



The Surin Project

AN OVERVIEW OF THE CAPTIVE
ELEPHANT SITUATION IN THAILAND



1. STATUS OF THE ASIAN ELEPHANT IN THAILAND

The Asian elephant (*Elephas maximus*) occurs in the wild in 13 countries ranging across South East Asia and South Asia. Used by humans for over 4,000 years, a significant number of individuals are found in captivity throughout the majority of range states. Thailand possesses an estimated 1000-1500 wild individuals, most of which occur in protected areas such as Khao Yai National Park and Huay Kha Keng Wildlife Sanctuary. However, contrary to most other countries, Thailand holds a higher number of captive individuals than wild ones, the former comprising approximately 60% of the total population. The wild and captive elephants in Thailand fall under different legislations. The wild population essentially comes under the 1992 Wildlife Protection Act granting it a certain level of protection from any form of anthropocentric use. The captive population however comes under the somewhat outdated 1939 Draught Animal Act, classifying it as working livestock, similar to cattle, buffalo and oxen. Internationally, the Asian Elephant is classified as “Endangered” on the IUCN Red List (1994) and is thus protected under the CITES Act, restricting and monitoring international trade. Habitat loss and fragmentation have been recognized as the most significant threats to wild elephants in Thailand. Although the overall percentage of forest cover has been increasing in Thailand in the last few years, much of this is mono-specific plantations such as eucalyptus and palm. These are unsuitable for wild elephants as they are usually private land and represent an unsuitable food source for the elephants. Furthermore, habitat fragmentation is increasing with the economic development, constituting a worsening threat to the already precarious wild population. The captive population on the other hand faces a number of other threats. The demographic sustainability of the captive population is dependent on the ability of this population to restock itself with no input from exterior populations, notably the wild ones. The financial sustainability of keeping elephants in captivity is dependent on the ability of the owner to generate enough revenue to feed and suitably care for their elephant. Both of these aspects are jeopardized by the current situation. A relatively low birth rate as well as a change in the preference in the age of the captive elephants has led to a strong need to maintain former numbers by harvesting wild individuals. Furthermore, the 1989 ban on logging has led to a widespread unemployment problem throughout the elephant industry nationwide. These aspects will be addressed in more depth in the following sections.

2. CURRENT THREATS TO WORKING ELEPHANTS IN THAILAND

The importance of environmental, social, economic and political issues shows the extremely complex and multifaceted aspect of the predicament of the Asian Elephants in captivity in Thailand. Although many parties are working towards improving the current situation, the lack of coordination between different acting organizations and involved government branches is seen by experts as a major hindrance to the efficient conservation of captive Asian Elephants in Thailand. As mentioned earlier, a larger proportion of the elephants in Thailand are in captivity, over 90% of which are owned by private owners (Lair, 1997). Management of the elephants for conservation is greatly complicated by the fact that these



animals are essentially private property. This problem is compounded by the fact that no specific national legislation applies specifically to the elephants. Captive elephants are classified as draught animals, like cattle, oxen and buffalo. These individuals therefore have the supplementary burden of often being the only source of revenue for their owner. The situation of the captive elephants in Thailand has evolved over the past century to become the highly complex situation it is today, consisting of environmental, social, economical and political issues. Appendix 1 is a flowchart briefly describing the evolution of the situation over the last century. Below is a point by point description of the major components that have shaped the current state of affairs.

3. DESCRIPTIONS OF THE INFLUENCING FACTORS

Economic and industrial development decreases the need for elephants.

Between 1900 and 1989, elephants working in logging concessions were slowly replaced by mechanized vehicles. This trend was accelerated by the continuing decrease in forest cover and ramification of access roads within the second half of the century. Although, previously essential for accessing logs deep in the forests, the constant deforestation has led to elephants being substituted for more efficient, on-site processing heavy machinery. Similarly, mechanical transport in the form of cars and motorcycles further reduced the need for elephants for transport purposes, these becoming increasingly restricted to remote mountain areas with little or no road networks. It may be noted also that, after initial investment, operation and maintenance of mechanical vehicles is far less costly than that of providing proper husbandry for elephants.

The construction of paved roads and the introduction of motorized vehicles have essentially eliminated any need for elephants as load or people carriers. This loss of utility was most visible between the turn of the 20th century and 1989 when the number of captive elephants in Thailand decreased by approximately 95% from 100,000 to 4,500 individuals (Lair, 1997).

