

ELEPHANT AND IVORY TRADE IN MYANMAR

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A TRAFFIC SOUTHEAST ASIA REPORT



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Cover: Bridges on display for sale in Yangon

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Southeast Asia

ELEPHANT AND IVORY TRADE IN MYANMAR

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A carved tusk or bridge on display in a shop selling numerous pieces of ivory

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EXECUTIVE SUMMARY

Myanmar has been a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1997. Illegal trade in ivory and other Asian Elephant *Elephas maximus* products remains widespread, especially in markets along Myanmar's international borders. In 2006, TRAFFIC surveyed 14 markets in Myanmar and three border markets in Thailand and China, and found some 9000 pieces of ivory and 16 whole tusks for sale, representing the ivory of an estimated 116 bulls. Illegal killing and capture of elephants for trade continues to be a major cause of decline for Myanmar's wild Asian Elephant populations. 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. 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. The observed and reported levels of cross-border trade indicate that neighbouring countries, especially China and Thailand, also have enforcement problems, and that illegal international trade is frequently carried out with minimal risk of detection.

In addition to trade in ivory, TRAFFIC documents reports of some 250 live Asian Elephants being exported from Myanmar to neighbouring countries in the last ten years; this is mostly to supply the demand of tourist locations in neighbouring Thailand. It is important to note that no cross-border exports or imports of live elephants have been reported to CITES by either Myanmar or Thailand. Based on observations and discussions with interviewees, the capture of live elephants may be at such a rate that it is also having a negative impact on wild populations.

The most significant apparent loophole in Myanmar's legislation is the allowance of tips of tusks and tusks from government and privately-owned elephants that have died of natural causes to be sold legally. To the extent that this practice defines the current situation, it provides a ready avenue for illicit ivory to be traded under the guise of legally-acquired stocks. Dealers seem well aware of the ambiguous legislation and the potential loopholes it provides, and exploit the situation accordingly.

The Government of Myanmar should increase efforts to stop the illegal trade in elephant products, especially ivory, focusing on major trade centres, including Yangon and Mandalay, and at important border markets such as Tachilek. The Government of Myanmar should likewise increase efforts to stop the illegal trade in live elephants, especially when it pertains to cross-border trade. With respect to continued domestic trade in elephants and elephant products, TRAFFIC proposes that Myanmar instigates an effective control system that complies with the requirements of *CITES Resolution Conf. 10.10 (Rev. CoP14)*.

The Governments of China and Thailand should take action against the traders of illegal wildlife products along the borders with Myanmar, and work in co-operation with the Myanmar authorities to deal with illegal trade in elephants and elephant products.

Based on the findings of this study, TRAFFIC makes the following recommendations:

- Recognizing that international co-operation is essential to put an end to this illegal cross-border trade, Myanmar's CITES, Customs and police authorities should be encouraged to work

closely with enforcement officers in neighbouring Thailand and China, the two main consuming countries of Myanmar-sourced ivory.

- With respect to both the domestic and international trade in ivory, Myanmar needs to comply with *CITES Resolution Conf. 10.10 (Rev. CoP14)*. Myanmar needs to adopt comprehensive internal legislative, regulatory, and enforcement measures. All importers, manufacturers, wholesalers, and retailers dealing in raw, semi-worked or worked ivory products need to be registered or licensed. Recording and inspecting procedures to enable appropriate government agencies to monitor the flow of ivory in the country by means of a compulsory trade control over raw ivory and a comprehensive reporting and enforcement system for worked ivory need to be introduced. It should be made compulsory for shops, traders, and retail outlets to inform tourist 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.
- Myanmar needs to submit any data on the seizure of elephant products to the Elephant Trade Information System, and a comprehensive overview of trade in ivory should be prepared prior to the CITES Conference of the Parties 15 (CoP15).
- Authorities at airports and other points of international entry and exit must be more vigilant to prevent ivory from being carried across Myanmar's borders. Myanmar should ensure that staff based at these checkpoints are sufficiently trained in CITES implementation, enforcement and species/parts of species identification.
- Regular monitoring by Myanmar's law enforcement agencies of the markets in Myanmar should be carried out to identify and apprehend illegal trade participants, as well as monitor trends in the trade, as a move towards effective enforcement.
- Offenders should be prosecuted, to ensure just punishment and to serve as a deterrent for repeat offenders and other dealers.
- Myanmar, as a Party to CITES, must introduce and enforce Category I CITES-enabling legislation and clarify the existing national legislation on domestic ivory trade.
- Greater monitoring of domestic elephant populations is needed employing microchip and tattoo-based identification/registration systems to prevent illegal cross-border elephant trade, and to assist with management of Myanmar's wild and captive elephant populations.

INTRODUCTION

Background

Asian Elephant *Elephas maximus* populations are in serious decline throughout their range. Once roaming in the millions from Mesopotamia to China and south to Sri Lanka and Sumatra, Asian Elephant range and numbers have contracted dramatically over the last century and now only a fraction of the original population remain scattered in highly fragmented bands (Kemf and Santiapillai, 2000). This progressive decline is largely due to unrelenting human–elephant conflict, habitat loss and fragmentation, as well as ongoing illegal capture, killing and trade. The Asian Elephant is listed as Endangered under the IUCN Red List classification system (IUCN, 2006). Both population numbers and trends in population numbers and demographics are poorly understood. Generally speaking, elephant censusing techniques are poorly developed in Asia and there is little focused research tracking Asian elephant numbers. The frequently cited global estimate of 30 000–50 000 Asian Elephants is often acknowledged as little more than an outdated educated guess (Kemf and Santiapillai, 2000; Blake and Hedges, 2004). Here the focus is on the trade in Asian Elephants in and from Myanmar, and this report presents data on significant trade volumes of ivory, various other elephant parts and live elephants.

Elephants in Myanmar

Myanmar (formerly known as Burma) is the largest country in mainland Southeast Asia. Bordering five nations, Bangladesh, India, Thailand, Lao PDR and the People’s Republic of China, it is strategically located as a land bridge between South and East Asia. The country is endowed with rich natural resources – arable land, forestry, minerals including gas and oil, and freshwater and marine



A very young elephant being used for logging in Myanmar

Lek Chailert

resources (ADB, 2006). Although rich in wildlife, habitat loss, illegal and unregulated hunting for domestic and international trade (Martin and Redford, 2000; Shepherd, 2001; Rao *et al.*, 2005; Shepherd and Nijman 2007a,b, 2008), threaten the existence of many species in Myanmar. Law enforcement with respect to wildlife conservation in Myanmar is poor, and overall Myanmar has a weak record of transparency and accountability. Indeed, Myanmar consistently ranks amongst the most corrupt countries in the world, being in the unenviable position, alongside Somalia, as the most corrupt countries in the world, according to the 2007 country rankings of the Corruption Perception Index (Transparency International, 2007).

Myanmar is thought to have the largest remaining population of wild Asian Elephants in Southeast Asia, and is second only to India in all of Asia (Kemf and Santiapillai, 2000). However, there is only crude information on elephant distribution, with no accurate numbers for the national population available (Blake and Hedges, 2004). Current estimates put Myanmar's wild elephant population at approximately 4000–5000 animals (Aung, 1997; Kemf and Santiapillai, 2000), although no accurate nationwide census has ever been carried out and Blake and Hedges (2004) argued convincingly that all estimates are deemed to be no more than educated guesses.

Unlike neighbouring countries, Myanmar still has large tracts of relatively intact forests (Rao, *et al.*, 2005) which, if adequately protected, could be a major stronghold for Asian Elephants (Leimgruber *et al.* 2003). With efficient land use planning and forest protection, the potential to maintain or regain large viable populations of elephants is promising. Maintaining connectivity between forest blocks in Myanmar, however, is essential to allow for natural migration of elephant herds.

Two sites have been identified in Myanmar (Shwe U Duang and Alangdaw Kathapa National Park) to monitor elephant poaching under the CITES-mandated Monitoring of the Illegal Killing of Elephants (MIKE) programme. Preliminary surveys of the Shwe U Duang elephant populations have been carried out by the Smithsonian Institute, but censusing of the Alangdaw Kathapa National Park population has not yet occurred. Results of these surveys, and from other anecdotal sources working in other parts of Myanmar, suggest that wild populations are very low, even though large areas of suitable habitat remain (BirdLife International, 2005). It is suspected, at least in some areas, that local elephant populations may have been negatively impacted by persistent capture and sale to tourism operations in Thailand (David Lawson, *in litt.* to TRAFFIC, April, 2007). It has also been reported that, in some locations in Myanmar, hunting has resulted in the local extirpation of elephants (Rao *et al.*, 2005).

Hunting and capture of elephants in Myanmar is mainly to satisfy the demand for ivory and live elephants respectively, and not to provide a source of protein through the consumption of elephant meat. Unfortunately, there is little detailed information on the overall scale and dynamics of the wildlife trade in Myanmar and investment in tackling the illegal and unsustainable trade has been severely limited (BirdLife International, 2005). Unlike African Elephants *Loxodonta africana*, where both sexes carry tusks, only the male Asian Elephant has tusks (females very rarely do). It has been suggested that a history of poaching of adult males for their tusks can result in significantly skewed sex ratio in some populations, reducing population viability (Santiapillai, 1997; Sukumar *et al.* 1998), however more detailed research is needed to confirm this hypothesis.

