

An elephant show at a tourist spot in northern Thailand

# The status, distribution and management of the domesticated Asian elephant in Cambodia<sup>1</sup>

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## Introduction

Funding provided by FAO for this study allowed the first ever nationwide census of domesticated elephants in Cambodia. This is highly significant, and should be regarded as a benchmark for future monitoring of the country's domesticated elephant population.

The census was conducted by the Wildlife Protection Office (WPO) of the Department of Forestry and Wildlife (DFW), Ministry of Agriculture, Forestry, and Fisheries (MAFF). WPO officials from most provinces were contacted. Extended site visits were made to Mondulhiri, which has the largest elephant population in Cambodia. Sites in Siem Reap, which has highly visible tourist elephants at Angkor Wat, were visited only briefly, as were sites in Takeo and Kampot, which have zoo elephant populations.

## Wild elephants

At present, the exact status of wild elephants in Cambodia is unclear. In 2000 and 2001, for the first time, specific elephant focused surveys began to establish locations and approximate numbers for the various populations. Because of the incomplete nature of the work and the inherent difficulties of surveying low-density populations in forest habitats (Heffernan *et al.*, 2001), the total population size is unknown. Field surveys are ongoing, but on the basis of the information available now, the authors believe that it is possible that between 300 and 600 wild elephants remain in Cambodia. This is considerably lower than other recent estimates of 2 000 (Kemf and Jackson, 1995) and 500 to 1000 (Osborn and Vinton, 1999).

The most important elephant range remaining in Cambodia appears to be the southwest mountain complex, consisting of the Cardamom (KraVanh) Range, the Elephant Mountains, and Phnom Aural. This region occupies portions of the provinces of Battambang, Pursat, Koh Kong, Kampong Speu, and Kampot. Large numbers of elephants appear to be using the Areng Valley, down to Botum Sakor National Park, and a cautious estimate is that these comprise up to four or five groups (Heffernan *et al.*, 2001). Elephants are known to be present in the Phnom Samkos Wildlife Sanctuary, largely in Pursat province (Daltry and Momberg, 2000). Other small and fragmented herds are known to be present in the Phnom Aural Wildlife Sanctuary (B. Long, personal communication) and in the Kirirom and Bokor National Parks in the Elephant Mountains (J. Walston, personal communication). All populations are under constant stress from a combination of factors, including anarchic logging practices, agricultural conversions, and human resettlement. In particular, hunting pressure is relentless in many areas as a result of the continued demand for ivory and other elephant products, as witnessed in the shops of Phnom Penh and Siem Reap, amongst other places (E. Bradley Martin, personal communication). Within the past year, organized hunting groups have shot numerous elephants for ivory, bone, and tails, particularly in Koh Kong and Western Pursat provinces.

A second important elephant area in Cambodia is Mondulhiri province, located east of the Mekong River and bordering the Vietnamese province of Dak Lak. Recent field surveys by World Wide Fund for Nature (WWF), Wildlife Conservation Society (WCS), and by Fauna and Flora International (FFI), working with the DFW, the Department of Nature Conservation and Protection

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<sup>1</sup> This is a revised version of the paper that was presented at the International Workshop. It contains information that was not available at that time.

(DNCP), the provincial forestry department and local hunters, have confirmed herds of elephants in four districts. Limited survey data have been collected, but because of large-scale movements of at least one herd, population estimates are impossible at this time. Opportunistic hunting still occurs widely, as evidenced by the skeletal remains of recently hunted individuals, hunter accounts, and the trade in elephant products.

WWF, DNCP, and DFW have confirmed small, scattered populations of elephants in Western Virachey National Park in Ratanakiri province, located east of the Mekong and bordering Viet Nam and Lao PDR. The available evidence suggests that the total number of elephants is low, although in Siemrang district the number is probably viable for conservation. (A. Maxwell, personal communication).

West of the Mekong and north of the Tonle Sap lies a large lowland dry evergreen forest encompassing portions of Kratie, Stung Treng, Kampong Thom, and Preah Vihear provinces. FFI and DFW have just completed field surveys in this forest. Initial estimates indicate only one group, with probably as few as three individuals, remaining in the whole forest. The entire forest is under logging concession and logging is extensive. There is a large core area that has not yet been logged and is, therefore, in exceptionally good condition. There is little sign of humans and important populations of pileated gibbons and small and medium size carnivore communities are found there. However, large mammals are no longer found because of hunting.

In the area focused on Chhep district of Preah Vihear, near the Lao PDR border, WCS, DNCP and DFW field surveys have recently confirmed a population of elephants, consisting of multiple small groups. Widespread logging is taking place in the area, and although provincial and district governors have recently forbidden any hunters to shoot elephants, these herds are under severe hunting pressure.

As would be expected from such continued hunting pressure, both focused and incidental (as a result of soldiers being based in the forest), and the availability of large tracts of forest habitat, wild elephants in Cambodia appear to be on the move almost continuously.

By the end of this field season, WWF, WCS, FFI, DFW and DNCP will have conducted initial elephant surveys in most of the significant elephant ranges. Workshops are planned for June and July 2001, to assess the present situation in the light of this year's data, and prepare an action strategy, including prioritization of key areas for conservation and protection activities. Landscape-scale elephant conservation projects are required, especially those that can find a balance between policies suiting humans and habitat focused conservation. Most elephant populations in Cambodia move in and out of designated protected areas and logging concessions to fulfil different food and habitat requirements. Elephants do not require pristine unlogged forest, and strategies incorporating the various stakeholders' interests in elephant areas are to be encouraged.

It is likely that some of the existing populations could recover to natural levels if the necessary protection measures are implemented successfully, though some herds may no longer have the diversity in their remaining gene pool to survive any of the predictable stochasticity from the environment and demographic pressures. Cambodia's human population of about 11 million is quite small, relative to the total country area, and large intact blocks of wildlife habitat remain. If trends in gun control, hunting reduction, development and enforcement of legal measures, forest area planning and management all continue, Cambodia's wild elephants have a chance of survival into the next decade, leaving sufficient numbers to recover, in theory, to natural levels, according to habitat availability at that time.

### **Domesticated elephants**

The just completed survey of all provinces in Cambodia resulted in a total of 162 domesticated elephants. This is considerably lower than the estimate of 300 to 600 published in *Gone astray* in 1997.

Whilst this latest survey is not expected to have detected all the domesticated elephants in Cambodia, it can be regarded as the best estimate available at this time (see Table 1).

**Table 1. Domesticated elephant numbers**

Name of province	Estimated number of domesticated elephants
Mondulkiri	91
Ratanakiri	39
Siem Reap	11
Stung Treng	5
Kampong Speu	4
Kampot	3
Kandal	3
Takeo	2
Kratie	1
Kampong Thom	1
Koh Kong	1
Phnom Penh	1
<b>Total number</b>	<b>162</b>

**Mondulkiri (91):** In Mondulkiri, records of domesticated elephant numbers have been kept since at least 1995 (Lic Vuthy *et al.*, 1995). In 1995, 104 elephants were reported and is considered to be a reliable minimum (Lair, 1997). In 1999, the number of domesticated elephants recorded by the provincial forestry department was 93, in 2000 it was 83 and in July 2001 it was 91. In order to cross check the data, two districts (Pichreada and Orieng) were checked by two of the authors, who recorded the same number (91) of elephants as on the records.

**Ratanakkiri (39):** Because of the long distance to this province from Phnom Penh, a member of the survey team spoke to three provincial officers by telephone (one from each of the Department of Forestry and Wildlife, the Department of Animal Health and the Department of Nature Conservation and Protection). They each confirmed the figure of 39 domesticated elephants in the province (according to the most recent record kept by the provincial DFW in June 2001).

**Siem Reap (11):** A field visit to Siem Reap (where all 11 elephants were observed) and discussions with the Deputy Director of the provincial office of the DFW indicated that these are the only domesticated elephants in the province.

**Stung Treng (5):** A telephone call was placed to the Deputy Director of the provincial office of the DFW who gave this figure.

**Kampong Speu (4):** Field staff visited this province, and an official from the provincial office of the DFW was interviewed. The official stated that five domesticated elephants had died between 1995 and 1996 as a result of old age.

**Kampot (3):** Field staff visited this province and, in the company of officials from the provincial office of the DFW, three elephants were observed. These officials believe that no other elephants are present.

**Kandal (3):** Field staff visited this province and, in the company of officials from the provincial office of the DFW, three elephants were observed. These officials believe that no other elephants are present.

**Takeo (2):** Field staff visited this province and, in the company of officials from the provincial office of the DFW, two elephants were observed. These officials believe that no other elephants are present.

**Kratie (1):** A telephone call was placed to the Deputy Director of the provincial office of the DFW who gave this figure.

**Kampong Thom (1):** A telephone call was placed to the Deputy Director of the provincial office of the DFW who gave this figure.

**Koh Kong (1):** A telephone call was placed to the Deputy Director of the provincial office of the DFW who gave this figure.

**Phnom Penh (1):** This elephant is employed in the tourism industry and is well known.

### **Discussion of the status of domesticated elephants**

Suspicion of the authorities by local people and their strong tendency to avoid the intrusion of officials make full reporting unlikely and suggest that these figures must be considered as reliable minimums only. However, declarations of ownership may be difficult to avoid, especially as development and transport links improve and the communities become less isolated. Moreover, registration carries no further responsibilities as there is no legal framework and may be regarded simply as a formality. Further research, therefore, should examine this issue of the reliability of reporting more closely.

Because of the time constraints of the investigators involved, independent confirmation of numbers given by provincial officials was not always possible. Moreover, it is possible that births or deaths may have occurred fairly recently, and these would not have been recorded at the time of investigation.

Because of the inherent problems in collecting information on domesticated elephants, it is unlikely that the previous estimates (Lair, 1997; Kemf and Jackson, 1995; McNeely, 1975) are sufficiently rigorous to form the basis of any assessment of trends in numbers. However, it is certain that there has been a reduction in the numbers of domesticated elephants as a result of decreased opportunities for industrial work, e.g. logging and heavy lifting, which have been mechanized almost everywhere.

This survey should be regarded as a baseline survey, despite the limitations noted above, as it gives a detailed provincial breakdown.

In 1999, Mondulhiri provincial DFW officials recorded 93 elephants, but by 2000 the number had declined to 83 elephants. These ten elephants 'lost' between 1999 and 2000 were in fact sent to Siem Reap. According to the last double check conducted by Mondulhiri DFW in June to July 2001, 91 domesticated elephants were recorded. Others were possibly sold to Thailand and Viet Nam between 1999 and 2000. During this period, six calf elephants were captured, ranging in age from 6 months to five years old, according to provincial DFW sources. One particular young elephant that avoided the hunters was brought to the WPO Wildlife Rescue Center in Phnom Penh. During a hunt, the mother of this individual was killed, and the young animal ran into a village. It was caught in a villager's kitchen searching for food. The villagers negotiated with the DFW as they did not wish to raise the elephant. In the end, an undisclosed sum of money was paid to bring the young animal to the Wildlife Rescue Center. This young animal unfortunately died on 5 April 2001 because of an infection following an accident that resulted in a number of broken bones.

Elephants normally belong to clans of the Phnong minority. Each clan is composed of 10 to 35 families, and each family in that clan has the right to use any elephant. Furthermore, ownership is passed on from generation to generation, so sometimes an elephant belongs to three or four generations of a clan at the same time. Therefore, the chances of double counting (at least!) are quite high in any simple

interview census. The numbers cited in this report are expected to be accurate because they were crosschecked by provincial and DFW staff, who have been recording the animals in this area for quite some time. In two districts cross-checked by surveyors, the number recorded was consistent with the number counted.

Elephants are rarely bred in captivity, often because of local taboos or financial concerns. Moreover, expeditions to capture wild elephant are conducted less often than in previous years because of a decreased demand for elephants and the availability of alternative incomes for local people. For example, in Koh Nhek district of Mondulkiri, according to one local commune chief, many former elephant hunters are now engaged in wet rice production, and have little time to organize large-scale expeditions. Furthermore, uncontrolled hunting and warfare have decimated the population of wild elephants, making it more difficult to locate and catch young individuals. This situation is exacerbated by the problem of killing wild females to obtain calves, the net result being that the young, the breeding females and the future breeding of the captured animal are all removed from the total wild elephant population.

Although the country's forest area is still extensive, the people's houses, especially in old communes, are being located farther from the forest edge. Owners cannot allow the elephants to forage a long distance from the house for fear of hunters after ivory, "medicinal parts" or meat. Because of the increasing numbers of people living in areas traditionally inhabited by elephants, destruction of crops while foraging is becoming more common, leaving the owners with another headache if they leave their elephants to roam free. People are therefore obliged either to mind their elephants all day, or to go to the forest to collect food for their prized pet. This, coupled with rural poverty in many areas, makes the prospect of elephant ownership less inviting.

Widespread availability of motorbikes and military trucks has also resulted in a greatly reduced demand for elephants for transport and labour (log haulage was formerly a primary use of domesticated elephants).

Many of the domesticated elephants today are extremely old. For example, only one elephant in the whole of the Siem Reap group is below 45 years old. All the elephants are believed to be wild caught, and some, according to one informant, have been trafficked through Mondulkiri. During the Pol Pot regime, some domesticated elephants reverted to a wild state. Very few wild elephants were captured during the period 1980 to 2000, according to local people in Mondulkiri. Only a few old men still know the traditional techniques of how to catch and train elephants. Their skills are not being passed on to the next generation, which seems to prefer mopeds to elephants. This is an indication that the cultural heritage is dwindling, along with the symbiotic expanses of forest.

In Phnong culture, it is believed that if a domesticated elephant gets pregnant or even has sexual relations, unhappiness will result for the entire village. Many villagers still maintain this belief. Therefore, the owner of a pregnant elephant often must pay compensation to all villagers, such as a hosted feast where at least three buffalo and three pigs are sacrificed and a large quantity of rice wine is consumed. A village committee, in accordance with commune regulations, generally determines the required scale of these sacrifices. The resulting time and cost of these parties is a lot of trouble for an elephant owner, and discourage any thought of breeding domesticated elephants.

### **Legal status**

Currently, there is a general lack of laws governing animal issues in Cambodia and there are no specific laws governing domesticated elephants. A draft wildlife law has recently been prepared by DFW, with technical assistance from WCS and WWF and financial support from the British Embassy in Cambodia. This draft will be presented to interested organizations for review at a workshop later in 2001. The law will deal in detail with both the capture and killing of wild animals.

In the meantime, there are a variety of wildlife-related decrees, sub-decrees, declarations, etc. in place that are confusing and contradictory. These are poorly known and generally misunderstood, particularly in rural areas, where most human-wildlife contact takes place. Order No. 2, requesting the restriction of illegal logging, issued by the Royal Government of Cambodia (RGC) on 6 January 1999, and Declaration No. 1, "Actions of Forest Management and Law Enforcement", issued on 25 January by RGC, explicitly banned all capture and killing of wildlife in Cambodia. Thus, a lack of laws is not the whole problem. The problem is the rural people's lack of comprehension of the policies. Lack of enforcement by the authorities is also a major obstacle to the successful protection of wildlife in general, including elephants.

Very little enforcement of wildlife laws takes place. Two actions involving elephants that have taken place in recent years illustrate this. In one case, four domesticated elephants being transported between provinces for sale were intercepted and confiscated by the DFW, but the Kratie Provincial court ordered the government to return the elephants after the owners sued. In July 1999, a farmer in Kampong Speu fired into a herd of elephants that had been grazing on his crops for several nights. He killed a female and captured the calf, which he sold for US\$460. The farmer was arrested and released after he paid half his profit in fines. The calf was subsequently sold to a government official with a private zoo for US\$1 800. A third case, however, illustrates that the situation may be changing for the better. DFW was negotiating with a group in Srey Huei Commune in Koh Nhek district of Monduliri province to arrange transfer of a captured calf to the Phnom Tamao Wildlife Rescue Center, near Phnom Penh. However, due to fears of being fined and legal action being taken, the animal was released back into the forest. The people of the commune then told officials that the animal had escaped. This indicates that people are beginning to understand that the law will not allow them to continue to capture these animals from the wild. Moreover, if they are forced to relinquish ownership of captured animals repeatedly, they will quickly learn that the effort and time required to mount a hunting operation is simply wasted.

