

Population Status and Conservation of Wild and Captive Asian Elephants (*Elephas maximus*) in Alaungdaw Kathapa National Park, Myanmar

SURENDRA VARMA

Asian Elephant Research and Conservation Centre (A Division of Asian Nature Conservation Foundation), C/o Centre for Ecological Sciences, Indian Institute of Science, Bangalore 560 012, Karnataka, India
Email: varma@ces.iisc.ernet.in

ABSTRACT

An investigation on the status and conservation of both wild and captive Asian elephant was carried out in Alaungdaw Kathapa National Park (AKNP). Population status of wild elephant was done through indirect method of estimating population number and the survey on human-elephant conflict was through visiting villages located within and around the park. The status of captive elephants was assessed through recoding the morphological measurements and relating its influence on overall body condition of the captive elephants managed there. The results showed a dung encounter rate of 0.85 km^{-1} for the park and it indicated that the elephants were found to be using only the southwest regions of the park ($3 \text{ dung piles km}^{-1}$) and other routes encountered no dung piles. A mean dung density of 1633.85 km^{-2} was estimated resulting in a mean elephant density of $0.64\text{-elephants km}^{-2}$ for the park. The human- elephant conflict was nil and no human casualty or household property damage has been reported. It was found for most of the elephants in the camp that the measurements of height and neck girth were identical and that relationship is possible only if the elephants are in good condition.

Key Words: Population Status, Habitat Usage Pattern, Human-Elephant Conflict, Captive Elephant Management, Conservation.

INTRODUCTION

Alaungdaw Kathapa National Park (AKNP) situated in the northern Myanmar, has exceptional beauty, known for its historical and scientific significance, natural landscape undisturbed by developmental activities or exploitation, large in size, and has great diversity of flora and fauna (Salter 1982, IUCN 1989, Hut 1997). The park also has one of the last remaining contiguous habitats for the Asian elephant (*Elephas maximus*). Conserving a flagship species (Sukumar 1989) may eventually protect the overall biodiversity. However, the terrain and the vegetation of AKNP are such that direct observations on elephants is extremely difficult and information collected from local hunters and villagers, provide basic information on occurrence and status of the species.

More than in any other country the captive elephant has always been considered the backbone of the timber industry of Myanmar and about 50% of all timber in Myanmar is still extracted by elephants. The country has substantial captive elephant population

and care and management of these elephants have been formulated through the adaptation of the indigenous people's traditional practices, research and experiences (Zaw 2000). AKNP also contributes some experience and knowledge of captive elephant management: the animals, which are unable to work in the timber logging camps and zoological garden, are brought to an elephant camp in AKNP and managed there. The survey was aimed at assessing the current status of both wild and captive Asian elephants. The objectives were fulfilled through assessing the population number, status of human-elephant conflict and captive elephant management in the park.

MATERIALS AND METHODS

Study Area

The AKNP (22° to 23° N and 95° to 96° E) is a well-forested mountainous region situated in west of the lower Chindwin River and Myittha Valley (Figure 1).

The 1606 km² Park comprises the Patolon and adjoining Taungdwin Reserved Forests. The elevation of the park varies from 200 to 1300 m asl with an average of 1000 m asl and Hlaingma Taung (1290 m asl) is the highest peak of the park. The park is drained by a number of tributaries of Patolon River: Petpa Chaung and Taungdwin Chaung being perennial among them (FAO 1982, Tun 1997). Major rainfall occurs between May and October and is heaviest in August and September. Rainfall is affected by the western Chin Hills, with annual mean of 1500 mm (FAO 1982, Tun 1997). Except selective logging of teak (*Tectona grandis*) in the past, the natural forest cover is least disturbed and the major forest types found here are Moist Upper Mixed Deciduous, Dry Upper Mixed Deciduous, Semi-Indaing, Pine and Evergreen (FAO 1982, Tun 1997). There is a rich wildlife prevalent in the park; elephant, tiger, gaur, tsaine, sambar and muntjac are the major mammalian

fauna here (FAO 1982). Black bear, dhole (Indian wild dog), otter, jungle cat, golden cat, fishing cat, civets, pigs, serow and other species are reported in the park (Tun 1997).