Capture of elephants for the local timber industry has further fuelled the decline of wild populations (Kemf and Santiapillai, 2000). Significantly, Myanmar has the largest captive population of Asian

Elephants in the world (Lair, 1997; Kemf and Santiapillai, 2000; Naylor, 2004; BirdLife International, 2005), which has been estimated to number between 6000–7000 animals (Kemf and Santiapillai, 2000). Of these, approximately 2800 are registered working elephants in the timber industry, and the remainder are privately-owned (Kemf and Santiapillai, 2000). In addition to use in the logging industry, elephants are also used on farms as draught animals, pulling ploughs in northern Myanmar (Onishi, 2001). While much of the capture of wild elephants for use in logging and timber operations has in the past been carried out in adherence with national legislation, illegal capture of live elephants for employment occurs as well (Santiapillai, 1997). Wild elephants continue to be taken from the wild to augment captive populations within Myanmar and also in Thailand (Kemf and Santiapillai, 2000; Shepherd, 2002). Kemf and Santiapillai (2000) stated that as many as 120 elephants were being taken from the wild annually at that time. Illegal capture remains common in some locations where there are still wild elephants as well as indigenous peoples with elephant-capturing traditions (Lair, 1997).

The capture and sale of live animals for use in the tourism industry, especially in neighbouring Thailand, also constitutes a major threat to Myanmar’s elephants. In the past, live elephants were often smuggled into Thailand for use in the logging industry (Lair, 1997). However, since Thailand banned logging in 1990, market preferences have caused a shift in the age composition of the live elephants taken out of Myanmar, with calves and juveniles now being targeted and sold into the tourism industry (Lair, 1997; Shepherd, 2002).

While there is some domestic use of elephant parts within Myanmar for traditional medicinal purposes, and of live elephants for the logging and agricultural industry that still relies on elephants

as draught animals, from a wildlife trade perspective the most serious threat may be from the international demand for ivory, sold largely to foreign buyers (Shepherd, 2002). It is acknowledged that at least some of this ivory may result from elephants that die naturally, or that are killed as a consequence of human-elephant conflict, but the large monetary value of ivory, its durability and ease of transportation, makes killing of elephants for ivory an important issue in the conservation of Myanmar’s elephants.

In the 1980s, it was reported that much of the Asian Elephant ivory being supplied illegally to Thailand originated from Myanmar (Nash, 1997). Official surveys carried out by the Forestry Department of



Large tusks including this one were observed in a craftsman’s home awaiting carving

Chris R. Shepherd/TRAFFIC Southeast Asia

markets known to be places where ivory is frequently traded have apparently found no evidence of ivory trade (Lwin, 1994). While this may represent some degree of denial on the part of the authorities, it is also possible that dealers were aware of the timing of these surveys and temporarily hid their ivory stocks. It is also common knowledge, reaffirmed by observations in the present survey, that ivory dealers specifically target foreign visitors as these are most likely to have the sources available for purchasing (worked) ivory (products). Local people are generally not viewed as credible buyers of worked ivory products in such markets.

Protection of elephants

I. National protection

Myanmar has committed to safeguard its wild elephants through national legislation and international conventions. Asian Elephants in Myanmar were first protected in 1879 under the Elephant Preservation Act, which was later amended in 1883. This Act was superseded in 1935 by the Wildlife Protection Act, which was also amended in 1956 (Aung, 1997). Today, the Asian Elephant is listed as a “Totally Protected Species” under the Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (State Law and Order Restoration Council Law No.583/94.1994), which states that killing, hunting or wounding a totally protected wild animal without permission, or possessing, selling, transporting or transferring such wild animals or any part thereof without permission is illegal. Violation of this law is an offence punishable with imprisonment for a term which may extend to seven years, or with a fine which may reach 50 000 MMK (USD 1490). The Elephants Registration Act of 1951 was also put into place to further protect live elephants from illegal trade (Aung, 1997).

It is interesting to note that Divisional Forest Officers are empowered to give to any person who captures or kills any animal in defence of himself or any other person, or in bona fide defence of property, the animal or any part thereof, although elephant tusks are explicitly exempt from this practice.

It has been stated in earlier publications that it is legal to purchase the tips of tusks cut off from domestic elephants and to transport and sell carved ivory (Martin and Stiles, 2002) or tusks from domestic elephants that have died of natural causes (Naylor, 2005). However, according to the Nature and Wildlife Conservation Division (NWCD), Forest Department, Ministry of Forestry, this is not the case, and any sale of ivory is illegal (Tin Tun, Deputy Director, NWCD *in litt.* to TRAFFIC, 2007). Some ambiguity remains, however, as the Forest Department and Myanmar Timber Enterprise (MTE) have previously stated that State-owned Myanmar Timber Enterprises used to export tusks from dead



Elephants are used in the logging industry and as draught animals in Myanmar

Lek Chailert

elephants belonging to MTE to international markets before Myanmar became a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1997. Apparently, MTE continues to auction extra ivory (presumably sawn-off tips and tusks from elephants that have died of natural causes) in local markets with the permission of the Ministry (U Than Myint, WCS Myanmar Program, *in litt.* to TRAFFIC, 2007).

Any death of privately-owned elephants must be reported to the Forest Department, so that the registration can be cancelled. If the dead elephant had tusks, the owner may sell them locally. However, there is no clear procedure, order or instruction for selling such ivory to local dealers (Anon., WCS Myanmar Program, *in litt.* to TRAFFIC, 2007).

2. International regulations

Internationally, Asian Elephants have been listed in Appendix I of CITES since 1975, which prohibits international commercial trade of live specimens, their parts or derivatives. This includes the trade in raw ivory, and all products made out of ivory.

In September 1997, Myanmar acceded to CITES, thus committing to eradicating the international trade in Asian Elephants and their parts and derivatives. The agency responsible for the national implementation and enforcement of CITES in Myanmar is the Forest Department, under the Ministry of Forestry, which houses both the CITES Management and CITES Scientific Authorities. Furthermore, all countries bordering Myanmar are Parties to CITES.

As a Party to CITES, Myanmar is fully obliged to implement and enforce the requirements of the Convention through national legislation. All Parties to CITES have been categorized under the CITES National Legislation Project based on the ability of their national legislation to implement and enforce CITES. The categories are as follows:

Category 1 – legislation that is believed generally to meet the requirements for the implementation of CITES.

Category 2 – legislation that is believed generally not to meet all requirements for the implementation of CITES.

Category 3 – legislation that is believed generally not to meet the requirements for the implementation of CITES.

Ten years after becoming a signatory to CITES, Myanmar has yet to fulfil this obligation, and as yet does not have a legal framework that sufficiently allows for CITES to be effectively implemented; Myanmar's legislation remains rated in Category 3.

The African Elephant was transferred from Appendix II to Appendix I in 1989, but four national populations were subsequently re-listed in Appendix II, in 1997 and 2000, subject to a conditional annotation (<http://www.cites.org/eng/res/10/10-10.shtml>). The Asian Elephant's CITES listing has not been subject to change and has remained in Appendix I since 1975. Poaching to supply the global demand for ivory has played a major role in the decline in numbers of both species in recent times (Santiapillai *et al.*, 1999; Bulte *et al.*, 2003; Naylor, 2005). All commercial international trade in elephant ivory has been banned under CITES since January 1990, with a few exceptions including legal



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Numerous pieces of ivory for sale in a retail outlet in Mandalay according to the owner of this shop the majority of the pieces are sold to buyers from China, Japan and Thailand

trade in worked ivory being permitted in Zimbabwe since 1997, and a one-off sale of African ivory in 1999 to Japan. As a Party to the Convention, no commercial trade in live animals or their parts (including ivory) from either elephant species to or from Myanmar should be permitted. However, the CITES trade ban does not seem to have been successful in reducing the scale of ivory markets and demand in many places around the world (Stiles, 2004), including Myanmar.

The basic CITES requirements for internal trade in ivory are clearly delineated in *Resolution Conf. 10.10 (Rev. CoP14)*, calling for:

The registration of all importers, manufacturers, wholesalers and retailers dealing in raw, semi-worked or worked ivory products;

- The introduction of “*recording and inspection procedures to enable the CITES Management Authority and other appropriate government agencies to monitor the flow of ivory within the State*”;
- The instigation of “*compulsory trade controls over raw ivory*” and the introduction of a “*comprehensive and demonstrably effective reporting and enforcement system for worked ivory*”; and
- The dissemination of 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 own home countries*”.

In response to the Elephant Trade Information System (ETIS) analysis (see below) at CoP12, the Parties agreed Decision 12.39 which initiated an intersessional CITES process, under the direction of the Standing Committee, to deal with the issue of domestic ivory markets that fail to



Intricate ivory carvings such as this which was photographed in a Mandalay shop, may take months to carve

comply with the requirements specified in *Resolution 10.10 (Rev. CoP12)*. At CoP13, this decision was replaced by *Decision 13.26* which established an “*action plan for the control of trade in African elephant ivory*”.

