elephants that are used to being close to humans could become fearless crop raiders, and experimental releases are needed to evaluate the feasibility of such reintroductions (Sukumar 2003). While Hedges (2006) argues that reintroducing captive elephants is not currently a conservation priority for Asian Elephants and that protecting the remaining wild populations and their habitat is a much higher priority, in Myanmar the situation is unique in that there are many more captive elephants than wild elephants and a need to consider all options for the management of the captive population (see Chapter 13)

7.0 VISION FOR ELEPHANT CONSERVATION IN MYANMAR

7.1 Introduction

Most strategic planning processes, including the new IUCN/SSC Species Conservation Planning Guidelines, define a vision as an inspirational and relatively short statement describing the desired future state for the species. Hence, the vision describes, in broad terms, the desired range and abundance for the species, its ecological role, and it relationship with humans. The vision, therefore, should be derived from an analysis of a species' status, and from a detailed consideration of the long-term and range-wide (or regional and national) conservation needs of the species (informed by a threat analysis). The vision should be as ambitious and as inclusive as possible. During the discussions at the first MECAP workshop in January 2015, it was agreed to prepare a 100-year vision. A 100-year vision was chosen because 100 years is only about twice the lifespan of a wild elephant. Thus, it is difficult to conceive of a shorter period that would be meaningful if our vision and goals are to address questions of population and habitat viability. Along with the 100-year vision, this MECAP document also contains 10-year goals and 3-year implementation plans designed to achieve those goals.

7.2 Values that should inform any vision statement for Asian Elephant conservation

It was further agreed that the following values should inform the conservation community's 100-year, country-wide vision for Asian Elephant conservation even if they are not explicitly included in the vision statement:

- **Representation** – Myanmar's Asian Elephant populations should be present in all the major ecological settings in which the species was once found. It was understood that this might require re-establishing elephant populations in areas of former range.
- **Resiliency and functionality** – Myanmar's Asian Elephant populations should be large enough, and in areas large enough, to support self-sustaining, viable, and ecologically functioning populations in ecologically healthy landscapes/ Managed Elephant Ranges (MERs) (with appropriate legal protection for the elephants and their habitat).
- **Replication** – as far as possible, there should be more than one Asian Elephant population within each ecological setting to avoid catastrophic loss. It was understood that this might require re-establishing elephant populations in areas of former range.
- **Human needs and aspirations** – the cultural, social, and economic needs of people associated with the species should also be addressed.

7.3 A vision for Myanmar's elephants

Recognizing the need for a pithy phrase encapsulating the vision for Asian Elephant conservation in Myanmar, the values identified above were condensed into the following 100-year, Myanmar-wide vision statement:

'Wild elephants thrive across their current and recoverable range in Myanmar while co-existing harmoniously with people in ecologically functional landscapes'.

8.0 GOALS FOR ELEPHANT CONSERVATION IN MYANMAR

8.1 Introduction

While vision statements of the type described above are inspiring encapsulations of what needs to be achieved in order to save a species, a more detailed set of high-level goals are also needed. Therefore, the new IUCN/SSC Species Conservation Planning Guidelines treat goals as the vision re-defined in operational terms. Thus, goals specify, for example, the desired number of ecologically functioning populations to achieve replication per major habitat type, or whether restoration (reintroduction) is needed. Goals, thus, have the same long-term timeframe (100 years in this case) and wide spatial (Myanmar-wide) scale as the vision, and they are developed using the same criteria for what it means to save a species followed when developing the vision (e.g. striving to achieve ecologically functioning populations). The following section presents and explains the rationale underlying the long-term goals agreed upon at the January 2015 MECAP workshop and also gives shorter (10-year) goals.

8.2 Long-term goals (100-years)

1. **Wild Asian Elephant populations are at natural densities in priority sites and landscapes**. Maintenance (and, where necessary, restoration)

of ecologically functional elephant population densities is a key goal of the MECAP. It is here assumed that Ecologically Functional Densities result in populations that are larger than Minimum Viable Populations and that such populations also preserve the entire range of normal social and behavioural interactions.

2. **The area of secure high-quality elephant habitat in priority sites and landscapes is as large as possible, and these sites and landscapes are treated as Managed Elephant Ranges (MER) and connected to other priority sites and landscapes**. Large interconnected sites and landscapes are key elements of a successful Asian Elephant strategy as they help ensure both population viability and resilience in the face of threats.
3. **Illegal killing, captures, and the trade in elephants and their parts are no longer a threat to Myanmar's elephants**. This goal helps address the 'elephants are thriving across their range' component of the vision and recognizes the need to work outside of sites and landscapes if trade issues are to be addressed effectively. [Note: 'no longer a threat' means these factors are not causing population declines or significant reductions in geographical range.]
4. **Conflict between humans and elephants is no longer a threat to Asian Elephants and their habitat, or undermining the conservation of elephants and other species**. This goal helps address both the elephants are 'thriving across their range' and 'coexisting with people' components of the vision. [Note: 'no longer a threat' means these factors are not causing population declines, range contractions, or significant reductions in elephant habitat quality.]
5. **Regular, reliable monitoring, using best practices, of all priority Asian Elephant populations and their habitat as well as threats and interventions is in place**. Monitoring (as a vital part of adaptive management) is an essential goal of the strategy because, without such monitoring, it is impossible to tell whether Asian Elephant populations are declining, stable, or increasing; how they are threatened; or whether conservation interventions are effective.
6. **The biology of Myanmar's elephants is well understood and being used to inform their conservation.** This goal recognizes that successful conservation of a species requires a proper understanding of its biological needs.
7. **Myanmar's captive elephant population is well-managed, not a threat to wild elephants, and contributing to wild elephant conservation.** This goal recognizes that the successful conservation of a species with captive relatives – including Asian Elephants – requires the captive population to be managed in such a manner that it does not constitute a threat to the wild population.

8.3 10-year goals

Recognizing the need for a set of shorter-term goals that the Government of Myanmar and its partners will implement, the long-term goals described above were used to produce the following set of 10-year goals for the MECAP (given that it is a strategy for the 10-year period, 2018–2027):

1. **Elephant numbers are at natural density or are increasing towards natural density in all priority sites and landscapes [Note: Goal 1 is an overarching goal which the other four goals will all contribute to when they are achieved]**
2. **Illegal killing of elephants and habitat loss, fragmentation, or degradation are not threats to the elephants in any priority site and landscape**
3. **Illegal captures and the trade in elephants and their parts is no longer a threat to elephants in any priority site or landscape**
4. **Conflict between humans and elephants is no longer a threat to elephants and their habitat in any priority site or landscape**
5. **Best practices are demonstrably informing captive elephant management in Myanmar**

In addition, given the critical need to assess progress over a shorter timeframe than 10 years and to ensure implementation of the MECAP remains ‘on track’, a set of short-term (1-, 2-, and 3-year) targets (initially for 2018 through 2020) have been developed for each of the goals. The relationship between the long-term goals, the 10-year goals, and the 1-, 2- and 3-year targets is shown in the 3-year implementation plans, which also show the actions necessary to meet the targets, and the indicators of progress.

9.0 THREAT ANALYSIS

9.1 Threats to Asian Elephants and constraints on their conservation

This section lists all known threats to Asian Elephants across all range States including Myanmar. Note that a threat is any factor that causes either a significant decline in the number of individuals or a contraction in a population's geographic range. Threat categories are often linked so that, for example, loss of habitat through forest conversion can lead to increased HEC levels, and, thus, also to an increase in the risk of death for elephants and people.

9.1.1 Threats to Asian Elephants

Threats to Asian Elephants across the range states are largely derived from the competition for resources between people and wildlife, and illegal trade in ivory and other elephant parts. The increase in human populations and the demands of growing economies have led to dramatic reductions in forest cover [approaching 0.8–0.9% per annum in SE Asia (Mayaux *et al.* 2005)]; and the spread of commercial agriculture on land which was once the home of elephants. Threats to elephants fall under the following major classes:

9.1.1.1 Loss, fragmentation, and degradation of elephant habitat

Habitat loss due to legal activities (e.g. clear-cut-logging, conversion of natural forest into forest plantations, creation of settlements, agricultural activities, development activities such as dams and mining) and illegal activities (e.g. artisanal mining and land encroachment): Reduction in size of habitat blocks reduces their suitability and the resources necessary to sustain large elephant populations (Leimgruber *et al.* 2003). Chartier *et al*. (2011) showed that forest loss over a threshold of 30–40% could lead to increasing human-elephant conflict.

Habitat fragmentation (loss or disturbances from linear infrastructure and other developments, e.g. settlements, roads, railways, canals, etc.): Increases the likelihood of elephant contact with humans, and can remove access to important resources, including water, food plants, and mineral licks. Fragmentation also generates direct impacts on the blocks of elephant habitat which remain, such as producing unsustainable over-consumption of food resources, such as bamboos (Joshi & Singh 2008).

Habitat degradation due to the presence of domestic livestock (competition, over-grazing, and resource competition), invasive plants, overly frequent and/or extensive fires, fodder and fuel-wood collection, or human activities that reduce water quality (e.g. mining): Hoare and Du Toit (1999) suggest that human density above 15/km² in Africa produces negative impacts on elephant populations. Degradation can also be caused deliberately by people exacting revenge for crop depredations by elephants (or other wildlife), e.g. by setting fires or destroying water sources.

9.1.1.2 Legal and illegal killing of elephants

Illegal killing (poaching or killings related to human–elephant conflict, e.g. revenge killings) of Asian Elephants: Is often carried out by poaching gangs seeking ivory or other body parts for sale to China or to other important consumer countries, including Thailand. China is the principal market for ivory from both Africa and Asia but elephant killing for the ivory trade occurs in all range States (EIA 2007; Martin & Vigne 2011). While it is argued that poaching is a relatively minor threat to Asian Elephants since some males and all females lack tusks (Dawson & Blackburn 1991), Asian Elephants are poached for a variety of other products. Research conducted in 2016 indicates a continued trade in elephant skin, and growing interest in elephant skin products in China (Elephant Family, 2016) - a finding supported by an increase of incidents of skinned elephants in Myanmar in recent years (Myanmar NWCD, 2016). Poaching has for some time been acknowledged as a threat to the long-term survival of some Asian Elephant populations (Kemf & Santiapillai 2000; Menon 2002) particularly as removal of males for ivory creates a sexual and genetic imbalance that may be less immediately

visible but affects the sustainability of discrete & fragmented populations.

Accidental killing by trains and the like: Railway trains, particularly in India, are a major cause of elephant mortality (Roy *et al.* 2009). As car ownership and general levels of traffic increase throughout Asia, with associated road building and fragmentation, the incidences of car and other road-vehicle-related elephant (and human) deaths due to collisions are likely to increase.

9.1.1.3 Illegal captures of elephants

Capture of elephants, for example, for tourist attractions, or to act as working elephants (e.g. in the logging industry or as transport animals): There appears to be a continuing trade in wild-caught young elephants for use as attractions in elephant camps in Thailand, China and elsewhere. This trade, centred on Myanmar and Thailand, is likely driving loss of maternal groups, which are probably shot in order to capture the juveniles (Shepherd & Nijman 2008). As entertainment facilities continue to thrive along with tourism, the demand for young Asian Elephants is likely to remain; though countries such as Thailand are introducing stricter regulation and more modern, DNA based registration systems it remains to be seen how effectively these will be enforced in the long term.

9.1.1.4 Inappropriate or poorly executed management activities that pose threats to Asian Elephants

Translocation of elephants is used as a management tool for dealing with problem animals primarily in Indonesia, Malaysia, India, and Sri Lanka: Although these methods are needed to deal with 'pocketed' or 'doomed' (i.e. non-viable) small herds, which are isolated from adequate areas of suitable habitat, they have been primarily used as a mitigation tool for human–elephant conflict. The stress resulting from capture and translocation may lead to behavioural perturbations (Bradshaw *et al.* 2005). There have been cases where translocation may not achieve its aim, because problem elephants can return to their original locations (Stüwe *et al.* 1998; Campos-Arceiz pers comm.) or translocated animals continue to create problems in their new location (Roy *et al.* 2010). Fernando *et al*. (2008) emphasize that elephants need resources both within and outside protected areas to thrive and that translocation of animals into protected areas (and restricting them from using other resources) will be 'detrimental to their survival'.

Electric fences, when poorly-located, restrict elephant movements, leading to loss of access to food and water resources: Where land-use is not managed with regard to elephants, and in areas where alternative resources cannot be accessed, elephants are likely to be driven to break

fences and raid crops, creating human–elephant conflict (Fernando *et al.* 2010).

Removal from the wild through legal, but poorly executed and/or unnecessary capture operations: Live capture of wild animals always involves some risk of injury or death. Even well-managed capture operations can produce high mortality rates. DWNP figures for their translocation program in peninsular Malaysia indicate over one fifth (21.9%) of the animals caught between 1974 and 2011 subsequently died.

9.1.1.5 Small population size

Small population size: Acts as a threat through the reduced likelihood of small populations surviving environmental catastrophes (floods, tsunami, fire), outbreaks of disease, and through stochastic threats (e.g. loss of genetic diversity leading to lowered fecundity).

9.1.1.6 Disease

'Natural' (most likely to be a threat to small populations): Wild elephants are susceptible to several serious diseases, which lead to conditions including shortened lifespan, low fecundity, infant mortality, chronic physical disability, and sudden death. Epizootic diseases in wild elephants include foot-and-mouth and elephant-pox. Hemorrhagic septicaemia (Harish *et al.* 2009) has been detected in wild elephants in India. Tuberculosis (TB) has been identified in free-roaming wild Asian Elephants (Chandranaik *et al*, 2017).

Transmitted from livestock: cattle or pigs can carry and transmit serious diseases (e.g. foot-and-mouth) to elephants where they are in close proximity.

Transmitted from captive elephants: Tuberculosis has been found in captive elephants (e.g. Ong *et al,* 2013) and in wild elephants (Chandranaik *et al*, 2017) and the frequent contact between wild and captive animals in several range States makes transmission of this contagious disease this a potentially serious threat (Mikota 2009). However, the transmission rate of this disease between wild and captive elephants is unknown and cross-species transmission of TB is a risk for humans and elephants (H. Riddle pers. comm.).

9.1.1.7 Direct disturbances to Asian Elephants

Includes:

- Collection of non-timber forest products in elephant habitat (may drive elephants away from water holes or salt licks, for example);
- Civil unrest (leading to large numbers of people entering elephant habitat);
- Refugees (leading to large numbers of people entering elephant habitat).

