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Project to Microchip and Register Captive Elephants in Assam, India

B. Dutta[1], B. Chaudhury[2] and A. Talukdar[2]

[1] *College of Veterinary Science, Assam India*
[2] *Wildlife Trust of India, India*

Introduction

The population number of captive elephants in India was based only on estimations, as prior to the year 2002 no formal scientific census had been taken. However the population was estimated to be 3400–3600 (Bist 2003), of which Assam is thought to have about 1500 elephants distributed throughout the state. Therefore in 2002 Project Elephant (Government of India) decided to undertake a project of microchip implantation in all captive elephants of India for identification and proper maintenance of a database. As part of this project the Department of Environment and Forest (Government of Assam) started the implantation project and decided to conduct a mass implantation programme during the "Kaziranga Elephant Festival". Details of planning, preparation and mass scale implantation, is discussed hereunder.

Kaziranga National Park is regarded as the heart of wildlife conservation in Northeast India. The "Kaziranga Elephant Festival" was conceptualized and organized by the Department of Tourism and the Department of Environment and Forest (Government of Assam) and held on January 11-13, 2003. The aim of the festival is to promote tourism in the state, creating public awareness about the plight of the Asian elephant in the state, and promote the concept of "elephant-human coexistence" in today's world of mosaic habitat types.

The event was the best opportunity to implant microchips in captive elephants in Assam as the Department of Environment and Forest invited all private elephant owners of the neighbouring districts to participate with their animals. Looking at the possibility of one of the largest ever congregations of captive elephants in the state, most of which are privately owned and reside in remote areas, it was decided to implant microchips in all the participating captive elephants during the three day festival. It was put forward by the authors to the concerned Department to invite the owners with their elephants at least two days before the festival so that the exercise could be started well ahead of the hustle and bustle of the tourism festival. The Wildlife Trust of India, a non-government organization, with support from the International Fund for Animal Welfare (IFAW) supported a free health check-up for all participating elephants in the event. It is worth mentioning that in terms of quality veterinary care for captive elephants it is estimated that about 15% of captive elephants get good veterinary care, 25% get average care, while 55% of captive elephants get poor care. This is one of the most serious problems faced by these animals (Bist 2003). After the December 1996 ban on logging operations in Northeast India by the Honourable Supreme Court of India, most of the captive elephants of the region suddenly became jobless, and gradually became "beasts of burden" for the private owners, except some 10% of family owners who kept their elephants as a symbol of pride.

Materials and methods

Microchip tagging

The microchip technology was developed in USA during the early 1980s for identification of animals. The microchips are a tag in the form of "Read Only Transponder". Each tag comprises some read only memory, a power rectifying circuit, an onboard oscillator, and a variable antenna, loading circuit and driving logic. The memory is permanent and the tags do not need power to retain their identity and function without any battery.

The microchip is small, barely larger than a grain of rice, and is approximately 12 mm x 2 mm in size. Newly designed microchips consist of a glass capsule made of bio-compatible glass, which is readily accepted by the body tissue. Within the glass capsule there is a silicon chip carrying the unique individual code, along with a ferried rod and copper coil that receives and sends the information to the reader.

The FDX–B microchips conforming to ISO 11784 and 11785 are preloaded in a sterilized hypodermic syringe. The code on the microchip is unique and can be read by passing the reader over the microchip. A built in rechargeable battery powers the hand-held lightweight reader. Readings are received by the reader and displayed on its LCD screen, while the presence of a microchip is also confirmed by a beep signal. The Tracer ISOMAX 111 reader, which was used in the festival, is a second-generation reader and is fitted with a data port that allows transfer of stored data into a computer system.

Method and site of implant

The recommended method of implantation is by hypodermal injection. Each microchip is contained in a separate hypodermic sterile pack. Before injecting the implant, the chip may be read to confirm that it is reading properly and the number can be noted accordingly.

The recommended implant site in elephants is subcutaneous, in the neck behind the left ear (Fig. 1). The site is chosen for easy access and to allow consistency within large groups. It is effective for easier reading on a national scale.

The needle is inserted upward at an angle of 45–50° at the site (Fig. 2). After implantation the site should be checked for any bleeding or tearing of tissues, and should be disinfected. Then the chip is read by the hand-held reader to ensure its location and function (Fig. 3).

Figure 1. Photograph showing the site of implantation.

Figure 2. Photograph showing the process of implantation

Season and weather considerations

January is peak winter in Northeast India and peak tourist season as well; hence the festival was planned during this month. This is favourable for the mahouts and captive elephants, as they can transport their animal from far away places through the shortest route to Kaziranga, crossing rivers and rivulets, which in the monsoon season would not be possible. Almost 90% of the elephants were transported on foot by their owners who cannot

afford the luxury of transporting them by vehicles.