This action plan calls for all African Elephant range States:

- *To prohibit unregulated domestic sale of ivory, whether raw, semi-worked, or worked;*
- *To instruct all law enforcement and border control agencies to enforce such laws; and*
- *To engage in public awareness campaigns to publicise these prohibitions.*

The “action plan” clearly targets Africa’s unregulated domestic ivory markets by obliging all elephant range States to comply with CITES requirements for internal trade in ivory outlined in *Resolution Conf. 10.10 (Rev. CoP14)* or face the imposition of punitive sanctions, including the possible suspension of all international trade in CITES-listed species. *Decision 13.26* also calls for the continued monitoring of “*all domestic ivory markets outside Africa to ensure that internal*

controls are adequate and comply with the relevant provisions of Resolution Conf. 10.10 (Rev. CoP12) on trade in elephant specimens” and that “*priority should be given to China, Japan and Thailand*” in this regard. In its latest manifestation, *Decision 13.26 (Rev. CoP14)*, the “action plan” calls for all elephant range States and other countries identified by ETIS to respond to a detailed questionnaire on ivory trade controls by 31 December 2007. The Secretariat will be preparing a report on the response to the questionnaire for the 58th meeting of the CITES Standing Committee.

3. Elephant Trade Information System

To track continuing illegal international trade in ivory, ETIS was developed as one of the two formal monitoring systems for elephants under CITES (the second being the Monitoring the Illegal Killing of Elephants—MIKE), as mandated in *Resolution Conf. 10.10 (Rev. CoP14)*. Based on global elephant product seizure records from 1989 onwards, ETIS now comprises the world’s most comprehensive set of law enforcement records on illegal trade in elephant products. Using various statistical methods, ETIS is designed to track trends and changes in trends in the illegal trade in ivory over time, and to identify those countries most heavily implicated in ivory trade dynamic (<http://www.cites.org/eng/prog/ETIS/index.shtml>). ETIS has been developed and managed by TRAFFIC on behalf of the CITES Parties since its inception in 1997 (Milliken *et al.*, 2004). As a Party to CITES, Myanmar is obliged to participate in the ETIS process, as *Resolution Conf. 10.10 (Rev. CoP14)* calls for all Parties to submit elephant product seizure information within 90 days of their occurrence. To

date, Myanmar has yet to submit a single elephant product seizure record to ETIS (Tom Milliken TRAFFIC, *in litt.*, 2007).

In ETIS, there are few reported records of seizures of ivory or other elephant products that relate to Myanmar. Since 1980, only two countries have reported such seizures to CITES, including New Zealand, which seized eight elephant bone pieces in 1997 and one bone in 1998, and the USA, which seized 12 ivory carvings in 1988, one ivory carving in 1999 and four more in 2005 (UNEP-WCMC, 2007). Other sources report seizures of elephant products from Myanmar in China (e.g. O’Connell-Rodwell and Parry-Jones, 2002), but these have apparently not been reported to ETIS. However, market observations and anecdotal information from Myanmar and its neighbouring countries suggest illegal trade levels remain relatively high (Lair, 1997; Shepherd, 2002; Stiles, 2004).

4. Regional protection efforts

Myanmar, along with all 10 Member Countries of the Association of South-East Asian Nations (ASEAN), has committed to a Regional Action Plan on Trade in Wild Fauna and Flora. This action plan includes objectives on increased law enforcement networking to prevent illegal trade, which is being implemented through the ASEAN Wildlife Enforcement Network (ASEAN-WEN). Formed in 2005, this represents the world’s largest wildlife enforcement network, which aims to facilitate better intelligence sharing between national counterparts, increased collaboration between government agencies, and cross-border co-operation to prevent illegal trade.

Given the international nature of trade in elephants and elephant products, ASEAN-WEN provides a platform for international cooperation between enforcement agencies to combat the illegal cross-border trade. Myanmar and Thailand could initiate targeted enforcement operations to combat cross-border trade.



An ivory dealer showing a carved tusk or bridge for sale in his shop.

Chris R. Shepherd/TRAFFIC Southeast Asia

Aims of the present study

Despite measures to protect Asian Elephants in Myanmar, illegal trade continues both at national and international levels. Markets selling products derived from elephants, especially ivory, are located

along Myanmar's borders with China and Thailand (but less so with Bangladesh, Lao PDR and India) indicating that much of the trade is destined for international markets in East and Southeast Asia, and further abroad, in violation of CITES and Myanmar's national legislation.

Figure 1.
Southeast Asia, showing the survey sites in Myanmar, two survey sites in China and one survey site in Thailand.



In order to assess the current level of trade in Asian Elephants and elephant products in Myanmar (especially focusing on ivory), TRAFFIC carried out surveys of markets and trade centres in Myanmar, as well as markets along its borders with Thailand and China in 2006.

This report also examines the extent of the trade in live elephants and their parts in Myanmar, and illustrates methods and routes used by illegal traders to move live elephants and ivory across international borders. This study attempts to quantify the trade in elephants and elephant parts in Myanmar and identify the major consumers. Further, using these data, the effectiveness of national and international trade regulations implemented by Myanmar and its neighbouring (importing) countries are assessed. It is hypothesized that trade in elephant parts is largely demand-driven, and that



An ivory carver's work station with ivory chopsticks being prepared.

differences in the relative availability of different categories (raw ivory, worked ivory, non-ivory, etc.) of elephant parts between markets, if any, reflect variations in clientele.

This study also briefly explores the nature of the captive-breeding of Asian Elephants in Myanmar, with respect to its relevance to CITES, and proposes a detailed set of

recommendations to curb the trade in elephants, elephant parts and ivory in and from Myanmar.

Prior to release of this report, all intelligence gathered during these surveys was handed over to the Myanmar CITES Management Authority, detailing volumes, locales, trade routes and dates. Subsequently, a similar letter was sent to the CITES Management Authorities in China and Thailand, and the CITES Secretariat.

METHODS

Data acquisition

Based on earlier surveys of the trade in elephants and their parts and derivatives in Myanmar (Shepherd, 2001, 2002; Martin and Stiles, 2002), priority locations were selected and re-visited in early 2006. Other information led to the selection of some additional locations not previously surveyed. In addition to study sites within Myanmar, surveys were also carried out in known and suspected markets along its borders, inside of China and Thailand.

More specifically, within Myanmar, surveys were carried out in 14 locations: 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 (see Figure 1). Of these, Three Pagodas Pass and Tachilek are situated on the Thai border, Mong La is located on the China border, and Nanyan, Tanaing and Shin Bwa Yan are all within 20 km of the Indian border. Surveys in China were carried out in the towns of Ruili and Jiegao. In Thailand, only one market was surveyed, in Maesei (also transcribed as Mae Sai or May Sei), across the border from the Tachilek market in Myanmar.

All surveys were conducted between January and March 2006 by one or both of the authors and/or an anonymous consultant. Occasionally the researchers posed as precious stone dealers with casual interest in the ivory trade, but more often they simply showed an interest in ivory and other elephant

products, and there was no need to resort to undercover techniques to obtain the relevant data. In Mong La an obligatory State tourist guide helped with locating places where wildlife was sold, and in Three Pagodas Pass, an individual working for the Ministry of Agriculture and Irrigation assisted in locating ivory and other wildlife products. Neither of these government officials was aware of the true nature of this survey.

During these surveys, all elephant products observed were recorded as far as possible, and additional information was gleaned from dealers through informal interviews and conversations. The larger part of the survey focused on elephant products, but in relevant locations data on trade in live elephants were collected.



Chris R. Shepherd/TRAFFIC Southeast Asia

Newly carved ivory chopsticks in a carver's workshop in Myanmar. Chopsticks are one of the most common ivory items produced for illegal export

The elephant in Myanmar is known locally by various names, depending on the language in use (U Tun Yin, 1967). By the Kachin, from the northern hills, it is known as *Magwi*, the Karen, originally a hill people but now largely settled in the central plains, know it as *Rhasaw*, whereas the Shan, from the eastern Shan Plateau, know it as *Sang*. In Burmese, widely spoken by the Burmese and the Mon, the Elephant is known as *Sin*. However, the Burmese have different names for different kinds of males, depending on the tusks they exhibit. Thus, males with two tusks are known as *Swai-sone*, males with one tusk as *Tai*, males with tushes (like those of females) as *Han*, and males without tusks or tushes as *Hine*. The Burmese also have different terms for the different types of tusks, i.e. *Swai-gar* for widely spread, curving tusks; *Swai-saik* for straight downward curving tusks; *Swai-toke* for short stumpy tusks and *Hnget-pyaw-bu* for stumpy tusked and shaped like a banana bud (U Tun Yin, 1967).

In addition to gathering data through surveys, information was also gathered from published and unpublished literature, media reports and other sources. Data on the export of elephants from Myanmar was obtained from the UNEP-WCMC database (<http://www.unep-wcmc.org/citestrade/>). No elephants or elephant products were purchased during this study.

Analysis

Analysis is based on data from 2006 only. All elephant parts recorded were categorised into “ivory” and “non-ivory items” groups. Non-ivory parts included skin pieces, molars, pelvic bones and jewellery made out of elephant tail hairs. The ivory parts were divided into five main categories — jewellery, utensils, name seals, ornaments, and raw ivory. Each category comprised between 1 and 10 distinct items (see Table 2 for an overview). With non-ivory items as a sixth category, the aforementioned categories form the basis of this analysis. A market is defined here as any shop or stall selling wildlife products, and in particular elephant parts within a limited geographic area, usually a town or a village. For the purposes of analysis, national borders by definition separate markets. Border markets and interior markets were differentiated based on their proximity and access to neighbouring

countries, and medicinal markets and tourist markets based on the products they offer and based on their clientele.