Rapid Decrease Forest Cover

Over the last century, forest cover in Thailand has dropped dramatically, due principally to logging and economic and industrial development. In the year 1900, 90% of Thailand's land was forested (Kashio, 1997). Lakanavichian (2001) described deforestation trends in Thailand between 1961, when forest cover was estimated at 53.3% of the land and 1995, when only 22.8% was still covered with forests. Reforestation projects had restored 2% of forest cover by 1999 bringing the percentage up to 25%. Included in these reforested areas are eucalyptus and palm plantations, which have also replaced much of the subsistence agriculture in the Surin province (Lair, 1997). Eucalyptus is not suitable fodder for elephants (Pimmanrojngool & Wanghongsa, 2002) which have, in effect lost two sources of forage from these cash plantations (loss of forest to eucalyptus plantations and loss of food stuff grown by the elephant owners in the Surin Province).

The 1989 Logging Ban

The 1989 logging ban followed as a consequence of devastating floods in southern Thailand that occurred in 1988, the latter attributed to intense deforestation for logging purposes (Pimmanrojngool & Wanghongsa, 2002). The ban was implemented by the Royal Thai Government (Lakanavichian, 2001) effectively rendering 70% of the working elephants in Thailand without work practically overnight (Tippraset, 2002).

Dramatic Reduction in available legal employment for working elephants

The current lack of employment of for the remaining captive elephants is considered to be one of the major problems for the conservation of elephants in Thailand (Ratanakorn, 2002; Lohanan, 2002; Lair, 2002). The logging industry provided employment for a significant number of elephants, especially in the Northern provinces. The ban therefore impacted this region considerably more than other parts of the country. The Forest Industry Organisation (FIO), a government agency was worst hit. In 1989, the FIO owned 60% of the 306 logging licenses in the country and as a result of the ban had to lay off 50% of its mahouts and elephants (Tuntiwiwut, 2002). Alternative employments for the mahout were offered such as reforestation projects but the latter, as well as the farmers who owned the land recognized more financial benefit in farming than in commercial reforestation (Lakanavichian, 2001). The 50% of the mahouts and elephants that were still employed by the FIO were transferred to a new Center in Lampang in 1991 (Thai Elephant Conservation Center) giving demonstrations of logging practices and offering short rides to tourists. The elephants that were dismissed after the ban however, were not given any alternative employment options. Also responsible is the economic and industrial development that occurred in Thailand over the last century. As mentioned in Lair (1997), many more elephants were used for transportation than were ever used for logging. The construction of paved roads and the introduction of motorised vehicles essentially eliminated any need for elephants as load or people carriers. This loss of utility was most visible between the turn of the 20th century and 1989 when the number of captive elephants in Thailand decreased by approximately 95% (Lair, 1997). However, it may be assumed also that the decline in utility in jobs other than logging will have continued past the ban, only exacerbating the unemployment problem.

Many owners were forced to use their elephants for illegal activities. Following the implementation of the ban, those mahouts and their elephants rendered unemployed had few alternatives for work. Opportunities in tourism at the time were few and moving to the big cities from the Northern parts of the country for begging involved high costs of transportation. Illegal logging became a preferred option for many mahouts, sometimes whole villages continuing their logging work in an illegal fashion. This in effect rendered the ban ineffective on an ecological level and additionally, due to the dangerous nature of the work, having to work at night, jeopardized the health of the elephants (Lakanavichian, 2001). Furthermore, elephants and their mahouts were still permitted to carry out legal logging activities in Myanmar, where the presence of landmines, from years of conflict, incurred many elephant fatalities (Lohanan, 2002). The use of drugs (*yaa baa*; amphetamines)



to make the elephants work harder and longer hours has become common place in illegal logging (Lair, 1997, Lohanan, 2002) and also causes its fair share of casualties.

Decrease in the availability of free forage and roaming grounds

The reduction in forest cover described above has denied the owners and mahouts a significant source of free or cheap food stuff. Elephants consume between 150-250kg of food daily, 1-1.5% of their body weight (Vancuylenberg, 1977; H Hatt & Cl lauss, 2006). The availability of such quantities of food for any substantial elephant population is either no longer present in many provinces, on privately owned land or found within protected areas and is therefore not available to captive elephants. This incurs a dramatic increase in cost to the owners for the maintenance of elephants on a daily basis and has forced many mahouts to bring their elephants to the cities to beg (Lohanan, 2002; Pimmanrojnagool & Wanghongsa, 2002).