Methods

General

Along with line transect survey, different survey routes were identified for sampling wild elephants and villages located within and outside the park were visited for the status of human elephant conflict. The captive elephants belonging to the park were chosen to study captive elephant management. The survey was a part of Wildlife expedition carried out by the UK based Scientific Exploration Society. The expedition team was divided into sub groups, each sub group with a group leader, carried out the survey.

Population Estimate of Wild Elephant

The line transect method (Burnham et al. 1980) was followed to estimate the density of wild elephant dung piles. Transects were cut afresh for each count, and on locating a dung pile, the perpendicular distance of the dung pile to the transect line was measured. The other parameters such as dung decay and defecation experiments (to compute the elephant density) were not carried out as there was a time constraint, and also the data on these two parameters is already available from the study conducted earlier by Forest Department, Myanmar (Myint 1994).

Status of Human-Elephant Conflict

Villages within and outside the park were surveyed for assessing the human-elephant conflict. A questionnaire was used. The survey also extracted data on elephants sighted by the villagers during their visit to forest areas for collecting various forest products.

Captive Elephant Survey

To create an informative database and to understand the status of elephants and their keepers (locally called oozies), elephant and oozie management, veterinary care and benefits (cost benefit) of keeping the elephants in the park were studied by the following methods:

- Type I: Morphological measurements of captive working elephants were recorded.
- Type II: Interviews with the park warden, veterinary surgeon, oozie leaders, oozies and assistant oozies were made with the help of an interpreter

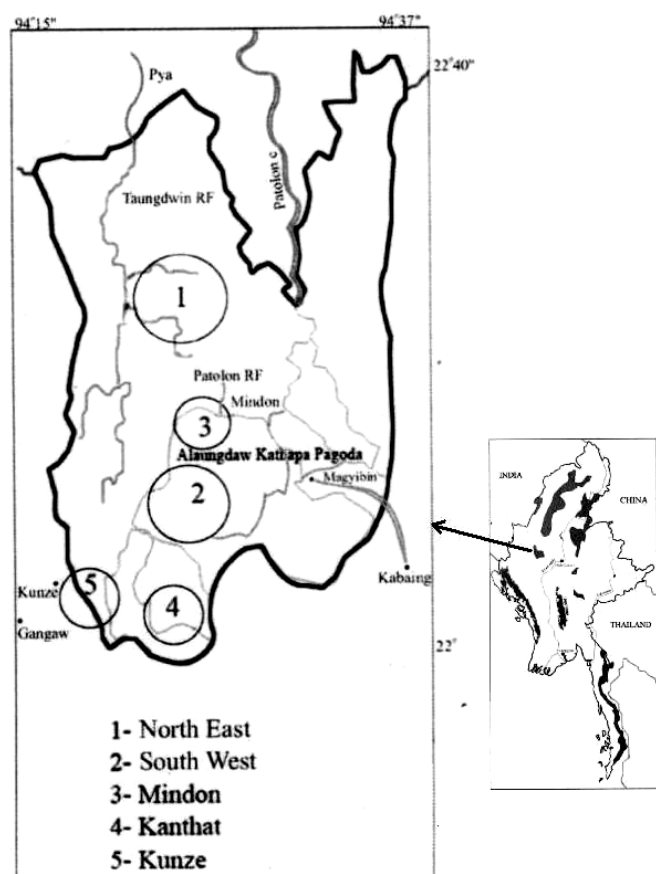


Figure 1. Location of AKNP in Myanmar.

wherever necessary. Photographs of each elephant and their oozies were taken. Drawings of distinguishing features (ears, tusk and tails) were also made to identify the individual animal.

Data Processing

Elephant dung density was estimated using the Computer Program Gajaha (AECC 1995). The results of data on elephant defecation and dung decay rate was obtained from the earlier study and was incorporated into the program to arrive at the elephant density.

The analysis of village survey data included relationship between distance to the forest and conflict with elephants, water source and conflict, type of crops cultivated and conflict and efficacy of methods to detect the elephant problem.

For captive elephant, using the information collected through the questionnaire and direct observations, fact sheets were prepared for each elephant, it's oozi (elephant keeper) which included veterinary care and management. The data has been analyzed for the population parameters, and the relationship between various body measurements (particularly height, neck girth and the circumference of the front foot) were also compared. Comparison of the values of mean height and neck girth was made for a specific age class elephants to validate the relation-ship between height and neck girth.