The number of items recorded in the different categories at individual markets number in the thousands. Because of these high numbers, by comparing the relative proportions between markets with, for instance, Chi-square tests, even minor differences (e.g. a few percent more or less), can be statistically significant. A more robust manner of testing for differences between markets was used, which assumes that if two markets are similar with respect to availability and clientele, there would be a significant correlation between the numbers of items in the different categories.

Based on dissimilarities (squared Euclidian distances) between markets, a hierarchical cluster analysis was constructed, where markets that are most similar cluster together and where markets that offer different sets of elephant parts end up on different branches. The relationship between size of raw ivory (length and weight) and requested prices was explored. For a selected group of items for which sufficient data on prices was available, i.e. carved bridges (a bridge is the term used to describe a whole carved tusk), the relationship between size of the item and retail price was explored.

The size of elephant tusks is related to the age of the animal, with older animals bearing larger tusks. To obtain an indication of the number of elephant tusks needed to produce the ivory products as

observed in Myanmar in 2006, an estimate of “average” tusk weights is needed. In the late 1960s, when Asian Elephants were more abundant in Myanmar, with possibly males having longer tusks on average than they have today, it was reported that most males had tusks which averaged between 1.20–1.50 m in length (U Tun Yin, 1967). About one-third of the total length of the tusk is hidden in the skull. Given the relationship between tusk length and weight (see results, Figure 4), tusks of this length would probably average some 15 to 20 kg. However, based on observations during this study, most of the tusks observed in trade were considerably smaller, closer to 80 cm on average, placing them in the 7.5 to 8.0 kg weight range. Other published estimates of an “average tusk” weight are 3.4 kg/tusk (Sukumar *et al.*, 1998) to 10.6 kg/tusk (Sukumar, 1989). Combining these data, an “average tusk” weight of 7.25 kg is derived. Most come from male Asian Elephants, with only a small proportion possibly originating from female Asian Elephants which occasionally carry small tusks, known as *tushes*.



Chris R. Shepherd/TRAFFIC Southeast Asia

Large tusks including this one were observed in a craftsman’s home awaiting carving

make up between 4–8% of the total population. In African Elephants, Parker and Martin (1982) used a figure of 1.88 as the “average” number of tusks per individual (males and females), closely

As indicated earlier, not all males have two “normal” tusks. Sukumar (1989) indicated that in southern India, depending on the age-class, tuskless males



A shop owner packaging newly carved ivory chopsticks. She stated that these had been ordered by a company in Japan and added that the main buyers of ivory chopsticks were from Japan.

corresponding with the data from Sukumar (1989). This number was used to estimate the average amount of ivory that can be obtained per male Asian Elephant (i.e. $7.25 \text{ kg} \times 1.88 = 13.6 \text{ kg}$). For each of the main items “average” weights were estimated, based on the system of Martin and Stiles (2002); i.e. 50 grams for jewellery, utensils, name seals; 500 grams for raw tusk pieces, figurines, boxes, etc.; 2 kg for a bridge; 7.25 kg for a polished tusk, and multiplied by the number of items observed. The summed total was divided by 13.6 to estimate the minimum number of (male) Asian Elephants from which the tusks were derived.

In Myanmar prices were either given in local currency (Myanmar Kyat, MMK) or frequently, and often exclusively, in US Dollars (USD), Thai Baht (THB) or Chinese Yuan Renminbi (CNY). Prices in Thailand and China were either in local currency or USD. Prices have been converted at the prevailing exchange rate at the time (1 USD = 38.76 THB; 17.74 CNY; 6.65 MMK at the official rate).

RESULTS

Trade in elephant products

I. Numbers and origin

Elephant products are sold generally as luxury goods (ivory) or for traditional medicinal uses. Elephant parts commonly found in traditional medicines include molars, bones and pieces of skin.

Almost 800 rings made of elephant tail hairs were recorded. These hairs may have been taken after the elephant had been killed or died naturally, or may have been harvested in a non-detrimental manner from domestic elephants. Because of these latter possibilities, these items have been excluded from the analysis. The total amount of ivory observed during this study was 8886 pieces, including 16 whole tusks (Table 1). All whole tusks were observed in Myanmar. Using the assumptions described in the Methods section above, this totals an estimated 1500 kg of ivory, and conceivably represents the ivory of a minimum of 116 male Asian Elephants. There were no indications that any of the ivory observed was from African Elephants, although it is recognized that distinguishing African from Asian Elephant ivory without employing sophisticated forensic techniques is generally not possible. All indications,

Table 1.

Overview of number of elephant items recorded in seven markets in Myanmar and three in towns bordering Myanmar.

Item	Myanmar (7 markets)	Thailand (1 market)	China (2 markets)
Worked ivory	7882	444	519
Raw ivory	34	2	5
Non-ivory	51	0	27
Tail hair rings	789	0	0
Total	8756	446	551

however, suggested that the ivory observed originated from Myanmar itself, while there remains a possibility that some ivory had been sourced from India. According to ivory carvers and dealers in Myanmar, Asian ivory is perceived as being far superior to African ivory and carvers in Mandalay stated to TRAFFIC researchers that ivory from Myanmar's elephants was of a higher quality than that from India.

According to all dealers in all markets surveyed, ivory was generally intended to be sold to foreigners, especially individuals from China, Thailand and Japan. Two retail dealers in Mandalay and Yangon also stated that some carved ivory is exported to the USA, Italy and France. This was further confirmed by dealers in Myanmar, who stated to TRAFFIC that the trade in ivory exists largely to supply international demand, especially that in Thailand, China and Japan.

2. Similarities and dissimilarities between markets

No ivory or other elephant products were found for sale in Bago, Nanyan, Tanaing, Shin Bwae Yan, Mindone, Pho Kya, and Myit Kyit Nar, and these locations have subsequently been left out of the comparative analysis of markets. There were significant positive correlations between the distribution of the six types of elephant products between the markets of Tachilek-Three Pagodas Pass, Tachilek-Ruili, and Tachilek-Jiegao (Pearson Correlation Coefficient $r > 0.97$, $N = 6$, $P < 0.001$), meaning



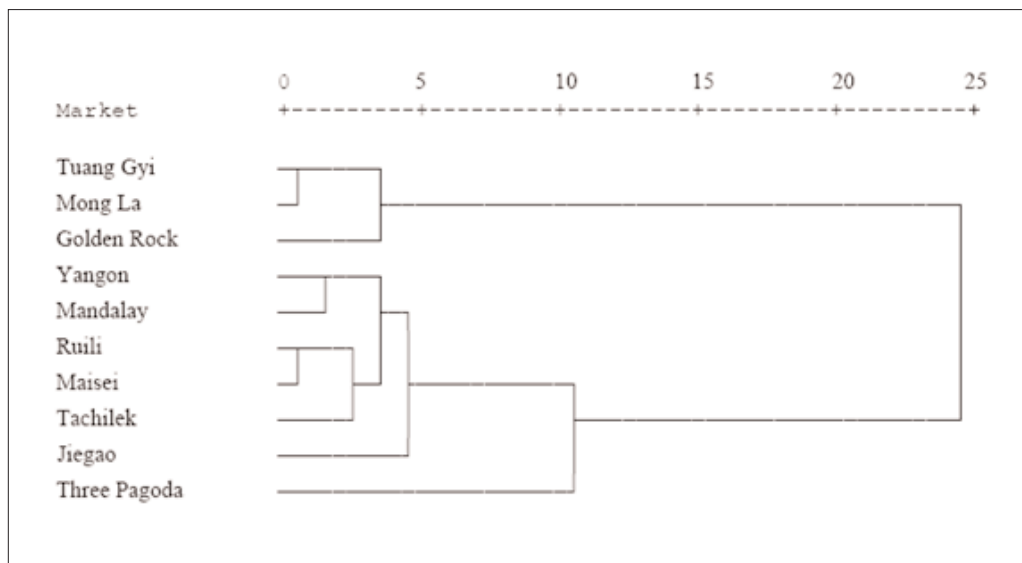
Chris R. Shepherd/TRAFFIC Southeast Asia

Carved ivory on display in a retailer's shop. The owner stated that the majority of these pieces are exported to China and Japan

that the relative amount of the different items (non-ivory, ivory utensils, ivory name seals etc.) on offer were similar in these markets. Likewise, similar positive correlations were found between Golden Rock-Tuang Gyi and Golden Rock-Mong La ($r = 0.99$, $N = 6$, $P < 0.001$), Tuang Gui and Mong La ($r = 1.00$, $N = 6$, $P = 0.000$), Three Pagodas Pass-Ruili, Three Pagodas Pass – Jiegao ($r > 0.95$, $N = 6$, $P < 0.004$), Ruili-Jiegao, Ruili-Meisai and Jiegao-Meisai ($r > 0.93$, $N = 6$, $P < 0.007$), again indicating that

Figure 2

Hierarchical cluster analysis of ten markets selling ivory and elephant parts in Myanmar in 2006, showing the two main clusters of medicinal markers (top part) and tourist markets (bottom part)



these markets have a similar range of products on offer. There were no significant negative correlations, meaning that there were no markets that strongly contrasted in what they had on offer.