9.1.2 Constraints on elephant conservation

- Limited monitoring makes assessing the effectiveness of conservation interventions difficult or impossible.
- A lack of political will for elephant conservation at all levels of government.
- The lack of specific elephant conservation/management policies in most range States.
- Poor and/or conflicting government policies and laws.
- Poor administration by government agencies, including both limited intra- and inter-national cooperation.
- Poor enforcement of existing legislation.
- A low willingness by the commercial sector to engage with elephant conservationists, including government agencies charged with conservation.
- Limited appreciation by many stakeholders of the value of Asian Elephants (e.g. their biological, cultural, and economic values are poorly appreciated), and so the need to conserve wild elephants is not widely understood.
- A lack of resources (i.e. a lack of funds).
- Low capacity (i.e. limited human and technical resources in government agencies and NGOs).
- Security issues (e.g. the presence of land-mines in some areas of elephant habitat prevents management action).

10.0 STATUS OF WILD ELEPHANTS IN MYANMAR, CURRENT MANAGEMENT INTERVENTIONS, AND PROPOSED STRATEGY FOR PROTECTION OF WILD ELEPHANTS AND THEIR HABITAT

10.1 Overview

10.1.1 Historical elephant distribution, abundance, and population trends in Myanmar

Myanmar was formerly suspected to have Asia's largest elephant population outside of India, despite annual captures in large numbers since the early 1900s to support the logging industry. Up until the 1970s, expert-opinion-based estimates of the wild population were at more than 6000 animals, but has trended downwards since that time (Leimgruber *et al.* 2011). A range-wide assessment of elephant habitat indicated that Myanmar has more potential elephant habitat remaining than any other range country (Leimgruber *et al.* 2003), with large areas of the country considered priorities for survey due to lack of information on status (Hedges *et al.*2008) Fig. 1). Previous information on elephant abundance suggests that, despite the availability of habitat, elephant abundance was lower than expected. For

example, indirect recce-surveys at Alaungdaw Kathapa National Park (AKNP) and Htamanthi Wildlife Sanctuary (HWS) showed that these protected areas support only 0.001-0.024 and 0.019-0.085 elephants/ km^2, respectively (Leimgruber *et al.* 2011). Line transect estimates for elephants also suggested very low densities at Alaungdaw Kathapa (0.64/ km^2) (Satterfield &O'Rourke 1981; Varma 2008; Clements *et al.* 2014) (Satterfield &O'Rourke 1981; Varma 2008; Clements *et al.* 2014) (Satterfield &O'Rourke 1981; Varma 2008; Clements *et al.*2014) and Rakhine Yoma (0.008 – 0.2/km^2) and low densities at Bago Yoma (1.49-1.75/km^2;(Varma *et al.* 2008). Based on the results of expert assessments, the guesstimate for the wild elephant population was fewer than 2,000 elephants, with the greatest threats from habitat loss and human-elephant conflict (Leimgruber & Wemmer 2004). The largest elephant ranges (those supporting >100 individuals) were in the Northern Forest Complex, Sagaing Division (Homalin and Phaungpyin Townships), Rakhine State (Mayyu, Gwa, Thaboung, Pathein and Naguputaw Townships), Bago Yoma, and Tanintharyi Division (Lenya-Mandaing-Manolon area). In the Northern Forest Complex, abundance estimates for elephants are lacking, but wildlife survey teams noted the presence of live elephants in the core zone and north-western section of what is now the Hukaung Tiger Reserve (WCS unpublished data). At the same time, elephant capture teams were active in the Hukaung Valley during the period in 2002-2003 when tiger surveys were ongoing (A.J. Lynam pers. observations). Modelling of population viability suggested that harvest rates of 100 wild elephants per year, which would be required to maintain the captive population, would not be sustainable, and could potentially lead to extinction of the wild population within 30 years (Leimgruber *et al.* 2008).

10.1.2 Current elephant distribution, abundance, and population trends in Myanmar

The national population of wild elephants in Myanmar has never formally been estimated. This is because methods for estimating the distribution and abundance of Asian Elephants (Hedges & Lawson 2006; Hedges 2012) have not been utilized, except in one forest area. Recommended methods include dung counting for populations that are >1,000 individuals, or dung DNA surveys for populations <1,000 individuals (Hedges & Lawson 2006). Only Alaungdaw Kathapa has received a dung DNA survey, in 2014, with results still pending. By comparison, the number of captive elephants is fairly accurately known from registrations of government or privately held animals. This number was 5,634 in 2016 (CITES/IUCN 2016) with the total captive population, including unregistered animals held in border areas, estimated at more than 6,000 individuals. In lieu of accurate population estimates, a review of other available information on elephant distribution and abundance is presented here. This review comprises 1) records of elephants from surveys, both formal camera-trapping and incidental observations obtained during the course of exploration and reconnaissance; 2) observations

from Elephant Protection Units (EPUs) and other ranger patrols collected in SMART databases; 3) records of elephant mortality assembled by the NWCD, and 4) records of human-elephant conflict. This review is arranged by the major elephant ranges following Leimgruber et al. (2003) (Fig. 1).

Southeast - Bilaktaung/Tenasserim Elephant Range (62,339km^2): In the last five years, access survey access to tropical monsoon forest areas along the Thai-Myanmar border. have been possible Explorative surveys in Myeik and Kawthaung Districts of southern Tanintharyi Division revealed widespread presence of elephants and evidence of targeted hunting of elephants (FFI 2015) (Fig. 2.). Unfortunately, due to unexploded ordnance, it is not possible to conduct a formal dung-based survey in this area. Similarly, further north in Doo Pla Ya District, Karen State, field workers of the Karen Environmental and Social Action Network (KESAN) detected small numbers of live elephants and indirect sign of elephants on forest walks in the core of the Megatha Wildlife Sanctuary (Htoo 2010). In Northern Karen State, the Karen Wildlife Conservation Initiative has recorded live elephants in camera-trap networks set for general wildlife surveys across 6 wildlife sanctuaries managed by the Karen Forest Department in 2014-2015 (Saw S.B. Moo unpublished data). Forest areas in Megatha and elsewhere along the Thai-Myanmar border in Karen managed areas feature pit traps, which are currently being or have been used in the recent past for live-capture of elephants for the cross-border trade with Thailand (Shepherd 2002). Mortality rates of animals caught in these pits is estimated to be around 80% (Htoo 2010), which is unsustainably high. Old pit traps used for elephant capture were also recorded in the Tanintharyi Nature Reserve east of Kanbauk (Shwe & Lynam 2012). Live elephants were recorded from the core zone and western perimeter of the Tanintharyi Nature Reserve by patrol teams (WCS unpublished data). There are no official records of human-elephant conflict or illegal killings from this region, presumably as they are reported to Karen authorities rather than the Myanmar Forest Department.

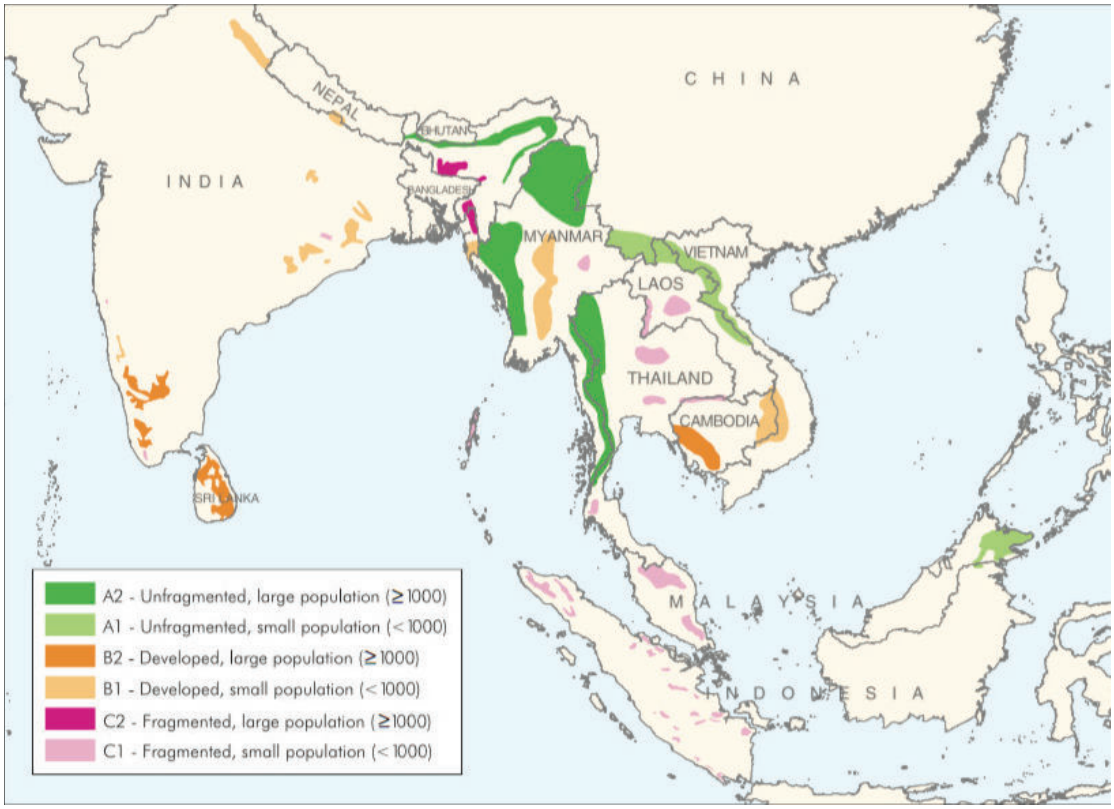

Figure 10.1: Management categories for elephant ranges in Asia (from Leimgruber et al. 2003). Three of the four largest, unfragmented elephant populations in the region were considered to lie at least partly in Myanmar.

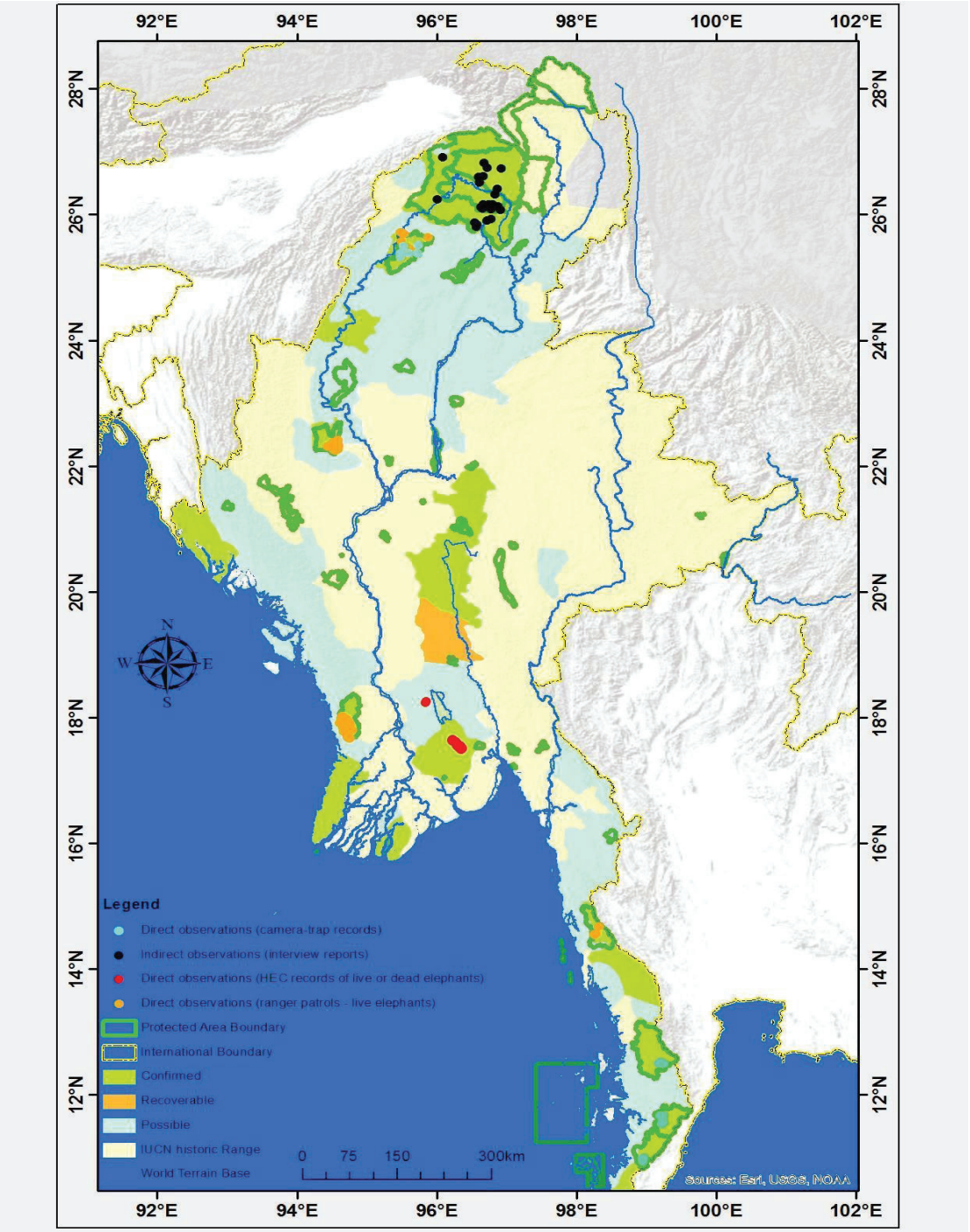

Figure 10.2: Recent observations of wild elephants and elephant ranges in Myanmar. Direct observations include records from camera-traps, records of human–elephant conflict, and ranger patrols. Indirect observations include interview reports. Map needs updating with HEC and elephant carcass localities from NWCD.

Central - Bago Yoma Elephant Range (9,537km^2): Elephants occur in small subpopulations in the central range, with movement possible via forest corridors (Leimgruber *et al.* 2011). Line transect surveys done in the late 2000s confirmed low to medium densities for 7 survey areas in South and North Zarmari, Yenwe, Idokan and Okkan Forest Reserves. Highest densities were found in South Zarmari where densities were more than twice the mean (Varma *et al.* 2008). Large parts of these reserves were formerly under intensive timber harvest managed by MTE with very little natural forest remaining. This fact partly explains the overall low densities recorded, wide-ranging behaviour of elephants, and the highest incidence of human-elephant conflict; 16 of 58 records from 2010 – 2016 (NWCD unpublished data for Bago Division). A fifth (19.8%) of the official records (22 of 111 records) of elephant deaths were in Bago Division (NWCD unpublished data; Fig. 2). Recently, commercial timber harvest was stopped in North Zarmari, and the Forest Department used the opportunity to create Myanmar's third protected area dedicated to wild elephant conservation -- the2,620 km^2 North Zarmari Elephant Sanctuary, which may potentially support a genetically effective population of up to 10 breeding herds, or 200 elephants (Htut *et al.* 2012). The Forest Department recently attempted to supplement the dwindling existing wild population at North Zarmari by translocating problem elephants from Ayeyarwaddy Division to North Zarmari.