RESULTS

Status of Wild Elephant in AKNP

Based on the transect survey a mean dung encounter rate of 0.85 (Standard Error = 0.12) km^{-1} was calculated for the park. The encounter rate of dung piles indicated that the elephants were found to be using only the southwest regions of the park (Table 1). The southeast route encountered a mean 3 dung piles (Standard Error = 0.54) km^{-1} , which is about 72% higher than the mean encounter rate for the park and other routes encountered no dung piles.

Based on the survey of dung piles across different sighting distance class (through line transect survey), histogram of perpendicular distance of dung piles in kilometers was arrived and the same is given in Figure 2. From this it can be seen, elephant dung piles are seen more at 2 to 3 meter class intervals, followed by 3 to 4 and least in 6 to 7 meter class interval.

Table 1. Forest reserves sampled for elephant density estimation during elephant survey in AKNP.

Name of the Route covered	No. of transects	Distance covered (km)	Dung piles recorded
South-west	6	12	36
North-west	4	8	0
Mindon	4	6	0
Kunze	4	8	0
Kanthat	4	8	0
Total	22	42	36

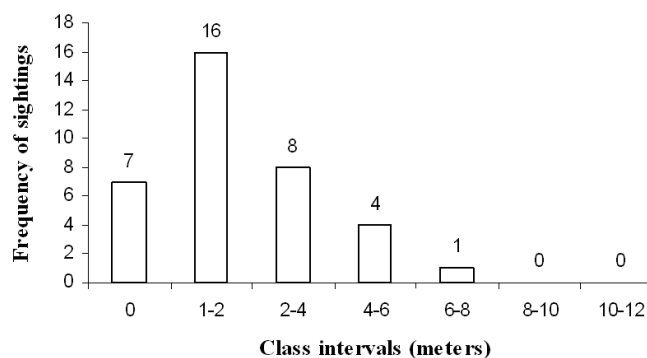


Figure 2. Histogram of perpendicular distance (km) of dung piles. The values are based on the probability density function. Here the assumption is that as the distance of sighting (from the line) increases, the probability of sighting the object decreases. The number of dung piles detected is plotted against the distance class of dung piles sighted.

The results of elephant dung density, decay rate and defecation rate are given in Table 2. A mean dung density of 1633.85 (Standard Error= 375.8) km^{-2} was estimated for the park and elephant density of 0.64 ranged from 0.53 to 0.74 elephants km^{-2} for the park.

Status of Human Elephant Conflict

A total of 12 villages were visited. Agriculture was the main source (98%) of income for all these villages. Paddy, wheat, peanut and vegetable are the major crops cultivated here. All these villages are located very close (Mean 2, Standard Error = 0.24 km distance) to forest

Table 2. Estimates of elephant density for AKNP. Dung and elephant densities are expressed as number per km² and the dung density estimates are based on Fourier series analysis.

Parameters	Values
Dung Density	1633.85
Standard Error of dung density	375.84
Decay Rate	0.01
Standard Error of decay rate	0.00
Defecation Rate	23.00
Standard Error of defecation rate	1.50
Mean Elephant Density	0.64
95% Lower Confident limit	0.53
95% Upper Confident limit	0.74

and water source (within mean distance of 3.2, Standard Error = 0.64). The major forest type found in these regions is mixed deciduous (3 km radius of the village). Though these villages are located close to forest and rivers, the human-animal conflict, particularly with elephants, is almost nil and no human casualty or household property damage has been reported.

Captive Elephant Management

Population Status of Captive Elephants

The Park was started as a sanctuary in 1984 and later, notified as a National Park in 1989. Since then elephants are kept in this camp. The elephant camp was started with 3 elephants and later more elephants were included. The animals, which are wounded, retired and unable to work in the timber logging camps and zoological garden, are brought to this camp and is a refugium for such elephants. Since the establishment of Park and the camp, there has been a gradual increase in the number of elephants with the annual increase of 0.928 animals and currently the park has 14 elephants. For 13 years of existence, only two elephants have died (One 50-year-old female due to old age and a 21 yr old due to disease), resulting to an annual morality of only 0.14%. There is no captive-breeding program here.