Camp sites for elephants

Based on the data available to the Forest Department and other sources, it was estimated that at least 150 captive elephants would participate from five adjoining districts of Kaziranga National Park: Golaghat, Nagaon, Jorhat, Sonitpur and Kamrup. Planning for temporary housing of the participating captive elephants was done according to their basic management and husbandry requirements. Two sites close to the southern boundary of Kaziranga National Park were selected based on availability of space, a large water source, distance from human habitation, accessibility by vehicles, availability of shade, availability of fodder, and safety considerations for the animals and humans from wild elephants. For ease of record keeping and logistic supply the two sites were strategically located so that elephants coming from districts in any direction could camp on either side, hence the distance travelled would be less. Special attention was paid to the disposal of dung and residual fodder of the captive elephants that would accumulate during the period of the event. Huge pits of 15 m. x 15 m. x 10 m. in size were dug at both sites for disposal of dung and residual fodder, and instructions were given to the mahouts to dispose of litter on a daily basis and burn it every alternate day.

Captive elephants

The captive elephants were divided into four different groups: adult males, adult females, sub-adults, and adult females with suckling calves. The winter, specifically from October to April, is the peak period for healthy adult male elephants to come into musth (Dutta & Pathak 1997), hence a solitary camp was selected for these animals. After registration and examination for initial signs of musth (i.e. swelling over the perineal region or temporal region accompanied by behavioral change with aggression) such animals were kept isolated. It was also taken into consideration that in cases of more than one individual coming into musth or showing signs of premusth, the tethering distance between them would be at least 50 meters apart, and prior arrangements were made accordingly. The adult females, the sub-adults and docile male elephants were kept at both camp sites. Adult females with suckling calves were allowed to stay with the camp elephants of Kaziranga NP for two reasons: safety of the calves from chances of a predator attack, and minimal stress of transport and of disturbance by crowds at this site. The site has electricity and armed guards patrol the area.

Registration of elephants

Each captive elephant was registered on arrival at the camp and an identification number was given to it. The identification number was written on a cotton cloth with permanent marker pen and handed over to the mahout or the owner who was asked to tie it on the gaddi (saddle) of the elephant on all occasions. The support staff of the Forest Department kept a record of the elephants separately, to be distributed to the veterinary officers in charge of the health camp and implantation programme. During the registration basic information was recorded for all captive elephants. This information included name and address of the owner, name of the elephant, sex and approximate age, temperament and physical parameters like height at shoulder, chest girth, circumference of left foreleg.

The veterinary team and support staff

A total of six veterinary surgeons, experienced in working with elephants, participated in the event. The team of veterinary surgeons was divided into two groups to address the elephants at two different sites at the same time. Among the groups, two veterinary surgeons were given the responsibility of performing a thorough health check-up and collection of data as well as rendering necessary treatment, while the other two veterinarians implanted microchips. The remaining two members supported each team where needed.

Figure 3. Photograph showing the method of reading the microchip.

Data collectors, four forest guards and two skilled mahouts supported each team of veterinary surgeons.

Protocol for mahouts and elephants

For the microchip implantation and health check-up of the elephants a no-man zone was created close to the area where the elephants were tethered at both campsites. The two teams placed themselves in the no-man zone at least 50 meters away from each other. A forest guard was put on duty with the elephants and given a whistle and a red flag, while another staff member was assigned to the implantation team with a whistle and a green flag. The forest guard with the implantation team waved the green flag to the forest guard with the elephants signalling that one elephant with its mahout could come for implantation. The forest guard waved the red flag signalling he had seen the instruction. The elephants' registration number was displayed to the team and was noted. After completing implantation, the same elephant was taken to the team of veterinarians conducting the health check-up and treatment. Once the elephant left the implantation team, the forest guard waved the green flag signalling that the next elephant could come and the cycle moved on. After completing the health check-up and any necessary treatments, the elephant returned to the tethering area by another route, to ensure that the teams attended to all elephants and that the mahouts were not confused during the exercise. During the implantation and examination only essential personnel was allowed in the area, the media was placed in a strategic point away from both teams.

Veterinary surgeon protocol during implantation

The veterinary staff followed a protocol during the entire exercise. This included instructions given beforehand to the owners and to the mahouts about what was going to be done and what was expected of them. The protocol included that the elephant would have hobbles on its forelegs and the owner or mahout would tie the forelegs with the hobbles. After securing the elephant with the hobbles the mahout gave the command of "Sam beit" (kneel down) and

the owner then pulled the left ear of the animal towards the eyes of the animal. After this the animal was approached from behind by one of the veterinarians and the area on the elephant's neck was sterilized for implantation. The second veterinary surgeon immediately followed and implanted the chip sub-cutaneously. Standard sterilization protocols were followed by the veterinary surgeons while implanting the microchips.