East - Shan Plateau Elephant Range (2,693km^2): Forest habitats for elephants have been severely fragmented and degraded in this range. The Shwe U-Daung Wildlife Sanctuary (119km^2) is a dedicated elephant sanctuary and one of two sites in Myanmar under the CITES Monitoring the Illegal Killing of Elephants (MIKE) program. However, due to large scale incompatibilities with conservation (Rao *et al.* 2002), the reserve is unsuitable for wild elephants. A decade ago, the best guess for the elephant population was possibly up to 60 individuals (Leimgruber & Wemmer 2004). There is no recent information on elephant numbers or mortality, and only one official record of human-elephant conflict (NWCD unpublished data).

Southwest - Arakan Yoma Elephant Range (39,332km^2): This is one of the largest elephant ranges in the country and has good future potential for elephants given contiguity of forest habitats that are relatively inaccessible, especially in the central and northern sections. The Rakhine Yoma Elephant Range (1,755km^2) is the only formally protected area and therefore a focus for wild elephant management by NWCD, in addition to its importance for turtles and other wildlife (S. Platt pers. comm.). Despite its potential, the only formal surveys done in the mid-2000s estimated very low densities (0.05km^2) for elephants (Varma *et al.* 2008). It is, however, encouraging that ranger patrols recorded live observations of elephants across all patrol routes during 2015-2016 (WCS unpublished data; Fig. 2.). Half of the recent reports (55 of 111 records) of elephant mortality come from Ayeyarwady Division, which includes the southern end of this elephant range, and 11% of reports were from Rakhine State. A fifth of human-elephant conflict reports (22 of 58

records) come from these two areas combined. Surveys of villages reported that 94% of communities had problems with crop-raiding elephants (Varma *et al.* 2008).

North - Myitkyina/Upper Chindwin (98,375km^2): The largest Asian Elephant range extends from the central dry zone where lands are densely settled, to the vast Northern Forest Complex forests and wetlands where permanent human settlement is sparse or non-existent. Forests extending from the Upper Chindwin, through the Naga Hills and Hukaung Valley make up the largest area of wildlands across the entire geographic range of the Asian Elephant (Leimgruber *et al.* 2003) and, thus, are incredibly important potential elephant habitat. A formal dung DNA survey was attempted in the Hukaung Valley in (2008?) but unfortunately, due to problems with management of samples, a result was not forthcoming. Otherwise, there is a dearth of reliable survey data for the entire range except for confirmed reports of live elephants from the core zone and northern perimeter of Htmanthi Wildlife Sanctuary observed by survey teams, and patrol teams (WCS unpublished data; Fig. 2.). Observations from ranger patrol teams indicate that wild elephants persist at Alaungdaw Kathapa but are restricted to an area in the far SE corner where protection is focused (WCS unpublished data; Fig.2.), and possibly number only 10-15 individuals (Chit Saw pers. comm.). There are only 12 reports (10.8% of total) of elephant mortality for the period 2010-2016 from all of Mandalay, Sagaing, Magwe, Kachin and Nay Pyi Taw divisions (NWCD unpublished data). Half of these records (5.4% of total) are from Mandalay and Nay Pyi Taw Divisions. A fifth of human-elephant conflict reports (22 of 58 records) come from these states.

Overall, there continues to be a dire lack of reliable baseline information on elephant population size and trends. At the same time, what is well established is that reported cases of elephant mortality indicate a dramatic increase in rates of mortality over the last 7 years. This is a worrying trend, especially for Ayeyarwady Division where elephant killings have increased by ten-fold since 2012 (Fig. 3.).

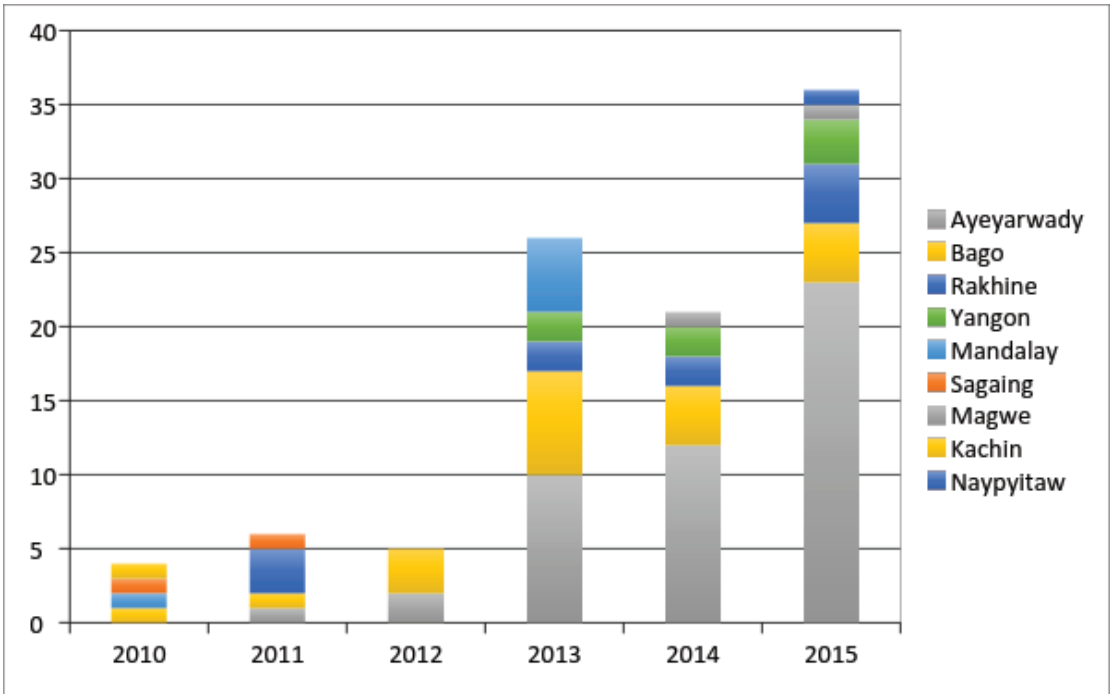

Figure 10.3: Increasing trend in elephant mortality across 9 states and divisions in Myanmar from 2010 to 2015 (source: NWCD unpublished data).

10.1.3 Habitat loss, fragmentation, and degradation

Habitat loss can be due to legal activities (settlements; agriculture; development activities such as dams and mining) and illegal activities (e.g. encroachment, mining). Currently, forests in Myanmar are declining rapidly with an annual loss of 0.94% with less than 38% of forests now considered intact (Leimgruber *et al.* 2016). Only a fifth of intact forests, most of which lies in Shan State., receives formal protection. Much of the remaining potential habitat for elephants is at risk of deforestation, especially potential elephant ranges in the southeast where forest land is being converted for oil plantations, and in the northern forest complex where illegal or quasi-legal small-holder gold mining has degraded forests (Leimgruber *et al.* 2016).

Habitat fragmentation results from the division of continuous habitat into smaller parcels by legal development such as settlements, roads, railways, and canals, and illegal developments such as roads put in to facilitate illegal logging. Road expansion has facilitated illegal wildlife trade in Myanmar (Clements *et al.* 2014). New officially sanctioned infrastructure and planned expansion of roads to support such infrastructure threatens intact forests in Tanintharyi Division (WWF 2015). Rampant illegal logging and land speculation in far southern Tanintharyi has already opened up lowland forest areas to loggers and wildlife traders (Donald *et al.* 2015) and threatens elephants, tigers and other regional endemic species such as Gurney's pitta (Eames *et al.* 2005). Ranging behaviour of elephants is influenced

by the size of the natural forest habitat and the availability of permanent water sources, and in one population (in Sabah, Borneo; Alfred *et al.* 2012), elephants range more widely in fragmented forest than in continuous forest.

Habitat degradation may be due to the presence of domestic livestock (competition, over- grazing, and resource competition), invasive plants, overly frequent and/or extensive fires, fodder and fuel-wood collection, or human activities that reduce water quality (e.g. mining). For example, Pidaung Wildlife Sanctuary, one of Myanmar's oldest protected areas, which has lost its wild elephant population, has been degraded over almost its entire area due to a combination of fuel wood collection, over-harvesting of non-timber forest products, livestock grazing, and shifting cultivation (Rao *et al.* 2002). Habitat degradation may also result due to people exacting revenge for crop depredations by elephants (or other wildlife), e.g. by setting fires and destroying water sources. This has occurred in many of the more well-settled areas across Myanmar.

10.1.4 Illegal killing, capture, and trade in elephants and their parts (including ivory)

Legal killing and capture of elephants happens when killing of problem animals is sanctioned by the authorities or when problem animals are purposely removed from a population to another place. Translocation of problem animals to repopulate the decimated North Zarmari Elephant Sanctuary was recently done with animals captured at HEC hotspots in Ayeyarwady Division. Unfortunately, such movements usually fail as animals may become problems in the new area to which they are moved, or they find their way back home. However, if animals are monitored following translocation, their fate can be known and the success of the operation can be evaluated.

Illegal killing happens for a variety of reasons, including to traffic ivory or other elephant body parts including skin, and as revenge killings motivated by human–elephant conflict (see Chapter 11). Killing of elephants motivated by illegal trade in ivory have increased in Myanmar in the last decade as demand from other countries, primarily China and Thailand, has increased. The illegal capture of elephants results in loss of animals from a population and may be viewed as a kind of illegal "killing". Illegal capture for cross-border trade to supply circuses or tourist camps, or as working elephants (e.g. in the logging industry or as transport animals) has been known to be a problem for a long time (Shepherd 2002), and research suggests that the trade continues. For more on the illegal wildlife trade and its impact on Myanmar, see Chapter 12. Overall, illegal killing of elephants has increased at an alarming rate with around 70% of elephant deaths in Myanmar being associated with illegal killing in 2016, the highest rate recorded in over 7 years of data collection (Fig. 4.)

Accidental killing may occur due to collisions with vehicles or trains, when animals fall into wells, or step on landmines, or when animals die during illegal capture exercises or during translocation exercises. Accidental killing of elephants has been recorded as a result of civil conflict in eastern Myanmar in the last two decades (Htoo 2010).

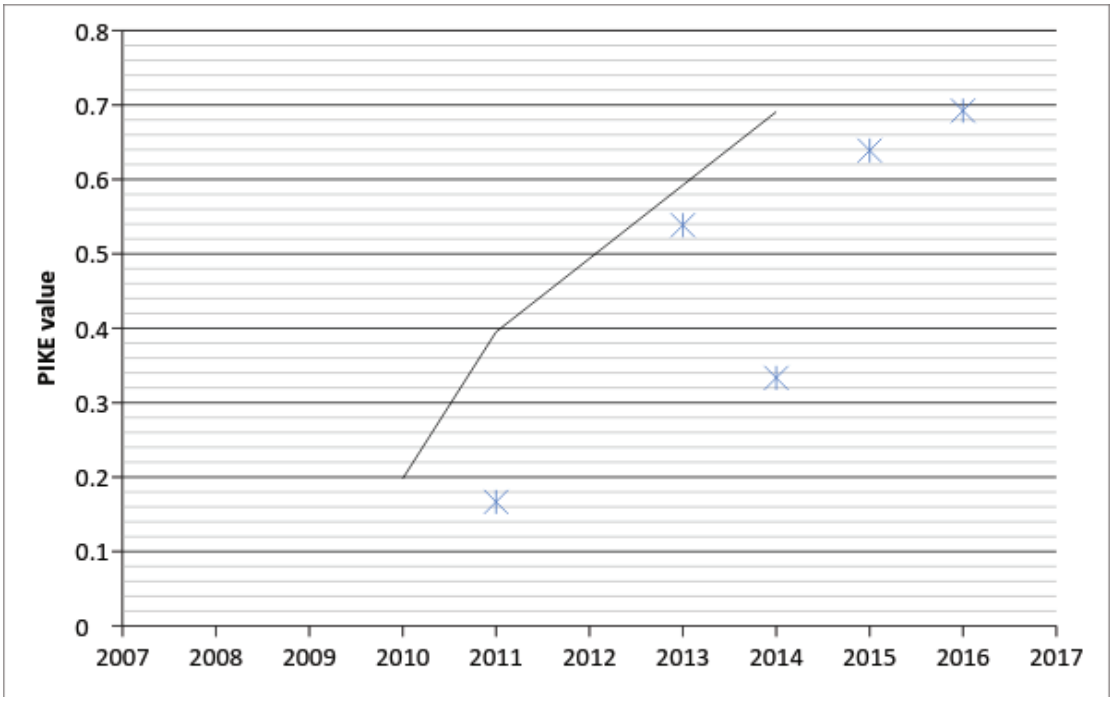

Figure 10.4: Increasing trend in the proportion of illegally killed elephants (PIKE) in Myanmar from official mortality records (source: NWCD unpublished data).

10.2 Current interventions for wild elephant conservation in Myanmar

10.2.1 Legal protection conferred on wild elephants in Myanmar

In Myanmar, wild elephants are afforded legal protection under the Protection of Wildlife and Wild Plants and the Conservation of Natural Areas Law, which was enacted in 1994. Chapter 5, Section 15 of this law prescribed that elephants are listed as a completely protected species. Under Chapter 11, Offences and Penalties, the law states that whoever commits any of the following acts shall be punished with imprisonment for a term that may amount to 7 years or with a fine which may amount to kyats 50,000 or both: (a) killing, hunting, or wounding a completely protected wildlife species

without permission, and possessing, selling, transporting or transferring such wildlife or any part thereof; (b) exporting completely protected wildlife or protected wild plant species or any parts thereof without the recommendation of the Director General of the Forest. Although trade-motivated illegal killing continues to be reported (Zin 2016), actual prosecutions are rare, with a total of just 8 cases in three states (4 in Ayeyarwady Division, 3 in Bago Division, and 1 in Mandalay Division) between July 2012 and October 2014 (NWCD unpublished data).

10.2.2. Creation of protected areas for elephants

The creation of Managed Elephant Ranges (MER) that connect habitat and secure movement corridors for elephants within forested landscapes is a strategy for securing habitat in landscapes that are increasingly dominated by humans (Blake & Hedges 2010). The establishment of MERs at Rakhine Yoma (1997) and the new North Zarmari Elephant Sanctuary (2012), and the designation of Alaungdaw Kathapa and Shwe U Daung as focal sites for monitoring elephants exemplifies the commitment of the Ministry of Forestry in protecting wild elephant populations in Myanmar. However, all of these protected areas suffer from hunting, resource extraction, grazing and insufficient staffing (Rao *et al.* 2002). While forested landscapes in the Bago Yoma range hold potential for elephants (Hedges *et al.* 2008), until recently, elephant density at North Zarmari was lower than surrounding areas due to disturbance from logging operations (Varma *et al.* 2008).