On 30 April 1999, the Royal Government of Cambodia issued Sub-decree No. 38, Management and Control of All Types of Firearms and Explosives. This prohibited civilian possession of firearms and all civilians were ordered to turn in their guns. This has been so effective that in most provinces officials and hunters report that there are far fewer people in the forest with guns these days. However, in the Cardamom Range, elephants are still being killed at an alarming rate by the placement of landmines on elephant trails.

## **Registration**

There is no nationwide registration of domesticated elephants, although in Siem Reap there is province-level registration of the tourist elephants at Angkor Wat, and in Monduliri the provincial office of the MAFF takes on this task. Responsibility for a registration system lies with DFW. The concept for this is currently being designed and will be implemented by the DFW/FFI Elephant Programme. The basis of this will involve collecting locality and ownership data, a physical description, a photograph, and implantation of a small microchip by experienced veterinarians. This information will be stored in a central database. Owners throughout the country will be notified of the requirement to register their elephants, and they will be allowed a reasonable time to contact the authorities. Failure to comply with this requirement will initially lead to a small fine, followed by the confiscation of illegally captured animals.

## **Organisations and their major projects**

There are no major projects dealing specifically with domesticated elephants in Cambodia, although the DFW/FFI programme is preparing to take responsibility for some aspects of this work,

thus ensuring government involvement. Moreover, as noted previously, WCS and WWF are assisting the DFW to prepare a new wildlife law, which will include details of domesticated elephant protocol.

Under the Asian Elephant Conservation Fund, the United States Fish and Wildlife Service has funded two projects in Cambodia: one involving WWF, WCS, DNCP, and DFW, and one involving FFI, DFW, and the Asian Elephant Research and Conservation Centre (AERCC) in India. The combined efforts of both projects will result in field data from all of the major elephant ranges and a far better understanding of the present status and distribution of the Asian elephant in Cambodia.

WildAide is working with the Forest Crime Monitoring Unit of the DFW nationwide in efforts to control illegal hunting and the wildlife trade.

Cat Action Treasury (CAT) and the University of Minnesota are working with the DFW to develop the Community-based Tiger Conservation Project. Regional offices have been established in Koh Kong, Preah Vihear, and Monduliri. Over 30 ex-hunters have been recruited as wildlife rangers. Recently, a Koh Kong wildlife ranger discovered six dead elephants. He photographed these and then recorded their GPS locations and passed on the information to the authorities. The investigation which followed resulted in the break-up of an elephant hunting gang.

### **Employment of domesticated elephants**

Eight elephants in Siem Reap are used to transport tourists at Angkor Wat, two are in training, and one calf is being raised.

In Kampot, two elephants are in a private zoo. One originated in Koh Kong, and another in Monduliri. A medicine seller uses a third elephant for transportation. This elephant, age 38, is reported to have originated in Kampot.

In Takeo, a number of calves are being looked after in the Phnom Tamao Zoo and Wildlife Rescue Center to promote conservation education and to protect the calves from exploitation. One of these elephants (age 3) was confiscated in Koh Kong. Another animal (aged 2) was collected from ethnic minorities in Monduliri, but recently died, following an accident.

One elephant is engaged in tourist activities in the heart of Phnom Penh, at Wat Phnom. The elephant is used to give rides. Three elephants are also based in a private zoo, owned by a Frenchman, on an island in the Mekong River, close to Phnom Penh.

In Monduliri and Ratanakiri, Cambodia's largest population of domesticated elephants is still used for transport and occasionally for log transport. Most owners are from minority ethnic groups. Monduliri elephants have been used on several wildlife surveys, and two Ratanakiri elephants were employed during the production of a documentary film in 1999 called "Search for the Kouprey". Elephants are most used during the rice harvest in Northern Monduliri and the cost of hiring them is increased accordingly at this time. Occasionally, elephants are used for an unusual task, but not always with success – the final outcome of Monduliri province voting in the 1998 election was delayed by a day when a lovesick elephant transporting ballot boxes ran off into the forest after a wild elephant. After the ballot boxes were recovered, a helicopter was called in to prevent further delays.

### **Veterinary care**

The Siem Reap elephants used for tourist transport at Angkor Wat are well cared for and appear quite healthy. A local veterinarian performs a medical and health check once a week. An international veterinarian from Thailand specializing in domesticated elephants sees the elephants one a month and

is also available for emergency cases. Within the last year, one elephant has died of illness and one has died of old age. The adult elephants receive about 200 kg of food a day, consisting of sugar cane, coconut leaf, green leaves, and grass. The two years old baby elephant is fed milk. Arrangements are being made for the transfer of eight more elephants from Mondulkiri to Angkor Wat to assist in the tourist trade. This transfer has been approved by WPO, with the provisions that regular checks will be allowed on the welfare of the animals, and the new owner will facilitate breeding of the domesticated animals to establish a non-wild caught pool of animals within the famous temple complex.

The juvenile elephants at Phnom Tamao Zoo and Wildlife Rescue Center are the only other domesticated elephants in Cambodia *confirmed* to have an adequate diet and medical care. They are fed milk, boiled rice with beans, palm sugar, and sugar cane and are under strict veterinary supervision.

Anecdotal evidence indicates that many elephants kept in remote villages are poorly treated and not properly fed, although the availability of wild feed, especially for those animals that work in or near to the forests, probably improves their diet.

### Summary and recommendations

Once an important part of Khmer life, the domesticated elephant population is now quite small and will almost certainly continue to decline, mainly because of improved roads, a preference for motorized vehicles, bans on wild elephant capture, a limited wild elephant base, and an ageing domesticated elephant population. With no younger animals coming in and the loss of knowledge of how to capture and train elephants, the cultural heritage associated with this way of life is also in decline. It may be that the domesticated elephant will disappear from Cambodian culture, except in memory and art. Supplementation of the domesticated population is not acceptable because of the great threat of extinction hanging over the wild population. The transfer of elephants from Thailand could fill the requirements of a booming tourist market, but wild capture for domestication is now completely unacceptable anywhere in Indochina.

1. The working group recommends that DFW establish a programme for the registration of all remaining domesticated elephants in Cambodia. Regulations should be developed to ensure the humane care, feeding, and employment of these elephants. Elephant owners should be educated on the regulations, and a system and schedule of compliance inspection, reporting, and enforcement should be established. This must go hand in hand with attempts to stop the hunting, capture and the domestication of wild individuals.
2. If it is shown that any ethnic or rural populations are in need of a working elephants, and to maintain a tourist transport base at Angkor Wat and other tourist centres, a study should be carried out to determine the feasibility of breeding domesticated elephants.
3. A study should be carried out to determine the feasibility of rehabilitating domesticated elephants to a wild state. This has been shown to be possible in previous studies (R. Lair, personal communication), and should be encouraged in any cases where owners cannot keep their animals in a humane condition.
4. Reasonably priced veterinary support should be made available to all remaining domesticated elephants in Cambodia.
5. Clear dietary guidelines should be developed and distributed to all owners of domesticated elephants, along with details of the forthcoming registration programme.
6. Cooperation with Thailand, Lao PDR, and Viet Nam should be developed to ensure that the issue of domesticated elephants and dwindling wild populations are considered a regional, not just a national, issue. Interestingly, the results from a preliminary analysis of mitochondria DNA

demonstrated that elephants from Thailand and Cambodia share a number of heliotypes. This is consistent with there being little genetic differentiation between elephant populations from these two countries (P. Fernando, personal communication).

7. The new draft of the Cambodian wildlife law should contain one article that deals with the issues relating to the overall welfare, capture, procurement, ownership, transfer, sale and movement of domesticated elephants in and out of the country, and should address the needs of animals that have been converted from the wild to pet status.
8. Supplementing dwindling domesticated elephant “herds” with individuals from areas with a surplus, such as Northern Thailand, should be examined.

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### **Question and answer session**

- Q1: Did you say in your presentation that you have completed a countrywide survey of domesticated elephants?  
A1: No, it is ongoing.
- Q2: Is there much elephant trading in Cambodia?  
A2: It has probably reduced in recent years but there is still some poaching to sell the ivory and for the traditional medicine trade. Thai and Chinese are involved in the trade.

# **The care and management of the domesticated Asian elephant in Myanmar**

**U Tun Aung and U Thoung Nyunt**

## **Introduction**

The Union of Myanmar is situated in Southeast Asia. Its geographical coordinates are 9°53' to 28°25'N latitude and 92°10' to 101°10'E longitude. It comprises a total land area of 676 533 square km, spread over 14 administrative states and divisions. There are four main rivers, an extensive network of feeder streams, many mountain ranges and a long coastline. Approximately 75 percent of the country lies within the tropics and the remainder lies in the subtropical and temperate zones. The annual rainfall is 900 mm in the Dry Zone and over 5 000 mm in the coastal region and other parts of the country. The average temperature is below 10°C in the hilly region and over 40°C in the Central Dry Zone (Forest Resource Division, 1993). The great variation in rainfall, temperature, soil and topography results in many different forest types, such as evergreen, semi-evergreen, and mixed deciduous forest, which are the most important for the elephant. Bamboo, one of the preferred foods of the elephant, is abundant in Myanmar's forests.

The elephant is not only of great cultural and historical significance in Myanmar, but is also of major economic importance in the country's timber industry. There were 4 075 elephants in timber harvesting operations in the Union of Myanmar in 1999–2000. The elephants of Myanmar are providing an invaluable service to the country not merely by supporting the national economy but, more importantly, by conserving the environment. It is universally accepted that animal skidding is the most environmentally friendly method of logging. Elephant skidding will continue to play a vital role in the timber operations of Myanma Timber Enterprise (MTE) for the foreseeable future, particularly in the many mountainous and swamp areas of Myanmar's forests.

MTE is the sole government agency involved in the timber industry and is responsible for the extraction, processing and marketing of the country's teak and other hard woods. MTE earns nearly 30 percent of the nation's foreign exchange.

Although the domesticated elephant populations (of known size and demographic characteristics) belonging to MTE and private owners are properly kept and receive regular and skilful veterinary care, the country's domesticated elephant population is declining year by year.

The great majority of domesticated elephants were procured directly from the wild elephant population by capturing and training them over several decades. Now the wild elephant population is also declining year by year. The main cause of the decline is poaching for ivory, skins and meat.

To ensure the protection and welfare of Asian elephants throughout their range in Myanmar and guarantee their long term survival, an effective management strategy, proper veterinary care of domesticated and wild elephants, a good education programme and projects and a public awareness campaign on the need to conserve wild elephants, adequate trained staff and funds, and collaboration with the Japan Wildlife Research Center (JWRC) and other organizations, associations, and groups are crucial.

Myanmar's elephants, both wild and captive, are widely distributed throughout the country.

## **Wild elephants**

Wild elephants in Myanmar are widely distributed throughout the whole country except for the Dry Zone areas. The total area of wild elephant habitat is over 115 600 sq. km in 87 township areas

(Myint Aung, 1994). According to a questionnaire survey done by the Nature and Wildlife Conservation Division in 1990–1991 (Tables 1 and 2) the estimated population was 4 639, which excluded Kayah State (U Uga, 2000).

The wild elephant population size has been estimated from time to time by the Forest Department, through reliable local informants and questionnaire surveys. Documented figures are as follows:

1942	5 500	(Burma Forest, Vol. 5. No.2)
1949	5 000	(Smith)
1950	6 000	(Willion)
1959	6 500	(Tun Yin)
Between 1960 and 1961	9 660	(FD, Unpublished data)
1962	9 057	(Wint – Sein Maung)
Between 1969 and 1970	7 340	(FD, Unpublished data)
1972	6 000	(Caughley, 1980)
1974	8 500	(Hundley) (Olivier)
1977	5 000	(Hundley). (Olivier, 1978) (Guardian Magazine June 1979, U Tun Yin)
1980	6 008 ( $\pm$ 1 000)	(Hundley) (Report to AESG.)
1980-81	5 508	(FD, Unpublished data)
1982	6 560	(Thet Htun)
Between 1990 and 1991	5 000 to 10 000	(FAO, 1983)
1991	4 000 to 6 000	(Myint Aung and Ye Htut,)
1996	5 000	(FD, 1996)

In 1999-2000, the wild elephant population was less than 4 000 widely distributed throughout Myanmar but mainly in the northern hills, the Arakan Yoma, the Bago Yoma, the Taninthari Yoma, Shan State and Chin State (Myint Aung, 1994 and U Uga, 2000). Thus, the wild elephant population trend is downward and can be explained by three factors. First, elephant habitats are shrinking at a faster pace than ever before and habitat fragmentation and disturbances to elephant ranges and corridors are quite common nowadays. This has resulted in a reduced carrying capacity to hold a viable population in many elephant ranges, especially in heavily disturbed pockets of habitats. Second, serious physical disturbance to elephants and the blocking of their regular movements has resulted in a decreased birth rate among the wild elephants. Third, poaching for ivory has resulted in the death of many wild elephants (U Uga, 2000).

Further poaching, continued habitat loss and habitat fragmentation and also seasonal migration routes being blocked and cut, may cause homeless and frightened elephant to stray into paddy fields, sugarcane fields, banana plantations and other farm lands, resulting in more and more human–elephant conflicts in the near future. The continued survival of the country's elephants, which are internationally endangered and regarded as a worldwide flagship species (U Uga, 2000), is threatened and serious measures to tackle the problem must be urgently implemented.

### Domesticated elephants

It is normally accepted that domesticated elephants were put into the service of man almost 2 000 years ago in Myanmar. Historical depictions of war elephants date back to the time of King Anawrahta of Bagan in the year 1044 AD. He conquered Thaton, a flourishing seaport at that time, and after subduing it, brought back to Bagan (together with other sacred relics of Lord Buddha) thirty sets of Tripitaka placed on the backs of thirty two white elephants that had been the property of King Manuha of Thaton (U Toke Gale, 1974).

Ancient kings possessed elephant forces. Indeed royal cavalry and infantry were of no use without an elephant corps that played a similar role to the tank regiments of present day armies. And there is a record showing that joust fighting on the backs of elephants took place during a war between the two powerful kings of Ava and Hanthawaddy.

Before 1942, the total number of elephants owned by the Timber Industry of Myanmar was about 10 000 and 6 500 of these were full grown, 2 500 were trained calves between the ages of five and eighteen and about 1 000 were calves.

By the end of the Second World War in 1945, only about 2 500 full grown elephants, less than one half of the pre-war amount, were available for the extraction of timber (U Toke Gale, 1974).

After 1948, the number of elephants owned and hired by MTE was as follows:

Year	MTE owned	Hired	Total
1962–1963	1 526	1 336	2 862
1988–1989	2 959	2 290	5 249
1999–2000	2 715	1 360	4 075

As can be seen from the data, elephants owned by MTE increased between 1962–63 and 1988–89 and then slightly decreased between the 1988–89 and 1999–2000 period (Tables 3 and 4). Map 1 (page 97) shows the existing distribution of MTE's elephant camps.

An animal census carried out by the Livestock Breeding and Veterinary Department (1993–94), revealed the following picture of the privately owned domesticated elephants:

	Male	Female	Total
Under 5 years old	151	170	321
5 to 15 years old	302	332	634
Above 15 years old	749	1 014	1 763
<b>Total</b>	<b>1 202</b>	<b>1 516</b>	<b>2 718</b>

Source: L.B.V.D Headquarters, Yangon

In 1999–2000, the elephants registered with the Forest Department consisted of:

	Male	Female	Total
Forest Department	7	5	12
Myanmar Timber Enterprise	737	935	1 672
Private owners	762	1 095	1 857
<b>Total</b>	<b>1 506</b>	<b>2 035</b>	<b>3 541</b>

Source: Forest Department Headquarters, Yangon.