Lohanan (2002) illustrates the severity of this problem by stating that “*unemployment and starvation are the root of all elephant problems in Thailand*”. Although the problem is only clearly visible in a minority of cases, it seems (from personal interviews and observations) that the majority of the captive population suffers, to some degree, from an imbalance in diet or simply a quantitative insufficiency of food. The ramifications of such a problem are multiple as described by Hatt & Clauss (2006); “A balanced diet is a prerequisite for good health, longevity and reproductive success.”

Increased cost of maintenance for the Owner/Mahout

The increase in cost of maintenance for the owner was mentioned in the past section with reference to the increased cost of feeding the elephant and possibly having to rent land to house it instead of letting it roam and feed on public forest land. Additional to these costs is the indirect loss of benefits, such as veterinary care, previously enjoyed by the owners when working in many concessions of the logging industry (Lair, 1997).

Financial inability to provide appropriate husbandry

The combination of decreased revenue when working in tourism camps, the decrease in employment opportunities and the loss of benefits such as veterinary care have lead to a generalized financial inability for mahout owners to provide appropriate levels of husbandry for their elephants (Lair, 1997; Tippraset, 2002; Pimmanrojnagool & Wanghongsa, 2002).

Transfer of elephants from logging to street begging

Following the 1989 ban on logging, many mahouts brought their elephants to Thailand's big cities to roam the streets. The mahouts would generally sell elephant snacks (bananas, sugarcane or pineapple) to tourists for these in turn to feed them to the elephants. Street wandering elephants occur in largest numbers in Bangkok, Khorat and Chiang Mai, targeting mostly foreign tourists (Pimmanrojnagool & Wanghongsa, 2002) but are also present in smaller towns and university areas (personal observation) targeting local populations. In Pimmanrojnagool & Wanghongsa's study (2002) on street wandering



elephants in Bangkok (the only such study published in English), the researchers found that vending of elephant snacks was most successful with restaurant guests, the owners/mahouts usually lingering outside the restaurants to increase their sales. The elephants and their mahouts wander the streets at night from 18h00 until midnight, the second half of this period being the most lucrative. In this study alone, the 41 elephants that were recorded and their 3 owner/mahouts each were believed to make a combined estimate of 14-17 million baht (322,000 – 391,000 USD) annually. In many cases the mahout does not own the elephant, the latter being owned by a business man with little or no active involvement with elephants, simply renting it out to the mahout for 10,000 -12,000 Baht a month (Lair, 1997). The commute time, from the outskirts of the city, where the elephants and mahouts spend the day to the city center varies depending on the location of the camp but may require as much as 3 hours of walking along roads with heavy traffic, thus endangering the lives of the mahouts, the elephant and the drivers. Several case studies have been documented concerning traffic accidents involving elephants, the latter usually coming off worst (such as the case of Honey, a performing elephant that was struck by a truck, breaking her pelvis [Lair, 1997] and Maximus, an old male that was struck and dragged along by an 18 wheel truck, breaking his front left leg [webl]). Due to the fact that the elephants only obtain approximately 13% of their daily food requirements during working hours, the nature of which does not comprise a healthy or sustainable diet (Claus et al., 2003), it is vital that the elephants consume sufficient roughage and grasses during the day. Although one of the principal motivation for bringing elephants to the city is the shortage of appropriate fodder in the home Provinces (Buriram and Surin Provinces), finding enough good quality food for the elephants around major cities is challenging, requiring the mahouts to move between wastelands and swamps setting up temporary camps (Pimmanrojngool & Wanghongsa,2002; Lair 1997). Even considering the ban on bringing elephants into Bangkok, implemented in 1997, many mahouts still risk fines and confiscation (Lair,1997; Pimmanrojngool & Wanghongsa,2002) by coming into town with their elephants, considering the fines as “business expenses”. Following the ban however, a number of mahouts moved to other cities and tourist destinations such as Phuket to continue working. The latest reports tell of young elephants being brought into the newly developed islands such as Koh Tao by boat to fill the elephant niche (personal account).

