Ecology and conservation of *Bos gaurus* in Belaka forest of Udaypur District, Nepal

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Population status of *Bos gauras* (gaur) in Balaka forest of Udayapur District was studied throuth direct observation and local interview during the summer of 1994. Results indicated that the gaurs once abundant in the area has been reduced to unprecedented level. With the deterioration of natural habitats, uncontrolled poaching, livestock grazing and disease, the number of gaurs has depleted significantly during recent decades. The paper suggests conservation and protection measures for this species.

Keywords: *Bos gaurus*, wildlife corridor, poaching, buffer zone, conservation, Nepal

The Gaur or Indian Bison (*Bos gaurus* H. Smith) is the largest wild oxen. It distributes throughout the South and South-east Asia and are found mainly in Nepal, India, Bhutan, Burma and Malaysia. They are now considered endangered throughout these regions. Of the 21 asian taxa, the population of gaur in India and Nepal was considered at low risk (Heinen and Srikosamatara 1996). In Nepal, the gaur inhabit the sal forest of the Terai mostly in the Churia and Bhabar hills of eastern and central lowlands. Royal Chitwan National Park is said to harbour the largest population (about 300 gaurs) of gaur whereas small numbers are also reported in Trijuga forest, Trijuga Hunting Reserve and in forested areas of Bara District (Wegge 1976).

Gaur seems to be on the decline due to shrinking habitat and poaching. The change in religious values seems also contributing to their decline, as in the past, gaurs were regarded as cows by the Hindus thereby offering protection it as a sacred animal. Today, their number has declined to a critical stage and exist in scattered herds only in the forests of Tamilnadu, Kerala, Karnatak, Madhya Pradesh, Bihar, West Bengal, Assam in India numbering upto 5000 (Shahi 1997) and in Nepal's lowland forests where the current status of this animals is unknown.

It is in this context, the present study attempts to assess the gaur population in Belaka forests at Udayapur District and recommend conservation measures.

Study area

Belaka or Trijuga forest (fig) of Udayapur District (lat. 26° 30' and 27° 11' " long 86° 10' and 87° 10' E) is dominated by Sal (*Shorea robusta*) trees. The forest is a representative of the Siwalik (Churia) hills of central and eastern Nepal. The climate is subtropical (max. temperature 32° C in summer and about 15° C in winter; annual precipitation 2000 mm). Detail description of the area is given by Wegge (1976), Wilson (1976) and ECOAN (1994).

Wild animals such as spotted deer (*Axis axis*), Hog deer (*Axis porcinus*), Leopard (*Panthera pardus*), Sloth bear (*Melurus ursinus*), Gaur bison (*Bos gaurus*),wild pig (*Sus scrofa*), Pangolin (*Manis* spp), Porcupine (*Hystrix* spp) and a few Tigers (*Panthera tigris*), etc. are present in the forest. Wild elephants also occasionally visit this area. Being close to the Koshi Tappu Wildlife Reserve (designated as Internationally important Ramsar site) the area is rich in wetland birds.

The forest is important from the archaeological and religious point of view also. Beads, pieces of refined gold, silver, and other human utilities were reported to be present in the forests. The local people were also involved in collecting those items.

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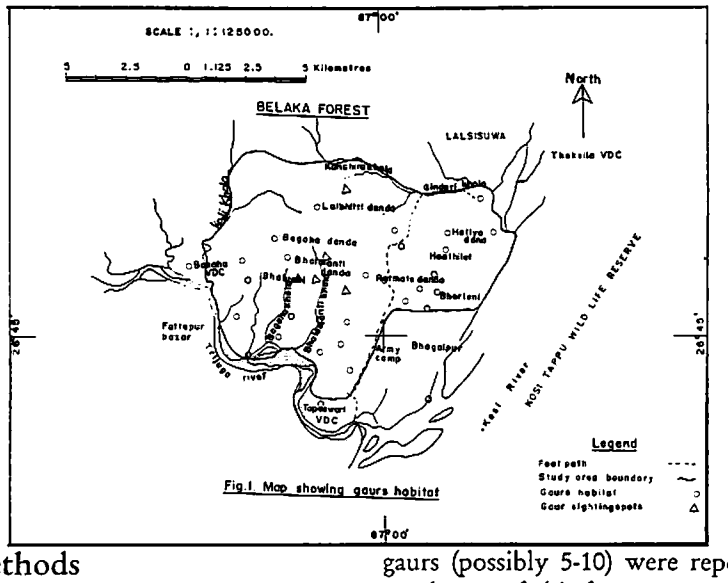

Fig.1 Map showing gaurs habitat

Materials and methods

The following methods were used to study the gaur population in Belaka forest.

Interview

Information on the population status of gaur was collected through questionnaires and interviewing farmers, herders, hunters, forest officials, army personnel, game scout, teachers and Village Development Committee (VDC) representatives.

Field observation

Field survey (March to June 1994) was started from the bank of Koshi river to Kali Khola of Basah VDC and from Gideri and Kanchira Khola to the bank of Trijuga river and edge of Tapaswori VDC. Selection of the main study area was made on the basis of the information gathered from the questionnaire and the local people who are knowledgeable in this respect. Trees were used as observation towers and direct counts with the help of naked eye (or binocular) were made at monthly interval.