The overall body condition, veterinary care and management appeared to be relatively good. This was evident from the comparison of various body measurements of the animal. For most of the elephants in the camp the measurements of height and neck girth were identical (Figure 3) as the mean values of height and neck girth for a specific age class (where more data were available for comparison) were not statistically different ($z = 1.33$, $P < 0.05$). According to an expert on

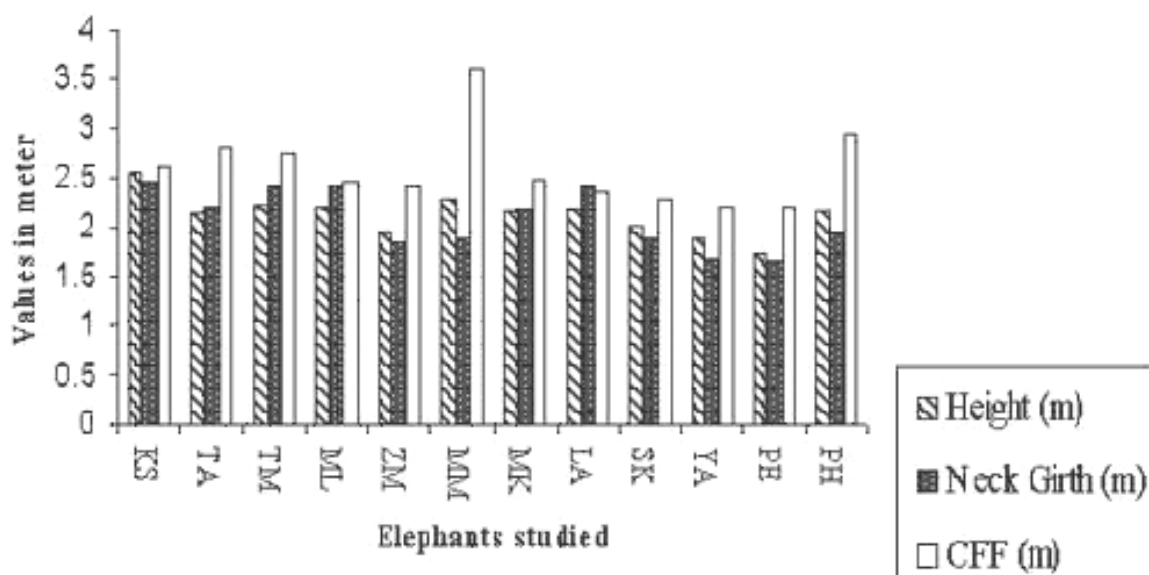


Figure 3. Height, neck girth and circumference of front foot (CFF) of the Park elephants. The value of CFF is obtained by multiplying the actual value with a factor of 2.

KS: Kan Sein, Than Aung Tun, TA, TM: Than Moe Oo, ML: Ma Lu, ZM: Zaw Ma, MM: Moe Moe, MK: Ma Kaw, LA: Lu Aung, SK: Shwe Kaing Moe, YA: Yan Aung, PE: Poe Ei San, PH: Pan Htay Lwin

captive elephants (Krishnamurthy, personal communication), such a relationship (no difference of mean values of neck girth and height) is possible only if the elephants are in good condition.

The good health status of elephants of the elephants kept here could be also related to the natural working atmosphere given to them. The elephants start working when they are ten years old and retire at the age of 65 and veterinary history of each elephant is maintained. During dry season the elephants transport the pilgrims who visit Alaungdaw Kattapa Shrine and only 50% these elephants are used for this purpose. As most of the park area is inaccessible through other transport, the elephants are used to transport goods from the nearest town Kapang, patrolling the forests and to transport sick and old people from the camp to the nearest village or town for treatment. Very specific working hours are followed, which were between 7 to 11 in the morning, and 4 to 6 in the evening. In the morning working hours rice is given as food and in the evening, tamarind and salt are given to the elephants. When elephant is released for free ranging, they are hobbled and released, their "free-ranging" duration depending on the work given to the animal.