10.2.3 Management of protected areas

Myanmar now plans to build on its foundation of protected areas dedicated for elephant conservation by implementing systems for protection and monitoring that will ensure the survival of populations inside these areas, and reduce the trafficking of wild elephants. The Spatial Monitoring and Reporting Tool (SMART) has been adopted for use in monitoring patrolling efforts and other law enforcement interventions in Alaungdaw Kathapa, Rakhine and Tanintharyi Nature Reserve. SMART has potential for helping to improve adaptive management of important wildlife sites and landscapes where there is commitment to make change (Hotte *et al.* 2016). The first mobile Elephant Protection Units (EPUs) were initiated in the Hukaung Valley Wildlife Sanctuary in 2008. Now EPUs have been established in other key areas for wild elephants (Alaungdaw Kathapa and Rakhine Yoma Elephant Range). One function of the EPUs has been to collect baseline data on elephant distribution in order to identify elephant ‘hotspots’ in need of protection, and to guide future survey efforts. Data collected by EPUs is recorded using standardized patrol forms, and entered into SMART databases customized for each protected area.

10.2.4 Monitoring the illegal killing of elephants in Myanmar

Monitoring the deaths of wild elephants, and particular use of the CITES MIKE program's proportion of illegally killed elephants to the total number of deaths from all causes (PIKE) index in particular, is undertaken in Myanmar. The PIKE data are used in the global analyses of elephant poaching trends conducted by the CITES MIKE program whose success depends on generating reliable flows of high quality law enforcement monitoring data from the sites for inclusion in ongoing regional and global analyses. MIKE data collection started in Southeast Asia in 2005, and involves thirteen sites across eight range countries. Myanmar was one of the few countries that produced detailed carcass and patrol effort data during the first phase (2004 – 2008) of MIKE. This is in large part due to the leadership of the MIKE program in Myanmar that has encouraged use of standard patrol forms by ranger teams. Capacity of field rangers to collect patrol effort and elephant mortality was increased through training workshops convened at Alaungdaw Kathapa National Park, starting in 2012. In other protected areas that support elephants, including Hukaung Valley Wildlife Sanctuary and Tanintharyi Nature Reserve, training of rangers in law enforcement monitoring methods, including use of standardized carcass forms, has extended the reach of the MIKE training program. There is a need for continued monitoring of elephant poaching rates at the MIKE sites, and other elephant habitats across the country with annual reporting of PIKE.

10.2.5 Summary of current management interventions

In summary, Myanmar has made impressive steps in the setting aside of new areas for conservation of elephants and other wildlife. Targeted management activities for elephants in Myanmar protected areas thus far have involved allocating staff for on-site management, and providing support for the training and capacity building of law enforcement staff, which is arranged in conjunction with conservation organizations. However, ranger densities are very low compared to those required to stabilize threats in typical tropical protected areas (Bruner *et al.* 2001), and the level of protection for elephants urgently needs to be raised at key sites in order to meet the current level of threat, especially from poaching (Fig. 3,4). The Myanmar Government does not have sufficient funds to pay for ranger patrols that are needed to secure their parks and wildlife sanctuaries against poaching, so they will need support of such patrolling and protection work, including provision of basic ranger equipment, supplies and rations for ranger patrols, and implementation of the SMART (Spatial Monitoring and Response Tool) database to allow for collection of elephant mortality and patrol effort data which is required by the MIKE Program.

10.3 Strategy for successful protection of wild elephants and their habitat in Myanmar

A strategy for successful management of wild elephants in Myanmar requires a focus on addressing threats to elephants and their habitats, developing capacity of law enforcement agencies, conservation staff, and infrastructure for forest protection and management.

10.3.1 Identify threat hotspots and develop a patrolling strategy for forest reserves and protected areas

- ► Use observation data collected from field patrols to create maps showing locations of poaching incidents involving elephants, including snare and trap locations, and carcasses.
- ► Use observation data collected from field patrols to create maps showing locations of forest loss, illegal logging, degradation and disturbance.
- ► Create SMART patrol plans including locations of illegal human activity as spatial.

10.3.2 Raise capacity for site-level protection

- ► Develop standard operating procedures for SMART patrols that specify roles and responsibilities, and guidelines for patrol team conduct, patrol planning and procedures, data collection, data management and reporting, training and mentoring, monitoring performance and incentives, and compensation for injury or death.
- ► Design a training programme for frontline staff to raise capacity for elephant and habitat protection and monitoring using standardized data collection procedures including use of Cybertracker and mobile handheld devices.
- ► Design a training programme for data managers to raise capacity for using SMART software to analyse and report on patrol enforcement activities.
- ► Design a training programme for park wardens to raise capacity for interpreting and making decisions based around information created by SMART processes.

10.3.3 Upgrade ranger infrastructure in forest reserves and protected areas

- ► Improve existing ranger stations and build new stations in strategic locations. Configure remote stations with sustainable power solutions, especially solar.
- ► Redeploy out of work elephants to Elephant Protection Units (EPUs) for use in supporting forest patrols.

10.3.4 Promote collaborations and sharing of intelligence about forestry and wildlife crime between law enforcement agencies

- ► Hold a workshop to bring representatives together from Forest, Police, Customs and General Administration Departments to discuss current knowledge on the status of elephant trade, and priority locations for enforcement interventions
- ► Revise and upgrade the Protected Areas and Protection of Wildlife Law (2002) to enable CITES implementation

11.0 HUMAN–ELEPHANT CONFLICT IN MYANMAR: CURRENT STATUS, CAUSES, AND PROPOSED MANAGEMENT STRATEGY

11.1 Overview

11.1.1 Human–elephant conflict in Myanmar: What is the extent of the problem?

Human–elephant conflict (HEC) is one of the greatest challenges to successful conservation of Asian Elephants throughout the range states. For most of the 20th century, HEC was thought to be relatively low in Myanmar (Leimgruber et al. 2011). However, the numbers of people killed by elephants per year rose slowly but steadily from 2-4 people/year in the early 1990s to 12 people/year killed in the early 2000s (Leimgruber et al. 2011, Figure 1A). During this period, HEC was linked closely with forest declines at the State/Division level, indicating that increasing encroachment into forested elephant areas and exploitation of previously remote forest areas may have been a major contributor to the increase in HEC (Leimgruber et al., 2011; Figure 11.1B).

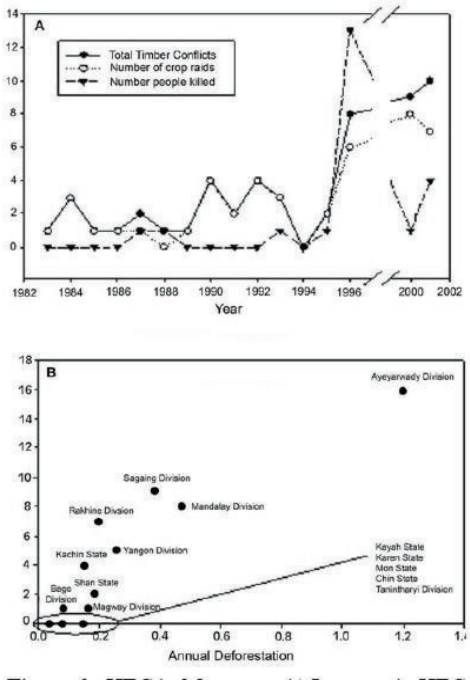

Figure 11.1. HEC in Myanmar. A) Increase in HEC over time; B) Annual deforestation rate and HEC. Adapted from Leimgruber et al. 2011.

In recent years, human and elephant deaths from HEC and related conflicts (e.g. retaliatory killings, increased elephant poaching) have reached critical highs locally. Townships in Bago, Yangon, and Ayeyarwady Division often experience 2–4 deaths/year, increasing countrywide totals to well above 12 people/year (Sampson et al., unpublished data).

For example, recent interview surveys in the Southern Bago Yoma by the Smithsonian show increases in HEC with growing rates of injury and death in human and elephant populations. In desperation, farmers are constructing homemade electric fences around their properties and crops. These designs can be dangerous and have killed both humans and elephants in countries

such as Sri Lanka (Fernando, pers. com.). Local communities are using more and more aggressive techniques to scare off elephants (Sampson et al. in prep), a practice which will likely increase the severity of HEC in the region over time. HEC in the adjacent Ayeyarwady and Bago Divisions is also steadily rising.

While direct impacts of HEC, such as loss of crops and human injury or death are well recognized, indirect effects are often overlooked (Barua et al. 2013). However, these impacts, such as time lost to crop protection or elephant presence limiting children's ability to attend school in high HEC zones, can have severe and lasting consequences for local communities and drive negative views of elephants. Assessing these indirect impacts will enable local governments and their partners in the conservation community to provide support where it is needed and help researchers understand the full weight of living in areas of high HEC. Ultimately, a better understanding of HEC, including its indirect effects, will lead to prevention and mitigation strategies that are better tailored to the individual needs of the affected communities.

The government's ability to record and measure HEC across Myanmar is unclear. Frequently, HEC is reported up the chain of command, with Township Forest Officers being the first responders. However, it is also not clear whether the government has standardized procedures and databases for recording HEC, and whether there are dedicated staff that compile this information and develop response plans. As a consequence, the public, decision makers, government agencies, and conservation NGOs do not understand the full extent of HEC in Myanmar, and it is not possible to quantify the economic, human, and conservation costs of HEC.

Myanmar's recent re-entry to the global market, continuing forest loss and agricultural expansion, as well as increasing numbers of dam developments, are all creating greater pressures for wild elephants, ultimately increasing HEC in the country and potentially leading to severe declines in Myanmar's elephant populations. In this context, it is critical to develop a systematic approach to managing HEC with a special focus on the conservation of wild elephant populations in the long-term.

11.1.2 Where and why does HEC occur in Myanmar?

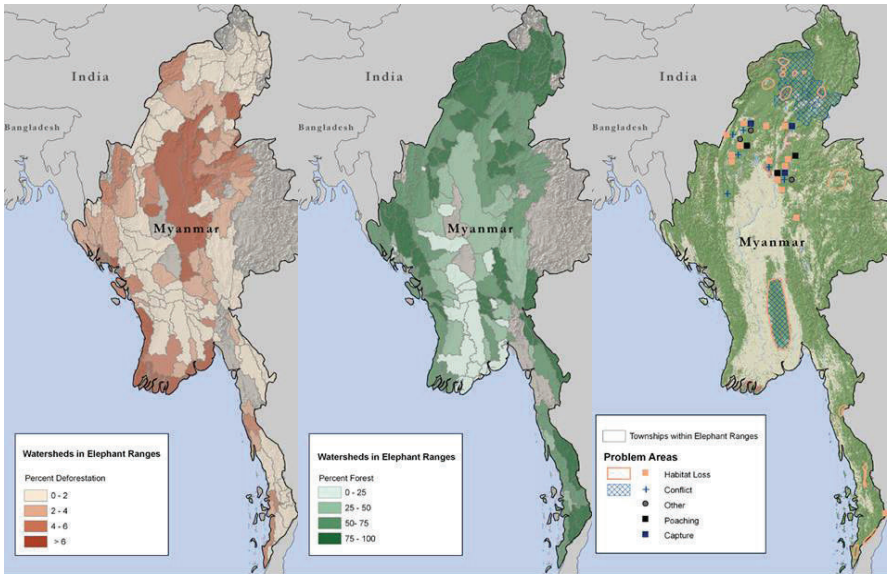

Figure 11.2. HEC in Myanmar in 2002, adapted from Leimgruber and Wemmer (2008). A) HEC and other threats to elephants; B) Elephant presence summarized by watersheds; C) Percent forest cover summarized by watersheds.

Over the past two decades, there have been several attempts to use expert opinion to better understand where and why HEC occurs in Myanmar. This previous work indicates that HEC is highest in places where logging occurs and forest is being replaced by agriculture (Figure 11.22). Not surprisingly, conflict often is highest in those States and Divisions that have experienced high rates of forest loss over the past 2-3 decades (Figure 11.1B), and specifically in places that represent the agricultural frontier (Figure 11.2). These areas are characterized by landscape mosaics of forest and agriculture, which provide elephants with ample food and shelter initially, but over time become ecological traps as HEC intensifies and elephants are driven from the land, captured, or killed.

More recent expert assessments conducted during the Myanmar Elephant Conservation Action Plan (MECAP) workshop in 2015, confirm these previous assessments, with experts specifically listing the following townships as HEC hotspots:

- Thabeikgyin, Thazi (Mandalay)
- Tharbaung, Ngapudaw, Pathein (Ayeyarwady)
- Helgi, Taki (Yangon)
- Gwa, Buthidaung, Maungdaw (Rakhine)
- Kyaukdaga, Tharyawady (Bago)
- Taninthayi Region

However, this list is likely to be incomplete and needs to be expanded to include HEC from currently under-reported areas.

11.1.3 What HEC management exists in Myanmar?

Figure 11.3. Tree huts in Thabeikgyin township, used by families during the harvest season to avoid attacks by elephants. Photo: P. Leimgruber.

As is true for most elephant range countries, local people are generally the first to respond to HEC. Initially, they tend to rely on simple techniques for crop guarding and protection, including driving elephants from their fields using flashlights, banging pots, and shouting. As conflict increase, people frequently use large Chinese firecrackers, and large noise makers such as bamboo cannons. They also start constructing tree platforms to facilitate crop protection (usually in the fields), and to keep their families safe (Fig. 11.3).

Figure 11.4. MTE elephant drive and capture at Taikyi. Photo: C. Sampson.

HEC is usually reported to Township Foresters, sometimes to local police and the military, and these agencies sometimes attempt to assist affected communities. Often, Myanmar's HEC management is also closely linked with the management of Myanmar's captive elephant population. Trained elephant teams, managed by Myanma Timber Enterprise (MTE), are used to drive elephants from crop fields back into the forest (Fig 11.4). In the past, MTE frequently was given permission to capture returning "problem elephants" for transfer into the captive population and to be used as trained elephants in the logging industry. This practice may have reduced HEC at least locally, but probably also contributed to the steady decline and very low densities of wild elephants throughout Myanmar (Leimgruber et al. 2011, Leimgruber et al. 2008, Uga 2000, Myint Aung 1997). For the past years, all elephant captures have been stopped to better safeguard remaining wild populations. However, elephant drives continue in some areas.

There are not enough MTE elephant teams to drive elephants in all areas where HEC occurs. Also, drives may only cause a temporary reduction in HEC. Local NGOs and village cooperatives have experimented with other low-tech crop protection methods and HEC management tools. These include:

- Burning tires or dung with chilies to produce a noxious smoke to drive elephants away.
- Planting alternative crops that may be unpalatable to elephants (though this can be difficult because elephants eat a wide variety or crops.
- Alarm systems to activate crop protection groups.
- Homemade electric fencing

Figure 11.5. Homemade electric fencing set-up in Taikyi Township, Yangon Division. Photo: C. Sampson.

