inbreeding at best or outright decimation at the hands of the irate cultivators at worst.

Poaching is also becoming more intense. In the past, it has been the high price of ivory that led to the slaughter of the elephants in Thailand. Today however, the greed of a few rich people has taken a different course: In Khaeng Krachan National Park in the Phetcaburi province, a cow elephant was killed to provide a land lord an abnormally fair skinned calf elephant that was associated with the mother. In another incident, (again in the same park), an elephant was killed to satisfy the needs of a mistaken rich man who believed in the Chinese nonsense of the elephant's penis being a strong aphrodisiac! Bull elephants were thus killed just for the penis! What an elephantine waste! In Thailand, a partly dried penis (elephant's) is worth about US$ 20/– per kg. Given that the elephant's penis weights about 20 kg, the maximum that can be earned is US$ 400/– an enormous amount for a poor peasant in Thailand.

There had been human casualities from the elephants in National Parks too. In Khao Yai National Park, a well known monk was killed when he tried to calm an enraged bull elephant. There are other instances when elephants have either killed or injured tourists in National Parks. In Phu Kradung National Park, an injured elephant was found to be such a menace to the tourists that the park had to be closed for a while.

Recommendations

Since the causes for the decline in number of the wild elephant populations in Thailand have been forest destruction, poaching and the intrinsically small size of some of the protected areas that harbour elephants, the future conservation policies that would be designed must take these issues into consideration.

1. Protection of elephant habitat is of primary importance. Hand in hand with this must go the control of further indiscriminate land-use activities of man.
2. A strict control on the illegal hunting and poaching activities in and outside protected areas.
3. Regular monitoring and censussing of elephant populations in the protected areas. Such information must form the backbone of management.
4. Much emphasis of the research must be aimed at resolving human-elephant conflicts through a better understanding of the ecological and biological needs of the elephants.
5. In the case of small reserves, forest corridors must be provided to link them and thus ensure the movement of elephants – if this is indeed possible.

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MANAGEMENT

MANAGEMENT OF ELEPHANTS IN CAMPS

Dr V. Krishnamurthy
Project Officer: Bombay Natural History Society
Elephant Research Project
Kargudi Post, Nigiris 643 211, India

In many States of India, trained elephants are being used by the State Forest Department for various purposes such as logging, providing joy rides etc. in sanctuaries and national parks and for hauling equipment and baggage. For this purpose, elephants were captured by various methods. In States such as Kerala, Tamil Nadu, Assam, Uttar Pradesh, Bihar etc, elephants are

maintained by temples as well as private individuals.

Several methods are used for training and managing these elephants. But in most of the State Forest Departments, standard management practices are adopted with minor variations suitable for the conditions prevalent in their States.

Mr A.J.W. Milroy (1922) who retired as the Chief Conservator of Forests in Assam had written a small book on the management of elephants for the use in the Forest Department in Assam. Several States have codified the Management Practices adopted for the elephants in the respective States.

An elephant is essentially a herd animal, and feels happy amidst its own company. A captive elephant is no exception. In most of the Forest Departments, this fact has been realised and they therefore maintain and manage elephants in groups. But many temples and private owners however, have elephants which lead a lonely life. They are kept constantly tethered or in a stall or under a tree and are taken out only for bath or during the processions. Some animals are hired out for logging and other operations. Many such elephants lead a miserable life, and in particular the tuskers who many a times show a behaviour that veer from timidity to violence.

This paper deals with the general management practice followed in several Forest Departments in India.

1. Selection of a camp-site: Camps should always be selected on high, well drained ground, level at the surface, close to a stream, where there is plenty of good water and fodder. Care should be taken to avoid swampy or marshy areas. It is essential to see that the camps are as far as possible located near the working area. Elephant mahouts should not be allowed to live within the camp, but permitted to remain some distances away. The camp should have the necessary sheds such as kitchens, if cooked food is to be fed; store for maintaining the provisions; a shed to keep the elephant gear; and quarters for the staff. It is also advisable to have a kraal for training newly captured elephants, weaned calves or to keep animals that are sick.

2. Mahouts: The selection of mahouts is very important. A mahout should have a love for his animal and at the sametime, be firm enough to control his ward. He should be healthy and able to withstand the rigours connected with the job. He should be able to use all the command words and make the animal under his care able to understand and obey the commands. He should be able to judge, know the moods of his elephant, and also be able to detect the signs of any indisposition. A well trained elephant is an asset, and the mahout is mainly responsible for making it so. Mahouts should not normally be changed from one elephant to another. Such frequent changes may spoil the elephant. In many parts of India, the local tribals are associated with the capture and training of wild elephants and many of them are excellent elephant-men.

3. Watering: Elephants should be watered in one spot, and bathed in a different spot. The watering place must always be up-stream in relation to the bathing place. To prevent animals from drinking at the place where they are bathed, they must invariably be watered at the drinking place *before* leading them down stream for a bath.

The supply of drinking water, preferably from a flowing stream, is quite essential, as many of the parasitic diseases besides several other ailments are water-borne. Whenever an elephant is put to strenuous work, it should not be watered or bathed immediately after work. Instead, it should be done only after a lapse of 30—40 minutes, to prevent the possibility of the animal developing either chill, cramps or even colic.

4. Bathing: A domesticated elephant needs a thorough bath every day at least once (twice a day is even preferable in the Southern States of India), if it is to keep fit and well. While bathing, the body should be scrubbed well by the attendants using soft coconut fibre or matured fruits of *Pandanus odorotissimus* cut into

proper sizes. Washing and grooming will improve the condition of the animals and also enhance the appearance of the skin texture and condition. Bath should last at least an hour. It would also keep the ecto-parasites on the elephant to a minimum. No elephant must be bathed if it has eaten earth or appears ill. The dung voided by an elephant during the bath should not be allowed to float in the water, but should be collected and thrown into a pit specially dug for that purpose and covered with a layer of earth.