Change in preference of elephant characteristics

Intrinsic to this shift from logging to street wandering is the change in preferred characteristics of the working elephants. Where strong male tuskers were the premium type for working in the forest and skidding logs, the new favourites on the streets are the young, newly weaned and trained calves. The reasoning for this being, obviously their heightened attractiveness to tourists, but also on a more practical level, these smaller, more submissive elephants are easier to control, to “store” and of course require far less food on a daily basis. Unfortunately, the origin of these young elephants is hard to ascertain. Considering the general low birth rate in captivity (Rees, 2003; Hermes et al, 2004; Lair 1997) and the ever increasing numbers of young elephants found in the cities, it is not overly pessimistic to



assume that the latter have been captured from the wild and most probably from Myanmar (Lair, 1997).

Transfer of elephants from logging to tourism camps

Upon implementation of the ban on logging activities declared in 1989, a large percentage of elephants were transferred to the growing tourism industry. This change in employment did however not occur uniformly throughout the country. Many of the elephants working in logging camps in the north of the country were not “tame” enough to work with tourists (Lohanan, 2002). Coincidentally, these elephants were probably the best suited for working in the illegal logging industry that developed following the ban, the most important activities being in Phrae province (Lakanavichian, 2001). Elephants from the northeast of the country are more used to interacting with lay men, in part due to the annual Surin Elephant Festival (Lohanan, 2002). Oddly enough though, and possibly due to ethnic and lifestyle ancestry of the Isarn mahouts (Lair, 1997), most of the Surin elephants can now be found nomadically wandering the streets of big cities or used for festivals.

Growing dichotomy between Mahoutship and Ownership

The somewhat complex concept of differentiation between ownership and husbandry is thoroughly explained by (Lair, 1997). In the past, elephants either belonged to the government, working in logging concessions employing mahouts to “operate” the elephants or belonged to private mahout families. In the past decades however, especially since the ban on logging, a new ownership system has developed; that of the *private non-mahout owners*. These individuals have little or no physical involvement with the elephants. *Non-mahout owners* are exclusively dependant on *hired mahouts* for husbandry of their elephant and therefore have little influence on the quality of the care provided to the elephants. The hired mahouts have no particular personal or financial interest in ensuring that the elephants is cared for in a sustainable manner, with respects to the latter’s vital needs such as water, food and shelter (Lair, 1997). The combination of the *owner’s* dis-involvement and the mahout’s lack of incentive for sustainable husbandry ultimately impact the elephant’s physical fitness and mental welfare. The social and economic differentiation between the *non-mahout owners* and the *hired mahouts*, the former group comprising of an increasingly large proportion of rich or relatively well-off business men (Pimmanrojngool & Wanghongsas, 2002; Lair, 1997) and the latter group consisting of very poor hill-tribesmen (Karen or Kui) (Lair, 1997) complicates this supposedly symbiotic relationship further exacerbating the situation. It is unlikely however that the *non-mahout owner* has no control or no interest in the elephant’s health and reproductive ability. The elephant represents a significant financial investment for the owner and it may therefore be assumed that there is an unofficial and undocumented understanding between the owner and the mahout concerning the survival of the elephant. These underlying factors are, ironically, maybe the only aspects of this relationship that actively protect the elephant from apathetical treatment (Personal Interview).



Decrease in financial revenue for Mahouts

As mentioned in a past section, the legal employment opportunities available to mahouts and their elephants after the logging ban were few and the revenue these generated for the mahout were, in most cases, low. Lohanan (2002) describes work in the tourist camps as suffering from “*unfair employment practices*” underpaying the mahout and often not providing the latter with a contract. A single elephant, if not owned by a non-mahout owner is owned by two or three mahouts (Lair, 1997) working in partnership. One elephant therefore has to generate revenue for two or three families. This has often incurred the need for the mahouts to increase the workload of the elephant. The elephant will be shared between the owners on a shift basis, each owner maximizing his time with the elephant.

Decreased incentive for appropriate husbandry

The increasing dichotomy between non-mahout owners and mahouts previously mentioned compounded by the decrease in revenue of the latter has led to a generalized drop in elephant care throughout the industry (Lair, 1997). Furthermore, the inclusion of the working elephant in the Draught Animal Act of 1939 put the latter under the same legal status as buffalo or oxen (Lair, 1997), for which no regulations on appropriate care and treatment have been formulated. There are therefore no legal requirements for proper husbandry, further decreasing the incentive for appropriate care.