Socio-Economic Status of Elephant Keepers

Every elephant in the camp has an oozi, each oozi works with given elephant for a number of years. An oozi is promoted to second head oozi, to first head oozi, and head oozi; every 2 years oozi is promoted depending on the need. Average monthly salary of an oozi is 600 kyats (=US\$ 3). Although no accommodation is given for the elephant staff, the Government provides land and small-scale agricultural practice is followed by the oozi. They cultivate vegetable and other crops in this land; as the land is close to forest, house construction materials (generally bamboo and wood) are obtained from the forest. The monthly salary is not sufficient for family maintenance, and according to oozies, an income of 7,000 kyats is required for overall maintenance of family. Agricultural and animal farming activities (rearing chicken and pigs, selling them to local market) bring some income to the family. During the rainy season, the markets do not function and only barter system takes place. The oozies wish to have a large family, and everyone works to raise a decent income. No oozi is educated beyond fourth standard but are keen on providing good education to their children. The nearest school (middle, primary and high school level) was situated 22 miles away and children stay in the village to get educated.

DISCUSSION

Status of Wild Elephants in the Park

The status of wild elephants in this park was not well known, nor has it been studied scientifically. Information available on the species is only based on indirect observations. As the visibility, in most of the forest is very poor, it's very difficult to study them directly. Through the current survey, it was noticed that the elephants have specific places for their movement and utilization in the park. Patches of typical deciduous forest were noticed in some part of the park along with other species, the forest surveyed had tree species of teak, (*Tectona grandis*) gooseberry (*Emblica officinalis*) and xylia (*Xylia dolabriformis*). Only close to these forests, elephant dung was noticed. Overall the dung density was very low, but in some patches, where the forest has sufficient food (tall grass), shade and water, elephants may regularly use these places. For elephants the availability of food or such forests (typical deciduous with grass cover) are ideal microhabitat, but these forests are very rare or the distribution of such forest type is patchy in the park. Myint (1994) found elephants using more of (87%) moist mixed deciduous forest, followed by Indaing forest (9%), dry upper mixed forest (6%) and grassland (3%). However the habitat usage pattern in relation to different habitat or forest types available to elephants was not clearly established by this study. Myint (1994) estimated a total population of 101 elephants for the park, our estimate of 0.64 km⁻² could be a over estimate of numbers; however, stratification of habitat based on actual elephant usage area and extrapolating the estimated density to only those area would give a reasonable or acceptable number of elephants for the park. Elephants used occur, particularly in the Taungdwin drainage, but is not a very common mammal. They are reported to be heavily hunted for their ivory by poachers from Chin region (FAO 1982).

Status of Human Habitation and Resultant Human Elephant Conflict

AKNP has no or very negligible state of human elephant conflict, as there are no villages located within the forest; the nearest village is about 50 miles away. The fertile Myittha Valley located in the western side of the park is a heavily populated region. However, the only settlements within the reserved forests of Patolon and Taungdwin are the two small villages of Zanabok

and Pya. Along the Chindwin Valley, the main population centres are Kani, Monya, Yimmabin and Kabaing, the nearest village to the park. The lower valley of the Patolon and bordering Taungdwin RF with many flat and fertile valleys, has many villages, majority of the population of these villages are primarily agriculturalists, cultivating rice and ground-nut along the river valley. In other regions of Asia, the human-elephant conflict is one of the main conservation problems, and at present it is not a major issue in AKNP. However, the conflict is likely to heighten with the increase of the human population or activities along the periphery of the forests.

Captive Elephant Status

The elephant camp was started with a small number of elephants and later more elephants were included. The major objective of having this camp was to manage animals that were wounded, retired and unable to work in the timber logging camps and zoological garden. Since the establishment of the camp, there was a gradual increase in the number of elephants. The camp does have some problems; although good veterinary care is available; there were problems in identifying sensitive diseases, there was no veterinary clinic and the medical budget to run the camp was very low. However, the overall body condition, veterinary care and management appeared to be relatively good. This is evident from the matching measurement values of both height and neck girth of animals surveyed. From socio-economic status point of view, the status of elephant keepers appeared to be not in a positive state. There was no accommodation provided to the keepers, the salary given was not sufficient for family maintenance and no oozi is educated beyond fourth standard.

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