The three main medicinal markets (Golden Rock, Tuang Gyi, Mong La) form one cluster, and within this cluster Tuang Gyi and Mong La grouping together (Figure 2). The main tourist retail markets (Yangon, Mandalay, Ruili, Maisei, Tachilek, Jiegao) form a second cluster, with the markets of Ruili in China and Maisei in Thailand showing great similarity in composition of the types of elephant products on sale. Three Pagodas Pass sells elephant parts both for the medicinal and tourist trade; it clusters basal to the main tourist retail markets. Although the hierarchical [cluster] analysis results in the types of markets clustering together, i.e. medicinal markets clustering with medicinal markets and tourist markets clustering with tourist markets, no such pattern emerges regarding geographical location (i.e. interior markets vs. border markets, or Myanmar, Thai or Chinese markets). It appears that border markets offer a slightly different range of products than the markets in the interior, and may cater for a different clientele. A discussion on these two main types of markets, medicinal and tourist, is found below.

2.1 Medicinal Markets

2.1.1 Interior

Golden Rock

The town of Kyaik-tiyo, commonly known as Golden Rock, was surveyed and found to have a large variety of wildlife parts and products for sale as traditional medicines, including elephant parts. Unlike markets catering to foreign tourists, this particular market supplies buyers with traditional medicines, not luxury or trophy items. The vast majority of the customers visiting this market are locals, and all prices were quoted in MMK, the Myanmar currency. In 2000, a wider variety of products was observed, including six soles of elephant feet, 25 pieces of skin, numerous tail hair rings, two tails, 2

(partial) leg bones, numerous beads made from bones and 22 molars (Shepherd, 2001). During the survey in 2006, 21 pieces of skin, eight molars and approximately 400 rings made of tail hair were observed, in addition to four tusk tips (Table 2). According to one dealer, the elephant parts in this market were purchased from the nearby Karen people. Numerous other wildlife products, many of which were from protected species, were observed. However, dealers stated that they sometimes have to hide these products as the authorities occasionally check on the market.

Tuang Gyi

In the town of Tuang Gyi, a total of 50 elephant tail hair rings were observed as well as three skin pieces. No other elephant products were available and very little wildlife of any kind was observed for sale, although informants stated that the town once had a significant trade. Products that were observed were for sale for medicinal purposes, not for the tourism industry. According to a dealer, elephants and other large animals are now extremely rare and when they are found and killed, they are taken by large dealers



Chris R. Shepherd/TRAFFIC Southeast Asia

Small religious icons carved from ivory are sold in a number of locations in Myanmar

(usually from the military) to the main trade centres in Mandalay or Yangon. The majority of the customers visiting this market are from Myanmar, and all prices were quoted in MMK.

2.1.2 Borders

Three Pagodas Pass

Three Pagodas Pass is situated along the Thai-Myanmar border, on the Myanmar side. Numerous wildlife parts and derivatives from a wide range of species, all apparently originating in Myanmar were observed. The wildlife for sale in this market is largely for medicinal use, as well as for trophies and luxury, including some elephant ivory products, (21 pieces of ivory and two molars) (Table 2). The majority of the customers visiting this market are locals and Thais, with prices being quoted in MMK as well as THB.

Mong La

Mong La is situated in one of Myanmar's Special Development Zones, immediately adjacent to the border with China's Yunnan Province. Nightclubs, brothels, hotels, and 24-hour casinos attract large numbers of Chinese to indulge in activities largely banned inside China (Oswell and Davies, 2002; Davies, 2005). In the past, the region was off limits to non-Chinese foreign visitors, but more recently, foreigners from elsewhere have begun to visit the area intermittently, regardless of the seven-hour land journey from the Thai/Myanmar border. The market sells mostly wild meat, although some other wildlife parts are also sold for medicinal purposes. During a one-day visit in 2006, 14

vendors were observed selling a combination of freshly killed animals and dried or durable parts (horns, antlers, etc.) including four pieces of Asian Elephant skin (Shepherd and Nijman, 2007a). The majority of the customers visiting this market were Chinese, with some products purchased by locals too. Along with Burmese, Chinese is commonly spoken. All signs in Mong La are written in Chinese characters, and the CNY, and not the MMK, is the currency of daily use.

2.2 Tourist Markets

2.2.1 Interior

Bago

The town of Bago, once an important trade centre for ivory, was surveyed, but no ivory or other elephant products observed. According to vendors in Bago, they could no longer afford to buy ivory. The majority of the customers visiting markets in Bago are locals, however, nearby temples and other cultural important sites do attract visitors from abroad. The currency of daily use in Bago is the MMK.

Yangon

Yangon, formerly Rangoon, is the largest city in Myanmar, and an important trade centre for numerous wildlife commodities, including ivory. Forty shops were found in Yangon with ivory openly available for sale, with a total of 1904 pieces observed, the second highest quantity (after Tachilek) observed in any location during this survey (Table 2). Customers visiting these markets were a mixture of foreign tourists and businessmen, and locals. Prices for ivory were quoted in both MMK and USD. Dealers acknowledged that the trade was illegal, and stated that tusks were kept in their homes and only brought into the shop if someone ordered them. One dealer, who had raw tusks, stated that people ordered specific carved pieces, and only then did she send the tusks to be carved according to the customer's specifications. She stated that all carving in Myanmar is done in Mandalay, as did most other dealers in Yangon. Mandalay was the only location mentioned by any dealers as a carving centre.

In the Alone township of Yangon, near the main port, is the Myanmar Timber Enterprise head office. According to staff, a store of tusks is kept there, presumably all from dead timber-working elephants. No information, however, on the number of tusks in the store was given.

Mandalay

In Mandalay, the second largest city in



Figure 3 - A large tusk being cut into smaller pieces in preparation for carving at a craftsman's home in Mandalay

Chris R. Shepherd/TRAFIC Southeast Asia

Myanmar, a total of 17 retail outlets were found with a total of 1821 pieces of ivory observed openly for sale. According to dealers in Mandalay, the majority of ivory is sold to visiting Chinese, Japanese and Thai buyers, much of which is sold wholesale. However, two large-scale dealers with in-house carving



Chris R. Shepherd/TRAFFIC Southeast Asia

Figurines such as these, were amongst the most numerous carved ivory pieces offered for sale in Myanmar

operations stated that they also sold ivory to buyers from France and Italy. Customers visiting markets in Mandalay are a mixture of foreign and local tourists and businessmen; prices were quoted in MMK and USD. No other wildlife products were observed for sale in the shops selling ivory.

Two carvers were also visited in Mandalay. During TRAFFIC's visit to one of these locations, a carver was in the process of cutting raw tusks into pieces for carving (See Figure 3). Six large raw tusks were observed in this carver's workplace. According to the owner of this business, she was the fourth generation of carvers in this family (photos of two other since deceased individuals, and her very elderly father in his bed were all shown to the TRAFFIC investigator). The owner of this shop stated that in the past much time and effort was put into creating beautifully carved pieces. Now, most of the products ordered, especially from Japanese wholesale buyers, are name seals and chopsticks, items which can be produced simply and quickly. She stated that the carving art in Myanmar is dying.

2.2.2 Borders

Tachilek

Tachilek is a notorious border town situated on the Myanmar side of the Thai-Myanmar border, adjacent to the Thai city of Maesei, and well known for the availability of a wide variety of illegal wildlife products. The town has a large wildlife market, selling a range of specimens from Myanmar, as well as from India and China. The vast majority of wildlife parts for sale are for trophies and ornamental purposes, although some parts are sold for medicinal purposes too. A total of 23 shops surveyed were found to have elephant parts for sale, consisting of 4159 pieces of ivory, seven tusks, 340 elephant tail hair rings, eight whole pelvic bones and five molars. More elephant products were observed in this town than any other location surveyed. According to dealers, the ivory is sourced from Myanmar, although some dealers suggested that some of the ivory was also from India. Dealers stated that the majority of ivory was sold to Thai, Chinese and Japanese buyers, many of whom were wholesale buyers who resell the ivory in their own countries. A lesser volume of ivory is apparently sold to tourists. Virtually all customers visiting this market are foreigners, including large numbers of Thais, and all prices were quoted in THB and USD. All dealers stated that smuggling ivory in any quantity from Tachilek into Thailand was simple, and that taking it by air out of Bangkok was also not a problem. They stated that many of their customers did this.

Maesei, Thailand

Maesei is a town in Thailand, situated immediately on the Thai-Myanmar border, adjacent to the town of Tachilek. While across the border in the Tachilek market, there are many species of wildlife available for sale, only ivory is offered for sale in the shops of Maesei. According to vendors there, people wanting to buy other species of animal, should go to Tachilek. Ivory is openly sold in Maesei (and throughout Thailand) with little fear of persecution from the Thai authorities due to a loophole in Thailand's legislation, which does not prohibit the sale of ivory derived from domestic elephants. Eight shops in the city of Maesei were found with ivory for sale, with a total of 446 pieces. According to all dealers in Maesei, the ivory they had for sale was from Myanmar. The majority of the customers visiting this market are Thais and foreign tourists, and all prices were quoted in THB.