Decrease training of mahouts leading to decrease in quality of husbandry

Additional to this is the problem is the fading of mahout knowledge. Ancestrally, becoming a fully fledged mahout would take 20 years (Lair, 1997, 2002). Today, mahoutship is seemingly becoming a short term job for money strapped foolhardy youths with little or no previous experience with elephants (Lair, 1997; Tippraset, 2002).

Decreased Longevity of Elephants

When considering all the threats that new elephant employment have incurred it is easy to recognize that the current captive population is subject to a great deal of pressure. The longevity of the population itself is questionable given the current circumstance, and can by no means be considered sustainable. Captive elephant in different sectors of work face different direct and indirect threats. Those working in illegal logging activities are threatened by the dangers of drug use, landmines, precarious night time work and more generally overwork and underfeeding. The young street wandering elephants are more affected by traffic, inappropriate food and water quality and the associated psychological trauma of their urban environment. Elephants working in tourism camps are seemingly less endangered on a physical level other than inappropriate diet and shelter, but may suffer decreased welfare (psychological wellbeing; Weasy, 2006) from long periods under physical restraints. The problem of overworking originates essentially from the use of one single

elephant by a number of mahouts, each paying a share in its' rental. Each party wanting to profit for the animal as much as possible, the latter is often denied proper resting and foraging time.

Need for restocking the captive population

Although the numbers of elephants in captivity in Thailand are estimated to be relatively constant, it is also believed that there is a high through-flow rate, caused by an increased mortality rate, in turn caused by the factors mentioned in the above sections. The changes in elephant type preferences mentioned earlier have also incurred a need for restocking of the captive population.

Lack of enforcement of registration and ease of documents falsification

The lack of registration of working elephants in Thailand is principally due to the lack of coordination and effective action from the concerned government departments and NGOs (Lair, 2002). The current registration system involves an A4 sheet of paper presenting far from comprehensive data on the animals life history, physical traits and ownership. The document is written solely in Thai hindering use of its data on an international level. Furthermore, a significant number of elephants are either not registered (Lair, 1997) or are registered in the names of previously deceased individuals, effectively rendering the registration data useless.

Import of wild caught elephants from Myanmar

The combination of increased need for recruitment and poor legislation and its enforcement have lead experts to assume a non-negligible import of young elephants captured in Myanmar and smuggled over the border. Lair (1997) describes the high level of organisation and efficiency with which any private party may order a young elephant, matching their specific preferences on gender and age. With a single young costing between 2,800 and 3,200 \$US (70,000 – 90,000 THB) in 1997, this is a well oiled and lucrative business. Current estimates have put the cost of a young elephant at around half a million baht. Experts have estimated the inflow from Myanmar of newly captured elephants to be approximately 150-200 individuals a year (Personal Correspondence). A further problem, not specifically relating to the elephant situation in Thailand but hugely relevant to elephant conservation is the fact that, for every one calf captured, up to four adult, mostly females, may be killed (Lohanan, 2002).

Reluctance of many Owners to register their animals

As result of owners having to engage in illegal activities with their elephants, (logging, street begging) the former are reluctant to registering their elephants with the government, which would effectively make it easier for the latter to monitor such activities. This



deliberate “hiding” of elephants further reduces the reliability of available population data complicating the design or implementation of any conservation endeavours.

Out-dated nature of the registration system inefficient registration system

Current legislation concerning the captive elephant in Thailand is outdated and unsuited to the present condition of the elephant population (Lair, 1997). Since 1939, the captive elephant has come under the Draught Animal Act, essentially being grouped with all other working livestock such as oxen cattle and buffalo. Thailand is a signatory of CITES but this only limits movement of elephant internationally, this convention having no effect within Thailand. Currently, there are no laws imposing the assignment of exterior visible markings on the elephants (Lair, 1997), making identification of individual elephants extremely complicated or nigh impossible. With no way of relating registration documents to any one elephant, the former cannot be relied upon to provide accurate information concerning a particular elephant.

Inefficient tracking of elephant translocation domestically

As described by Lair (1997), the tracking of domestic elephant translocation is plagued by inconsistent monitoring and corruption at the highway checkpoints. An elephant can effectively be moved rapidly and over great distances without any written record being made. This compounds the existing problems associated with the inefficient registration system further decreasing the reliability of the registration information and facilitating the movement of imported animals once over the border.