For fuller details by state/division see Table 5.

Apart from the above registered elephants, some elephants are being raised in zoological gardens, national parks and elephant sanctuaries, as follows:

- a) Hlawga National Park 6 elephants
- b) Zoological Garden (Yangon) 3 elephants
- c) Zoological Garden (Mandalay) 2 elephants
- d) Gwa Elephant Range 3 elephants
- e) National Park (Alaungdawka thapha) 14 elephants.

## Laws

With regard to elephant management in Myanmar, elephants were first legally protected under the Elephant Preservation Act 1879 (Saw Han, 1984) that regulated hunting and capture. They were then protected by the Burma Wildlife Protection Act, 1936 (revised in 1956), under which hunting was prohibited except by licence. According to the Protection of Wildlife and Wild Plants and the Conservation of Natural Areas Law, 1994, elephants were listed as a completely protected species, and their capture was prohibited, except for scientific purposes. But even then one first had to obtain a licence (U Uga, 2000).

Regarding current legislation and law enforcement, the Forest Law, 1992 and the Protection of Wildlife and Wild Plants and the Conservation of Natural Areas Law, 1994 have been enacted. With regard to international obligations, Myanmar has been a party to CITES since 1997 and the Convention on Biological Diversity (CBD) since 1994. In addition to law enforcement, and for the more effective conservation of wildlife species, including elephants, Myint Aung (1994) recommended that a nationwide anti-poaching campaign be carried out in Myanmar (cited in U Uga, 2000).

The Protection of Wildlife and Protected Area Law (The State Law and Order Restoration Council Law No. 6/94 dated 8 June, 1994) consists of 12 chapters: 1) Title and Definition, 2) Objectives, 3) Formation of the Committee and Functions and Duties Thereof, 4) Designation of Protected Areas and Establishment of Zoological Gardens and Botanical Gardens, 5) Protected Wildlife and Wild Plants, 6) Hunting, 7) Right to Establish Zoological Gardens and Botanical Gardens, 8) Registration, 9) Taking Administrative Action, 10) Appeals, 11) Offences and Penalties, and 12) Miscellaneous.

The objectives of this law are to:

- a) implement the policy of protecting the country's wildlife;
- b) implement the policy of conserving the country's protected areas;
- c) carry out the country's obligations in accordance with the international conventions agreed by the state in respect of the protection of wild species of both flora and fauna and representative ecosystems occurring in the country;
- d) protect endangered species of wild flora and fauna and their habitats;
- e) contribute to the development of research on natural science;
- f) establish zoological gardens and botanical gardens for the protection of flora and fauna.

Under Chapter 5, Protected Wildlife and Wild Plants, section 15 (a), elephants and another 38 mammals have been listed as completely protected wildlife species.

Under Chapter 11, Offences and Penalties, section 37 mentions that whoever commits any of the following acts shall on conviction 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 with 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 without the recommendation of the Director General of the Forest Department a completely protected wildlife or protected wild plant species or any parts thereof.

## Registration

Domesticated elephants (privately owned and state owned) have to be registered at the Forest Department under the Essential Supplies and Services Act, the Burma Act XLVII, 1974, and the Elephant Registration Act, 1951.

MTE elephants are registered at the Forest Department at the age of five years old and above. The renewal of registration is required every three years. If an elephant gives birth, MTE personnel must inform the nearest Forest Department office within three months of the birth.

To register a domesticated elephant with the Forest Department a registration fee and three photographs of the elephant (front, right side and behind) must be submitted with the application. The registration fees scale is as follows.

a) MTE elephants	- Registration fee	2 500 kyats (for each elephant)
	- Renewal fee	750 kyats
b) Privately owned	- Registration fee	10 000 kyats (for each elephant)
	- Renewal fee	3 000 kyats

Captive born elephants and captured wild elephants belonging to MTE are also registered at the MTE headquarters from birth to death. A registration number and the name of the elephant are given after training. After receiving the name and registration number of the elephant, MTE personnel use a branding iron to affix the registration number and a star onto both buttocks of the elephants.

In former times, up to 1942, five European firms and one indigenous firm worked the country's teak forests, and they marked and registered their elephants as follows:

<u>Companies</u>	<u>Registration mark (by branding)</u>
Bombay Burma Trading Co., Ltd.	C
Steel Brothers Co., Ltd.	SB
McGregor and Co., Ltd.	M
Foucar Co., Ltd.	F
T.D. Findlay and sons	TD
Ba O Co., Ltd.	O

At present, MTEs mark their elephants with a star and the FD mark their elephants with the letters FD.

Under the Protection of Wildlife and Protected Area Law 1994, Chapter 8, Registration, Section 26(a) mentions that, "A person who possesses a souvenir or wears as a traditional custom any part of a completely protected wildlife species, before this law came into force, shall register it at the relevant township Forest Department in the manner described by the Minister of Forestry".

In Section 27, the law mentions that a forest officer who has been assigned to perform the functions of registration by the Director General: (a) may scrutinize the application for registration under section 26 in the prescribed manner and register or refuse registration; (b) if registration is accepted under subsection (a) he shall issue a certificate of registration to the applicant.

### **Organizations and their major projects**

MTE and FD have both been active in conserving and maintaining the population of domesticated and wild elephants. The Forest Department has prohibited the capture of wild elephants since 1994–95, although after 1994–95 MTE captured a few wild elephants in areas where there were conflicts between the elephants and people. To maintain the MTE elephants, MTE carried out the following projects with the assistance of the I.F.S. (International Foundation for Science – Sweden):

- 1) The development of RIA of serum progesterone to study the estrus cycle of Myanmar cow elephants to improve breeding management. (Daw Khyne U Mar, Manager of Research, MTE).

- 2) The study of spermiogram of elephants' semen with special reference to its employment for natural and artificial breeding. (U Aung Tun Khine, Assistant Lecturer, University of Veterinary Medicine, Yezin).
- 3) The establishment of a programme of captive breeding by natural mating of timber elephants in Bago Division. (U Soe Win – Assistant Manager (Vet) MTE).
- 4) The initiation of database management of a stud book of domesticated elephants from the Union of Myanmar. (U Thaung Nyunt – Assistant Manager (Vet) MTE).

The long-term survival of elephants is crucial to the Myanmar ecosystem. It cannot be ensured only by conservation of elephant habitat and the enactment of laws designed to protect them. A nationwide campaign is needed to educate people about the ecological interactions between elephants and their environment.

The Asian Elephant Specialist Group (AESG) meeting in Yangon in 1997, jointly sponsored by the Ministry of Forestry and IUCN/SSC, recommended the conservation of wild and captive elephants in Myanmar with the assistance of other countries and some relevant international organizations, such as the Wildlife Conservation Society (WCS), the Asian Elephant Specialist Group (AESG), the Smithsonian Institution (SI), etc.

The Forest Department has tried to establish Managed Elephant Ranges (MERs) that would be managed by the Nature and Wildlife Conservation Division. Five elephant ranges have been proposed (U Uga & Ye Htut, 1997) namely, Yakhine Yoma Elephant Range (Yakhine State), Tanine Elephant Range (Kachin State), Bago Yoma Elephant Range (Bago Division), Mayyu Elephant Range (Yakhine State), and Taninthari Elephant Range (Taninthari Division). These should be established as soon as possible (U Uga, 2000).

### **The work of domesticated elephants**

Domesticated elephants are used mainly for the following purposes:

- 1) timber extraction (logging);
- 2) transportation (as baggage elephants in hilly forests);
- 3) religious ceremonies and processions;
- 4) capturing wild elephants (as *kunchee* elephants);
- 5) state functions and ceremonies;
- 6) tourism (for elephant shows and trekking in the jungle);
- 7) agriculture activities in difficult terrain, especially in the northern part of Myanmar.

Trained domesticated elephants are used mainly for logging in Myanmar. Timber elephants enter the forest (work-sites) around mid-June when there is enough water and food for them. About 1700 working elephants owned by MTE and about 1500 owned by private contractors were engaged in timber extraction work in 1999–2000. Usually elephants work from mid-June to mid-February with a short break of two or three weeks at the end of October when the weather is extremely hot.

Usually, the working week is fixed at five days, but elderly elephants or elephants in poor health sometimes need extra resting days. The working hours are four to eight hours per day, depending on the weather, the dragging path, the health of the elephant, the topography, the size of the logs, and the amount of fodder and water available for the elephants. The baggage elephants are used to transport the equipment used for forest operations, the utensils of the inspection officers and forest rations. Logging by elephants is still widely practised and is the most suitable means under the prevailing selective felling system of Myanmar. The economic and environmental advantages of using trained elephants in forestry operations are numerous. A fully trained elephant is an investment for a lifetime. Such an elephant has a working life of 30 years (U Saw Richard *et al.*, 2000).

### Three kinds of working elephants

1) Trained calves (age 5 years to 17 years) are engaged in transporting the personal equipment of the staff involved in timber operations and rations for the elephants in the rainy season and early winter season before the construction of logging roads.

**Maximum loading capacity:**

Age 5–12 years	-	30 kg
Age 12–15 years	-	70 kg in plains areas
	-	45 kg in hilly areas
	-	30 kg in steeper and difficult areas
Age 16–17 years	-	100 kg.

**Travelling limits:**

- Not more than 25 km per day in flat areas.
- Not more than 16 km per day in mountainous and muddy paths.
- Not more than 3 strenuous marches without any rest period.

2) Logging elephants (age 18 years to 55 years) are engaged in dragging logs and pushing logs according to their power or strength from tree stumps to the point where they are measured or to the streams in which they are floated.

3) Yelaiking elephants are engaged in freeing the jammed logs floating in the stream to enable them to continue on their way to the rafting depot.

**Working capacity:**

100 to 180 hoppus tons<sup>1</sup> / head / year for teak logs  
 180 to 240 hoppus tons / head / year for other hard woods.

**Maximum loading capacity:**

18–24 years	-	Light dragging work
25–45 years	-	Full working
46–55 years	-	Work capacity declines
56–60 years	-	Very light work
Over 60 years	-	Retired.

Classification of working elephants according to their dragging power:

- A first class elephant can drag more than 2 hoppus tons logs at a time
- A second class elephant can drag 1 to 2 hoppus tons logs at a time
- A third class elephant can drag 1 hoppus ton logs at a time
- A fourth class elephant can drag less than 1 hoppus ton.

### Veterinary care

For veterinary care of the domesticated elephants, the veterinarians go from camp to camp and elephant to elephant to give the necessary treatment with modern drugs and traditional medicines. The major health problems of the elephants in Myanmar are parasitic infestations and nutritional disorders. Contagious diseases such as anthrax and haemorrhagic septicemia (H.S.) are controlled by using

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<sup>1</sup> 1 hoppus ton = 1.8 cu. m.

vaccines and by segregation. The elephants undergo stool, skin and blood checks quarterly at the Central Laboratory or a Regional Laboratory of the Livestock Breeding & Veterinary Department.

In Myanmar there are 87 veterinarians caring for the health of domesticated elephants as follows:

Organization	Graduates	Dip. in Vet. Med.	Total
MTE	19	58	77
FD	10	-	10
Total	29	58	87

The veterinarians from MTE inspect each elephant at least once a month routinely and if necessary to give treatment, they stay at the elephant camps, sometimes for long periods.

MTE purchases veterinary medicines from foreign and local companies. This involves considerable expense as can be seen from the following information:

Financial Year	Local Currency (kyats)	Foreign Currency (US\$)
1995–1996	1 050 000 kyats	120 000
1996–1997	1 030 000 kyats	-
1997–1998	1 400 000 kyats	270 000
1998–1999	1 200 000 kyats	-
1999–2000	1 310 000 kyats	260 000

The numbers of tool and blood tests given to timber elephants between 1996 and 2000 (Central lab – LBVD Yangon) are as follows:

Year	Stool Test	Blood Test
1996	419	186
1997	432	380
1998	888	987
1999	709	1 183
2000	302	992

(Up to 26.12.2000)

The elephants of the MTE all receive excellent veterinary care. Caughley (1980) states that veterinary treatment and training in Burma is modern, highly developed and backed by an elaborate recording system.

### Summary and recommendations

Elephants have had a relationship with Myanmar society for a long time in terms of religion, culture and the economy. Elephants still play an important role in logging because of the topography of the country and the selective felling system of Myanmar. Wild and domesticated elephants are found throughout the country. In the first half of the twentieth century there were about 5 500 wild elephants (in 1942) and about 10 000 captive elephants (in 1942), but in the latter part of the century there were about 4 000–6 000 wild elephants and about 6000–7 000 captive elephants in Myanmar. So the population of elephants in Myanmar has declined gradually, because of poaching, deforestation, loss of habitat, habitat fragmentation and overload. Appropriate solutions are urgently required to ensure the long-term survival of both captive and wild elephants. The remaining population of Asian elephants is at a critically low level and is declining gradually throughout most of their ranges. The continuing loss of habitat for wild and domesticated elephants and the unbalanced death and birth rate

of domesticated elephants are the primary obstacles to maintaining a viable elephant population in Myanmar.

The Ministry of Forestry has laid great stress on implementing a comprehensive management programme incorporating both wild and domesticated elephant populations. It is hoped that this will ensure the continued survival of this species. In other words, the Ministry of Forestry is giving priority to both the *in situ* and the *ex situ* conservation of elephants in Myanmar. Uga and Ye Htut (1997) recommended the expansion of the protected area network including managed elephant ranges. Myanmar has already established the first elephant range called Yakhine Yoma Elephant Sanctuary. In the long-term a network of elephant ranges throughout the country will be gradually established.

The average birth rate of timber elephants is 3.1 percent and the death rate is 3.3 percent (based on the total population). The breeding age of timber elephants is as early as eight years old and as late as 55 years old. But the average breeding age of cow-elephants is from 18 years old to 50 years old. To encourage captive elephant breeding, MTE appoints elephants of both sexes to the same logging teams and allows them a night out for free grazing and mating. To get better elephant breeding results, MTE has initiated a research programme to raise the calving rate of cow-elephants between the ages of 15 and 18 that are used for travelling and transport purposes (light work). For the sake of the long-term survival of elephants in Myanmar, all foresters belonging to the Ministry of Forestry, especially those in the Forest Department and MTE, and decision makers at all levels, are strongly urged to view the forests as complex ecosystems, to pay adequate attention to saving elephant habitat, to promote the welfare of staff working with elephants and to co-operate with other countries.