In Teikyi and Hlegu townships, we have seen a rise in farmers constructing their own, homemade electric fences (Figure 5) around their properties and crops. The fences used tend to be extremely dangerous and have killed both humans and elephants in countries such as Sri Lanka (Fernando, pers. com.). For example, in June 2016, two buffaloes were electrocuted by a home-made electric fence in Taikyi township. Small-scale and temporary seasonal electric fencing, however, may become a useful component of an HEC management 'toolkit' in Myanmar, if the fences are constructed correctly and are safe for animals and people. The Smithsonian has organized several expert consultations and staff exchanges between Myanmar and Sri Lanka, where small-scale fencing is widely and very successfully used to manage and mitigate HEC.

Most of the existing HEC management in Myanmar is targeted at entire local elephant populations, rather than the specific elephant individuals that may be causing most of the conflict. Although most local people and elephant experts will agree that the most severe conflict and attacks can be attributed to specific bull elephants, no systematic assessments exist.

11.1.4 Who is responsible for HEC management?

In Myanmar, wild elephants are managed by the Nature and Wildlife Conservation Division (NWCD), which is also responsible for managing HEC. However, most NWCD staff are located near protected areas, which often are far from HEC sites. NWCD, therefore, works closely with other government bodies to respond to HEC and to manage it. The Forest Department often has local offices and staff in elephant conflict area who end up dealing with HEC. Myanma Timber Enterprise (MTE) usually assists with elephant drives, and in the past also worked on elephant captures and translocations. If needed, local police and military also assist in HEC management. However,

government staff and resources to address HEC across all of Myanmar are scarce. Consequently, the people affected by HEC are left to their own devices and have had to develop their own management methods.

11.2 Strategy for successful human–elephant conflict management in Myanmar

A strategy for successful management of HEC in Myanmar requires a new approach informed by ‘best practices elsewhere. Such a strategy needs, then, to recognize and incorporate the following concepts and approaches.

11.2.1 Develop appropriate management structures and mechanisms for managing HEC

11.2.1.1 Implement National HEC Management Plan:

► The National Coordination Committee (NCC) for the MECAP (see Chapter 14) will promote and monitor the implementation of the overall HEC strategy presented below and the detailed HEC implementation plan. The NCC:

- Is chaired by DG FD/MD MTE
- Has broad participation by representatives from other government committees
- Meets 2 times/year
- Is supported by Advisory Group (NGOs, INGOs)
  - Meets a day or two before the NCC
- Holds regular broad stakeholder meetings organized by NCC
- Is set up by FD

11.2.1.2 Adopt “Local Management” and support/create local capacity

► The village administrator, FD, and MTE should take leading role at the ground level with capacity building of ground level staff is needed.

► Create Local HEC Management Capacity: HEC is a local problem and cannot be managed effectively from Nay Pyi Daw. The village administrator, FD, NWCD, and MTE will take a leading role at the local level. NWCD will need to train local responders and then assist them by coordinating HEC responses and by directing resources from the national and state level to these local staff. Ideally, NWCD and FD will identify local HEC managers/experts that report to both the FD and NWCD. These local staff can be trained in monitoring and managing HEC following standardized procedures that are used across all areas.

11.2.2 Incorporate HEC into all land use planning and development impact protocols

11.2.2.1 Adopt “Developer Pays” principle

► HEC is often caused by rapid development of rural and wild areas by forest, agriculture, and transportation departments. HEC management and mitigation needs to be integrated in the forest, agriculture, and transportation planning sectors, and should also be funded by these sectors. This “developer-pays” principle is well integrated in environmental and conservation planning in other countries. It is neither reasonable nor realistic to assume that a resource-poor government department, such as the NWCD should absorb all the costs of managing conservation problems that are caused by resource-rich government departments.

11.2.2.2 Integrate HEC Management into all Development and Land Use Planning:

► Large-scale agricultural, transportation, and hydroelectric development projects need to address elephant and biodiversity conservation in their planning and implementation stages. This integration should include environmental impact assessments before, during, and after development, and large-scale development projects should be required to help with the financing of HEC management as needed. However, the willingness of developers and government agencies to pay towards post-development HEC mitigation should not be regarded as a ‘green light’ which facilitates conversion of elephant habitat.

11.2.3 Support local communities affected by HEC

11.2.3.1 Reduce human fatalities

► Frequent human deaths from HEC could be avoided by better educating local communities about the “dos and don’ts” in elephant areas, and by developing relatively simple alarm systems (e.g. cell phone alarms to warn one’s neighbours about elephant presence in populated areas).

11.2.3.2 Conduct public education and awareness campaigns

► Many people in HEC areas in Myanmar have migrated there from other areas and are inexperienced with elephants. They do not know how to behave safely around wild elephants. Education and awareness campaigns targeting local schools as well as adults are likely to be very effective in reducing injury and death for people and elephants. One such campaign was recently started by Myanmar National Television in collaboration with local NGOs and filmmakers, and

the effectiveness of that campaign should be monitored with a view to replication elsewhere in the country.

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11.2.3.3 Institutionalize and promote appropriate compensation and insurance schemes

► Compensation for crop losses and other such damage is a controversial topic in HEC management, and most experts agree that compensation schemes are unsustainable and can even be counter-productive by acting as a disincentive to guard one's crops. However, most experts also agree that there should be some kind of compensation for injuries and deaths: such a compensation scheme needs to be institutionalized and promoted across Myanmar as a means of building support for conservation.

► Insurance for crop losses is attracting increasing attention as an approach to mitigate human–wildlife conflict that avoids many of the problems of compensation schemes. Insurance schemes need to be assessed for their suitability for HEC in Myanmar.

11.2.4 Promote effective HEC monitoring and mitigation methods and develop and disseminate Standard Operating Procedures

11.2.4.1 Develop and promote the use of standardized data collection methods for monitoring HEC:

► Monitoring is critical for effective long-term HEC management. Monitoring helps quantify the extent of the problem, as well as the economic costs of HEC. Monitoring data are critical to develop the financial support of HEC management and to integrate the cost of HEC management into government budgets (e.g. the NWCD's budget). Finally, monitoring is an essential component of the overall adaptive management approach that is central to the MECAP.

► Monitoring of HEC rates (e.g. frequency, severity, and types of HEC that occur in different places and at different times of year) is often needed but the data needed varies according to the aim of the monitoring: sometimes broad-brush data will suffice at other times precise data on the actual costs incurred as a result of HEC will be needed. There is a need therefore to agree on what data are needed under what circumstances and the best means of collecting those data reliably and efficiently.

11.2.4.2 Assess the effectiveness of HEC mitigation methods:

► Not every method for mitigating HEC works under all circumstances and the effectiveness of some methods has been poorly assessed. The methods already in use in Myanmar, as well as additional methods suggested for use in the country,

need to be properly assessed. Effective methods should then be incorporated into recommendations and Standard Operating Procedures.

11.2.4.3 Promote effective HEC mitigation methods and develop and disseminate Standard Operating Procedures (SOPs):

► Develop (where necessary), disseminate, and promote standardized approaches for different HEC management techniques (e.g. specifications for electric fencing).

11.2.4.4 Expand and develop the national HEC database:

► Having a well-managed HEC database is critical to a) monitor HEC over time, b) assess the effectiveness of existing management approaches, and c) serve as an early warning system. Data on death and injury might be more reliable than data on crop damage as crop damage can be over-reported. Regular patrols by the Elephant Emergency Response Units (EERUs) can feed input to both HEC and poaching data records.

11.2.5 Conduct research to improve the effectiveness of HEC mitigation methods

11.2.5.1 Conduct research on HEC and elephant biology and behaviour:

► The Asian Elephant community still has a relatively poor understanding of how HEC is influenced by basic elephant biology, ecology, and behaviour. Advancing this knowledge has the potential to significantly improve HEC management and its effectiveness in the future. Critical questions are:

- What proportion of the elephant population is involved in conflict?
- Are there measurable characteristics that make some elephants more likely to engage in conflict than others?
- Is it possible to use our knowledge of elephant ecology and behaviour to design mixed use landscapes where elephants and people can co-exist?

12.0 ILLEGAL TRADE IN ELEPHANTS AND ELEPHANT BODY PARTS INCLUDING IVORY IN MYANMAR AND A STRATEGY TO COMBAT THE THREAT POSED BY THIS TRADE

12.1 The nature and extent of the illegal trade in ivory and other elephant body parts and products, as well as in live elephants, in Myanmar

12.1.1 Introduction

The nature and extent of the illegal trade in elephant body parts and products, including ivory as well as the illegal trade in live elephants, in Myanmar is reasonably well known based on a number of studies, including: Martin and Stiles (2002); Shepherd (2002); Stiles (2002); Vigne and Martin (2002), Stiles (2004); Shepherd and Nijman (2007, 2008, 2014a, 2014b); Nijman (2014), Min (2015), and CITES (2016). However comprehensive field-based data gathering is limited by geography and access restrictions e.g. in conflict zones.

12.1.2 Ivory

The ivory trade is long-established in Myanmar with ivory carving a multi-generational family business in some cases, especially in the traditional ivory carving centre of Mandalay. Ivory is sourced in, as well as imported into, Myanmar, carved or otherwise processed, and then sold to local buyers (and some of that trade is legal, see “Legislation”, below) and – more frequently – to foreigners, especially Chinese and Thai nationals, including through unregulated border markets, which constitutes a significant illegal trade.

Myanmar has been a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1997 but, nevertheless, ivory and other elephant parts are routinely smuggled out of Myanmar in contravention of the Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (State Law and Order Restoration Council Law No.583/94.1994), “suggesting a serious lack of law enforcement and a blatant disregard for international conventions and national laws”. Moreover, the “fact that retail dealers openly display ivory and other elephant parts, and rarely hesitate in disclosing smuggling techniques and other illegal activities with potential buyers, further highlights that effective law enforcement is lacking” (Shepherd & Nijman 2008).

In the 1980s, it was reported that much of the Asian Elephant ivory being supplied illegally to Thailand originated from Myanmar (Nash 1997), a trade that was still continuing apace in the early 2000s (Martin & Stiles 2002). In 2006, TRAFFIC surveyed 14 markets in Myanmar and three border markets in Thailand and China: within Myanmar, surveys were carried out in Yangon, Mandalay, Golden Rock, Tuang Gyi, Bago, Nanyan, Mindone, Tanaing, Pho Kya, Shin Bwae Yan, Myit Kyit Nar, Mong La, Three Pagodas Pass, and Tachilek; in China, the surveys were carried out in the towns of Ruili and Jiegao; and in Thailand, the survey was carried out at Mae Sai, across the border from the Tachilek market in Myanmar (Figure 12.1). The surveys revealed some 9000 pieces of ivory and 16 whole tusks for sale and according to the dealers in all the markets surveyed, the ivory was generally intended to be sold to foreigners, especially Chinese, Thai, and Japanese nationals, although some ivory was also exported to the USA, Italy, and France (Shepherd & Nijman 2008).

Illegal killing of elephants for trade in their parts continues to be a major threat to Myanmar’s wild elephant populations (Chapter 9) and there are worrying indications that the illegal ivory trade has increased in Myanmar over the last decade. Nijman and Shepherd (2014b) report on the illegal trade in ivory and elephant parts in the Special Development Zone of Mong La, in Myanmar’s Shan State on the border with China. Mong La reportedly caters exclusively for the Chinese market and the authors describe it as “a Chinese enclave in Myanmar”. The authors found 3494 pieces of carved ivory openly for sale (none in 2006, 200 in 2009, and 3294 in 2013–2014) and 49 whole tusks (all in 2013–2014) and they argue that these results suggest

that Mong La has recently emerged as a significant hub in the ivory trade. The increase in the illegal ivory trade that Nijman and Shepherd observed over the course of surveys in Mong La mirrors the overall pattern observed globally (Underwood *et al.* 2013), with the illegal ivory trade increasing more or less year on year since 2006. The origin of the ivory for sale in Mong La seemed to constitute a combination of Asian Elephant ivory from Myanmar (and possible other parts of Asia) and African ivory imported via China (then re-exported to China once carved). According to local sources, the carving was done by Chinese craftsmen in Mong La and across the border in China, and was largely, if not exclusively, intended for the internal Chinese market. Based on asking prices of the most commonly offered items, the retail value of the ivory on display in Mong La during the 2013–2014 survey represented an estimated US$1.2 million (Nijman & Shepherd 2014b).

Figure 12.1: Survey sites in Myanmar, China, and Thailand visited during the surveys of Shepherd and Nijman (2008). © Nijman/TRAFFIC used with permission.

12.1.3 Elephant skin, teeth, and other body parts

Various elephant parts and products in addition to ivory have been found in Myanmar's markets, including elephant skin, teeth, bones, hair, and other parts and derivatives such as meat or genitalia. In the surveys conducted by Nijman and Shepherd (2014b) in Mong La's morning market, shops, and hotels in February 2006, February 2009, and December 2013–January 2014, which were referred to above, they found that the trade in elephant body parts primarily concerned dried elephant skin (4 pieces in 2006, 278 in 2009, and 1238 in 2013–2014), and to a lesser extent, molars and bones. Min (2015) found 700 pieces of elephant skin for sale at Mong La in surveys conducted between October 2014 and October 2015, and reported that the trade was increasing.

Nijman and Shepherd (2014b) review data on the trade in elephant skin in Myanmar and adjacent parts of Asia (especially China) and note that the trade has been continuing for many years – Santiapillai (1997) stated that there were reports of elephants being illegally killed for their hides in Myanmar – but there are reasons to believe that it is increasing and involves significant numbers of elephants. They list five seizures (from 2000, 2001, 2008, 2013, and 2014) from among other places Baoshan and Dehong Dai, both bordering Myanmar (with the latter shipment originating from Myanmar) as well as from Phyue in Myanmar, and these seizures alone represent over 300 dead elephants. The primary use of the elephant skin seems (or seemed) to be for traditional medicine (Guo *et al.* 1997); however, recent reports suggest that the trade in elephant skin is increasingly for elephant skin beads and other forms of jewellery and that demand for such products is being actively promoted. Research conducted as recently as October 2016 found elephant skin (along with ivory and myriad other wildlife products) for sale in Mong La, and "elephant beads" for sale in Yunnan Province, China (Elephant Family, 2016). More recent research has found such products for sale through internet forums and social media sites. Clearly the trade in elephant skin and other parts in Myanmar – and especially from Myanmar to China – needs to be pro-actively monitored and law enforcement efforts increased to combat all forms of trade in elephant parts and products, not just ivory.

12.1.4 Live elephants

The capture of wild elephants from Myanmar to supply the tourist trade in Thailand has been recognized as a potentially significant threat to the species in Myanmar for some time (at least 20 years). Some authors (e.g. Lair 1997) had suggested 50–100 wild elephants were smuggled from Myanmar to Thailand every year but because of the clandestine nature of the live elephant trade, and the fact that it often occurs in remote areas, there

was very little published information on the trade. Fortunately, in the last decade more information has become available.

