ELEPHANT BULLS OF RAJAJI-CORBETT ELEPHANT RANGE

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He towered over the tallest female in the group by almost one and half a foot. He stood on the edge of the Ramganga reservoir escorting a young adult female. He looked every inch a behemoth. His grace, sheer size and embodiment of power deserved the attention he was getting from us. He was one of the members of a group of elephants we were watching on Dhikala *chaur* in Corbett Tiger Reserve one late May evening.

The sun had just set behind a chain of hills on the far side of the Ramganga reservoir, leaving the sky painted with a hue of reddish gold. The lighting on the bull made it very picturesque. His *musth* flow was coming to an end as indicated by the two small wet patches along with traces of dried flow down the sides of his massive head. His interest in the young adult female was conspicuous as he always kept to her side. When she waded into the reservoir he plunged in after her. It was then that we realised the fear his immense size can generate on a smaller and younger bull. The young bull, who was already in the water, hastily moved away when it became apparent to him that he was between the female and the mammoth. The young bull moved around the pair in a wide circle and eventually got out of the water.

The mammoth was fully aware of the presence of the young bull and the other members of the group but was totally unconcerned about them. He submerged himself in the water alongside the female and gently nudged her. After a few minutes he waded towards the shore churning and splashing the water all along and then came on to the dry land. The young bull, although 30 m away, hurriedly moved away when the mammoth turned in his direction although totally indifferent to the young bull's presence. The twilight was soft but bright enough for us to clearly see the long massive tusks of the mammoth. The wear on the right tusk indicated that he had used it much more than the left one. As the night fell the mammoth strolled away from the group towards the forest. He walked with great dignity and poise and we painfully realised that, due to extensive poaching of tuskers, such magnificent bulls have become rare in many of the elephant ranges in India. We were fortunate that it was not the last encounter we had with him when we studied elephants for the next few days in Dhikala.

Although many articles and books, both popular and scientific, have been written on Asian elephants, the life of bulls in their natural environment has not been documented for many elephant ranges. This is largely due to the paucity of research on bulls and to some extent to the scarcity of adult bulls in most ranges due to poaching. We present here some fascinating information on the elephant bulls of Corbett Tiger Reserve and the adjoining elephant habitat. Only the bulls make Rajaji and Corbett a continuous elephant habitat entity, by moving across the flimsy corridors, which are disintegrating and shrinking day by day.

Not long ago the elephant habitat in the state of Uttar Pradesh was continuous from Katerniaghat in Bahraich Forest Division in the east to river Yamuna in the Shivalik Forest Division in the west. Over the decades, as a result of the growing demand for more land for the increasing human population, this contiguity was broken. Now there are six isolated elephant populations. The major population of elephants in this tract, about 800, occurs in the Rajaji-Corbett Elephant Range. This range, about 3000 km^2, spans from Kosi river, which forms the eastern boundary of Corbett Tiger Reserve to river Yamuna on the West. This forest tract includes the present Shivalik Forest Division, the proposed Rajaji National Park (which includes the three former Wildlife Sanctuaries: Chilla, Motichur and Rajaji), Corbett Tiger Reserve, and parts of Lansdowne, Bijnor and Kalagarh Forest Divisions.

We have urged time and again that elephant conservation in Uttar Pradesh should focus on the large Rajaji-Corbett population and its habitat which has already been broken into three isolated areas due to two major developmental projects. This includes the 14 km long Kunaun-Chilla power channel which was constructed on the eastern bank of Ganges in the early 1970s. Around the period when the channel was built, there were developmental projects on the west bank of Ganges, such as the establishment of Hindustan Antibiotics factory, Raiwala army camp, and the settlement of evacuees from the submersion area of Tehri dam village. These have made the Chilla-Motichur corridor totally unfit for elephant herds to move between Chilla and Motichur across the Ganges.

The second important development that has restricted the movement of elephants between Rajaji and Corbett is the Kotdwar-Lansdowne road which runs across the narrow Rajaji-Corbett corridor parallel to the Khoh river. This road construction has resulted in steep edges and building of walls which impede crossing by elephants. This hilly corridor is used only by bulls. Fortunately the elephant bulls still migrate across the power channel and the road thereby bringing about genetic exchange between the otherwise isolated populations. We have predicted that this genetic exchange would not continue for long if the fragile habitat continuity between the these areas is not immediately strengthened by consolidating the corridors.