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**Table 1. Population estimate of wild elephants**

(Based on a questionnaire survey by Wildlife Division, FD, 1990-1991)

State/Division	Population	Remark
Kachin	110	- Estimate for townships area.
Kayah	-	- Not available
Kayin	170	
Chin	0	
Sagaing	1 180	
Tenasserim	100	
Bago	230	
Magwe	4	- Estimate for Saetotetaya Township
Mandalay	33	
Mon	100	
Yakhine	1 161	
Yangon	117	
Shan	1 254	
Ayeyarwaddy	180	
<b>Total</b>	<b>4 639</b>	

Source: Myint Aung, 1994

**Table 2. Personal estimate of wild elephant population (1991)**

State/Division	Population (minimum)	No. of townships where wild elephants distributed	Approximate area with wild elephants (sq. km)
Kachin	850	11	19 900
Kayah	50	2	850
Kayin	170	3	5 500
Chin	-	-	-
Sagaing	800	18	22 000
Tenasserim	150	6	18 500
Bago	280	14	12 000
Magwe	25	2	1 200
Mandalay	100	10	3 750
Mon	100	1	1 250
Yakhine	750	8	16 500
Yangon	110	2	950
Shan	550	5	8 700
Ayeyarwaddy	180	5	4 500
<b>Total</b>	<b>4 115</b>	<b>87</b>	<b>115 600</b>

Source: Myint Aung, 1994

**Table 3. Distribution of MTE elephants (1999–2000)**

State/Division	Own elephant			Hired elephant
	FG	TC	CAH	
Kachin	45	21	3	86
Kayah	-	-	-	-
Kayin	-	-	-	-
Chin	61	23	7	37
Sagaing	524	292	82	191
Taninthari	-	-	-	-
Bago (West)	220	101	15	99
Bago (East)	175	108	12	585
Magwe	362	123	45	34
Mon State	-	-	-	-
Mandalay	132	70	6	134
Shan (South)	32	5	3	37
Shan (North)	35	40	7	51
Shan (East)	-	-	-	-
Yakhine	35	28	-	19
Ayeyarwaddy	72	30	1	87
Yangon	-	-	-	-
<b>Total</b>	<b>1 693</b>	<b>841</b>	<b>181</b>	<b>1 360</b>

Note: FG = Full grown; TC = Trained calf; CAH = Calf at heel

**Table 4. Status of MTE elephants and hired elephants**

Year	Full grown (18-above)	Trained calf (4-18 years)	Calf at Heel (0-4 years)	Total	Hired elephant
1962–63	883	398	245	1 526	1 336
1988–89	1 520	1 038	401	2 959	2 290
1999–2000	1 693	841	181	2 715	1 360

**Table 5. Registered elephants at Forest Department (1999–2000)**

State/ Division	FD			MTE			Private			Total		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Kachin	-	-	-	38	25	63	220	333	553	258	358	616
Kayah	-	-	-	-	-	-	17	17	34	17	17	34
Kayin	-	-	-	-	-	-	112	167	279	112	167	279
Chin	-	-	-	34	53	87	4	3	7	38	56	94
Sagaing	-	-	-	156	238	394	30	36	66	186	274	460
Taninthari	-	-	-	-	-	-	43	70	113	43	70	113
Bago	2	1	3	141	183	324	207	316	523	350	500	850
Magway	-	-	-	187	216	403	19	27	46	206	243	449
Mandalay	-	-	-	69	102	171	8	6	14	77	108	185
Mon	-	-	-	-	-	-	7	14	21	7	14	21
Yakhine	2	2	4	23	14	37	4	14	18	29	30	59
Yangon	-	-	-	-	-	-	-	-	-	-	-	-
Shan	3	2	5	37	54	91	33	26	59	73	82	155
Ayeyarwaddy	-	-	-	52	50	102	58	66	124	110	116	226
<b>Total</b>	<b>7</b>	<b>5</b>	<b>12</b>	<b>737</b>	<b>935</b>	<b>1 672</b>	<b>762</b>	<b>1 095</b>	<b>1 857</b>	<b>1 506</b>	<b>2 035</b>	<b>3 541</b>

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**Question and answer session**

Q1: What are the management links between wild and domesticated elephants?

A1: No real management links. Wild elephants are only counted, not managed. Domesticated elephants are generally worked for five to seven hours per day and let into the forest to rest. In such circumstances cows are generally impregnated by wild bulls.

Q2: Are wild elephants being domesticated?

A2: No, they are only caught for scientific purposes.

Q3: What do you do to enhance breeding success?

A3: In general there is only natural breeding but we do give the cows some nutritional supplements that helps with their pregnancies.

Q4: You need a constant supply of elephants for logging but if you rely on natural breeding don't you find that the supply goes down before it goes up?

A4: Yes, that is right.

Q5: Do all the vet technicians you employ have Bachelor's degrees?

A5: Yes.

Q6: Does MTE carry out reforestation to ensure that there will always be employment for elephants?

A6: Yes, we carry out reforestation.

Q7: Are there any official channels for talking about elephants among Myanmar, Thai and Indian institutions or agencies?

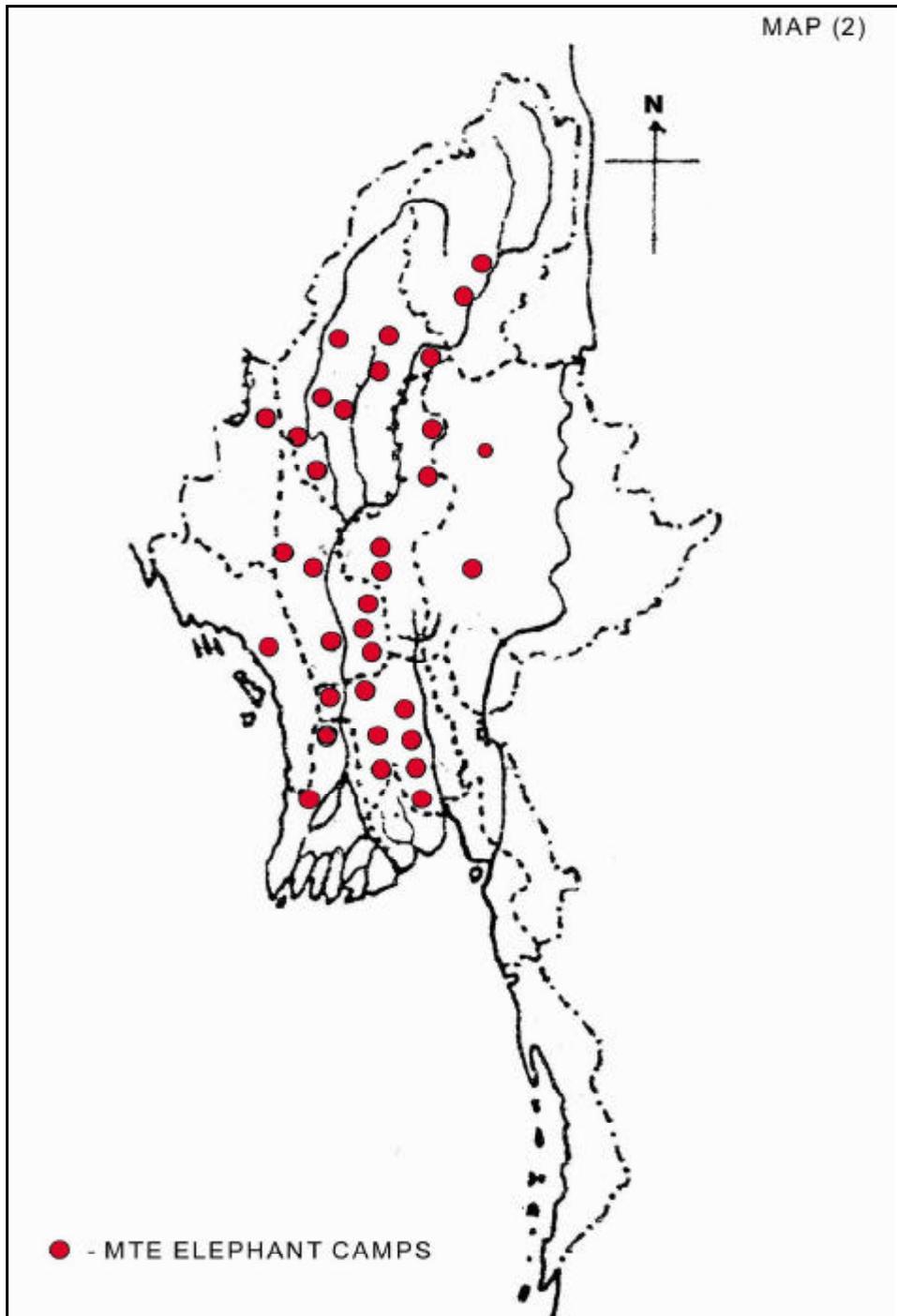
A7: No.

Q8: The best way to log sustainably is to use elephants rather than mechanize, is this official policy in Myanmar?

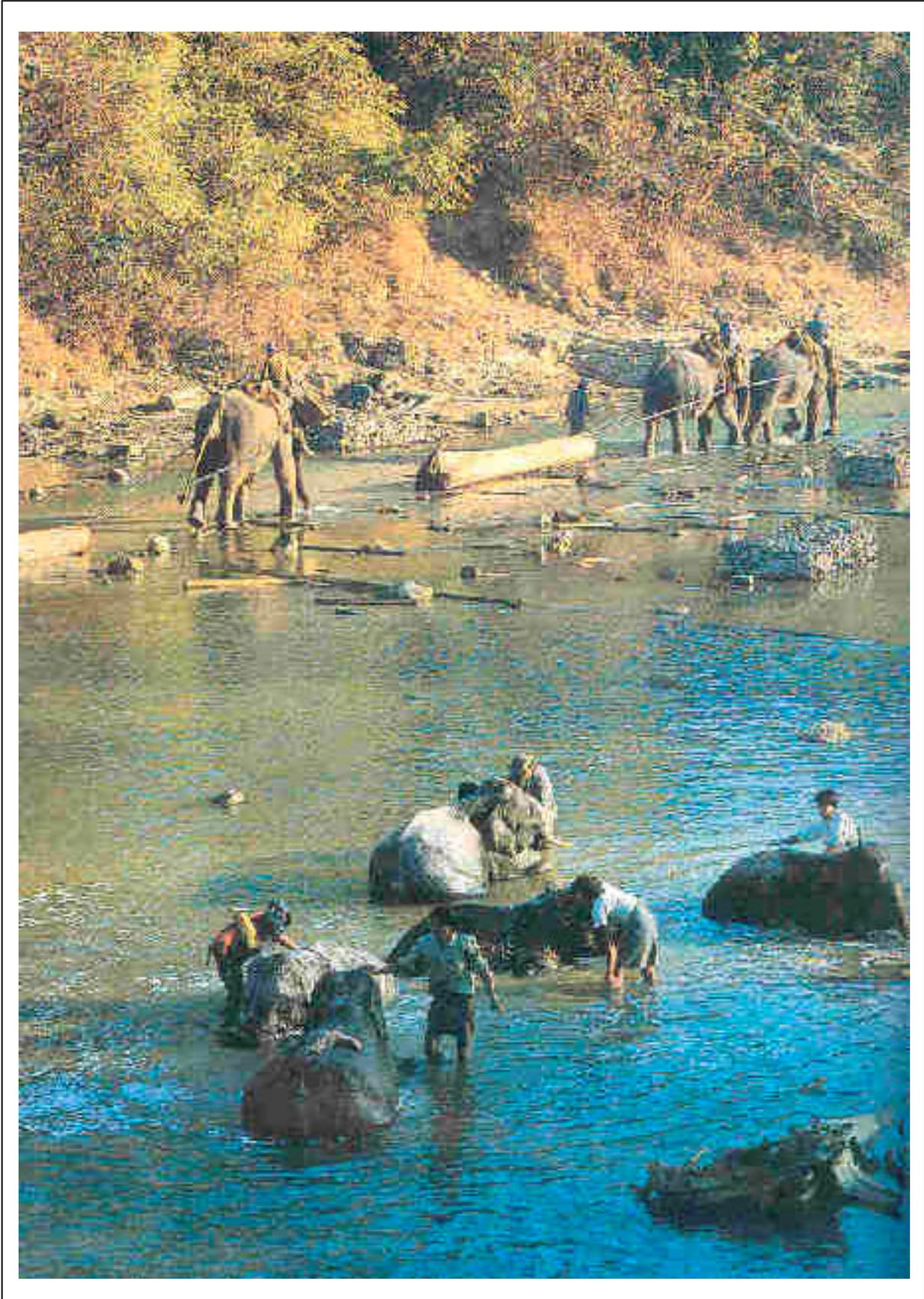
A8: Yes, selective logging using only elephants is the official policy.

Q9: Do private owners capture wild elephants?

A9: No. They do domestic breeding or release cows into the wild to get impregnated.



**Fig. 1. Map of MTE elephant camps**



Logging elephants – important partners in the teak forestry of Myanmar.

# The challenge of managing domesticated Asian elephants in Nepal

Fanindra R. Kharel

## Introduction

Almost 57 percent of Nepal's land was covered by forest in 1961 (Kharel, 1985). This was reduced to 29 percent during the last four decades (HMGN, 1999). The loss of forest resources, largely limited to the lowlands (the Terai region), was mostly the result of extensive clearing for agriculture and commercial timber operations aided by an increased fuelwood demand by a burgeoning population<sup>1</sup>. This resulted in the loss of wild Asian elephant habitat and, consequently, a decrease in the number of elephants found in Nepal.

The Asian elephant (*Elephas maximus*) is endangered throughout the region and is in danger of becoming extirpated in Nepal. A rapidly growing human population and its need for land development have led to an increase in the incidence of human-elephant conflicts. As a result, the elephants are now mostly confined to national parks and wildlife reserves.

The history of the capture, taming and use of Asian elephants is a long one. Domesticated Asian elephants have long been associated with religious beliefs and practices, and the elephant was a status symbol of a wealthy owner in the past. Now, the domesticated elephants in Nepal are used for forest excursions, and for entertaining tourists in parks and reserves. They have also become an important scientific subject for wildlife biologists, park/reserve managers and field investigators. Elephant camps have been established along with protected areas located in the lowlands of Nepal, namely the Koshi Tappu Wildlife Reserve (KTWR), the Parsa Wildlife Reserve (PWR), the Royal Chitwan National Park (RCNP), the Royal Bardia National Park (RBNP) and the Royal Suklaphanta Wildlife Reserve (RSWR).

Realizing the need to conserve the declining population of wild elephants in Nepal, a Task Force was commissioned in 1985 by the Chief Secretariat of His Majesty the King to carry out a study and make recommendations on the management of elephants in captivity. As a result of the recommendations contained in the Task Force Report (1985), an elephant breeding center was established at Khorsor in RCNP in 1986. The objectives of the breeding center were to begin scientific breeding and carry out research on elephants. It was also expected to gain experience in elephant management and their use in the management of protected areas. Initially, the elephant breeding center began with 22 elephants (16 from India, four from Thailand and two from Myanmar). Today, the number stands the same and consists of three adult males, two juvenile males, 13 breeding females and four infants.

The above mentioned elephant camps and breeding center have played a key role in conserving this species through captive breeding.

## Status of wild elephants

Until 1960, there was a large number of Asian elephants throughout the entire lowland forest area of Nepal. As a result of a massive human resettlement programme the forest cover was extensively cleared, and the elephant population dwindled to about 100 individuals.

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<sup>1</sup> The human population growth rate of Nepal's tropical region is an average of 2.66 percent per year and this was exacerbated by migration from the hills to the lowlands.

Based on the spatial movement of the wild elephants, the country's elephant population has been categorized into four groups or sub-populations.

- 1) Eastern population: The population of this region is confined to the highly degraded and fragmented forest patches. This population consists of temporary migrants from the neighbouring state of West Bengal. The total sub-population varies between 10–15 individuals and is mostly seen during the paddy-harvesting season that lasts from September to October (personal communication, Department of Forest personnel).
- 2) Central population: This comprises 25–30 resident animals within the Parsa Wildlife Reserve (PWR). Some splinter groups of this population have found their way into the adjoining Royal Chitwan National Park (RCNP) as well as into the buffer forest of the PWR (Chief Warden, PWR, personal communication and from an analysis of animal sighting reports of the last ten years).
- 3) Western population: The western population has been of particular interest since it was noted that there were only two bulls within the Royal Bardia National Park (RBNP) in 1987. However, later in the early nineties a herd of 25 elephants was sighted and recorded for the first time. These herds were known to have migrated in from the RSWR and from the adjoining forest areas of India and Dudhwa National Park. In 1994, 32 elephants were recorded in totality and have become residents for most of the year. The current population is between 45 and 50 individuals (S.S. Bajimaya, personal communication in 2000 and an analysis of animal sighting reports of the last 20 years). With this recruitment, it has become the largest sub-population of elephants in Nepal.
- 4) Far-western population: This population is not as stable as the populations of other places. The initial population was found to be between 25 and 30 animals. However, the population has reduced drastically over the years. These animals used to cross to the Indian side of the border during certain periods of the year and resided mainly in RSWR. They were seen moving along the foothills of the Siwalik Hills, eastward to RBNP and then returning by the same route. This movement of elephants has ceased since 1994. Now a herd of 12-18 animals (M.B. Pandey, personal communication in 2000 and an analysis of animal sighting reports of the last 15 years) can be seen in and around this area.