Shepherd and Nijman (2008) report that some 250 live Asian Elephants have been exported from Myanmar to neighbouring countries in the previous ten years, mostly to supply the demand for elephants of tourist facilities in Thailand. Since no cross-border exports or imports of live elephants were reported to CITES by either Myanmar or Thailand for that period, the trade was illegal and was thought to involve illegal captures of wild elephants at a rate likely to be having a negative impact on wild elephant populations in Myanmar.

Subsequent information, compiled by Nijman (2014), revealed that from April 2011 through March 2013, a minimum of 79 and possibly 81 wild elephants were likely to have been illegally captured for sale into the tourism industry in Thailand, with 65 to 69 of these sales occurring prior to a clampdown on live elephant trade by the Thai government in February 2012. Of the 53 cases for which the origin of the elephants is known, all but four were captured in Myanmar. These data represent the known trade: the actual level of trade could well be higher than these figures suggest, especially considering the clandestine nature of the trade. Moreover, these data do not include those elephants that may have been killed during the capturing process, which again suggests that the true impact of the illegal trade in live elephants is much greater than these numbers would suggest. The predominant source areas in Myanmar were Kachin State, Rakhine State and Sagaing Division, and the Dawna-Tenasserim landscape; while Chiang Mai Province, Phuket, and Surin were the main destinations for live elephants smuggled from Myanmar into Thailand (Figure 12.2). Following the clampdown by the Thai government, illegal trade of live elephants appears to have halted, at least for a while, but as Nijman noted, “it is impossible to rule out the possibility that some trafficking may still be occurring”. In October 2016, the Thai government passed a law that all elephant owners must be allow samples to be taken for a captive elephant DNA-database and is now using this database to detect and prosecute owners of illegal captive elephants, which were likely to be smuggled.

More recently, the Illegal trade in live elephants was thought to still be occurring in Myanmar and the country is considered a source country, and possibly also a transit country, for the illegal trade in live elephants in Asia, albeit at a much-reduced rate compared to before (CITES/IUCN 2016). The authors of the CITES/IUCN report write that most buyers allegedly prefer already captive elephants and it is likely that most of the elephants traded were already captive animals. No reliable information exists on current numbers of illegal captures of wild elephants, but the Forest Department believes the numbers are small. Nevertheless, it is thought that illegal captures of wild elephants are still occurring in some states (i.e. on the border with Thailand) using the pit method (CITES/IUCN 2016). Given the small size of Myanmar’s wild elephant populations, even low rates of capture

could have significant negative effects on population viability (Leimgruber *et al.* 2008; Samsudin *et al.* in review). There is, thus, a clear need to remain vigilant against the illegal capture of and trade in live elephants.

12.2 Challenges facing Myanmar in combating the illegal trade in elephants and elephant parts

12.2.1 Myanmar's location is a geographic "hotspot" for illegal trade in elephants and elephant products

The two most significant end-use ivory markets, China and Thailand, border Myanmar, as does India, the Asian Elephant range State with the largest elephant population (Figure 12.3). In addition, two major new ports are planned for Myanmar, which could increase the use of Myanmar as a transit point for illegal wildlife trafficking, especially as one port will be a deep-sea facility (CITES/IUCN 2016). Similar concerns apply to the construction of major new roads and other transport and communications infrastructure as Myanmar 'opens-up' to the wider world in the new post-sanctions era. There is, therefore, a worrying potential for the country to become an important transit country for illegal ivory to neighbouring countries, with the illustrative comparison here being ivory traffickers' use of Viet Nam and, more recently, Cambodia (or a route through both countries) as an overland "back door" conduit for ivory into China. A related concern is Myanmar's growing domestic ivory market, which serves both local buyers and the increasing number of tourists visiting the country.

12.2.2 Border issues

Policing and regulating wildlife trade in autonomous regions within Myanmar, especially along the border with China and the eastern border with Thailand, is a major challenge. An additional challenge for combating illegal wildlife crime in some places are concerns over security, particularly in border areas where law enforcement is very weak or conflicts are still occulting, and officers have been killed in the line of duty (CITES/IUCN 2016). Already Mong La, for example, has become a major crime hub, including for illegal trade in wildlife: Nijman and Shepherd (2014b) write that Mong La "is governed largely autonomously by an overlord and policed by an Eastern Shan State army" and they urge both the Myanmar and Chinese governments to liaise with the Mong La rulers to curb the trade in ivory (and other high profile species) and recommend that Myanmar's and China's CITES authorities collaborate urgently to address the illegal trade in ivory and elephant parts across their borders.

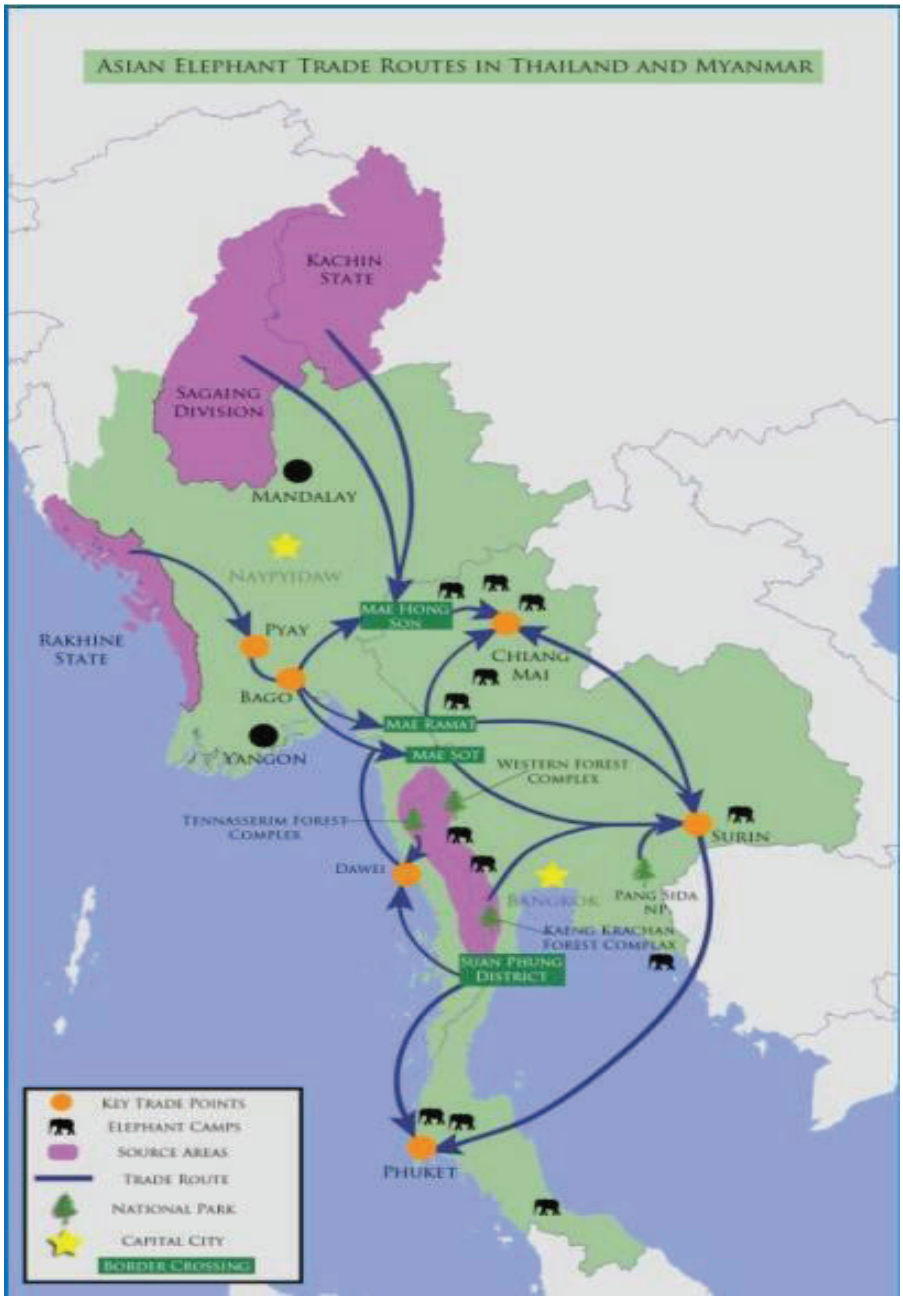

Figure 12.2: Trade routes for live elephants trafficked in Myanmar and Thailand from Nijman (2014). © Nijman/TRAFFIC used with permission.

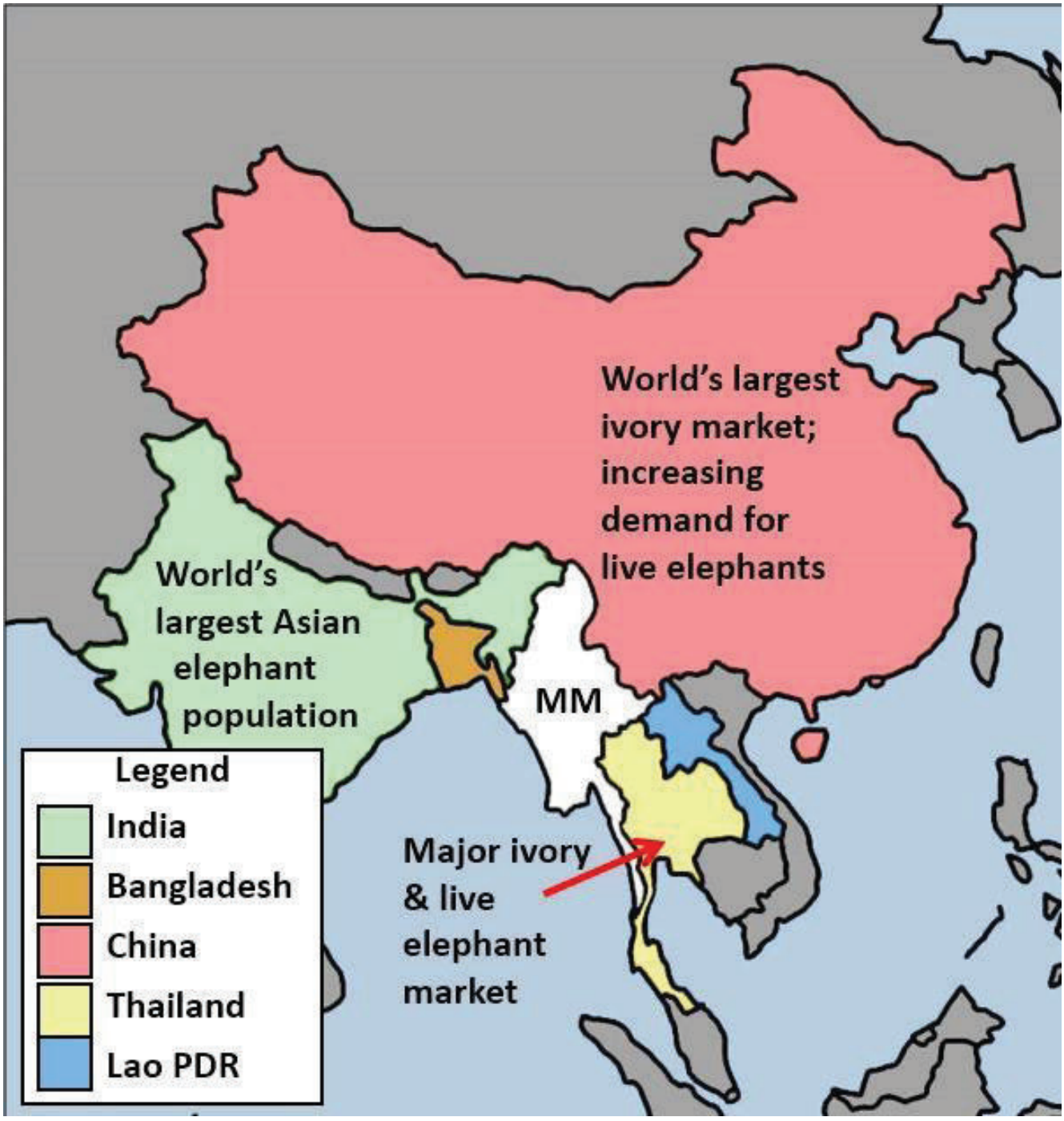

Figure 12.3: Myanmar's location makes it a geographic "hotspot" for the trade in live elephants and elephant parts including ivory (source: Tom Milliken; permission pending).

12.2.3 Enforcement capacity

As with many elephant range States, there are several significant constraints on the law enforcement agencies in Myanmar. The major ones are: limited budgets, insufficient staff, limited technical capacity, and limited cross-sectoral and transboundary collaborations. The impact of these constraints is made even more obvious when one considers the high and growing demand for natural resources, including timber and wildlife in neighbouring countries, and the fact that much of the trade in wildlife and timber is illegal and controlled by organized criminal networks that are well resourced in terms of finances and manpower, and use modern information distribution and communications methods (CITES 2016).

Partly as a result of the limited capacity described above, Myanmar rarely collaborates with neighbouring countries, especially with regard to enforcement of environmental regulations, including CITES. The authors of the CITES (2016) report argue that there is a pressing need for more intra-Asia cooperation as law enforcement collaborations are weak in ASEAN countries despite the existence of the Association of Southeast Asian Nations' Wildlife Enforcement Network (ASEAN-WEN; http://asean-wen.org/) since 2004.

If, as suggested above, Myanmar becomes an increasingly important transit country for contraband, including illegal wildlife, *en route* to China, there will be a need to very significantly improve both the human capacity and the equipment to scan and check cargo at ports and border crossings, and to make the necessary interdictions. To be effective, such law enforcement efforts will need to be informed by profiling and targeting of high-risk containers and other means of transporting goods and be supported by the political will to prosecute the criminals involved in the trade.

12.2.4 Legislation

According to Min (2015), Myanmar's legislation specifically covering domestic and international trade in wildlife and wildlife parts and products is very limited. Thus, while wildlife trade is typically "considered to be illegal by government officials … the legal framework is actually insufficient to deal with the complexities of the issue". Nijman (2014) also notes that Myanmar needs "to expedite the process of upgrading its legislation in order to meet the requirements for the effective implementation of CITES throughout the country." More specifically with regard to ivory, the most significant apparent problem with Myanmar's legislation is that the tips of tusks, as well as tusks from government and privately-owned elephants that have died of natural causes, can be sold legally. This 'loophole' provides a ready mechanism for illegal ivory to be sold under the guise of legally-acquired stocks and "Dealers

seem well aware of the ambiguous legislation and the potential loopholes it provides, and exploit the situation accordingly" (Shepherd & Nijman 2008). In addition, the authors of the CITES (2016) report consider there to be 'loopholes' in Myanmar's legislation concerning the import of live elephants, which is not covered in existing legislation, as well as a lack of differentiation between "captive" (wild caught) and "domesticated" (captive born) elephants. A review of the adequacy of existing legislation to prevent the illegal trade in live elephants and elephant parts including ivory and skin is clearly needed.