Ruili, China

Ruili is situated in China's Yunnan province, immediately on the Myanmar border. Substantial quantities of ivory were offered for sale in 2006, all of which was, according to dealers, from Myanmar. Dealers stated that ivory was safe to sell, but the authorities would take action against them if they sold any other protected wildlife species. In addition to ivory, large volumes of bone carvings were also available and according to dealers, was derived from elephants, again from Myanmar. A total of 268 pieces of ivory was observed for sale in Ruili. All customers visiting Ruili are Chinese, and all prices were quoted in CNY. In Ruili, 35 shops were found to have ivory for sale, and many more had products claiming to be derived from elephant bone, although the true identity of the bone could not be verified. Dealers in this market stated that all the ivory came from elephants killed in Myanmar. One of the larger dealers in Ruili had a laminated card with each ivory item on display. The card had a photo of the accompanying piece of carved ivory and stated that it was registered with the "Ruili Jade and Jewellery Association, Yunnan Province". This card was given to buyers as a guarantee that the product was genuine ivory. It did not state anything about the legality or origin of the ivory.

Jiegao, China

Like Ruili, Jiegao is situated near the Myanmar border. At Jiegao, substantial quantities of ivory, and parts or products of other wildlife species were observed for sale in 2006. A total of 283 pieces of ivory was observed for sale in Jiegao. As in Ruili, most (if not all) customers visiting Jiegao were Chinese, and all prices were quoted in CNY. A total of 45 shops was surveyed, of which 44 had ivory for sale. Dealers in 37 of these shops stated that they acquired their ivory from Myanmar, three stated it was from Thailand and one claimed to get some ivory from India. The remainder refused to answer. One

Chris R. Shepherd/TRAFFIC Southeast Asia



A wide variety of carved ivory items are available. These are mostly carved in Myanmar and sold to foreign buyers

Table 2. Elephant parts observed in seven market towns in Myanmar, and three market towns in Thailand and China across the Myanmar border, showing the different items and products offered for sale. Of the almost 10 000 products, fewer than 10 percent were non-ivory items, mostly elephant tail hair rings.

Items	Products	MYANMAR							THAILAND			CHINA		Total
		Golden Rock	Tuang Gyi	Three Pagodas Pass	Mong La	Yangon	Mandalay	Tachilek	Maesei	Ruili	Jiegao			
Jewellery	Bangle	0	0	9	0	40	25	164	4	12	0	254		
	Bead bracelet	0	0	0	0	15	32	15	5	0	24	91		
	Bead necklace	0	0	0	0	99	87	227	11	184	36	644		
	Beads (pendants)	0	0	0	0	0	100	0	0	0	0	100		
	Brooch	0	0	0	0	0	0	5	0	0	0	5		
	Earrings	0	0	0	0	14	39	284	14	8	18	377		
	Hair piece	0	0	0	0	8	12	0	0	0	0	20		
	Pendants	0	0	10	0	120	121	2152	228	12	35	2678		
	Pin	0	0	0	0	0	0	80	0	0	0	80		
	Ring	0	0	0	0	50	65	119	20	0	29	283		
Utensils	Chopsticks	0	0	0	0	62	100	51	0	3	32	248		
	Cigarette holder	0	0	0	0	193	5	85	5	18	11	317		
	Combs	0	0	0	0	24	4	0	0	1	1	30		
	Ear picks	0	0	0	0	0	0	290	25	0	0	315		
	Forks	0	0	0	0	5	0	0	0	0	0	5		
	Name seal	0	0	2	0	559	127	502	6	3	27	1226		
	Boats	0	0	0	0	0	2	0	0	0	0	2		
	Bridge	0	0	0	0	19	15	2	1	6	4	47		
	Containers	0	0	0	0	3	0	4	0	0	0	7		
	Dice	0	0	0	0	5	0	0	15	0	0	20		
Raw tusks	Fan	0	0	0	0	0	1	0	0	0	0	1		
	Figurines	0	0	0	0	672	1079	179	110	21	34	2095		
	Piece of tusk	0	0	0	0	9	1	3	0	0	0	13		
	Tusk tip	4	0	0	0	4	0	1	0	0	3	12		
	Tusks	0	0	0	0	3	6	3	2	0	2	16		
	Non-ivory parts	Hair ring	399	50	0	0	0	0	340	0	0	0	789	
		Pelvic bones	0	0	0	0	0	0	8	0	0	0	8	
		Skin piece	21	3	0	4	0	0	0	0	0	0	28	
		Teeth	8	0	2	0	0	0	5	0	0	27	42	
		Total	432	53	23	4	1904	1821	4519	446	268	283	9753	

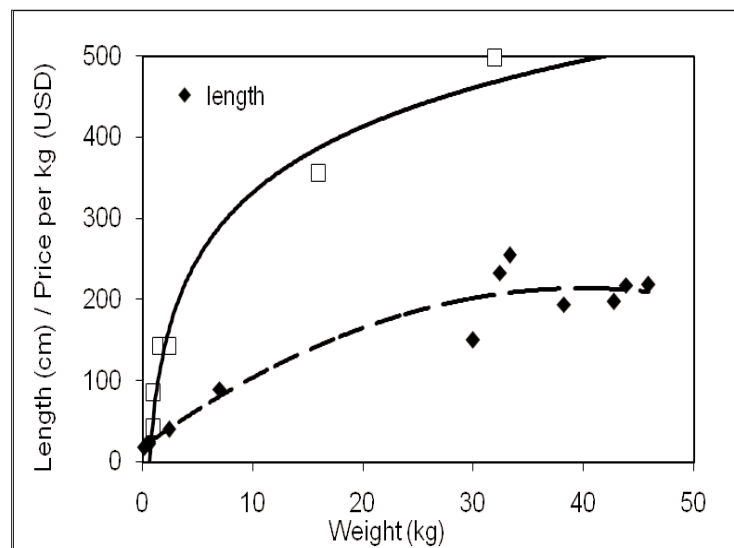
dealer said that he owned an ivory carving business in Myanmar, but declined to tell TRAFFIC where it was located. Two of the more significant dealers surveyed had a laminated card “registered with the Ruili Jade and Jewellery Association, Yunnan Province” with each ivory item on display. These cards did not indicate the ivory was part of a registered stock management scheme, or in fact anything about origin or legality. The function was purely to assure buyers that the ivory was genuine.

3. Prices

Based on data provided by Martin and Stiles (2002), U Tun Yin (1967), and this survey, there is a clear relationship between the length of a tusk and its weight (Figure 4); the relationship is best described by a second order polynomial function indicating that the relationship is not a simple linear one. The length of a tusk explains over 90% of the variation in its weight. There is a logarithmic relationship between tusk weight and its value in USD, with weight explaining 97% of the variation in price. Larger tusks are more expensive than smaller tusks, but apparently once a tusk reaches a certain size the increase in value slows down.

Figure 4.

Relationship between weight of raw tusks and length of raw tusks of Asian Elephants, and the price, showing that neither show a clear linear relationship



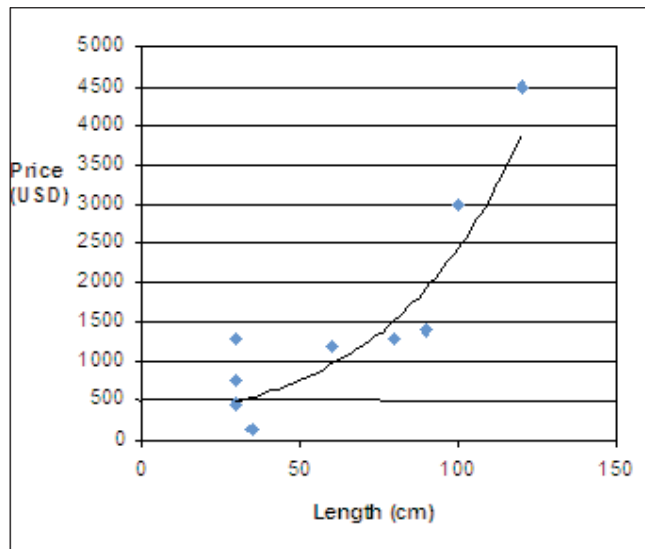
Thus in 2001, tusks or pieces of tusks weighing less than 1 kg, sold for USD 42–85 per kg, those of around 1.6–2.4 kg sold for USD 142 per kg, but tusks of more than 16 kg sold for USD 355–497 per kg. Raw tusks observed in Yangon, measuring approximately 50 cm, were offered for sale at USD 280–300 per tusk, suggesting that within Myanmar prices have not much changed much in the period 2001–2006.

In 2006, the price for carved ivory ranged from USD 6 for a pair of earrings to USD 4500 for a 1.2 metre long bridge. Even similar items differed largely in price, depending on the size and quality of the item. For instance, prices of bridges increase exponentially with length and hence weight (Figure 5). Bridges of about 30 cm in length originate from tusks weighing about 2 kg, those of 60 cm from tusks weighing some 5–6 kg and those of 90 cm in length from 7–10 kg tusks. Once carved into bridges, prices range from USD 450 to USD 4500, depending on size and quality. Some of the smaller bridges may have been carved from partial tusks, tushes or lengthy tusk tips.

Figure 5

Relation between the length of carved ivory bridges and prices, showing that prices increase exponentially with increasing length.