Six years ago, one summer evening, as the dusk was gathering, Mr. Wesley Sunderraj, a researcher from the Wildlife Institute of India, was returning to Kotdwar walking along the Khoh river. He spotted an elephant bull, a tusker, coming along a valley from the direction of the Rajaji National Park towards the Khoh river. Wesley photographed the bull and stayed near the river to find out whether the bull would cross the river. By the time the bull came close to the river it became so dark that Wesley had to abandon his observation. He, however, went back to the same area early the next morning and picked up the trail of the tusker. The elephant had crossed the river, Kotdwar-Lansdowne road and walked in the direction of the Corbett Tiger Reserve.

This was the only bull that Wesley had seen using the corridor during the two year period that he studied the elephant corridor between Rajaji National Park and Corbett Tiger Reserve. The corridor is to the west of Khoh river. He discovered that the movement of cow groups across the corridor was absent due to the steep terrain, which the calves cannot negotiate, and the disturbances caused by people. The cow groups, just to ensure the safety of the calves, avoid areas of disturbances even if they are rich in fodder resources. Bulls, as they do not care either for the safety of the calves or for the group, could negotiate even areas of high disturbance in the cover of darkness. Wesley, however, concluded that the growing disturbances in the corridor area - grass, bamboo, fodder and wood collection - may one day stop even the bulls moving across Rajaji-Corbett corridor. If that happens, the genetic exchange between the populations on the east and west of Khoh river would come to an end forever.

The number of socially and sexually mature elephant bulls in a population is an important factor in deciding the genetic virility of the population. Sadly in many elephant ranges in India, a good example being Periyar Tiger Reserve, uncontrolled poaching of tuskers has drastically depleted the bulls leading to a disproportionate sex ratio. The sex ratio reported in Periyar Tiger Reserve is 1 male to 120 females. Although there are some tuskless bulls (makhnas) in the population this disproportionate sex ratio definitely can have two disastrous consequences. One is that a proportion of females may not be able to mate, inspite of the fact that the elephant bulls are polygynous. The other is, the cows, which can make a decision in selecting the bull, in the absence of mature bulls, may allow even younger bulls to mate. Such matings in a large scale and for several generations, which is bound to happen in a place like Periyar, can eventually drastically affect the quality - size and vigour - of the elephants.

Corbett Tiger Reserve, fortunately, is one of the few places in Asia where the tuskers have not come under the shadow of the poachers gun. As a result there is about 1 bull for every 3 cows and in April 1996 when

we watched elephants, 80% of the cows had either calves or young juveniles. In Periyar in 1990 only about 30 percent of the cows were reported to be accompanied by young. When a cow is oestrous, several bulls compete for her and only the best bull - sexually and socially mature, fully grown, virile and aggressive - in that locality is able to mate with the female and thereby pass on the best genes to the population. This biological phenomenon warrants continued protection to the elephant bulls.

When the bulls are around 20 years old, they begin to experience a condition known as *musth*. The phenomenon of *musth* was first described in captive Asian elephants and though physiologically well explained, its role in the ecology of elephants was not understood for a long time. The period of *musth* may last from a few days to more than three months, depending on the age of the animal and it's body condition. The body condition of bulls coming into *musth* is usually very good. Studies have shown that during musth, level of the male hormone, testosterone, go up and bulls usually range far and wide in search of females which are oestrous. Some researchers have compared *musth* with rutting. Musth bulls are usually very aggressive towards other bulls and guard oestrous females very vigorously. Bulls not in *musth* are also known to mate successfully but the urge to search for females that are oestrous is very strong in *musth* males.