12.2.5 Compliance with CITES

In addition to the comments about legislation made immediately above, building a regulatory system that ensures that Myanmar's domestic ivory market complies with CITES requirements will probably involve development of new legislation to regulate all manufacturers and retailers. Myanmar is in CITES category 3, which means that it needs to submit a plan and timetables for legislative reforms, or risk trade suspension penalties. Furthermore, ensuring compliance will require collaboration with other law enforcement bodies and public awareness efforts (Milliken pers comm. 2015).

12.2.6 Stockpile management

Currently, both the Forest Department and the Myanma Timber Enterprise both maintain a stockpile of ivory (CITES/IUCN 2016). Stockpiles of ivory have to be secured effectively because the high price of ivory on the black market encourages thefts, and secure storage can cost a great deal of money, involve significant logistical challenges, and can put stockpile staff at risk. Thus, destroying stockpiles of confiscated ivory makes sense because it reduces the amount of money governments need to spend on secure facilities, armed guards, and the like. Note that destroying seized ivory on a regular basis rather than accumulating large stockpiles is the most effective way of avoiding the high costs and management burden associated with storing seized ivory securely. Regardless of whether Myanmar decides to store or destroy its ivory stockpiles, there is a requirement to conduct an inventory of its stockpiles and report to the CITES Secretariat every February 28th (CITES Resolution Conf. 10.10 (Rev. CoP17)).

12.2.7 Registration of captive elephants

Myanmar currently has an elephant registration scheme that is implemented by two different government departments: The Forest Department and the Myanma Timber Enterprise, although both fall under the Ministry of Natural Resources and Environmental Conservation. Private ownership of elephants is allowed in Myanmar but many owners have not properly registered their elephants, which hinders reliable monitoring of the captive elephant

population because there “is poor coordination by private owners who often do not register their elephants with the Forest Department or do not provide timely updates on changes of status (birth, death) of the elephant or of the owner” (CITES/IUCN 2016). The Forest Department told the authors of the CITES/IUCN (2016) report that they would be interested in the use of a DNA-based registration system to monitor privately owned captive elephants, but they do not have the capacity to do so.

12.3 Strategy for combating the illegal trade in elephants and elephant parts, including ivory

12.3.1 Review and where necessary strengthen legislation

► Conduct a review of all relevant current legislation to identify gaps, weaknesses, and ‘loopholes’.

- Key weaknesses that seemingly need to be addressed include the ‘loopholes’ that allow ivory from captive elephants to be traded legally and confusing legislation covering captive elephants and the import thereof.
- A review of ancillary legislation will also be needed: for example anti-corruption legislation or anti-money laundering legislation need to be revised to recognise wildlife crime (at the moment the AML law cannot be used to prosecute criminals involved in wildlife crime)
- The adequacy of Myanmar legislation to enforce CITES regulations also needs to be addressed, for example Myanmar’s regulatory framework for wildlife could be updated with inputs from CITES’ draft model law
- An assessment of Myanmar’s international obligations and the legal basis for international cooperation on wildlife crime

► Revise or add to, as necessary, relevant current legislation informed by the review.

12.3.2 Strengthen law enforcement capacity and effectiveness

► review current staffing and budget levels; assess existing capacity and identify training needs by comparison with countries in which detection/interception rates are at internationally high levels.

► Increase staff numbers at key locations, improve funding, and build human capacity through training, exchange visits and the like, with all these activities informed by appropriate needs analyses.

► Significantly improve the equipment to scan and check cargo at ports and border crossings, with secure electronic recording of scans to avoid local interceptions and corrupt interventions. Training in chain-of-custody and legal procedures for the necessary interdictions.

► Improve data-collection methods and information-sharing informed by specific needs assessments. This should include inter-agency training in crime scene investigation techniques for wildlife crime cases.
► Improve inter-agency collaboration within Myanmar, as well as internationally.
    - To be effective, such law enforcement efforts will need to be informed by profiling and targeting of high-risk containers and other means of transporting goods and be supported by the political will to prosecute the criminals involved in the trade.
    - A key example would be to promote controlled deliveries of large-scale ivory shipments so that the criminal webs behind these transactions can be better understood and unravelled. Such controlled deliveries should include real-time GPS tracking to establish the people and companies involved, routes used, and end destinations.
► Ensure the judiciary treats wildlife crime as a serious crime.
    - Will require political efforts, awareness-raising, and capacity building to support improved prosecution rates and to help ensure deterrent penalties, are handed-down. Where prison time is available as a penalty for an offence, it will have a much higher impact than fines for those convicted.

12.3.3 Take all necessary specific steps to combat trafficking in live elephants, ivory, and other elephant parts and products

12.3.3.1 Report on seizures and confiscations of ivory and other elephant specimens (in compliance with CITES Resolution Conf. 10.10 (Rev. CoP17)):

► Provide information on seizures and confiscations of ivory or other elephant specimens in the prescribed formats either to the CITES Secretariat or directly to ETIS within 90 days of their occurrence. Doing so is the responsibility of the CITES Management Authority, following liaison with appropriate law enforcement agencies.
    - Institutionalize participation in ETIS
        - Ensure that an appropriately trained person is made responsible for compiling ETIS seizure data and sending it to ETIS.
        - The ETIS focal point needs the authority to liaise with those law enforcement bodies that have the legal authority to seize ivory in Myanmar (Customs, others).

12.3.3.2 Follow CITES's requirements for domestic ivory markets (in compliance with CITES Resolution Conf. 10.10 (Rev CoP17)):

► Close domestic ivory markets if possible, or follow CITES requirements for domestic trade in ivory and prohibit all unregulated domestic sale of ivory (raw or

worked).

► Enforce compulsory trade controls over raw ivory.

► Ensure the registration of all importers, manufacturers, wholesalers, and retailers dealing in raw, semi-worked, and worked ivory products.

► Introduce and enforce recording and inspection procedures to enable the CITES Management Authority and other appropriate government agencies to monitor the flow of ivory within Myanmar.

- China, for example, aims to meet this requirement through worked ivory product identification cards that have discrete numbers for each ivory product that is legally traded and a national database tracking system for producers and sellers. Such a system needs to be considered for Myanmar.

► Ensure offenders are prosecuted, and deterrent penalties handed-down especially for repeat offenders.

► Disseminate public awareness materials, particularly in retail outlets, informing tourists and other non-nationals that they should not purchase ivory in cases where it is illegal for them to import it into their home countries.

12.3.3.3 Ensure secure management of ivory stockpiles in Myanmar

► Ensure all government-held stockpiles of ivory and, where possible, privately held stockpiles of ivory within Myanmar are secure and the ivory cannot re-enter the illegal trade, either nationally or internationally.

► Maintain an inventory of government-held stockpiles of ivory and, where possible, of significant privately held stockpiles of ivory within Myanmar, and inform the CITES Secretariat of the level of this stock each year before 28 February, indicating: the number of pieces and their weight per type of ivory (raw or worked) and if marked, their markings in accordance with the provisions of Resolution Conf. 10.10 (Rev. CoP17); the source of the ivory; and the reasons for any significant changes in the stockpile compared to the preceding year. These actions are needed to comply with CITES Resolution Conf. 10.10 (Rev. CoP17).

12.3.3.4 Strengthen measures to combat the Illegal trade in live elephants

► CITES Resolution Conf. 10.10 (Rev. CoP17) recommends that all elephant range States have in place legislative, regulatory, enforcement, or other measures to prevent illegal trade in live elephants. In Myanmar, this will require the responsible agencies to:

- undertake, as necessary, investigations into the illegal trade in live Asian Elephants, and endeavour to enforce, and where necessary improve, national laws concerning international trade in live specimens of Asian Elephants
- ensure that trade in, and cross-border movements of live Asian Elephants are conducted in compliance with CITES, including the provisions in Article III, paragraph 3, for Asian Elephants of wild origin;

► Improve and unify the registration system used for Myanmar's captive elephants, especially the privately-owned animals, including through the use of DNA-based methods, which should be made compulsory.

► Ensure all captive elephants are registered and the registration system is kept up-to-date.
► Monitor all captive elephants, especially those in private ownership, to better control the movement of and trade in these animals.
► Enhance collaborative mechanisms aimed at more effectively combating cross-border trafficking in wild elephants and other wildlife from Myanmar into Thailand and China. As part of this process, relevant enforcement agencies from all these countries should meet regularly, share intelligence and other information, and take coordinated, targeted action against all actors in the illicit trade chains.

13.0 MANAGEMENT OF CAPTIVE ELEPHANTS AND CAPTIVE–WILD ELEPHANT INTERACTIONS IN MYANMAR

13.1 Overview

13.1.1 Brief history of captive elephants in Myanmar

Working captive elephants belonging to the government and private owners have existed in Myanmar since the time of the Myanmar Royal Dynasties. Historically, captive elephants were used as part of the military force of the ancient kings. In Myanmar's early dynasties, the kings also wanted to own Royal white elephants, believing that these elephants were a symbol heralding the emergence of successful governance. Therefore, many Myanmar kings owned Royal white elephants. These beliefs still hold true in Myanmar's society today and currently there are nine Royal white elephants managed in two locations in Myanmar.

The elephant is not only of great cultural and historical significance in Myanmar, but it has been of major economic importance in the country's timber industry where elephants play a vital role in the logging operations, particularly in the country's mountainous and swamp areas.

The numbers of captive elephants held in Myanmar in the past are unclear. Evan (1910) stated that the Bombay Burma Trading Corporation owned 2,000 to 3,000 elephants. Gale (1974) mentions that there were approximately 10,000 captive elephants in Myanmar, including 6,500 full-grown elephants and 3,500 under the age of 18 years. Williams (1950) stated that before World War II, 6,000 captive elephants worked in Myanmar's teak industry. If we assume that 4,000 elephants were too young or too old for work, the information from Williams (1950) appears to agree with Gale (1974). Nowadays, the numbers of both wild and captive elephants in Myanmar is much smaller due to many factors, e.g. habitat loss and large-scale captures, as discussed elsewhere in this document.

13.1.2 Legal status of captive elephants in Myanmar

Elephants were first protected in Myanmar in 1879 under the Elephant Preservation Act, which regulated hunting and capture. The Burma Wildlife Protection Act 1936 (revised in 1956) completely prohibited hunting except under license. Captive elephants owned privately or by the State must be registered with the Forest Department under the Essential Supplies and Services Act, the Burma Act XLVII (1974), and the Elephant Registration Act (1951).

13.1.3 Registration of captive elephants

Whether owned by the Myanma Timber Enterprise (MTE), the Forest Department (FD), or by private individuals, elephants five years of age and older should all be registered with the Natural Forest and Plantation Division of the Forest Department in the Ministry of Natural Resources and Environmental Conservation. Renewal of registration is required every three years. If an elephant gives birth, MTE/FD personnel or the owner must inform the nearest Forest Department office within three months of the birth. Unfortunately, in practice, a considerable number of privately-owned elephants are not registered (also see Chapter 13).

All elephants in MTE are registered and issued with a record book that includes date of birth and date of death. All elephants owned by the MTE have a unique identification number and are given a permanent name at the age of 5 years old. At the age of 15 years, the identification number and a star-shaped mark are branded on the buttock muscle of each elephant using a branding paste. All data about these elephants, such as when the elephant is sick or transferred to another camp, is recorded in the individual's book. Information on mating, parturition, treatments, etc. is also included. By looking at the record book, the entire history of the elephant is known. Health care and management is done by veterinarians from the MTE. They check all elephants at least once a month and judge the elephant's health by looking at the external appearance, by assessing behaviour, and by asking the elephant

care staff (i.e. mahout/oozie).

Some privately-owned elephants are registered by the Forest Department and are issued an owners' license. However, one of the major constraints to monitoring the captive elephant population in Myanmar is that many privately-owned elephants are not registered. Additionally, there is a lack of follow-up in regards to any changes in the status of the elephant (e.g. death) or of the owner (e.g. transfer).

13.1.4 Current numbers and demography of captive elephants in Myanmar

Myanmar manages the largest captive elephant population in Asia and globally, primarily because elephants were the backbone of and a key player in Myanmar's forest industry for many years.

In 2016, the total number of captive elephants in Myanmar was close to 6,000 individuals. This number is based on records from the Forest Department (FD) and the Myanma Timber Enterprise (MTE). The MTE manages a total of 2959 captive elephants (1,352 males, 1,607 females); the Forest Department manages a total of 128 elephants (males 48, females 80); and private owners manage a total of 2,561 (males 1,056, females 1,505). It is estimated that there are also approximately 300–500 unregistered privately-owned elephants, mainly owned by insurgents or kept just inside the Myanmar–Thailand border area.
Currently, the Sagaing Division has the highest number of captive elephants (N=1041) followed by Bago Division (N=873) and Kachin State (N=868). There is limited information regarding the demography of privately-owned elephants in Myanmar. Recent figures available from the Natural Forest and Plantation Division of the Forest Department show that the highest number of privately-owned elephants is in Kachin state, where there are some 800 elephants (males 320, females 480).

The sex ratio for captive elephants in Myanmar is female-biased, except in Southern Shan and Kayar states, where 75% of the captive elephants are male. Thus far, statistics on the total number of elephant owners and the number of elephants managed by each owner have not been compiled. Because of the lack of such information, it is impossible to monitor elephant numbers, movement, ownership changes, and other demographic factors effectively.

There are over 1000 female elephants at the age of puberty that are able to reproduce. From these female elephants, approximately 100 elephant calves are born each year. Most have been sired by wild elephants. However, with an increasing number of elephants out of work (and with uncertain prospects for employment in the future) due to restrictions on logging, there

is perhaps a need to evaluate whether a program of contraception could be implemented to limit the natural growth of the captive elephant population in Myanmar.

13.1.5 Current utilization of captive elephants in Myanmar

Captive elephants in Myanmar are currently used for a variety of purposes: logging, tourism, cultural and religious activities, and transportation. Most captive elephants in Myanmar were, however, used for logging work – at least until 2014 (see below). Some captive elephants managed by the Forest Department are used in the forest for patrolling and for transport. In Myanmar's zoos, captive elephants are used for exhibition and public education. Additionally, some illegal uses of privately owned elephants, including working in the mining industry (as transport animals), illegal logging, and cross border trade, still occur in Myanmar.

13.1.6 Husbandry

In Myanmar, government and privately-owned elephants typically live in forest camps and are used during the day for riding, transport, or as draft animals. At night, the elephants usually forage unsupervised in the forest in their family groups, where they find food and encounter both other captive and wild elephants.