Length	Price
120	4000
100	3000
90	1400
80	1300
60	1200
30	100
25	450
25	750
25	1300



Live Elephant Trade

Between 1980–2005, a total of 101 live elephants were reported by various CITES member countries as being imported from Myanmar (UNEP-WCMC, 2007) (Table 3). Of these, the majority were imported by the Netherlands (N=42), followed by China (N=38). Of the elephants imported by the Netherlands, 18 were reportedly for commercial purposes, 10 for zoos and the purpose of trade for the remaining 14 was not reported. Of the 38 elephants imported by China, two were for zoos, 16 for breeding in captivity, and 20 for circuses or travelling exhibitions (which may mean that these elephants were only temporarily in China).

The reported source of the 101 elephants imported from Myanmar is claimed to be captive-bred animals in most cases. For three animals no source was reported and five specimens were said to be from the wild.

Collecting information on the trade in live elephants has proved to be very challenging, and at times nearly impossible. At least 30 elephants were observed in Tanaing and Shin Bwae Yan, near the Myanmar-India border, all employed by local gold mining operations. When the researcher photographed the elephants present, officials took the camera and deleted all the photos. This area apparently had a relatively large population of wild elephants but now, according to locals, the population has declined significantly due to poaching and capture operations. Whether these animals are used for cross-border operations, or whether some of the elephants from Myanmar have been taken into India remains unknown.

At Three Pagoda Pass the TRAFFIC investigator was taken to a Karen military camp and to a sawmill, as both locations apparently sometimes have had elephants or other wildlife products available. At the sawmill, a holding area for live elephants was seen, but on this particular day there were no elephants as they had apparently been taken into the nearby hills to feed. A border official stated that he collected bribes for the movement of livestock across the border, including sheep, cattle and chickens, the latter were coming over the border from Thailand in large volumes as the shipments had been

condemned for destruction due to the possibility of having been exposed to avian influenza. This official allowed the condemned poultry to be smuggled into Myanmar for sale in local markets instead. He also stated that he accepted bribes for large numbers of live elephants to be smuggled out of Myanmar into Thailand, for use in the tourism industry. He showed the TRAFFIC investigator a logbook which had notes referring to 240 elephants being taken across the border to Thailand over the past 18 months. He acknowledged this activity was illegal, but said that he was saving money to fly to Germany to watch the 2006 World Cup football tournament. He charged between USD 50–200 per head to facilitate trade. He stated that many of these elephants were young, but some were adults, to be used in tourist locations offering elephant safaris or elephant rides.

According to staff at the Kuala Gandah Elephant Conservation Centre in Pahang, Malaysia, four elephants were imported from Myanmar in the late 1990s to assist in training wild-caught Malaysian elephants. Three of these four were killed in an accident, and only one remains at the Centre. However, according to the UNEP-WCMC trade records database, there are no records of elephants being sent from Myanmar to Malaysia under CITES permits.

Table 3 lists other instances of export of elephants from Myanmar, showing that while the majority of unreported elephant trade appears to be to supply demand in Thailand, other countries such as Malaysia and China also appear to be receiving elephants from Myanmar. The total number of elephants exported from Myanmar, i.e. at least 360 individuals in the last 20 years, greatly exceeds those registered by the Parties to the CITES Secretariat.

DISCUSSION

Trade in Ivory

This study documents a significant and widespread trade in ivory within and from Myanmar. A total of 8870 items plus 16 whole tusks were observed during field research in the country, representing the ivory of an estimated 116 elephants. Hitherto limited surveys have been conducted in Myanmar documenting the ivory trade, and the only quantified study is that of Martin and Stiles (2002) who surveyed ivory shops in Yangon and Mandalay in 2001. Table 4 shows that in these two cities the number of workshops specializing in ivory carving has decreased and, at least in Yangon, the number of items on display has also apparently decreased. The number of retail outlets, however, has remained relatively stable over the five-year period.

According to ivory carvers and dealers in Myanmar, Asian ivory is perceived as being far superior to African ivory. If this is a widespread perception, greater pressure may be exerted on the remnant populations of Asian Elephants to acquire ivory. Furthermore, carvers in Mandalay stated that ivory from Myanmar's elephants was of a higher quality than that from India, again suggesting that even greater demand may be directed at local elephant populations.

O'Connell-Rodwell and Parry-Jones (2002) detailed trade in ivory and elephant bone in Ruili, China, which was reportedly from Myanmar. One place in particular, Myitkyina, Myanmar, was reportedly one of the main points of export for ivory into China; it was also reported to be a transit point for raw ivory in Myanmar going to Mandalay carvers. The illegal international trade in ivory from Myanmar

Table 3.

Records of Asian Elephants imported from Myanmar into CITES member states, including transactions under CITES permits (UNEP-WCMC) and reported transactions without CITES documentation

Year	Importer	Quantity	Import Purpose	Import Source	Reference
1980	Germany	9	Commercial	Bred in captivity	UNEP-WCMC, 2007
1986	United States of America	1	Zoo	Not reported	UNEP-WCMC, 2007
1987	Japan	1	Scientific	Bred in captivity	UNEP-WCMC, 2007
1987	Japan	4	Commercial	Bred in captivity	UNEP-WCMC, 2007
1988	Canada	2	Breeding in captivity	Bred in captivity	UNEP-WCMC, 2007
1988	The Netherlands	10	Zoo	Bred in captivity	UNEP-WCMC, 2007
1989	The Netherlands	18	Commercial	Bred in captivity	UNEP-WCMC, 2007
1990	The Netherlands	14	Not reported	Bred in captivity	UNEP-WCMC, 2007
1982 - 1990	Thailand	8	Unknown	Unknown	Lair (1997)
1993	Russia	2	Commercial	Not reported	UNEP-WCMC, 2007
1994	China	2	Zoo	Bred in captivity	UNEP-WCMC, 2007
1995	China	5 - 7	Unknown	Unknown	O'Connell-Rodwell and Parry-Jones (2002)
1994 - 1995	Thailand	≥ 3	Unknown	Unknown	Lair (1997)
1996	China	16	Breeding in captivity	Bred in captivity	UNEP-WCMC, 2007
late 1990s	Malaysia	4	Training	Unknown	This study
2001	China	5	Circus or travelling exhibition	Wild animal	UNEP-WCMC, 2007
2001	China	5	Circus or travelling exhibition	Bred in captivity	UNEP-WCMC, 2007
2003	China	5	Circus or travelling exhibition	Bred in captivity	UNEP-WCMC, 2007
2004	China	5	Circus or travelling exhibition	Bred in captivity	UNEP-WCMC, 2007
2004 - 2006	Thailand	240	Tourism industry	Unknown	This study
2005	Germany	2	Breeding in captivity	Born in captivity	UNEP-WCMC, 2007
Total		361 - 363			

is carried out in substantial quantities and, in 2002, it was reported that the largest illegal movements of tusks from wild Asian Elephants is trade from Myanmar to Thailand (Martin and Stiles, 2002).

Trade in non-ivory parts

The trade in non-ivory parts observed in and from Myanmar included a relatively small number of items, including pelvic bones, skin pieces and teeth. Evidence of large-scale trade in elephant skin was not found during this study, but some skin specimens were observed in Golden Rock, Tuang Gyi and Mong La. Santiapillai and Jackson (1990) noted that “more recently the trade in elephant hide to China through Thailand has become a very serious problem”. Santiapillai (1997) stated that there were reports of elephants being illegally killed for their hides in Myanmar, which were apparently smuggled to China, some through northern Thailand. Nooren and Claridge (2001) document a seizure of elephant skin, reported to be equivalent to 20 elephants in Kunming, the capital of Yunnan Province. This consignment had originated from Myanmar, together with 3000 kg of deer antlers, and had transpired as a number of small shipments in order to minimise the risk of detection and confiscation. The final destination of this trade was apparently a pharmaceutical company in Shanghai, suggesting considerable demand in China. O'Connell-Rodwell and Parry-Jones (2002) observed elephant skin in

Table 4.

Number of workshops specializing in carving ivory, number of retail outlets selling ivory and number of ivory items recorded in the two major ivory-selling towns in Myanmar (2001 data from Martin and Stiles, 2002; 2006 data from this survey).

City	Year	Workshops	Outlets	Ivory items
Mandalay	2001	6	19	2363
	2006	2	17	1821
Yangon	2001	5	34	3438
	2006	0	40	1904

various places in Yunnan Province along China’s border with Myanmar. The fact that little trade in elephant skin and hides was detected during the present survey may be indicative of a decrease in the amount of elephant skins in trade, or it may be that ivory and elephant skins are traded along different trade routes and therefore were not detected.

No data were available on the trade in Asian Elephant pelvic bones, teeth or other items in Myanmar or whether these items are being exported in any quantities. In 2000, tails, leg bones, numerous beads made from elephant bones and molars were observed at Golden Rock (Shepherd, 2001).