One morning in Dhikala, while driving to the *chaur*, we saw a 25-year-old bull standing nervously at the edge of a forest. We stopped the vehicle and watched him. After a minute or so he started running into the *chaur*. The reason became apparent when we saw another bull about 30 to 35 years old, in *musth* with thick short tusks. He was walking threateningly from the forest edge towards the younger bull which beat a hasty retreat from the area into the *chaur*. When we followed the *musth* bull, we found him courting a female. The other members of the group were mostly hidden by the vegetation. A little later, loud vocalizations in the form of rumblings and squeals and trumpets were heard. We grabbed our binoculars and started to scan the group. The *musth* male had mounted the female and was mating with her. After about 40 seconds, he dismounted and we again could hear excited vocalizations. We quickly hurried over to the group and took a good look at the *musth* male. He was in very good physical condition. He kept very close to the female and guarded her throughout the three days we watched him. During our observations we saw the *musth* bull chasing at least eight different adult bulls of varying ages from his vicinity.

Four years ago, one winter evening, we were on the trail of a large radio-collared bull elephant in the Chilla part of Rajaji National Park. He was a massive animal over 10 feet high and little over five tons in weight. We fondly called that 46-year-old bull, 'Big Boss'. Finally, when we located him, he was with a cow group vigorously courting a female. *Musth* profusely flowed down both his cheeks. A cow elephant comes into oestrous only for two or three days in a year and if conceives it may not cycle again for two or three years. This means that very few cows may be in oestrous at a given time. For a long time researchers were wondering how adult bulls, especially ones in *musth*, find females in oestrous. Catherine Payne and her colleagues, while working on infrasound communication by elephants in Etosha National Park in Namibia, discovered that females in oestrous give a peculiar call, inaudible to humans. They have speculated that elephant bulls 'hear' this, and are able to home in on females in oestrous. During the 3-4 month period when Big Boss was in *musth* he wandered over an area of about 200 km^2 and during this period we located him with eight different female groups. What he was doing was obvious - roaming in his home range looking for receptive females. By the time the winter coolness had given way to summer heat, his body condition declined, he lost his great urge for sex and became solitary.

Dr. Justus Joshua, a researcher from the Wildlife Institute of India, then studying elephants in Rajaji National Park, observed a great contraction in the home range of Big Boss- from 200 km^2 in winter to about 20 km^2 in summer. There was a total change in the behaviour of the elephant too. In summer Big Boss spent the whole day resting in a cool valley far away from any form of human disturbance. He stirred out of his hide only after darkness had

descended. Thereafter, he went to a small water hole in the dry river bed, dug out by gujjars, and drank his fill. This took almost an hour. He also threw water on his body several times to cool himself. Thereafter he disappeared into the forest to feed, largely on the bark and branches of the trees which he pushed down effortlessly.

Early one morning, when Justus tracked down Big Boss, the bull was still feeding and there was a cow group with him. Interestingly when Big Boss debarked and pushed down a tree the entire group gathered around and started feeding on the tree, leaving very little space for Big Boss. This made him move away and find another tree to debark and push down. Possibly to the consternation of Big Boss even this tree was taken over by the group. Then it occurred to Justus that one of the reasons for Big Boss leading a solitary life in summer (the major reason was lack of sexual desire) could be to avoid competition with cow groups over food trees which are hard to come by in a degraded and heavily disturbed habitat like Chilla.

We have quantified debarking by elephants in Rajaji National Park and in Corbett Tiger Reserve. Debarking begins in winter and reaches it's maximum in summer. Summer in most elephant ranges is characterised by a lack of forage and water. This is also the time when the elephants suffer from a lack of calcium in their diet. This makes them debark and feed on cambium, the internal tissue of the bark, along with which plant sap rich in calcium flows from the root system to the canopy. Interestingly, debarking is much more common in Rajaji National Park than in Corbett Tiger Reserve. We attribute this to the immense biotic pressures, like wood cutting, lopping and cattle grazing, which have led to severe degradation of the habitat in most places. The reason for the area around Dhikala not having many incidents of debarking is due to the rich forage that the Ramganga valley offers even in summer. The streams, rivers and the soil around Dhikala may be richer in calcium than in Rajaji National Park. This, however, needs to be studied.