### Status of domesticated elephants

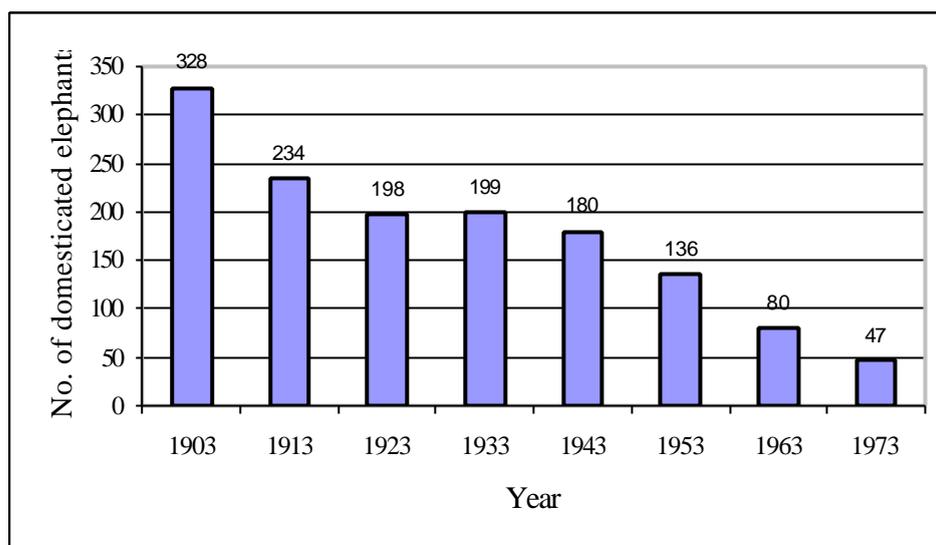
Available records indicate that the management of domesticated elephants in Nepal has a long history and is said to have begun in 1903. At one time there were 31 elephant camps throughout the lowlands of Nepal. The capture and training of wild animals was a common practice in the past. A total of 17 domesticated elephants were released into the wild in 1914 and 10 wild elephants were captured for domestication during 1954–1970.

Although the reason for releasing elephants into the wild is not mentioned in reports, it can be assumed that those elephants were released because of the difficulty of finding them work or because of their old age. If we analyse the elephant population data at ten-year intervals from 1903, there is a clear indication that the population has decreased over the years (Table 1 and Fig. 1).

**Table 1. Elephant populations at ten year intervals between 1903 and 1973**

Years	1903	1913	1923	1933	1943	1953	1963	1973
No. of elephants	328	234	198	199	180	136	80	47

Source: Janchbujh Kendra Bibhag, Raj Durbar (1986)



**Fig. 1. Declining trend of domesticated elephant populations at ten-year intervals between 1903 and 1973**

Since 1978, the management responsibility of the domesticated elephant camps has been given to the Department of National Parks and Wildlife Conservation (DNPWC) by His Majesty's Government of Nepal (HMGN). Accordingly, parks and reserves at KTWR, PWR, RCNP, RBNP and RSWR have maintained trained elephants. One elephant breeding center in RCNP has also been established and comprises 22 animals.

The number of elephants in these parks and reserves, including the breeding center, totals 77. Other than these elephants belonging to the government, the King Mahendra Trust for Nature Conservation (KMTNC), a prominent national NGO, and various hotels inside and outside of RCNP and outside of RBNP also keeps a significant number of elephants to cater to the needs of tourists and to conduct research. Tables 2 and 3 show the total number of domesticated elephants spread across the different camps.

**Table 2. Domesticated elephants in government camps**

Names of camps	Male			Female			Total
	Adult	Sub adult	Juvenile	Adult	Sub adult	Juvenile	
KTWR Elephant Camp	-	-	-	10	-	-	10
PWR ?	-	-	-	8	-	-	8
RCNP ?	11	-	-	9	-	-	20
RBNP ?	-	-	-	10	-	-	10
RSWR ?	-	-	-	7	-	-	7
RCNP Breeding Center	5	-	-	13	4	-	22
<b>Total</b>							<b>77</b>

**Table 3. Domesticated elephants in private camps**

Names of camps	Male			Female			Total
	Adult	Sub adult	Juvenile	Adult	Sub adult	Juvenile	
KMTNC, RCNP, Sauraha	-	-	-	5	-	-	5
KMTNC, RBNP	-	-	-	2	-	1	3
Hotel, West Nepal Adventure, RBNP	-	-	-	5	-	-	5
Hotel, Machan Wildlife, RCNP	1	-	-	9	-	-	10
Hotel, Chitwan Jungle Lodge, RCNP	-	-	-	9	-	-	9
Hotel Narayani Safari, RCNP	-	-	-	8	-	-	8
Hotel Tiger Tops, RCNP	3	-	1	10	-	-	14
Hotel Island, RCNP	-	-	-	6	-	-	6
Hotel Temple Tiger, RCNP	-	-	-	7	-	-	7
Central Zoo Jawalakhel	-	-	-	1	-	-	1
Individual Hotels at Sauraha outside the RCNP	-	-	-	17	-	-	17
Hotel at Piprahar outside the RCNP	-	-	-	2	-	-	2
Hotel Gaida Wildlife Camp, RCNP	-	-	-	7	-	-	7
<b>Total</b>							<b>94</b>

Altogether, there are 171 domesticated elephants in Nepal. This figure, which shows an increasing trend, is rather encouraging when we remember the decreasing trend of wild elephants seen from 1903 to 1973 (Table 1 and Fig. 1).

### Current legal status of the Asian elephant

Under the provision of the National Parks and Wildlife Conservation (NPWC) Act 2029 (1973) and its 4th amendment 2049 (1993), the wild elephant (and another 25 species of mammals) falls under the protected species list (Appendix 1). According to section 26(1) of the NPWC Act, the killing or wounding of a wild elephant or buying any part of it (trophy) is punishable by 5 to 15 years imprisonment or a penalty of NRs. 50 000 to 100 000, or both. According to section 25 (1) of the Act, anyone furnishing information leading to the capture of anyone who kills or wounds a wild elephant is entitled to a reward of up to NRs. 50 000. Similarly, anyone furnishing information regarding those involved in selling or buying of any wild elephant-related product is entitled to a reward of up to NRs. 10 000. To implement these legal provisions, the Royal Nepalese Army has been deployed in national parks and wildlife reserves, except in Makalu–Barun National Park and Conservation Area (located in the High Mountain region) and in hunting reserves.

However, there is no specific legal provision to handle the keeping of domesticated elephants by hoteliers for the purpose of tourism, and by the government for various purposes including anti-poaching operations. Although, the Elephant Management Rules 2022 (1966) were passed by the HMGN, the rules were later repealed by the Civil Service Act 2049 (1993). The old rules had defined the standard of the elephant camps operated by the government, the Terms of Reference (TOR) of the chief of the camp, the authority for elephant control as well as the arrangements for the use of the elephants, and the procedures to be followed to dispose of a dead elephant after its natural death. Nevertheless, the new rules framed under the Civil Service Act 2049 (1993) made arrangements for three people to look after each elephant, namely a *Pachhuwa*, a *Phanit* and a *Mahut*. A hierarchy of one *Rahut*, one *Daroga* and one *Shubba* (senior clerk level) positions to supervise daily elephant

caring activities has been stipulated for each elephant camp with the capacity to keep up to ten animals. To supervise all the government managed elephant camps in the country, an officer level position has also been provided by the rules framed under the Act. In addition, there is a daily food ration scale per elephant. According to the scale, an adult elephant is entitled to get 15 kg of paddy, 1.7 kg of sugar, 0.05 kg of salt, 15 kg of dry straw, 15 kg of carrot, 1.5 kg of pumpkin, 2.1 kg of potato, 80–100 kg of grass/fodder and 150 litres of drinking water.

However, it is not necessary for the private sector to abide by these provisions of the Civil Service Act, including the food ration scale system, when taking care of privately owned elephants. For the sake of these animals, a Domesticated Elephant Keeping and Management Act and Regulations are essential. These would ensure that government owned elephants and privately owned elephants are treated equally.

### Registration of domesticated elephants

Since the enactment of the National Parks and Wildlife Conservation Act 2029 in 1973, the capture of wild elephants for domestication has been strictly prohibited and no wild elephant has been captured. There is no report of breeding among the cow elephants kept by the private sector at hotels and safari camps, except one at the Tiger Tops in 1980 and one very recently in 2000, in KMTNC/RBNP. The Tiger Tops calf was later trained at the government-owned elephant breeding center in RCNP and the recently born calf is being taken care of by the KMTC/RBNP itself.

The registration system is only applied to government-owned elephants and consists of giving a new name to a calf. There is a tradition in Nepal of accompanying the names of elephants with a word identifying their sex: *Gaja* or *Prasad* denotes a male and *Kali* denotes a female. Before the restoration of the multi-party democratic system in 1990 in Nepal, the birth of a baby elephant used to be reported to the Royal Palace which provided a new name for the calf and appointed a caretaker for the elephant who then received the food rations for the baby elephant. After the baby reached the age of eight years, it was treated as an adult and received full rations. Since 1990, the Department of National Parks and Wildlife Conservation (DNPWC) has provided names for baby elephants after being sent news of a birth by the concerned warden. The positions of caretaker of the additional elephant are created by His Majesty's Government of Nepal (HMGN) and is processed through the Ministry of Forests and Soil Conservation (MFSC) as per the proposal forwarded by the DNPWC.

For breeding purposes, a *Birendra Prasad*, a good servicing male, is used. However, most of the newborn elephants are the products of visiting wild elephants. The data on elephant births in Nepal from 1979 to mid 2000 is presented in Table 4.

As no regulations cover the registration of privately domesticated elephants owned by private owners it is imperative that a new policy be framed to address this issue.

### Elephant care

The Department of National Parks and Wildlife Conservation (DNPWC) under the Ministry of Forests and Soil Conservation (MFSC) is the only government agency responsible for taking care of Asian elephants in the wild. The DNPWC has played a major role in taking care of the animals by managing elephant camps in the protected areas located at various locations in the lowlands of Nepal. The DNPWC was also instrumental in establishing a breeding centre. Apart from the DNPWC, the private sector (hoteliers) have kept significant numbers of elephants for tourism purposes, especially for trekking to view wildlife in and around the parks and reserves. There is a strong need for further research and collaboration related to the captive-breeding programme. So far, no national or international organization has provided support to the Department for this.

**Table 4. Births of domesticated elephants**

Name of mother	Calf's name	Year of birth	Status	Sire	Remarks
Tribhuvan Kali	Unnamed	1979	killed	Ganesh Gaja <sup>2</sup>	Kicked by mother after parturition
Durga Kali	Samsher Guj	1980	alive	Wild	Tiger tops
Manju Kali	Nirajan Prasad	1981	„	Ganesh Gaja	Born at KTWR
Tribhuvan Kali	Gyanendra Prasad	1981	„	„	„
Rup Kali	Puja kali	1984	„	„	„
Aishwarya Kali	Dipendra Prasad	1984	died	„	Died at age 6 in KTWR
Dipendra Kali	Unnamed	1986	„	„	Died after 9 days in KTWR
Tribhuvan Kali	Gyanednra Prasad	1981	alive	„	KTWR
Rup kali	Puja kali	1984	„	„	„
Aishwarya Kali	Dipendra Prasad	1984	died	„	Died after 9 days in KTWR
Tribhuban Kali	Prerana Kali	1986	live	„	KTWR
Rampyari Kali	Chitwan Kali	1987	„	„	RCNP
Bhrikuti Kali	Ram Gaja	1987	„	„	„
Rupa Kali	Ganesh Kali	1990	died	„	Died 2 hours later in RCNP
Komal Kali	Stillborn	1993	dead	Wild	Born dead, RCNP
Rampyari Kali	Bahadur Gaja	1994	alive	Birendra pd.	RCNP
Rup Kali	Unnamed	1996	died	Wild	Dead after 9 days in RSWR
Pawan Kali	stillborn	1997	dead	„	Born dead, RBNP
Prerana Kali	Gandaki Kali	1998	alive	„	RCNP
Sitashma Kali	Karnali Kali	„	„	„	„
Sashi Kali	Rapti Kali	„	„	„	„
Bhawani Kali	Stillborn	1999	dead	„	„
Sashi Kali	Narayani Kali	2000	alive	„	„
Laxmi kali	stillborn	„	dead	„	Born dead, RCNP
Shanti Kali	Unnamed	2000	live	„	KMTNC, Bardia

Source: DNPWC

<sup>2</sup> A very popular giant semi-wild bull and a regular visitor to KTWR Elephant camp. The bull used to mate with the captive females and played a significant role in the history of captive breeding of elephants in Nepal. This bull has left eight of its live calves behind from various cows. In 1991, the bull died of septic wounds.

## Use of elephants

As outlined earlier, domesticated elephants are mostly being used for forest excursions and for entertaining tourists in parks and reserves. The elephants have been heavily used by park/reserve managers and field investigators for the study of flagship species such as the Royal Bengal Tiger (*Panthera tigris*) and the Greater One Horned Rhinoceros (*Rhinoceros unicornis*).

Without the use of elephants, it is almost impossible to capture large mammals and carry out research studies. For example, the DNPWC was successful in translocating five rhinos between 1986 and 2000 from RCNP to RBNP and RSWR to establish a viable population there. In total, 58 rhinoceros were translocated to RBNP and four to RSWR. Similarly, elephants are being used for counting rhinoceros. The service provided by these elephants in all aspects of park management cannot be evaluated in monetary terms.

The elephants are also being used for conducting wildlife monitoring and anti-poaching activities in the parks and reserves. Moreover, the elephants are being used for rescue operations during natural calamities such as floods. The elephants are essential to the performance of special ceremonies such as royal weddings and during the coronation of the heir apparent.

In addition to all the above mentioned, the elephants are being used for promoting ecotourism. Because of the influx of wildlife tourism in and around the parks and reserves, the demand for elephants has increased from the private sector such as hoteliers and tour operators. In this respect, elephants are a very important source of income for their owners: an owner can legally charge a foreign tourist Rs.650 for providing two hours of riding on an elephant. An elephant can carry four tourists at a time and that amounts to Rs.1 300 per hour.

From the above discussion, it is safe to conclude that there are tangible and intangible benefits associated with elephants, if the animals are kept and managed properly. There is also scope for the private sector to keep elephants because of the increasing trend of tourists visiting parks and reserves.

## Veterinary care

Although there is a Department of Animal Health with an extensive network in 75 administrative districts of Nepal to take care of animal health, there is very little information about veterinary care for elephants. The DNPWC has only one Veterinary Officer and various paramedical assistant positions to take care of elephants kept in various camps and a breeding centre. Moreover, the DNPWC does not have sufficient funds to purchase the necessary drugs and equipment to take care of its elephants. In general, the veterinary care service is relatively poor and assistance is being solicited from a variety of sources.

## Summary and recommendations

As in other parts of the world, the destruction of dense forests led to the shrinking of the habitat of the Asian elephant in Nepal. To cope with the situation, the HMGN enacted the NPWC Act in 1973 to provide strict protection to this species (as well as another 25 mammals) in the wild. Domesticated elephant camps and a breeding centre, along with a hierarchy of supervision personnel, were established for captive elephants. Combined with veterinary care, the allocation of individual animal caretakers, and a system of daily food rations for the animals these measures helped to increase the number of elephants in captivity. The use of elephants in parks and reserves is essential for tourism and other activities. However, there are no specific acts and regulations to bring the private sector within the framework of the system established and practised by the government regarding the registration of animals, their care and their use. This has to be remedied by a provision in the NPWC

Act and by HMGN framing appropriate regulations to address these issues. In addition, the following recommendations have been made for the welfare of domesticated elephants.