4. THE DEMOGRAPHICS OF THE CAPTIVE POPULATION

Much of the current literature on the Asian Elephant is either focused on the conservation and management of wild populations or on disease and medical care for elephants kept in western zoos. Although any information on elephants is relevant and potentially useful, the situation of the captive elephants in Thailand, as in other home-range countries, is complicated by private ownership, lack of up-to-date legislation and socio-economic interests, rendering most management plans designed for wild elephants useless.

Furthermore, the relative low income of many owners (or the lack of incentive to provide proper care to the elephant) makes many of the new medical breakthroughs financially unattainable to a vast proportion of the captive population. These socio-economic conditions illustrate the limits of the usability of such literature for this specific case.

This section of the revue is structured so as to address the main questions posed in the study. Literature concerning the focus of the research is described and its relevance to this project assessed.

a. Distribution of Elephants



From preliminary studies, it seems that, in Thailand, contrarily to India, the majority of elephants in captivity have no contact with wild individuals. This, in India is a major benefactor in increasing the reproductive rate within the captive population. Females from Zoos and other camps are released into the forest with drag chains to “interact” with wild males. This is seemingly not the case in Thailand and may be explained by the fact that the majority of known and recorded wild populations are found within national parks (Khao Yai NP, Huae Ka Keng WS) and are therefore not proximal to the tourism camps and their captive elephants.

b. Demography of the Captive Elephant Population – Age and Gender

Of the number of studies carried out by Sukumar (et al.) concerning the demography and distribution of the Asian Elephant, one is particularly relevant to the proposed study. Sukumar et al. (1997) analyses the demographic properties of captive Asian Elephants in forest camps in Tamil Nadu (Southern India). Although the husbandry conditions are different from those found in the tourism industry in Thailand, results from Sukumar’s study somewhat infer what results may be expected from the present research. The elephants in the forest camps in India are kept in groups, closely mimicking wild group structures, with a matriarchal hierarchy and a number of young males. Furthermore, the elephants are released at night into nearby forests to interact and mate with wild individuals. The conclusions drawn by Sukumar from his data were that such captive elephant groups could effectively sustain their population without actual recruitment from the wild, but could however not grow. Therefore, the breeding rate in captivity, under these conditions was just sufficient to maintain the current population. This however is not the case in Thailand as will be discussed in this study. Other studies concerning demographics of wild populations may give us insight into how to optimize the structure of elephant groups in captivity in order to encourage breeding. Such a study by Ishwaran (1981) identifies variations in group structure depending on the characteristics of the habitat. Such studies may therefore give highly valuable information regarding appropriate group structures, relating to forage, space and resource availability. Ishwaran (1981), Choudhuri (1999) and Sukumar (2006) all three denounce the threat that small sizes of isolated populations pose on their long term viability and their relevance to the total population. Although all three papers address the problem in wild populations, this is a widespread problem in Thailand, with most camps comprising only a dozen or less individuals, which furthermore, are not given the opportunity to mate. The viability of such populations is therefore reliant on restocking, most likely from the wild. The proposed study, by calculating the age ranges and gender ratios for each population, will attempt to gauge the severity of the present situation. Concerning the breeding rate of captive elephants, Hermes et al. (2004) identified a distinct set of problems specific to isolation and bound captivity. Shortening of reproductive life-span, reduced fertility and consequently, irreversible acyclicity constituted the most commonly observed reductions in reproductive fitness. Denying the elephants the ability to mate for a 10-15 year period, a regular trend in Thai tourism camps, was determined to be a major cause of loss of reproductive fitness. Taylor & Pool (1998) carried out a study which attempted to distinguish variations in breeding success and infant mortality between different captive



facilities in the West and in Asia. Results showed better breeding success for Asian facilities which operate in a similar fashion to the Tamil Nadu Forest camp mentioned above. Their particular study did not include facilities or husbandry conditions like those found in Thailand. The proposed study should provide valuable baseline data on the demographics of the captive facilities in Thailand necessary for future studies, similar to Taylor and Pool's. Hilderbrandt et al. (2006) provide a comprehensive description of the husbandry related factors influencing reproduction. This is not directly relevant to the proposed study but serves in making a qualitative assessment of the appropriateness of the husbandry conditions of the sample camps, helping to determine the overall viability of the captive population in Thailand. Also of crucial importance to the viability of any population, is the genetic variability within it. Vidya et al. (2005) analysed the genetic variability between different wild elephant populations on the Indian subcontinent. A similar study may be relevant in Thailand both on the wild and domestic populations, although the genetic diversity of the captive population is probably relatively high, due to the increased translocation of elephants between facilities throughout the country as well as suspected restocking from the wild. Furthermore, the long life cycle of elephants relative to other mammals reduces the immediate threat of inbreeding depression. This may be extremely relevant for the wild populations however, as these are in small and isolated populations.