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Small simple pendants and jewellery make up much of the ivory pieces offered for sale in Myanmar

Trade in live elephants

The capture of wild elephants in Myanmar was banned in 1995, although, some government-condoned capture, especially of problem elephants, is still carried out (Lair, 1997). Capture of live elephants for the timber industry has always been controlled by the Forest Department through the elephant control scheme (Aung, 1997). A significant number of elephants apparently die during the capture process: for example, from 1970–1993, a total of 2122 elephants were taken from the wild under the elephant control scheme, of which 395 (or 18.6 %) died (Aung, 1997). It was reported that military troops

captured many elephants without obtaining licenses during operations in Kayin State and Tenasserim Division between 1991 and 1993 (Aung, 1997). Illegal capture of elephants for commercial trade from Myanmar continues. This study documents how hundreds of live elephants have been exported, the vast majority to neighbouring countries. Thailand appears to be the most significant importer of live elephants from Myanmar, although, according to UNEP-WCMC trade records, there has never been any elephants exported under CITES permits from Myanmar to Thailand (Table 3). Several sources, both in Myanmar and Thailand, have reported the illegal export of elephants from the former to the latter country. Sources in Thailand state that live elephants from Myanmar, especially calves, are in demand in Thailand to supply the tourism industry (Lair, 1997; Naylor, 2005). In addition to the findings of this report, Lair (1997) reported that one individual with in-depth knowledge of the trade estimated that as many as 50 calves were being sent from Myanmar to Thailand annually. Interestingly, in the same period that Thailand imported elephants illegally from Myanmar, it reportedly exported over 150 elephants to other countries (UNEP-WCMC 2007).

O’Connell-Rodwell and Parry-Jones (2002), document the smuggling of between five and seven live elephants across the border from Myanmar into Yunnan, China, in 1995.

Ninety-three out of the 101 elephants imported from Myanmar with CITES permits list the import source as “Bred in Captivity” (UNEP-WCMC, 2007; Table 4). However, as many captive female elephants are sourced from the wild, and are often bred with wild bulls, the offspring of these females, even though born in captivity, do not meet the CITES criteria of “Bred in Captivity”. Consequently, the import source of these animals should list “Wild”.

The continued illegal trade in live elephants in all likelihood poses a significant threat to the conservation of remaining populations in Myanmar. While many of the elephants entering the illegal trade may be taken directly from the wild, others could also represent individuals formerly used by the timber industry.

CONCLUSIONS

Myanmar is not fulfilling its obligations as a CITES Party in terms of implementing and enforcing the Convention, despite being a member for over a decade. Illegal hunting and trade in Asian Elephants and their products is still widespread in Myanmar, and is thought to be a significant cause for the decline in Myanmar’s wild Asian Elephant populations. Live elephants and ivory continue to be smuggled out of Myanmar. The ivory is believed to derive at least in part from illegally killed elephants within the country, although it is also possible that raw ivory is being smuggled into Myanmar for carving from neighbouring India. The domestic trade in ivory in Myanmar is carried out openly and often along international borders, catering to foreign buyers. With reference to Myanmar’s legislation, the Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (State Law and Order Restoration Council Law No.583/94.1994), this suggests a serious deficiency in law enforcement and a blatant disregard for international conventions and national laws. The fact that dealers openly display ivory and other elephant parts, and readily disclose smuggling techniques and other illegal activities with potential buyers, further highlights that enforcement is extremely lax. The observed and reported levels of cross-border trade indicate that neighbouring countries, especially China and Thailand, also have enforcement problems, and that illegal cross-border trade is basically carried out

with minimal risk of detection. No trade in ivory or live elephants was detected in the Naga Hills area along the Myanmar-India border during this survey. However, dealers in Myanmar stated ivory did sometimes come from India.

The most significant loophole in Myanmar's legislation seems to relate to the allowance of tusk tips and tusks from government and privately-owned elephants that have died of natural causes to be sold legally. If this practice is indeed currently providing an avenue for legal ivory trade in Myanmar, it clearly provides an "open window" for illicit ivory to be traded under the guise of legally-acquired stock because there is no registration and tracking system to differentiate clearly such ivory from that of illicit sources. Most dealers seem well aware of the lack of clarity in the country's legislation and potential loophole it provides, and they seem very willing to exploit such shortcomings to mask illegal trade in ivory.

Dealers in all markets within Myanmar acknowledged that the trade, especially the international trade, is illegal. The one exception, however, according to a few dealers in Yangon, is for them to acquire ivory tips through auctions conducted by the Forestry Department. All of the shops in Yangon have been surveyed in the past (Shepherd, 2002; Martin and Stiles, 2002). The general trend, according to dealers, is that elephants are becoming fewer in Myanmar and, as a result, ivory is becoming increasingly difficult to obtain.

In addition to the trade in ivory, this report also highlights a persistent international trade in live elephants from Myanmar to supply demand from tourist locations in neighbouring Thailand. While dealers and staff in tourist destinations in Myanmar claim that live elephants are sent to Thailand from Myanmar, no exports or imports have been reported to CITES by either country (UNEP-WCMC, 2007). Based on observations and discussions with various knowledgeable individuals, including some directly involved in the trade, the capture of live elephants may be at such a rate that it is also having a negative impact on wild populations. The export of elephants from Myanmar to international zoos, circuses and travelling exhibitions is also cause for concern. Most elephants exported from Myanmar are reportedly captive-bred (Table 3). Compared to the success rates of European and North American zoos in captive breeding Asian Elephants, the number of elephants bred in captivity in Myanmar is large. Based on data provided by the Myanmar Timber Enterprise, Taylor and Poole (1998) reported that between 1980-1994 some 1323 calves were born to female elephants owned by the company. In the last 20 years (1987–2006), no fewer than 79 captive-bred Asian Elephants were exported, at a time when global captive breeding programmes had failed to establish self-sustaining zoo populations, with generally low birth rates and high calf mortality rates (Rees 2003; Wiese 2000). While a range of ethical and practical issues concerning the import of Asian Elephants from range countries to western zoos is still being debated (e.g. Hutchins and Keele, 2006), scrutiny of the reported source of elephants traded from Myanmar is long overdue, as the data for captive births appear to be extremely high.

RECOMMENDATIONS

The Government of Myanmar should increase efforts to stop the illegal trade in elephant products, especially ivory, focusing on major trade centres, including Yangon and Mandalay, and at important border markets, such as Tachilek. The Government of Myanmar should likewise increase efforts to stop the illegal trade in live elephants, especially when it pertains to cross-border trade. With respect to continued domestic trade in elephants and elephant products, TRAFFIC proposes that Myanmar

instigates an effective control system that complies with the requirements of CITES Resolution Conf. 10.10 (Rev. CoP14).

The governments of China and Thailand should take action against the traders of illegal wildlife products along the borders with Myanmar, and work in co-operation with the Myanmar authorities to deal with illegal trade in elephants and elephant products.

Based on the findings of this study, TRAFFIC makes the following recommendations:

1. Recognizing that international co-operation is essential to put an end to this illegal cross-border trade, Myanmar's CITES, Customs and police authorities should be encouraged to work closely with their counterparts in neighbouring Thailand and China, as the two main consuming countries of Myanmar-sourced ivory. In Thailand this can be done under the umbrella of the ASEAN Wildlife Enforcement Network (ASEAN-WEN) to combat the smuggling of elephants and elephant products, whereas a bi-lateral agreement along the same lines needs to be reached with China.

2. With respect to both the domestic and international trade in ivory, Myanmar needs to comply with Resolution Conf 10.10 (Rev. CoP14). Parties in whose jurisdiction there is an ivory carving industry that is not yet structured, organized, or controlled, such as in Myanmar, need to adopt comprehensive internal legislative, regulatory, and enforcement measures. All importers, manufacturers, wholesalers, and retailers dealing in raw, semi-worked or worked ivory products need to be registered or licensed. Recording and inspecting procedures to enable the appropriate government agencies to monitor the flow of ivory in the country by means of a compulsory trade control over raw ivory and a comprehensive reporting and enforcement system for worked ivory need to be introduced.

3. Following recommendations in Resolution Conf. 10.10 (Rev. CoP14), Myanmar should make it compulsory for shops, traders, and retail outlets to



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International co-operation is essential to put an end to illegal cross-border trade in carved ivory and live elephants

inform tourist and other non-nationals that they should not purchase ivory in cases where it is illegal for them to import it into their own home countries. In the case of Myanmar, this is best done by making it compulsory for shops and retail outlets in Yangon, Mandalay, and Tachilek to provide this information.

4. As yet, Myanmar has never submitted a report on an illegal elephant product transaction as part of the ETIS process. A comprehensive overview of trade in ivory should be prepared prior to CITES CoP15 (Dubai, 2009). Training on the uses and applications of the ETIS system should also be carried out with relevant authorities in Myanmar to assist in this regard.

5. Authorities in the airports and other points of international entry and exit must be more vigilant to prevent ivory from being carried across Myanmar's borders. Myanmar should ensure that staff based at these checkpoints are sufficiently trained in CITES implementation, enforcement and species identification, including their parts and derivatives.

6. Regular monitoring by Myanmar's law enforcement agencies of the markets in Myanmar should be carried out to identify and apprehend illegal trade participants, as well as monitor trends in the trade, as a move towards effective enforcement.

7. Offenders should be prosecuted, to ensure just punishment and to serve as a deterrent for repeat offenders and other dealers.

8. Myanmar, as a Party to CITES, should take measures to improve its legislation for wildlife trade and CITES implementation with a view towards attaining a Category I ranking under the CITES legislation project. As an immediate goal, Myanmar needs to clarify the existing national legislation with respect to domestic trade in ivory.

9. Greater monitoring of domestic elephant populations is needed with the introduction of microchip and tattoo-based identification and registration systems. Such measures would serve to prevent illegal cross-border elephant trade and to assist with management of Myanmar's wild and captive elephant populations.

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TRAFFIC, the wildlife trade monitoring network, works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. It has offices covering most parts of the world and works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

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