Results and discussions

The underestimation in the number of attending elephants provided some last minute crises in terms of logistic supply and fodder. A total of 210 captive elephants attended the event instead of an estimated 150, but luckily there was enough space for the surplus 60 animals in both the main camps and the camp for musth elephants where some female elephants and sub-adults were accommodated. Among the 210 registered elephants there were 17 (8.0%) adult tuskers, 45 (20.9%) adult makhnas, 106 (50.4%) adult females, 19 (8.5%) sub-adults and 23 (10.9%) suckling calves.

A total of 199 captive elephants were implanted with microchips among the 210 registered elephants that attended the camp. The other 11 elephants could not be implanted because they were 3 months to 4 years of age, and being suckling calves accompanied by their mothers they did not cooperate with the physical restraining process required for the implantation. Chemical restraint was ruled out under these circumstances. Only 0.5% of the adult elephants required chemical immobilization because of non-cooperation with the procedure or getting too nervous. Almost 60% of the total number of animals (n=210) had their first exposure to a veterinary surgeon and for obvious reasons were curious or nervous, but with their skill the mahouts were capable of giving them the required security and comfort during the implantation.

There were at least three instances where the protocol for implantation could not be followed due to unavoidable circumstances. It was documented that most owners had 1-2 captive elephants up to a maximum of 4. Owners of 3-4 captive elephants brought their elephants together for implantation and health check, and convinced the authors that due to the strong social bond among them, no single elephant was eager to move alone leaving the other members behind!

Unlike other states in India where a sizeable captive elephant population exists (such as in Kerala) the management and husbandry of captive elephants in Northeast India is quite different. The majority of the captive elephants in the Northeast enjoy near wild or natural conditions as a result of their location in the vicinity of forests, either because of being employed in the timber industry or because they are owned or managed by tribal communities residing in close proximity to the forests. These elephants have access to natural forage and abundant sources of fresh water; hence they appear well hydrated and content like their wild brethren. During lay off from work, they are hobbled and let loose for grazing the entire day. If the elephant is engaged in work in the daytime, it is released to graze at night, allowing the elephant to choose forage and giving it a better chance for balanced nourishment (Sarma 2003). Striking differences noticed between the captive elephants managed by the protected areas and by private owners is that the body condition index is far better among elephants with private owners than elephants in protected areas. But interestingly, regarding the foot condition among 151 captive elephants that were given a detailed health examination, a total of 33.7% had nail cracks and 10.5% had fissures on the footpad (Ashraf *et al*. 2003). The nail cracks may be attributed to poor foot care or occupational hazard. A total of 2 adult female elephants had fractured hind legs, a result of a heavy log hitting directly over the affected leg during logging operations.

Despite minimal contact with human beings and inexperience with exposure to crowds, ochlophobia was noticed in only 1 adult female elephant during the festival. She was immediately moved away from the crowd.

A total of 4 (6.45%, n=62) male elephants came into musth and needed to be sedated

thereafter for better restraint and management. These elephants were implanted with microchips after sedative administration.

Because of the heavy demand of tuskers outside the state, many adult tuskers have been sold out of state, which resulted in a captive sex ratio of about 1 male to 5-6 females, which is similar to a natural undisturbed herd. Therefore, there is no dearth of breeding males to breed receptive captive females and they are procreating unlike captive females elsewhere (Sarma 2003). Among the 106 adult female elephants that attended the event, a total of 23 (21.6%) had suckling calves from 4 months to 5 years of age. Upon interrogation it was found that 100% of the breeding female elephants have mated with wild adult males to produce the offspring. This is quite a natural phenomenon for captive elephants in Northeast India and can be attributed to the husbandry and management system followed in the state. The weaning age of captive born calves is approximately 5 years as per the information gathered from the owners.

The transportation of almost 90% of the captive elephants was done on foot, even females with suckling calves. These elephants started their journey well in advance, with frequent breaks in villages and towns to finally reach the event. This resulted in some stress to the suckling calf and their lactating mothers, although per the information gathered from the mahouts, many female elephants could not come because of suckling calves below 1 year of age.

Almost 90% (n=240) of the mahouts were illiterate and needed more effort in making them understand the protocol, but with the help of the support staff this was not too difficult.

Conclusion

The FDX–B (Tracer) microchips conforming to ISO 11784 and 11785 were implanted successfully in 199 captive elephants during the "Kaziranga Elephant Festival". Following the same methodology, a few more mass scale implantation programmes have been successfully completed. So far in Assam a total of approximately 850 elephants are microchipped, and the method is very simple, safe, and without any post-implantation complications.

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Corresponding author's e-mail: bijoydutta2@rediffmail.com