The tragic end of Big Boss reminds us that all good and bad things in life should come to an end. In November 1995, the 50 year old Big Boss came into *musth* and he followed a young female who was in oestrous and in the company of a large herd. According to the wildlife guards the herd had about 60 elephants and there were 3-4 bulls with the herd. On the eventful day, when Big Boss courted the female, the other bulls joined together and attacked him. The fight raged over the river beds and hills, through forests and open areas. The guards tried to disperse the bulls by firing in the air but their efforts were in vain. Big Boss fought valiantly but the fight was uneven. In one place, Big Boss, who should have been extremely tired by this time, slipped and fell into a narrow *nallah* from where he could not get up. This made him totally vulnerable to his attackers, and exploiting his hapless situation, one bull, which was in its prime and had dagger-like tusks, gored him to death. Thus ended the life of a magnificent and noble bull (he had allowed us to approach him very closely on several occasions) who strolled through the Chilla forests in all his majesty for more than two decades.

The elephant bulls of Corbett Tiger Reserve and the adjoining areas are a peerless asset, which need to be assiduously protected for ecological and aesthetic reasons. The sight of magnificent bulls, strolling across the Dhikala *chaur* giving the impression that they are lords of the Reserve and afraid of none, can thrill any visitor. Their trumpets and fights, both mock and real, can bring a vision of a primordial world to an observer when woolly mammoths roamed over the land and man was a hunter and as well as prey.

Much needs to be done to ensure the future of these bulls. Effective protection should be continued. Corridors across the Ganges and Khoh rivers should be strengthened so that the bulls can continue to pass on genes from one population to the other. Corbett Tiger Reserve should be expanded to stretch between the Kotdwar-Lansdowne road in the west to the Nainital-Kaladhungi road in the east. This vast stretch of prime tiger and elephant habitat should be freed of human disturbances, as much as possible, which will benefit all forms of wildlife.

Prior to 1993, *gujjar* buffaloes roamed over the banks of Palain river in Halduparao range and their presence made large wild mammals shy away from the area. But the immense wildlife potential of the area was realised by Shri. A.S. Negi, IFS, former Director of Corbett Tiger Reserve. In February 1993, by persuading the *gujjars* to move to another area, he freed Halduparao from *gujjars*. The results were remarkable. When we visited Halduparao in May 1995, a herd of elephants trailed by a massive bull, was feeding peacefully. Numerous sambar were seen in the nearby Mandolti *sot* which was once an abode of buffaloes. Tiger signs were numerous in the *sot*. Such far-sighted conservation measures need to be taken all over the Rajaji-Corbett elephant range, where human disturbances destroy critical wildlife habitats. Fortunately several conservation agencies like the newly formed "Operation Eye of the Tiger" and "Corbett Foundation" are willing to help solve the problems of the Reserve. If suitable conservation measures are implemented in the field, the future of the awe-inspiring bulls and other wildlife of the area can be safe-guarded for several more decades.

EXEMPLARY SACRIFICE FOR PROTECTION OF WILDLIFE
(As informed by Shri R. G. Soni IFS, CCF & Chief Wildlife Warden, Rajasthan)

Bishnois from Rajasthan, Haryana and Punjab are well known for their outstanding contribution to protection of wildlife. It is due to their staunch belief in their religious commandments that we have thousands of blackbucks, chinkara, blue bulls etc besides khejari (*Prosopis sps.*) trees in thousands of square kilometres in western Rajasthan without any significant and extra efforts made by the Government to this end. Once in a while, examples of extreme sacrifice for wildlife protection are heard from the land of Bishnois. A recent sacrifice was made by **Shri Nihal Chand Bishnoi** of Bikaner district.

On 3rd October, 1996, 5-6 Bawarais (a hunting tribe) came on camel back and shot more than 6 chinkaras (*Indian gazelle*) near Sanwatsar village (District-Bikaner). Hearing the gun shots, a few Bishnois from the village gathered and chased the poachers in a tractor. In the effort to catch the poachers, Shri Nihal Chand Bishnoi lost his life when he succumbed to his injuries due to bullets fired at him by the poachers. Late Shri Nihal Chand was only 32 years old and the only earning member in his family comprising of his wife, two minor sons and four younger brothers who were all dependent on him.

Our readers who are moved by this exemplary case of sacrifice for the protection of wildlife, and feel concerned for the dependent family members of Late Shri Nihal Chand Bishnoi, may contact Shri R. G. Soni, Chief Wildlife Warden, Rajasthan, Jaipur for sending of any contribution/donation to the aggrieved family.

EDITOR