1. Because of the lack of sheds in elephant camps, the chained elephants are under the open sky throughout the year, even during the cold frosty nights of winter and the hot sunny days of summer, which shortens the lives of elephants. Therefore, the construction of sheds in all government and private elephant camps is required.
2. Because of the lack of compound walls in all elephant camps, the intrusion of domestic cattle poses a serious threat of transmitting various diseases to the elephants. To prevent this, the construction of compound walls is essential.
3. There are inadequate in-house store facilities and space to store food rations, fodder/grasses and straw. These should be provided in all elephant camps.
4. Reduced availability of fodder during the lean period means that there is a high level of damage to the surrounding vegetation caused by trampling. To sustain the elephant fodder supply in perpetuity the plantation of palatable species is recommended for government as well as for privately kept elephants.
5. Personnel employed in the elephant camps have had to learn to take care of the elephants on their own. Training in all aspects of elephant care and management should be provided to staff at all levels.
6. There is a need for research and monitoring of the domesticated elephants' impact on parks/ reserves and buffer zones as an integral part of national park management.

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# **The present status and management of domesticated Asian elephants in Viet Nam**

**Trinh Viet Cuong, Tran The Lien and Pham Mong Giao**

## **Introduction**

On a national scale, almost all of the forested areas in Viet Nam are located along the international borders with Laos and Cambodia, although some forested areas remain in various remote and inaccessible areas, such as in the far north and northwest. In lowland areas, human impacts, especially the conversion to industrial tree plantations, agricultural land, and human settlements have rapidly devastated (and continue to devastate) many forests. Moreover, logging, the exploitation of forest products and hunting are also adversely impacting the quality of the remaining forests. Population expansion has created a dilemma of Malthusian proportions in Viet Nam, and the resulting development and expansion of infrastructure, industry and agriculture can be regarded as the principal causes of bio-diversity decline and forest depletion in Viet Nam. The Government of Viet Nam is well aware of this issue, and has made considerable efforts to strengthen nature conservation activities by enlarging the protected area network. At present, there are 11 national parks, 53 natural reserves, 17 species reserves/habitats and 25 protected landscapes giving a total area of 2 340 440 ha set aside for the purpose of conserving bio-diversity and protecting fauna and flora in the remaining forest areas.

The Asian elephant (*Elephas maximus*) in Viet Nam (both wild and domesticated) is becoming increasingly endangered, and without urgent action, in terms of on-the-ground conservation, the species faces extinction. In 1996, a joint action programme, "Rescue of elephant species threatened with extinction in Viet Nam", between the Ministry of Agriculture and Rural Development (MARD) and Fauna and Flora International (FFI) was proposed. The programme is still active and has been carried out with great efforts from both sides in recent years.

Currently, there may be only two areas suitable for long term elephant conservation and it is absolutely essential that these areas are properly protected because their elephant populations are considerably higher than those in other places, and probably represent the only populations in the country whose long-term survival is likely. The areas are Dak Lak province (high plateau in West Viet Nam) which is suitable for the conservation of wild and domesticated elephants and Nghe An province (Central Viet Nam) which is suitable for the conservation of wild elephants.

The elephant has long been an animal of enormous cultural, religious and even political and economic significance in Viet Nam. Revered by certain ethnic minorities, domesticated elephants played a crucial role transporting supplies and weapons during the wars of independence, as well as gracing the royal courts of Hue as symbols of the power and majesty of the old kingdom. Even today elephants still play an active part in Viet Nam's culture and economy, for transportation, in zoos and circuses, at festivals and as an important facet of ecotourism.

## **The status of wild elephants**

The results of countrywide surveys conducted in the last 30 years document the critical decline of the wild elephant population. It is also evident that in many areas where elephants were known to occur, they no longer exist or their range has been severely restricted. Thus even in those areas where elephants still remain, they are generally only in very small and isolated herds. Indeed, the largest known herd in Viet Nam is found in Dak Lak, and consists of only 15–20 individuals (Trinh Viet Cuong, 2000). The elephant population was undoubtedly declining in the 30 years prior to the Viet Nam War. During the war, however, the elephant population was directly affected by bombing as elephants were used for transporting supplies. Since then, elephant numbers have been rapidly falling

as a result of poisoning (from agent orange, napalm and other defoliants), hunting, deforestation and habitat loss.

After the war, in the period from 1975 to 1980, the number of elephants was estimated to be about 1 500–2 000 individuals (Le Vu Khoi and Do Tuoc, 1989) with elephant ranges located across most of the country. Since 1980, the number of elephants began decreasing for several reasons:

- 1) Agricultural conversion has destroyed thousands of hectares of forest.
- 2) Logging has significantly reduced the forest area.
- 3) The extraction/exploitation of NTFPs has degraded many elephant habitats.
- 4) Forest fires.
- 5) Hunting for ivory.

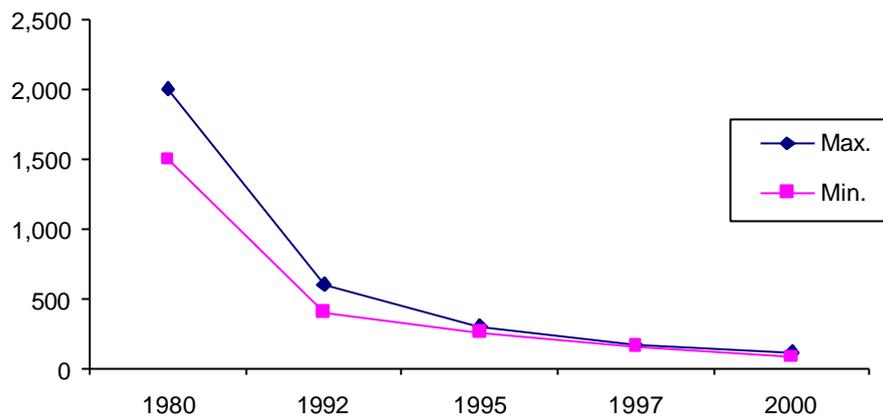
The result is that the majority of elephant populations are very small, have become extremely dispersed and isolated with a hugely restricted range. In short, many areas are not suitable, nor are the populations large enough to be viable and there is little hope for their long-term survival.

In the period from 1990-1992, the number of wild elephants was estimated to be about 400–600 individuals (Dawson *et al.*, 1996). In this period a great number of wild elephants and even domesticated elephants were killed for ivory. In the period 1993-1995, the elephant population fell to about 258-305 individuals in a total of 33 elephant ranges. Data collected between 1996 and 2000 suggests that there are only 19 elephant ranges left with a total of 85–114 individuals. These figures show, within ten years from 1990 to 2000, 14 elephant ranges have become non-existent, and the total elephant population has declined by more than 70 percent (see Table 1, and Fig. 1). All elephant ranges have been affected, with the elephants dispersing into small groups of five or six individuals. Many herds have only females, which means they have no possibility of reproducing and building up their populations.

From an overall perspective, North Viet Nam has no elephants and in Central Viet Nam there are some elephant ranges with very small and scattered populations. They are extremely isolated, with little or no chance of grouping together to form healthy, viable populations. Their range is mostly restricted to the border regions with Lao PDR and Cambodia. Dak Lak is now the only province to possess a significant population of elephants, but they are facing a number of threats and conflicts. In South Viet Nam, elephant populations are very small, isolated and face food shortages.

**Table 1. The estimated declining number of wild elephants in Viet Nam**

Year	Minimum individual number	Maximum individual number	Data source
1980	1 500	2 000	Le Vu Khoi
1992	400	600	Dawson <i>et al.</i>
1995	258	305	Trinh Viet Cuong
1997	160	170	Do Tuoc
2000	85	114	Trinh Viet Cuong



**Fig. 1. The decline in the number of wild elephants in Viet Nam**

### Causes of the decline in wild elephant populations

Forest habitat has been reduced, males are hunted for ivory, and elephants have been killed during human–elephant conflicts or as a result of human revenge attacks. In the high plateau area of West Viet Nam, wild elephants are also caught for taming.

The statistics below demonstrate the seriousness of the situation:

1. In Muong Te (Lai Chau province), in the period 1974–1976, there were approximately 180 elephants, however, by 1991 the numbers had declined by 91 percent with only 15 individuals left. Illegal hunting for ivory occurred intensely between 1987 and 1989. Elephant tusks were sold to Laos. It is reported that in Lai Chau town the FPD recovered about 250–300 kg of ivory, an amount that probably originally required at least 30 elephants to be killed by illegal hunting, and some of these, judging by the size of the recovered tusks, were still too young for ivory cutting. At present, there is no evidence to support the belief that elephants still exist in this province (Pham Mong Giao *et al.*, 2000)
2. The adjacent area between Binh Thuan, Dong Nai, Ba Ria and Vung Tau, between 1979–1983, contained more than 500 000 ha of forest with approximately 80–90 individuals. In 1992, as a consequence of heavy forest disturbance, the elephant population decreased by 44 individuals (Sharif B. Daim; Pham Mong Giao). By October 1999, it had no more than six individuals (Trinh Viet Cuong & Tran The Lien). The population had declined by 93 percent in 17 years.
3. Between 1960–1965, in Tra Mi and Tien Phuoc (Quang Nam province), there were two herds of elephant totalling about 80 individuals. In 1997, there were only approximately eight to nine individuals (Trinh Viet Cuong, 1997). Recent surveys conducted in May 2000, revealed there are only six individuals left (Trinh Viet Cuong, 2000).
4. In 1975, reports from local people indicated that Dak Lak had hundreds of elephants. In 1996, the population was estimated to be around 40 individuals (Dawson, Do Tuoc and Trinh Viet Cuong and Pham Mong Giao, 1996). Surveys conducted in September 2000 demonstrated a further decline of around 50 percent in four years to 15–20 individuals (Trinh Viet Cuong, 2000).
5. During 1990–1995, Nghe An province possessed a population of 40–50 individuals although surveys one year later in 1996 estimated the population to be around 17–24 individuals. However, at present, the population can be expected to be much lower.

Another matter that should also be considered is that of human-elephant conflict (HEC). It is not a new occurrence in many Asian countries, but this is one of the main threats to the existence of wild elephants. The data collected shows that HECs are proportionate to the area of forest converted in the interests of human expansion and development. From 1993 to 1997, a wild elephant herd in Tan Phu Forest Enterprise (Dong Nai province) killed nine people. In 1998, an elephant herd raided crops, huts and killed a further three people. In 1999, an elephant herd in Tan Phu (Dong Nai) (about five individuals including one young animal) crossed La Nga River to Binh Thuan province where they raided crops, destroyed huts and killed a married couple who had been staying in the forest. Later the elephants entered Bien Lac-Nui Ong Natural Reserve, Duc Linh district and killed two illegal loggers who had been staying in the forest. Still later, the elephants killed a firewood collector who had been staying in the forest.

During 10 days at the end of May 1999, an elephant herd killed five people (spontaneous immigrants), who were converting the forest for cultivation. Local authorities and other relevant agencies took active measures to urgently assist the victims' families, and at the same time informed local people about HEC conflict avoidance/mitigation measures.

In Viet Nam, human-elephant conflicts take place in many districts and provinces. There are nine areas among the 19 elephant ranges where human-elephant conflicts are taking place because of the reduction in areas of suitable habitat and the resulting food shortages. Because agricultural areas are located in or near forests, it is difficult to avoid crop damage because the crops, fruit trees, starch trees, and industrial trees such as sugarcane are palatable to elephants. Consequently, the human-elephant conflicts inflict heavy impacts on the local economy and rural livelihoods. As mentioned above the outcomes can be very grave indeed, including human deaths in some places, frightening local people off and leading to villagers driving elephants away or killing elephants out of revenge or for protection. At present, there are no effective measures to minimize HEC and some measures used by local people to drive elephants away are becoming increasingly ineffective as the elephants become habituated to this behaviour. Currently, levels of compensation and assistance for victims of HEC are very low, thus local people tend to do what they can to protect themselves, including killing the elephants.

### **The status of domesticated elephants**

At the turn of the century, Indochina was home perhaps to nearly half the entire Asian elephant population. As in India, the capture and domestication of wild elephants in Viet Nam was a traditional activity. Domesticated elephants were sold to neighbouring countries such as Cambodia and Laos.

Domesticated elephants are mainly concentrated in Dak Lak province (Tay Nguyen), the highest numbers are in Buon Don and Ea Sup districts where the ethnic minority peoples (M'Nong, Gia Rai, E De) have long held the tradition of catching and domesticating wild elephants. The domesticated elephants are used for a number of purposes such as transporting supplies, logging, travelling in forests (hunting, collecting forest products), taking part in festivals, worship or tourist services.

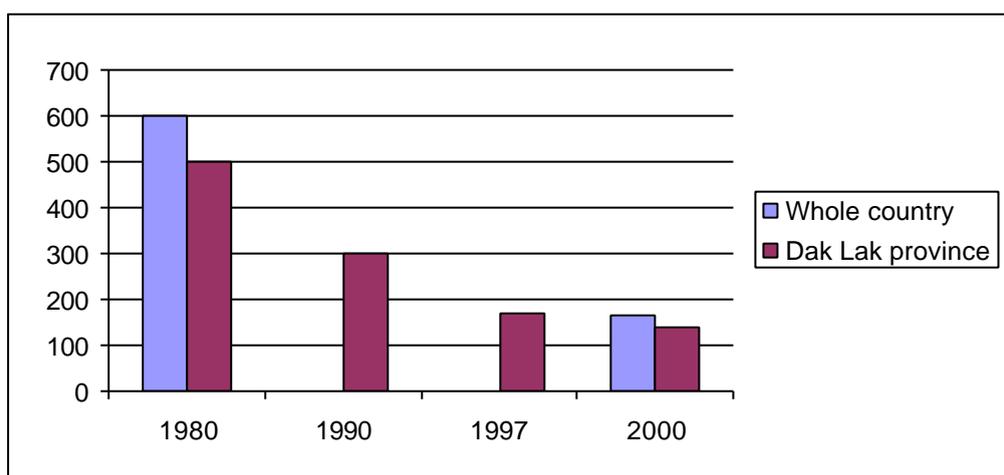
Some people, particularly those involved in ecotourism, would like to see the practice of capturing and domesticating wild elephants to be continued and perhaps expanded, however, this should be resisted on a number of grounds: (1) Elephants are state property; (2) the law prohibits the hunting of wild elephants for domestication; (3) elephants rarely breed in captivity in Viet Nam and thus domestication prevents the long term survival of the species in this country.

The number of elephants captured has been reduced during the last five years. However, this activity still takes place annually. Before 1990, every year 10–12 wild elephants (Do Tuoc, 1989) were captured in the Ban Don area (Buon Don district). The hunters who catch a large number of elephants are accorded considerable status and respect by their peers. Based on the data surveyed in 1979–1980, Dak Lak

province reportedly had 502 domesticated elephants. There were 299 animals left in 1990, and only 169 animals existed in 1997 in ten districts, a reduction of 130 domesticated elephants in seven years. According to recent survey statistics (12/2000), there are 138 domesticated elephants remaining in Dak Lak province, a decline of 364 individuals (1980-2000), and there are 27 individuals distributed in other parts of the country. Thus, the total number of domesticated elephants in the whole country is only 165 individuals (Table 2 and Fig. 2). Most of the domesticated elephants originate from Buon Don and Ea Sup districts (Dak Lak province).