Most calves born in camps are thought to be sired by wild bulls. Calves born in captivity are cared for by their biological mothers and allomothers, and are nursed until lactation no longer supports their demands. Working female MTE elephants are given rest from mid-pregnancy (beginning at 11 months of gestation) until the calves reach their first birthday. The majority of calves born to privately-owned elephants are allowed to suckle and stay with their mothers until 4 or 5 years of age. All elephants finish their work season by mid-February each year, and work resumes around mid-June depending on the arrival of the monsoon season.

13.2 Challenges

13.2.1 Overview

A cross-sectoral government policy on captive elephant management and sustainability is needed to address some of the current constraints. There are more elephants in captivity than in the wild in Myanmar. This is largely due to the past practice of replenishing the captive population by capturing

elephants from the wild as a result of a greater number of deaths than births among captive elephants. This situation creates a major management challenge. The lack of political will for long- and short-term schemes of controlled breeding (systematic breeding of animals when needed or manipulation of reproductive processes of animals), provision of adequate habitat (resources), and job security (financial) for mahouts all escalate this problem. Additionally, a large number of the captive elephants in the country are not adequately monitored, and many are not even registered.

13.2.2 What to do with approximately 5000 unemployed elephants?

In April 2014, the Myanmar Government imposed a ban on exporting raw timber, only allowing the export of high-end finished timber products. While undoubtedly a wise choice for forest preservation in the country, one unfortunate side effect was that it forced many logging elephants out of work. The ban reduced timber extraction by 50% and the MTE stopped leasing privately-owned elephants for logging. The ban effectively resulted in 90% of the privately-owned working elephants in Myanmar becoming unemployed, practically overnight. Privately-owned captive elephants are distributed all over the country, but occur especially in border areas such as the Myanmar/Thailand and Myanmar/China borders. Some of these elephants, which were previously employed in the forestry industry, are now involved in illegal activities such as illegal logging, charcoal burning, mining, and trading to border countries (see also Chapter 12). In order to meet their need to generate income, it is expected that many more elephant owners will cross the border illegally with their elephants to enter neighbouring countries to engage in the tourist industry. However, their elephants are not specially trained to work in tourism and accidents leading to human and elephant casualties, and which have been reported sporadically in the media.

In 2016, the new government announced plans to stop most or all logging activities in the country. When this happens, even the government owned logging elephants will be unemployed. In addition, the use of elephants in both the agricultural and logging industries is declining because of the availability of imported, affordable powerful machines, especially manually operated cross-cut sawing machines. Traditional elephant use in logging has been replaced by mechanized applications in many parts of Myanmar. Therefore, a plan needs to be discussed now for the future management of the country's captive elephants, and appropriate and responsible uses developed for these captive elephants.

It is important to remember in this context that Myanmar is unique among elephant range States in having considerably more captive elephants (c. 5000) than wild elephants (very approximately 2000). The country, and indeed the wider elephant conservation and management communities, now

face the prospect of up to 5000 unemployed or under-employed elephants, which raises considerable challenges for both elephant welfare and elephant conservation. How should these elephants be best managed to ensure that they do not undermine the conservation of wild elephants? Are there opportunities for these captive elephants to bolster initiatives aimed at conserving wild elephants, including perhaps reintroducing some of them to the wild? How can the welfare of so many elephants be assured? These and many other questions need to be addressed as a matter of urgency. It is essential that the government and other stakeholders develop policies and guidelines to support responsible alternative uses for the large population of underemployed and soon to be unemployed captive elephants in the country. Neighbouring Thailand has already undergone this process from 1989 and may be used as a case study providing worst and best practices.

13.2.3 Mahout capacity

All working elephants require a certain level of training to obey commands. This training can be provided by experienced mahouts. Importantly, given the need to continue managing thousands of captive elephants even if they are no longer used in the forestry industry, arrangements need to be put in place for the continued education of, and incentives for, mahouts to stay with their elephants for as long as possible. High mahout turnover is detrimental for camp owners as it requires additional resources for training, and it is detrimental for elephants as mahouts with insufficient skills and experience often resort to inappropriate methods to control elephants. Moreover, mahouts unfamiliar with an elephant are often unable to notice when things are amiss with an elephant's temperament or health. This lack of familiarity on the part of the mahout can lead to sudden attacks of the elephant directed toward the mahout or other nearby people. Elephants in tourism-related settings require especially skilful and prolonged training to ensure that their interactions with tourists are as safe and predictable as possible. A high turnover among mahouts will make elephant-related activities (e.g. tourism) a risky business. It is of the utmost importance, therefore, for Myanmar to have a training program to produce highly qualified mahouts for elephant-related activities even in the post-logging-ban future.

13.2.4 Availability of foraging lands for captive elephants

For the long-term sustainability of captive elephant populations (both government and privately owned) in Myanmar, there needs to be provision of land for elephant foraging and roaming. Some private owners are now requesting land from the government for their elephants. Each elephant owner has to find a way to feed their animal(s) — elephants can eat 500 pounds of food daily. The majority of these captive elephants cannot

be released to the wild and will, therefore, continue to require food and veterinary care. The owners and mahouts will also need to continue to make a living either dependent on their elephants or presented with alternatives.

Deforestation by government projects and industrial plantations worsen the situation by depriving the captive elephants of their natural food sources. This trend jeopardizes the goal of maintaining a self-sustaining captive population of elephants in Myanmar, and is also cause for concern among other Asian Elephant range countries.

13.2.5 Elephant health

For privately owned elephants, there is a need for regular health care programs. Most of these elephants, which are spread around the country, do not have any regular health care checks and treatment programs. These elephants are generally treated by their owners without any medical knowledge but using traditional methods. The government should consider expanding elephant health care programs to these captive elephants and setting-up nursing camps for pregnant females as well.

13.2.6 The reintroduction of captive elephants

One potential strategy to maintain sustainable Asian Elephant populations with sufficient genetic diversity in Myanmar is the reintroduction of captive individuals into the wild. However, the long-term maintenance of a captive population in Myanmar may render many individuals in the current population unsuitable for reintroduction. A primary concern is genetic adaptation to captivity, in which potentially deleterious alleles in wild populations become more prevalent in captivity (Frankham 2008). This is particularly damaging in captive-born individuals that are subjected to captive environments for several generations (Frankham 2008), such as MTE elephants. Approximately 75% of the individuals in the MTE between 2014 and 2015 were born in captivity (Figure 13.1), reducing the potential for successful reintroductions. In addition to genetic adaptation, morphological changes in dentition have been documented in elephants as a result of confinement to captivity (O'Regan & Kitchener 2005). Several species have also exhibited behavioural adaptations to captivity (e.g. Day & O'Connor 2000, Adams et al. 2011), and this may reduce the probability of survival and reproduction in the wild. A crucial issue when considering the reintroductions of captive elephants to the wild is the habituation of captive elephants to humans, which is likely to result in increased HEC following reintroduction. Thus any plans for the reintroduction of captive elephants to the wild must be carefully planned in terms of the demography and number of individuals to be reintroduced and the likelihood of creating or worsening HEC problems at release sites.

13.3 Strategy

13.3.1 Development of a reporting and data management system for the entire captive elephant population in Myanmar

► Ensure all captive elephants are properly registered, including using DNA-based methods.

13.3.2 Conduct an assessment of the suitability of alternative employment for Myanmar's captive elephants.

The alternatives to consider include:

► Continued use of elephants as transport animals in remote areas.
► Use of captive elephants in high-welfare-standard elephant-based tourism. The government and some private owners are interested in exploring opportunities for using captive elephants in the tourism sector but there are concerns that 'cowboy operators' from nearby countries are entering (or plan to enter) Myanmar to set up inappropriate facilities. It is essential for the Myanmar government to establish a policy for responsible, ethical - based on a scientific knowledge of elephants' needs - elephant tourism development in country as soon as possible.
► Use of captive elephants for reducing HEC (e.g. response units).
► Use of captive elephants for protected area (PA) patrolling, field research (wildlife monitoring) in difficult-to-access terrain, and other PA management purposes.
► Reintroduction of captive elephants to the wild. Many of the objections to reintroducing elephants to the wild in Asia do not apply in Myanmar. For example, many captive elephants forage unsupervised in family groups in forest areas containing wild elephants and intermingle and indeed breed with wild elephants. Thus, the risks of disease transfer (an objection in other places) are no longer obviously relevant. Myanmar has much elephant habitat that is empty or almost empty of elephants, and many more captive than wild elephants, a situation which lends itself to experimental, soft-release, well-monitored reintroduction schemes that, if successful, could significantly improve the status of wild elephants in the country (through increased numbers in the wild and the genetic and other benefits that would bring). However, reintroduction strategies must assess all potential problems resulting from the elephants' adaptation to captivity and the potential for released animals to create HEC problems (see Section 13.2.6).
► Creation of sanctuaries for elephants that are too old or otherwise unsuitable for the options listed above.

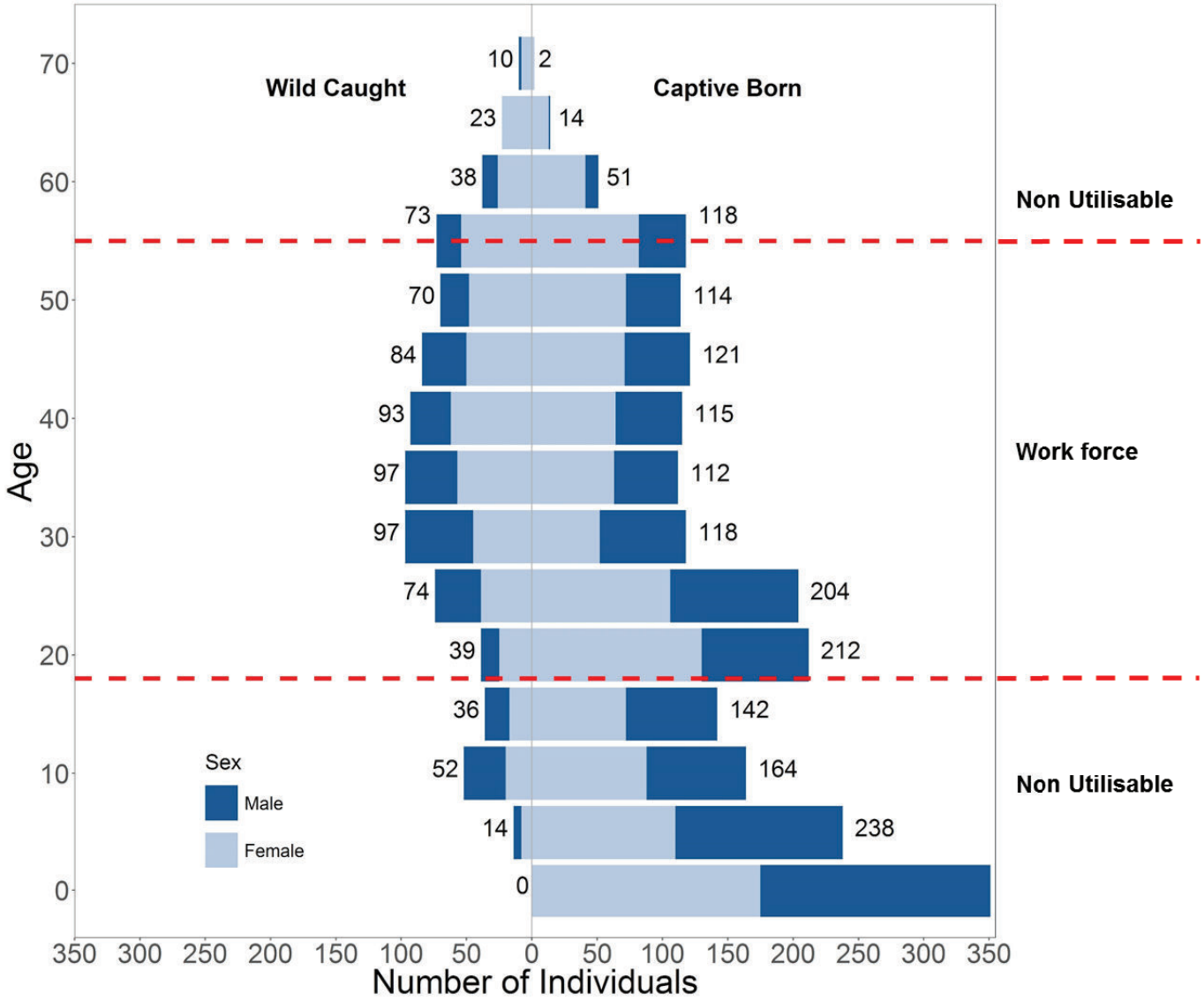

Figure 13.1: Population pyramid of captive-born and wild-caught elephants employed by the MTE in Myanmar between 2013 and 2014.

13.3.3 Develop a detailed document encompassing recommendations for managing elephants in all approved activities (e.g. patrolling, transport, tourism, and reintroduction programs).

► Identify relevant experts to prepare and review a document on best practices for managing elephants in all approved activities (e.g. patrolling, transport, tourism, and reintroduction programs).

13.3.4 Assess whether there is a need to maintain the current numbers of captive elephants in Myanmar or whether to reduce the numbers through controlled breeding (contraception), re-introductions, or other means

► In order to maintain a healthy, genetically diverse captive elephant population, reproduction programs relying on current scientific knowledge and best management practices need to be implemented without delay if Myanmar intends to maintain, decrease, or increase the numbers of captive elephants that it currently manages without impacting the wild population.

13.3.5 Identify and meet the training needs of Myanmar nationals in captive elephant biology and management

► Ongoing training opportunities for all levels of staff (mahout, camp managers, veterinarians, etc.) involved in captive elephant management should be supported.

► Additional, high-quality trading programs will most likely need to be developed as alternative uses for Myanmar's captive elephants are developed.

► Initiate a mahout training and certification program.

14.0 How to ensure coordinated, effective implementation of the MECAP

A National Coordination Committee (NCC) for the MECAP will be created to oversee and promote implementation of the MECAP and, especially, its 3-year implementation plans.

The NCC will be set-up by the Forestry Department and co-chaired by the Director General of the Forestry Department and the Managing Director of Myanma Timber Enterprise. Membership of the NCC be constituted so as to ensure broad participation by representatives from other government committees and departments including those responsible for land use planning, infrastructure development, and the judiciary, customs, police, and border security forces (for illegal trade matters). The NCC will meet two times per year. The NCC will also hold regular broad stakeholder meetings as necessary in order to promote implementation of the MECAP.

The NCC will be supported by a MECAP Advisory Group, which will be formed of representatives of NGOs, INGOs, university staff, and other experts involved in helping the Government of Myanmar implement the MECAP. The MECAP Advisory Group will meet for a day or two before each meeting of the NCC in order to prepare materials for the NCC meeting and, especially, summary reports on implementation of the 3-year MECAP implementation plans on protection of wild elephants and their habitat; mitigation of human–elephant conflict; countering illegal trade in elephants and elephant parts; and captive elephants.

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