c. Types of Ownership

"Information on Ownership is badly needed." (Lair, 1997). Lair goes on to describe the relevance of a ratio calculation between mahout owners and non-mahout owners. As described above, ownership has a significant effect on the treatment of the elephant and provision of its basic husbandry needs. Lair (1997) provides a great insight into the intricacies of ownership. Pimmanrojngool & Wanghongsa (2002) also describe to some level the current situation regarding ownership and the problems it entails. Consistent time-point data will allow an evaluation of the ratio described above by Lair in order to ascertain the need and nature of future legislations regarding ownership and husbandry of elephants. Furthermore, time-point data will allow, over the coming years, a monitoring of trends in ownership, also enabling the correct adaptation or fine tuning of legislation.

d. Types of Activity

Lair (1997) provides some of the only relevant information regarding the employment of elephants in the tourism industry and their activities. The gender and age of the elephants determine, to some extent, the nature of the activities in which they are involved. Although this is a one way relationship, trends over time may appear, regarding the changes in demands for tourist entertainment. A favourite activity with the tourists currently is painting by the elephants during shows, whereas several years back, displays of pachyderm acrobatics may have been the highlight of the show. Such trends may be useful in identifying changes in tourist preferences and awareness regarding elephants. It seems the current shows are focusing increasingly on emphasizing the intelligence of the animal, rather than man's control over the latter. This will however need to be evaluated over time.



e. Diet of Elephants

“Food has an incredible impact on the health of the elephant” (Phuangkum et al., 2005). The relevance of appropriate diet for captive elephants has been emphasised by most experts (Lair, 1997 & 2002; Tipprasert, 2002; Lohanan, 2002; Sukumar, 1989 & 2006; Clauss et al., 2003). Unsuitable forage is most often at the origin of poor body condition in elephants (Phuangkum et al., 2005). A number of studies concerning the nature and diversity of the diet of wild elephants help identify the nutritive needs of captive elephants. Sukumar (1989) reported that in one study, wild elephants in India’s northeastern states foraged on a total of 112 plant species, leading him to describe the elephants as generalist feeders. The diet of elephants in the wild varies, depending on the nature of the latter’s immediate environment. Elephants in Northeastern Sri Lanka were found to feed on 116 species of plants (Samansiri & Weerakoon, (2007). In Myanmar, Campoza-Arceiz et al. (2008) calculated that working elephants feeding in the forest foraged on 103 species of plants. In Thailand however, elephants were found to forage on a combination of over 200 species of plants, including grasses, bamboos and woody plants (Phuangkum et al., 2005). The average daily forage time in the wild is agreed to be around 18 hours (Vancuytberg, 1977; Sukumar 1989 & 2006; Samsiri & Weerakoon, 2007). Such findings contrast strongly with the current feeding systems in many elephant camps in Thailand, leading to a number of health problems for the elephants. The aforementioned studies illustrate the importance of diet composition and time allocation for feeding. It has therefore been considered of great relevance to gather basic data on the foraging and diet of the elephants in the camps. Phuangkum et al. (2005) estimated approximately 1000 elephants to be significantly or entirely dependent on cultivated food stuff. The same paper goes on to describe the severity of potential problems associated with cultivated foods, in some cases leading to the death of the elephants. The data gathered in this study therefore attempts to determine the proportions of natural to cultivated foods as well as the composition of the diet.

5. THE RELEVANCE OF CAPTIVE ELEPHANTS TO CONSERVATION

Most elephants in captivity are privately owned, thus any translocation or release of the latter would therefore be complicated by ownership concerns. However, the theoretical value of such a large, well distributed and essentially in situ elephant population to the conservation of wild populations is great and should not be dismissed. On the other hand, as it is assumed that a proportion of the captive population is still sourced from the wild, understanding the market demands and the major forces behind this recruitment are essential in order to understand to what degree this harvest threatens the targeted wild populations be they domestic or from abroad.

In conclusion, the lack of distribution and demographic information hinders the design of any conservation or management plans. This therefore justifies the need for information on population numbers, distribution, demography and ownership of Asian Elephants in captivity in Thailand.