**Table 2. The declining number of domesticated elephants in Viet Nam**

Year	Individual number		Data source
	Dak Lak province	Whole country	
1980	502	600	Dak Lak FPD
1990	299		Dak Lak FPD
1997	171		Trinh Viet Cuong, Dak Lak FPD
2000	138	165	Trinh Viet Cuong, Tran The Lien, Pham Mong Giao



**Fig. 2. The declining domesticated elephant population in Viet Nam**

The numbers of domesticated elephants in Dak Lak province in 1990, 1997 and 2000 were 299, 171 and 138 individuals respectively. Between 1990 and 1997, there was a decline of 33.7 percent and between 1997 and 2000 there was a decline of 27.5 percent. The 138 domesticated elephants in 2000 consisted of 95 females and 43 males. In terms of age, 40 (29 %) were over 50 years old, 87 (63 %) were between 20 to 49 years old (breeding age) and 11 (8 %) were under 20 years old and not mature enough for breeding (see Table 3).

### **Causes of the decline in the domesticated elephant population from 1990 to 1997**

1. The number of wild elephants has decreased in Buon Don – Ea Sup region, therefore it has become increasingly difficult to capture elephants. Furthermore, the law prohibits the hunting of elephants, and the catching and taming do not take place as openly as before. Good hunters specializing in capturing and domesticating elephants are scarce nowadays and many of those who practised the art as a livelihood or on a regular basis are now old.

**Table 3. The declining domesticated elephant population in Dak Lak province, 1990-2000**

Name of district	1990				1997			2000		
	Male	Female	Unclear sex	Sub-total	Male	Female	Sub-total	Male	Female	Sub-total
Buon Don					28	11	39	18	15	33
Ea Sup	44	26	2	72	12	16	28	6	9	15
Lak	5	34	2	41	5	20	25	2	18	20
Krong Bong	3	30	4	37	1	15	16	1	9	10
Dak Rlap	5	23		28	2	14	16	1	23	24
Krong No	22	14	1	37	5	8	13	5	6	11
Dak Mil	21	15		36	7	6	13	7	4	11
Dak Nong					2	12	14	0	8	8
Krong Ana		14		14		5	5	2	3	5
Krong Nang	6		1	7		2	2		1	1
Krong Buk		6		6						
Cu Mgar	2			2						
Ea Hleo		6		6						
Krong Pak		10		10						
Ea Kar	3			3						
M' Drak										
Cu Jut										
Ban Me Thuot										
<b>Total</b>	<b>111</b>	<b>178</b>	<b>10</b>	<b>299</b>	<b>62</b>	<b>109</b>	<b>171</b>	<b>42</b>	<b>96</b>	<b>138</b>

2. Elephants are used as a source of labour, so the mahouts do not want their elephants to breed, as this would prevent them from working. When domesticated elephants are left in the forest to feed, they are always tied to trees with a leg-iron, so it is really hard for them to breed with wild elephants or even with other domesticated elephants.

3. Recently, economic and social development has meant that machines are now replacing elephant labour, and using elephants for transportation is becoming less and less appropriate or necessary. Without these sources of work, elephants have become a "burden" for poor families who own them. In some places, they have to sell their elephants. Elephants are still useful in areas where transportation is not developed or in some places where there is tourism potential.

4. Forests areas are being converted for other land uses such as construction, national defence, industrial tree plantations of coffee and rubber. This fragments the elephant populations and reduces the chances for breeding as well as leading to food shortages.

5. At present, the domesticated elephants are still not controlled. The mahouts can sell or exchange their elephants illegally, for more benefit. This is done by transferring to someone inside the region or selling it to other districts and provinces including Lao PDR and Cambodia. Some households exchange elephants for oxen and buffaloes, etc.

6. Many elephants have died because of mahouts' carelessness, shortage of food and water in the dry seasons (annually, from November to April). Some have died of old age and weakness and lack of medical treatment, some have died of overwork. In some cases, elephants have died as a result of fighting with each other to get food in feeding areas or to breed with a wild elephant.

7. Many elephants (male) have been illegally shot for ivory while feeding in the forest. Ivory and elephant bone products are sold in many souvenir shops in tourist places, airports or in big towns and cities.

### Some information on the commercial value of elephants and associated products

1. Information on prices of selling domesticated elephants (survey records in May 2000 at the exchange rate: US\$1 = 15 000 Viet Nam dong)

- 1) Illegal sale to Cambodia: price unclear as they are exchanged for oxen, buffaloes or tools or equipment.
- 2) Sale inside Viet Nam (to other provinces): 30–60 million VND/individual (equivalent: US\$2 000–4 000). For example: in 1998, in Buon Don district, two elephants were sold to Dam Nha Phu Ecotourist Company (in Khanh Hoa province); one male (four years old) for a price of 30 million VND; one female (15 years old) for 50 million VND.
- 3) In 1993, the elephant relocation programme planned to buy three mature elephants (male and female) at a price of 100–150 million VND in Krong Bong district (Dak Lak province) to use them for catching problem elephants in Ba Ria, Vung Tau, Dong Nai, Binh Thuan (where human-elephant conflicts were known to occur). The programme eventually decided just to rent the elephants.

2. Information on sale price of elephant products:

- |   |   |
|---|---|
| a) Rough ivory:                         | 7.5 million VND/kg (equivalent: US\$500/kg)<br>In Buon Me Thuot |
| b) Small ivory statuette (about 0.2 g): | 300 000 VND (in Buon Me Thuot)                                  |
| c) Large, decorated ivory statuette:    | 1.8 million VND (Plei Ku)                                       |
| d) Ivory bracelet:                      | 700 000–1.5 million VND (Plei Ku, Hoi An)                       |
| e) Dry leg bone (about 10 kg):          | 300 000–400 000 VND   |

In Dak Lak province, the Forest Protection Department (March 2000) caught one man who was collecting domesticated elephant products from Lak district:

- |  |                   |
|--|-------------------|
| a) Dry leg bone (43 kg):                         | 1.5 million VND   |
| b) Elephant meat, skin, trunk and tail (499 kg): | 2 million VND     |
| c) Ivory cigarette-holder:                       | 20 000 VND        |
| d) Ivory ring:                                   | 5 000 VND         |
| e) Make-up box:                                  | 50 000–80 000 VND |
| f) Ivory knife with decoration:                  | 60 000 VND        |
| g) Ivory necklace:                               | 50 000–60 000 VND |
| h) Elephant tooth:                               | 50 000 VND        |

### Law

Viet Nam's elephants are on the brink of extinction, however, this is merely symptomatic of a general trend in the rapidly declining biodiversity of the country. Indeed, there are many species whose status must be regarded as endangered or critically endangered now in Viet Nam. The main reasons for this are hunting and the illegal wildlife trade. Although some violators have been fined or sentenced heavily and enforcement has improved in recent years, a great deal of trafficking continues unabated and, of course, so does hunting to fulfil the demand of the market. Furthermore, the high profits that can be obtained for animal parts, meat and skins may represent very significant incomes in marginalized communities and hence violations remain commonplace and are even increasing in some

areas. The limited level of local awareness about wildlife conservation and law is also a considerable limitation in trying to stem current trends.

Since the 1960s, the Government of Viet Nam has issued a number of regulations and the Criminal Law has been changed several times to cover all the recent changes. Regarding protection of elephants, there are concrete regulations and instructions that are summarized below:

1. Government Instruction 143/TTG, dated 21 June 1960, on the prohibition of elephant hunting.
2. Decree No. 39/CP, dated 5 April 1963, on temporal regulations of Viet Nam for hunting forest birds and animals.
3. Law of Forest Protection and Development approved by the National Assembly of the Socialist Republic of Viet Nam on 12 August 1991.
4. Decree No. 18/HDBT, dated 17 January 1992, determining the list of rare and precious fauna and flora and regulations for their management and protection. In this Decree elephants are listed in Group IB, which means that all means of exploitation – hunting, killing, selling, etc. – are strictly prohibited. Both wild and domesticated elephants are protected by the law at the highest degree.
5. Instruction 130/TTG, dated 27 March 1993, on the management and protection of rare and precious fauna and flora.
6. Instruction 359/TTG, dated 29 May 1996, on urgent measures for wildlife protection and development, which authorized all the relevant ministries, branches and levels to prevent hunting and seriously punish those caught hunting.
7. On 1 July 2000, the Criminal Law of Viet Nam came into effect. It determines concepts of tracking down the criminals responsible for illegal activities such as using and exploiting rare and precious wildlife.
8. Besides the regulations in law, elephants are listed in the Red Book of Viet Nam of group V (endangered species).
9. In April 1994, Viet Nam became a signatory to the Convention on International Trade of Endangered Species (CITES). Since then, the elephant has been included in Annex I. All means of exporting and importing elephants and their products for commercial purposes are prohibited.

Although the law of Viet Nam is very clear in its regulations prohibiting elephant hunting and trade in elephant products, hunting still occurs and hunters have become more and more deft at avoiding detection. The illegal hunters often hide their guns and equipment in the forest (a great part of this equipment remains from the Viet Nam War). They enter the forest like any other villager whose purpose is product collection. Almost all hunting incidents are discovered long after they have taken place. Thus it is very difficult to investigate the alleged offender. In many places, the illegal movement of people from other regions to forests is often associated with uncontrolled activities of hunting and exploitation.

One further constraint is that there are simply insufficient resources and capacity to effectively address the problem of hunting and wildlife trade monitoring, particularly in the face of a trade that is so large, complicated and frequently well organized. Thus, the number of offenders caught and brought to justice is very small and represents only a fraction of the problem. In addition, the fines that are applied are generally inadequate as a deterrent. The vast rewards of this kind of offence make the risk worthwhile.

A review of the preliminary statistics of incidents that led to prosecution reveals the following:

- 1) In 1980, in Nghe An, some elephant hunters were caught and prosecuted (there are no details of the outcome).
- 2) In 1983, in Ea Kar (Dak Lak province), one incident of killing elephant for ivory was punished with a two years prison sentence.
- 3) In 1991, in Muong Te district (Lai Chau province), one Dao man was sentenced to three months suspended sentence after being found guilty of involvement in six hunting incidents. The local FPD recovered about 250–300 kg of ivory.
- 4) In 1991, in Vinh Son district (Binh Dinh province), one Ba Na man (16 years old) was punished for shooting a male elephant. This was an internal commune prosecution.
- 5) In March 2000, in Buon Me Thuot town (Dak Lak province) Dak Lak FPD recovered 503 kg of bone, tusks, legs and skin from domesticated elephants killed in Lar and Buon Don districts.

From the above figures, it is clear that the number of incidents of illegal elephant hunting for which the offender is caught and punished reflects less than one percent of the actual thousands of incidents of elephant killing within the past 20 past years.

In the period 1990–1995, in Dak Lak province, a number of domesticated elephants were killed while feeding in the forest. For example, in a village of Buon Don district, nine domesticated elephants were killed between 1990 and 1992. Female elephants were also killed for their teeth. However, none of the offenders was prosecuted.

Hundreds of wild elephants have been caught for taming, but none of the persons involved in these incidents has been prosecuted. The trading of domesticated elephants and their products are still not, as yet, controlled. The law does need a certain amount of clarification and needs to be amended to improve regulation on this matter. Some incidents of trading elephant's products have been discovered, but confiscation of the goods was the only form of redress. This is one of the factors limiting efforts to halt the decline in the number of wild elephants in Viet Nam.

### **Management and registration of domesticated elephants**

There is no registration of domesticated elephants at any of the four authority levels: central government, province, district and commune. Domesticated elephants are locally managed at village or family level. They are not protected from illegal hunting while feeding in the forests.

The tusks of domesticated elephants that are cut periodically (about every three years) and sold in the form of various products are still not recorded and reported to any authority. The matter is completely decided by the mahout himself.

Only the sale of elephants to other provinces in the country is managed by permission from provincial and central government. Their sale or exchange inside Dak Lak province is decided by the mahouts. The sale of domesticated elephants to Lao PDR and Cambodia is not controlled yet and elephants are stealthily transported across the border along forest trails.

Since 1990, up to now, Dak Lak FPD has surveyed the controlled movement of domesticated elephants. However, other detailed studies on breeding, nutrition, veterinary care are still very limited and have not diffused to elephant mahouts. Veterinary centres have not yet been established to care for elephants when they are sick or injured or to deal with epidemic diseases.

The capture and domestication of wild elephants is still taking place, and there is yet to be implemented an effective system of prevention, despite the fact that the law prohibits these activities. Furthermore, the awareness and education activities that have been carried out appear to have met with only very limited success.

## National and international programmes and projects for elephant conservation

### *National programmes and projects:*

The government has already established a protected area network and there are some reserves and parks that have the responsibility for elephant conservation. They include Yok Don National Park in Dak Lak province, Cat Tien National Park and Pu Mat Nature Reserve in Nghe An province, Sop Cop Nature Reserve in Son La province, Vu Quang Nature Reserve in Ha Tinh province, Song Thanh – Dak Pring Nature Reserve in Quang Nam province, and Chu Mom Ray Nature Reserve in Kon Tum province. The most important areas are Yok Don National Park, Cat Tien National Park, and Pu Mat Nature Reserve.

The protected area network plan was devised by the Forest Inventory and Planning Institute (Ministry of Agriculture and Rural Development) in 1997 for the purpose of protecting rare and endangered species in Viet Nam.

The compilation of the Red Data Book of Viet Nam (section for mammals) was sponsored by the Ministry of Science, Technology and Environment (MOSTE).

In 1991, the Ministry of Agriculture and Rural Development directed all FPDs to monitor elephant populations in each province. From 1992 to 2000, no projects focused on surveying and assessing the present national status of wild elephants. This information has been compiled over the course of many years.

### *Joint national and international programmes and projects:*

Those programmes and projects are summarized in Table 4.

**Table 4. Joint national and international programmes and projects**

Year	Name of programmes, projects	Sponsoring agency	Participating agency	Financial sources
1992	Surveying wild elephants in three provinces: Dong Nai, Binh Thuan, Ba Ria-Vung Tau for planning the relocation of elephant herds	Ministry of Agriculture and Rural Development Maston Group (Singapore)	FPD and provincial FPDs, Botanical Garden of Ho Chi Minh City	Maston Group (Singapore)
1993	Relocation of elephant herds in three provinces: Dong Nai, Binh Thuan, Ba Ria-Vung Tau	Ministry of Agriculture and Rural Development Maston Group (Singapore)	FPD and provincial FPDs, Botanical Garden of Ho Chi Minh City	Maston Group (Singapore)
1992-1994	Surveying elephants in some main areas: Thanh Hoa, Nghe An, Ha Tinh, Quang Nam, Dak Lak, Dong Nai, Binh Thuan, Gai Lai, Kom Tum provinces	World Wide Fund for Nature (WWF)	Institute of Ecology & Biological Resources	World Wide Fund for Nature (WWF)
1994	Surveying human–elephant conflicts in Nghe An province	World Wide Fund for Nature (WWF)	Institute of Ecology & Biological Resources	World Wide Fund for Nature (WWF)

Year	Name of programmes, projects	Sponsoring agency	Participating agency	Financial sources
1996-1997	Continuing to assess human–elephant conflict in Nghe An and Quang Nam provinces	Fauna and Flora International (FFI)	Institute of Ecology & Biological Resources (IEBR), Forest Inventory and Planning Institute (FIPI)	Fauna and Flora International (FFI)
1999	Surveying the present status and establishing relocation programmes for elephant herds in the main conflict areas (Binh Thuan province). Implementing proposed programme for expanding Yok Don National Park (Dak Lak province) with the possibility to establish a long-term sanctuary for elephants	Fauna and Flora International (FFI), Ministry of Agriculture and Rural Development	FPD, Institute of Ecology & Biological Resources (IEBR), Forest Inventory and Planning Institute (FIPI)	Royal Embassy of Holland, Fauna and Flora International (FFI)
2000	Surveying the elephant trade and elephant's products in the three regions: North–Central–South	TRAFFIC, Hanoi University		TRAFFIC

***Joint national and international workshops on elephant conservation:***

- 1) Elephant conservation is included within the general programme for conserving the forest resources and bio-diversity of Viet Nam.
- 2) In 1992, a workshop on elephant conservation in Viet Nam was jointly sponsored by the Ministry of Forestry and the World Wide Fund for Nature (WWF). The participating agencies were the Institute of Ecology & Biological Resources (IEBR), Forest Inventory and Planning Institute (FIPI) as well as several national universities in Viet Nam.
- 3) In 1996, an international convention “Rescue of elephant species threatened with extinction in Viet Nam” was co-sponsored by Fauna and Flora International (FFI) and the Ministry of Forestry. The participating agencies were the Forest Protection Department (FPD), Provincial Forest Protection Departments (FPDs), the Institute of Ecology and Biological Resources (IEBR), and the Forest Inventory and Planning Institute (FIPI).
- 4) From 1995 to 1996, Viet Nam made efforts to coordinate with international organizations that aimed to give priority to elephant conservation. At the beginning of 1996, a memorandum of understanding (MoU) was signed between the Ministry of Agriculture and Rural Development and Fauna and Flora International (UK) to implement on-the-ground elephant conservation activities. A project strategy was agreed upon and then carried out between 1996-1998. The plan chose three priority sites that were considered practicable areas for elephant conservation: Dak Lak, Quang Nam, and Nghe An.
- 5) In 1998, an international conference on Asian Elephant Conservation in Indochina was held by Fauna and Flora International (FFI) and the Ministry of Agriculture and Rural Development. The conference was attended by research institutes, universities and organizations.