5. Feeding: Elephants feed both day and night (about 18—20 hours per day). In order to keep them in good condition, plenty of good food must be given. In captivity, half the time of the departmental elephants is spent on work, and during that time, they are deprived of their natural fodder; while the loss of energy during the work too is great. In order to compensate for the loss of energy from work, concentrates and easily digestible food is given.

It is advisable to let the elephants graze in the forests where they would have access to many varieties of plants and fodder. Except in special cases, where the elephant is either sick or in "musth", or in the case of the weaned calves, which may be attacked by predators if they are let out to graze in the forest. In such cases, care should be bestowed in providing sufficient quantity of fodder of different varieties. When elephants are let out to graze, especially during the evenings, care should be taken to hobble them properly and leave them to graze where there is good fodder. A trailing chain should be provided in all cases of elephants that are allowed to graze. It is safe for various reasons that every elephant be given a bell (tied around its neck). Bells will be of great use to trace the animal when grazing in the forests or to retrieve them once they bolt away.

It is the duty of a subordinate in charge of an elephant camp not only to look after the health and diet of the animals, but also to see that the progress of work is maintained. Hence he should be up early by day break and send the elephant men to fetch their charges from the grazing areas. The elephants then should be examined for signs of sickness, and led to the watering place, watered and given a bath and after the morning feeding with concentrates, are to be sent for work and the animals are made to work efficiently.

Care of elephant gear is important. The subordinate in charge should inspect daily the hobbles, trailing chains as to their condition and renew the weak links. He is also responsible for the training of new captures or weaned calves. He must be able to distinguish between signs of health and signs of indisposition among his elephants. Wounds, abraisions etc should be dressed as per instructions. Elephants that are suffering from diarrhoea, idigestion etc must be kept separately in the camp without being sent to work.

6. Care of feet: Elephants that are exposed to slush and those animals with soft pads are prone to foot-rot, mud sores or cracked heels. Animals developing foot-rot would become unfit for work and hence care should be taken to keep the feet in healthy condition. Further "Bot" flies lay their eggs around the nails and insertion of tushes. Applying fly repellent oil around the feet and insertion of tushes daily after bath is essential.

7. Care of pregnant animals: Cow elephants which evince gradual increase in size of mammary glands and chest girth and with a slowed down gait are to be suspected for pregnancy. Such animals should be periodically examined, and as soon as quickening or movements of the foetus can be detected at the floor of the abdomen (13—14th month of pregnancy), the elephant should not be put to heavy work, and preferably taken off from work. A pregnant elephant should never be used either as a kumky or to carry people. After calving, a cow elephant should not be put to work until the calf is six months of age. Afterwards, the elephant can be given light to moderate work till the calf is weaned.

8. Shifting of camp: If the elephants are kept in one and the same camp for a long time, the area around the camp may get depleted of fodder and the incidence of helminth infections

increases, due to the soil getting infected by the dung passed by the elephants. Hence it is advisable to shift the camp at least once a year to a different site for 2–3 months. This will help in the regeneration of the fodder resources and also in the death of the infective larvae by exposure to sunlight.

9. **Work:** Elephants are kept by the department primarily to drag timber from the forest to the road side. In addition to this they are also employed for arranging logs in the depots, loading timber on to truks, and wagons, carrying fodder to new captures, carrying provisions, riding and at times as "kumkies".

Elephants are not fully grown until they are 25 years old. If carefully worked, a good elephant will be able to do hard work for not less than 30 years. Elephants below six years of age should never be put to work. Elephants between 7–15 years of age may be trained gradually and used for light work such as carrying provisions, baggage and dragging poles etc. Depending on their age, the hours of work may be proportionately increased from 2 to 4 hours per day.

Between 15–25 years, the elephants are to be given moderate work and between 25–45 years they are put to heavy work. After the age of 45 years, depending on the condition, the work load can be maintained or gradually reduced. Elephants over 60 years of age should never be used for hauling timber. It is better to pension them off and not put to work at this age.

Elephants should be worked for not more than six hours a day in two sessions of three hours each. Working the elephant during the hottest part of the day should be avoided. During the monsoon period and even up to the middle of January, they can be worked between 0800–1130h and 1500–1730h. Later from January to March, it is advisable to put the animals to work from 0700–1000h and from 1530–1730h. It is advisable to plan your work in such a way that the elephants complete their work by the middle of February so that they can be given rest during the hottest part of the year.

In case of death of any elephant, it is advisable to have a post-mortem examination to ascertain the cause of death so as to take the preventive measures later on. The carcase should be burnt or buried in a pit 12 ft deep.

Finally, it can be said with confidence that an elephant, provided it is trained and managed properly, is an asset and can be put to useful work over long period of time, much to the benefit of man.

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RESEARCH NEWS

1. **Growth in the Asian Elephant**
   by R. Sukumar, N.V. Joshi & V. Krishnamurthy
   Proc. Indian Acad. Sci. 97 (6): 1988. 561-571.

Records of captive Asian elephants *(Elephas maximus)* were used to derive parameters of the von Bertalanffy function for growth in height, body weight and circumference of tusks with age. There was some evidence for a post-pubertal secondary growth spurt in both male and female elephants. Domestic elephants which were born in captivity or captured at a young age also showed a reduced growth in height in both the sexes and in body weight in males compared to wild elephants. Aspects of allometric growth such as height-body weight relationship are examined. The height was twice the circumference of front foot throughout the life span, indicating an isometric relationship.

2. **Sounds of silence revealed**
   by Ian Redmond in *Nature (BBC wildlife)* Sep. 1988

Human observers have long puzzled by the ability of elephants to converge simultaneously