Results and discussion

Population status

The overall status of gaur population in Nepal appears critical. A professional hunting party observed two herds totaling 27 animals in a small area of Haathilet unit of Belaka (or Trijuga) Forest, (Wilson 1976). Wegge estimated that there were more than 100 gaurs in Trijuga valley (Wegge 1976)

Two gaurs were reported recently in Koshi Tappu Wildlife Reserves (Game scout, pers. comm). A few gaurs (possibly 5-10) were reported in Churia hills southwest of this forests, according to local people. Small numbers of gaur were also reported to occur in forested areas of Bara district (Wegge, 1976). Recently, one gaur bull was brought to Jawalakhel zoo from Shivganj VDC of Jhapa district (DNPWC 1993).

Being a very timid animal gaurs are difficult to study in the wild. It is however, easy to see them but difficult to age them in such conditions (Hornaday, 1989). In the present study, gaur sex was identified on the basis of body size, colour, and external genitalia: age was identified on the basis of colour, horn and size as described by Schaller (Schaller, 1967).

In the past there were sightings of gaurs in the Belaka forest. According to the local people they were frequently seen in areas such as Bhorleni, Haathilet (also called Baghe Ahal), Sadhe Chauri, Rat Mate Danda, Jagana in the east, Bhaluahi, Gidhe Danda, Bengan Danda, Taktakia Danda, Gongia Dhap, Bhalmanti Danda in south, Magarni Danda, Lal Bhitta Danda, Dhara Khola, Kali Khola, Kanchira Khola in the western part of the forest (see fig. 1). They are now limited only in the southern portion of the forests. During May and June two gaurs, one young bull and one cow were observed at Bhalamanti area near a water hole (fig. 1). This was also confirmed by the local people. Personal communication with Tika Ram Luitel and Karichan Chaudhary of Tapeswori VDC indicted that they had also observed five gaurs in this area in 1990.

Respondents in three VDCs opined that gaur population is declining since 1979 as a result of logging and destruction of the forest thereby distructing gaur habitat which is similar to the

finding of Petrides (1962). Majority of the local people stated that they have not seen this animal since 1990 and the lack of control against poaching was blamed to be one of the reasons for such decline. Some of the respondents indicated that it is especially after the return of the retired Gorkha soldiers who have been accostumed to eat bison flesh during their oversees stay, have started to hunt this animal. This was followed also by the local residents. According to the local people, most of the gaurs were killed before 1979, the remaining gaurs escaped either to Koshi Tappu Wildlife Reserve or to the forests at southwest direction of the study area.

Gaurs have been found to be very sensitive to disturbance and are not able to survive in areas continually invaded by people or near permanent settlements (Khan 1973). Because of continued forest destruction, illegal poaching and livestock grazing in the study area, gaur population is declining. Wilson (1976) reported the same in Fattepur forest range. Skeletons found at Ratmate Danda near Trijuga river (Tapeswori VDC) might also indicate a possibility of diseases such as rinderpest, foot and mouth disease (FMD) being transmitted to gaurs from domestic cattle. As yet, no study on this perticular aspect has been done in Nepal. Report on outbreaks of foot and mouth diseases (FMD) in the gaur populations which had almost wiped out the gaur populations of Mandumulai Sanctuary in 1968 and Periyar Sanctuary in 1974 in India (Singh 1980). Such possibilities can not be ovelooked in Nepal also.

Horns used for religious purposes are expensive (about Nrs.1000.00 per horn) in India (Wilson 1976). This might also prove to be a threat to gaur as a few horns were also seen at some houses in the study area.

Recommendations

Except at the Royal Chitwan National Park which harbors a sizable population of gaur, the overall status of this animal is critical in Nepal. The population will remain vulnerable unless immediate protection measures such as given below are taken:

Habitat management

- illegal settlements in and around forest area should be discouraged followed by their complete removal.
- the forest patches between Sisuwa and Kali Khola and between Galeni and Jahada of Thoksila VDC serve as a corridor for gaur and other wildlife. Similarly, the recent settlements between Koshi Tappu Wildlife Reserve and Belaka forest should be removed for the area was an important corridor for wildlife.
- involve the local people in the management system of buffer forests by forming local user's committees. In order to ensure their cooperation, they should have a say in the formulation of management plans and receive benefits from the forest
- collection of timber, fuelwood, bamboo, thatch grass should be judicious.
- immigration of the so-called landless people should be discouraged and resolved politically
- stop grazing by domestic cattle at prime gaur habitat thereby preventing the possible outbreak of cattle-borne diseases
- check forest fires
- reclaim degraded habitat by fodder species preferred by gaur and develop pasture near rivers
- creat artificial salt licks and water holes inside the forest
- motivate local people and local NGOs in order to conserve natural resources including gaur.
- explore other income generation activities for off-farm periods

Poaching

Poaching has always remained a serious problem in protecting gaur. The local people should be made aware of the value of wild animals and also briefed about the consequences of legal enforcement. Formation of antipoaching units in each VDC may help detect and control poaching. Rewards should be given to those who inform poaching activities. Increasing the number of forest guards might also help control poaching to some extent.

Reintroduction of gaur

The study area is a suitable habitat for the gaur. Some breeding stocks from Royal Chitwan National Park could be reintroduced after proper habitat management, however protection is ensured. The monitoring of reintroduced population should be carried out at regular intervals.

Till date little is known about this animal's biology, behaviour and habitat requirements, and hence, a more comprehensive study is required for the long term conservation of this animal in Nepal.

Acknowledgement

The authors acknowledge the World Wildlife Fund, Nepal for financial support for this research work.

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