**Elephants' work**

Domesticated elephants have had a long-standing relationship with some ethnic people in the Tay Nguyen plateau, such as the M'Nong, Gia Rai, and E De. The practice of domesticating elephants is mainly concentrated in Buon Don and Ea Sup districts in Dak Lak province. For a long time, the

domesticated elephant have maintained an important role in the economic and cultural life, particularly within these ethnic societies.

The art of elephant hunting and taming has been practised since the eighteenth century. At the beginning of the twentieth century, Mr Y Thu was a celebrated elephant hunter and organizer of hunting, domestication and trade of elephants in Buon Don and his family possessed 100 elephants. The elephants captured and tamed in Buon Don were sold to the people in villages, communes or districts within Dak Lak province or in other provinces and to the government at that time. King Khai Dinh, King Bao Dai and President Ngo Dinh Diem were all known to have purchased elephants from Dak Lak province.

Elephants were also sold to neighbouring countries (Cambodia, Thailand and Lao PDR) and even exported to Hong Kong, Japan and France. Thus the elephant was a valuable economic asset to the ethnic minority people in the Tay Nguyen plateau.

During the Viet Nam War, elephants were employed in transporting people, food, weapons and supplies along the route through the Truong Son mountain range, where the rugged terrain prevented use of modern transportation. Eighteen elephants with more than 20 keepers were engaged in the work throughout this period.

After the war, domesticated elephants were still very useful animals in agricultural production and in other daily activities, such as transporting rice, hauling timber, making houses, and participating in celebrations and festivals. However, along with the modernization movement of the societies, such as road construction, mechanized agricultural production and industrial plantations, machinery and modern technology have gradually replaced the elephant in the working places. The role of domesticated elephants has now changed to serve the tourism industry. In Buon Don and Buon Ma Thuot City, for example, domesticated elephants are trained to run a race, play football, throw wood, and dance to the tune of a trumpet.

Among the families who bring up elephants, bulls are highly prized because a piece of ivory is harvested and sold every three years.

## Health and veterinary care

### *Grazing:*

Domesticated elephants consume from 100 kg to more than 200 kg of food per day, depending on their ages. They eat 54 species of forest vegetation [Le Vu Khoi (no date), or according to Cao Thi Ly, 1997, 62 species], and are particularly fond of Le grass (*Vietnamosasa darlacensis* and *Oxytenanthera nigrociliata*) and the tops of bamboo. They also eat Dipterocarpaceae species, such as Dau dong (*Dipterocarpus tuberculatus*), Cam lien (*Pentacme siamensis*), and Ca chit (*Shorea obtuse*). In Buon Don, families often release their elephants into the forest to find food for themselves.

People frequently move their elephants to different areas of the forest depending on food sources and seasonal changes. During the rainy season (between April and October), the elephants are usually released nearby, and the keeper will visit every three to five days. In the dry season (between November and March), food shortages often require greater distances to be travelled (up to 10 km) and the keeper will visit every one to two days to find new pastures. During the past ten years, as a result of illegal hunting levels intensifying (especially of bull elephants) and the number of wild elephants declining, domesticated elephants have become increasingly at risk from poachers when they are released far away. Consequently owners now tend to keep their elephants in pastures on average 3–5 km from their houses and check them one to two times a day. When ‘released’ into the forest the elephants usually have a chain 15–20 m long tied to their hind foot, near a stream. In the dry season, the elephant is bathed in a big river or stream a minimum of once a day.

When the elephants work, they often do not eat. They work all day and are then released into the pasture in the evening. The bull elephants in the estrus season (February–April and October–December) are often chained, and feeding is limited until the end of this period.

#### **Veterinary care:**

Health care for elephants has not been researched thoroughly in Viet Nam. The keepers generally treat them according to traditional methods using special leaves found in the forest. Apart from that the elephants must recover spontaneously. Elephants may frequently be afflicted by diarrhoea, typically at the end of the dry season and the beginning of the wet season (May/June) when the vegetation in the forests is developing. The methods of treatment are as follows:

- a) Feed sugarcane (three to five stalks per day) or give water with salt (0.5 g of salt with 5 litres of water). Let them drink this water once or twice a day, and feed banana and cassava.
- b) Use Ampixilin – ten tablets per day, putting them in sugarcane stalks for elephants to eat. Or boil the bark and heartwood of dipterocarpus trees in water and let elephants drink it.
- c) Burn straws of grass to ashes, afterwards put it on a corncob.
- d) Grind a horn of antelope (*Carpricornis sumatraensis*) and then put it on a sugarcane stalk or banana trunk for the elephant to eat.

Skin diseases or wounds caused by chafing when working are treated as follows:

- e) Pulverize Ampixilin and directly smear on wound.
- f) Mix the soil of termite nest with ammoniac solution ( $\text{NH}_3$ ) and apply it to the wound.
- g) Boil medicinal plants found in the forest. Cool it down, and smear it on the wound.

#### **Conclusions**

The domesticated and wild elephants are threatened with extinction in Viet Nam if urgent actions are not taken.

Almost all of the wild elephant populations are concentrated in the border areas. In North Viet Nam, the elephant population is almost certainly extirpated. The population in Central Viet Nam is very small and is largely isolated which does not bode well for its long-term survival. Some small herds exist in South Viet Nam although they are also isolated and are increasingly in conflict with humans as their range and habitat is being converted for other types of land use.

There are only two areas suitable for elephant conservation and the long-term survival of the species, if proper protection can be guaranteed. In Dak Lak province, where the largest herd in Viet Nam is found, there is hope that this may be a viable population that can be conserved in the long-term. In Nghe An province, the population estimated is approximately 17–24, which is much higher than in other provinces in Central Viet Nam. However, a number of elephants have been killed by hunters, whilst some have been killed in elephant–human conflicts. Furthermore, this population is no longer likely to be as large as the Dak Lak herd and should be re-surveyed. In spite of this, it still represents the second most important priority area for elephant conservation in Viet Nam.

Between 1990 and 1992, the elephant population status was 400–600 (Dawson *et al.*, 1993). Between 1996 and 2000, 19 areas had elephant populations with a total estimated population of 85–114 individuals. Hence the number of elephants has decreased by over 70 percent. All of the distribution areas have been and are being heavily impacted and most of the herds in Viet Nam do not exceed five to six individuals.

In Viet Nam, nine of the 19 elephant distribution areas are experiencing human-elephant conflicts, including two areas in critical status, Tra My–Tien Phuoc (Quang Nam province) and Tanh Linh district (Binh Thuan province). These conflicts are having a number of detrimental impacts on the local economy and livelihoods. In these areas, people are angry, afraid and often powerless and insufficiently supported. This has led to conflict levels heightened as the people have driven away the elephants from their croplands and in some instances have killed crop-raiding elephants out of revenge or to protect their crops. Now, no effective solutions seem to work. Almost all of the conflict mitigation measures are becoming ineffective as the elephants become habituated to them. Furthermore, these people are poorly assisted by both local, provincial and national government where there is no clearly defined policy that allows for compensation to victims of the conflicts, and there is little financial capacity to invest in more sophisticated conflict mitigation measures. It is for these reasons that those afflicted by conflicts have to deal with the situation themselves.

The population of domesticated elephants has also been in decline. Almost all originate from Buon Don district, Ea Sup district (Dak Lak province), where the tradition of wild elephant capture and domestication has been maintained. Between 1979 and 1980, the population was estimated to be 600 in Viet Nam, while Dak Lak province had 502 of those individuals. In December 2000, Viet Nam had only 165 domesticated elephants, 138 of them in Dak Lak. Thus, during the last 20 years, the domesticated elephant population has decreased by more than 70 percent.

The domesticated elephant population is decreasing for several reasons: the wild population has decreased so that capture has decreased accordingly. Also the introduction of laws and regulations prohibiting elephant hunting and domestication has meant a significant decline in hunting or at least hunting is not as visible as before. The keepers restrict production of the domesticated elephant: the number of elephants (under 20 years old) is very low (11 individuals), approximately eight percent (11/138), including four calves of domesticated elephants. Many domesticated elephants have become ill and some have died as a result of the neglect of the keepers, or food shortages in the pastures. The elephants have to work extremely hard, but there is a lack of proper veterinary care. Domesticated elephant trading and trading of their products are not closely controlled. The domesticated elephants are illegally hunted for ivory when they are in the forest.

Although the national laws and regulations prohibit anyone from hunting or catching elephants, law enforcement is weak and punitive action rare. Only one percent of the actual number of incidents has led to prosecution and punishment, whilst there has been no case of prosecution over domesticated elephant killing, hunting or trading of their body parts.

In terms of domesticated elephants, there are no regulations prohibiting trade of elephants or their products/parts at any of the four levels of governance (national, provincial, district and commune). As administrative management is regulated by the local community, trading elephants and exchanging their products in the region are not controlled yet. Selling elephants to other provinces in the country is possible simply by obtaining official permission from the provincial level to the central level. Illegal elephant sales across the country's borders have not been controlled.

Hunting of wild elephants for domestication has continued despite the amendment of the national laws and regulations and actions to promote awareness of these laws. Conservation awareness and education activities have made little contribution in real terms to solving the problem.

In the past, the domesticated elephant played an important role in economic and cultural life, particularly within the ethnic minority societies (M'ngong, Gia Rai, E De). Today, the domesticated elephant is more valuable in terms of ecotourism.

In 1991, the Ministry of Forestry commissioned FPDs to keep records of the number of elephants in their localities. Between 1992 and 2000, however, there was no assessment of the population status on a national scale. The information has been compiled over the course of many years with the

financial assistance of foreign organizations, such as the embassies of the Netherlands and Switzerland. Fauna and Flora International – Indochina Programme (FFI-IP) and the World Wide Fund for Nature (WWF) have combined efforts with research institutes and universities in Viet Nam. The government has established a protected area network, including national parks with the purpose of protecting elephants.

Three international conferences have been organized in Hanoi, aimed at formulating an action plan to save the elephant from extinction in Viet Nam.

## Recommendations

### 1. Yok Don (Dak Lak province): Priority A

- 1) Expand Yok Don National Park, and establish a long-term species reserve along the boundary, including Ea Sup district, Boun Don district, Cu Jut district and one part of the remaining forest in Dak Mil. Connect this complete area with part of the forest in the southwest of Gia Lai province to create a corridor for movement of elephants. The range of this future elephant reserve needs to be surveyed before further decisions are made.
- 2) Strengthen co-operation with neighbouring Cambodia for elephant conservation.
- 3) Minimize human-elephant conflicts (HEC) in the area by providing support for people who are impacted, combine with conflict avoidance and conservation awareness/education.
- 4) Conduct long-term planning of human development, restricting spontaneous immigration to conserve existing forest areas.
- 5) Relocate the Binh Thuan herd into the area to avoid further HEC. This population should augment and strengthen the existing population in Dak Lak.

### 2. Pu Mat Nature Reserve (Nghe An province): Priority A

This reserve is about 90 000 ha, and human habitation is not dense. The reserve is located along the border with Laos. The elephant population consists of two to three groups with 13 to 17 individuals.

- 1) Strengthen elephant management, especially in the buffer zones. Stop hunting for ivory and timber cutting immediately.
- 2) Mitigate human-elephant conflict in Anh Son, Thanh Chuong districts on the Southern part of the reserve.

### 3. Tra Mi – Tien Phuoc – Que Son: Priority B

At present, there are two herds of elephants with 13 to 16 individuals. In these regions, human habitation is very dense with many rice fields. Consequently HEC levels are intensifying.

- 1) Plan human habitations and cultivated areas. Population growth should be controlled and reduced to protect the forest for elephant habitation. Local awareness programme for forest protection should be conducted.
- 2) Mitigate human-elephant conflict in the area. Support the local people who are suffering from conflict and crop raiding. Increase local people's awareness of elephant protection.
- 3) Prevent hunting for ivory or killing for revenge when the victim of elephant-human conflicts.
- 4) Elephants are now on the brink of extinction, *in situ* conservation is the best solution for elephant protection. In some cases where *in situ* conservation is impossible, relocate

elephants to Song Thanh – Dac Pring Nature Reserve. But, this requires very careful and detailed surveys to be carried out beforehand.

4. Carry out a feasibility study on how to relocate the elephants in Tanh Linh (Binh Thuan province) to the Yok Don Nature Reserve.
5. Seek the participation of all international conservation organizations, all the local relevant bodies and agents of the Ministry of Agriculture and Rural Development, the Forest Protection Department, provincial FPDs, institutes, universities, colleges in one coherent action plan for the conservation of elephants.
6. Conduct a fund-raising programme from international organizations to implement the conservation plan.
7. Strengthen the management of domesticated elephants by taking the following measures:
  - Request registration of domesticated elephants;
  - Issue policies supporting mahouts;
  - Study nutrition, breeding and veterinary care for sick and injured elephants;
  - Support mahouts using domesticated elephants for tourists to improve income levels;
  - Manage the ivory market of domesticated elephants;
  - Create measures for the protection of domesticated elephants while they are left in the forest; and
  - Strengthen law enforcement to apprehend and punish persons guilty in killing elephants.

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**Question and answer session**

Q1: What is the attitude of ordinary people in Viet Nam regarding elephants? Do elephants get much attention in the media?

A1: Formerly people thought they were useful animals but now there are not many jobs for them, so people do not think of them so positively.

The representative of IFF stated that he did not think that the lack of jobs for elephants was a problem in Viet Nam. Tourism companies are increasing and they are using elephants. In fact, the price of an elephant is going up and some of the tribal people are selling off their elephants to tourism companies. It is the educated Vietnamese who start the companies and buy elephants from the tribal people. Mr Kashio stated that it was important to investigate the nature of these tourism businesses because although we know they provide jobs for the elephants we don't know how well the elephants are treated and we don't know how well those involved in the business as mahouts, etc. are paid.

On the subject of tourism, one participant working in Belize in Central America stated that in Belize the government has imposed a conservation tax of 7.50 Belize dollars on all tourists that is used directly for environmental conservation. He recommended this for other countries like Indonesia. Richard Lair stated that he didn't think this would work in large countries with many government agencies as they would all squabble about who gets the money.

Q2: Do some of the elephants in Viet Nam come from Cambodia?

A2: Some of the tribal people and Chinese sell Vietnamese elephants to Cambodia and Thailand.