

ECOBIOLOGY OF INDIAN WILD BUFFALO *BUBALUS ARNEE* L. IN UDANTI WILDLIFE SANCTUARY, CHHATTISGARH, INDIA¹

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The Indian Wild Buffalo (*Bubalus arnee* L.) is an endangered species according to the criteria of the IUCN, categorized in Appendix III of CITES and in Schedule I of the Wildlife (Protection) Act, 1972 of India. These studies were conducted in Udanti Wildlife Sanctuary, Chhattisgarh State, India. The species has been declared as the State animal of Chhattisgarh. The Sanctuary is a good habitat for Wild Buffalo, having easily available fodder, shelter and water. However, there are a number of threats to the natural habitat from human habitation, agriculture, livestock grazing, forest fires and collection of forest products. To conserve the species and its potential good habitat in the Sanctuary, it is necessary to involve the concerned local people in the management of the area.

Key words: Endangered species, habitat, welfare factors, genetic swarming, wallowing, grazing

INTRODUCTION

The Udanti Wildlife Sanctuary includes the best potential habitat for the Indian Wild Buffalo in Central India. Udanti was declared a wildlife sanctuary (IUCN Protected Area category IV) in 1985. Spread over 237.27 sq. km, the Sanctuary is located between 82° 11' 10" - 82° 24' 10" E and 19° 55' 30" - 20° 11' 15" N. The forests of the Sanctuary are tropical moist and tropical dry deciduous types with Sal (*Shorea robusta*) and mixed species (Champion and Seth 1968). They have a rich component of flora and fauna. Besides Wild Buffalo, the other important animals in the Sanctuary are *Axis axis*, *Cervus unicolor*, *Muntiacus muntjak*, *Boselaphus tragocamelus*, *Bos gaurus*, *Sus scrofa*, *Presbytis entellus*, *Panthera tigris*, *P. pardus*, and a large number of birds and reptiles.

There are three seasons, namely monsoon (July to October), winter (November to February) and summer (March to June). The average annual rainfall of the area is c. 1,200 mm. The temperature reaches a maximum of 44 °C in summer and minimum 5 °C in winter.

MATERIAL AND METHODS

Wild Buffaloes are shy animals and spend the major part of their time in dense forests, particularly during the day. The inferences of the three year study from 1998 to 2000 are based on direct observations of the wild buffalo and the habitat. Observations were made early morning, at noon and in the evening, over a period of 10 to 15 days in all three seasons. The observations were repeated three times in each season. Most of the observations were made from temporary

machans (observation towers) on trees. *Machans* were constructed at select places near the drinking, feeding and resting places of the Wild Buffalo. The animals were observed with the help of 7 x 50 and 20 x 50 binoculars. Observations were made while moving on foot, and also in vehicles, visiting different places from time to time. All possible areas of the Wild Buffalo habitat in the Sanctuary were surveyed. Several herds were observed in various forest beats, mostly near ponds.

OBSERVATIONS

Distribution: In peninsular India, the Wild Buffalo population survives in small scattered populations in some Protected Areas, particularly in Udanti Wildlife Sanctuary of Chhattisgarh State in India (Table 1). All these populations of Wild Buffalo are considered genetically pure.

Habitat: The areas under various vegetation types in different parts of the Sanctuary were mapped by remote sensing and field observations. The Sanctuary area under Sal forest is 20%, miscellaneous dense forest 37%, miscellaneous forest with bamboo 3%, open miscellaneous forest with grass 8%, miscellaneous medium density forest with grass 19%, and scrub 9%. The area under agriculture and habitation is 4%, while only 0.6% lies under water bodies (Mishra 2001b).

Home range: The home range of the Wild Buffalo in the Sanctuary was determined through remote sensing data and field observations. Six forest beats in 26 forest compartments, with a total area of 63.77 sq. km, are favourable for Wild Buffalo.

Food and water: Wild Buffalo generally feed on grass, but also browse on saplings of trees. They feed in this manner during winter and summer, as less grass is available then than

Table 1: Present distribution and population of the Indian Wild Buffalo (*Bubalus arnee* L.) in India

Sl. No.	Name of NP/WLS	Total area (sq. km)	Name of State	Estimated Wild buffalo population
1	Kaziranga NP	430	Assam	1666 ¹
2	Manas Tiger Reserve	2840	Assam	100 ²
3	Pabha Wildlife Sanctuary	49	Assam	25 ³
4	Indravati NP & Tiger Reserve	1258	Chhattisgarh	25-30 ⁴
5	Bhairamgarh WLS	136.38	Chhattisgarh	10 ⁵
6	Udanti WLS	237.27	Chhattisgarh	35-40 ⁶

Data Source:

- ¹: Wild Buffalo census in Kaziranga, The Rhino Foundation for Nature in NE India, Newsletter No. 3, June, 2001
- ²: G. Chetri, Research Officer, Manas Tiger Reserve (*pers. comm.*, February 3, 2000)
- ³: Various literature
- ⁴: Status survey report, team of BNHS, WII, Ranjitsinh *et al.* 2000
- ⁵: Status survey report, team of BNHS, WII, Ranjitsinh *et al.* 2000
- ⁶: Present study Mishra, 2001b

in the monsoon. A large variety of grasses occur in the Sanctuary, mostly during the monsoon. Wild Buffalo browse on saplings of *Shorea robusta*, *Pterocarpus marsupium*, and *Bridelia retusa*, among others. Grass species like *Heteropogon contortus* are commonly available in the Sanctuary area, but the Wild Buffalo prefers only immature tillers. Other important grass species, like *Andropogon pumilus*, *Apluda mutica*, *Aristida setacea*, *Digitaria granularis*, *Eragrostis pilosa*, *Imperata cylindrica*, species of *Panicum*, *Saccharum* and *Themeda* are commonly found in the Sanctuary area. There are five types of water sources in the Sanctuary, namely river, pond, anicut, jhiria and nullah bed. Udanti and Indravan rivers are seasonal sources of water while a few ponds are perennial water sources. There are more than 18 ponds in the valley and plains, which retain seasonal water, and about four of them retain water throughout the year. The animals generally use these ponds for drinking and wallowing, particularly during summer.

Seasonal and daily movements: The animals generally grazed more actively during the evening to late night. The monsoons are more favourable for the Wild Buffalo, as green grass and large quantities of water for drinking and wallowing are available. They sometimes move to nearby crop fields for grazing. Crops like paddy (*Oryza sativa*), kulthi (*Dolichos biflorus*), urad (*Vigna mungo*) and sarson (*Brassica campestris*) are grown in the area during winter and these are favoured by Wild Buffalo. The female buffaloes are more active than the male. Besides some small hills, the wild buffaloes move in the entire valley and plain area in the

Sanctuary. Maximum movements were recorded during summer. They migrate to other areas like the Sitanadi Wildlife Sanctuary and surrounding forest areas in search of water, fodder, and cover. They spend a lot of time during the monsoon and winter in the mixed forest, but with the advent of the hot weather move into the valley areas of Sal (*Shorea robusta*) forest. The daily movements of a herd average 7-8 sq. km, but sometimes considerably more, particularly during summer. The animals move slowly in a line while grazing. They cannot run fast in the forest, but they were observed running slowly during the breeding season. An adult female buffalo usually leads the herd during grazing and walking. The yearlings and calves are kept in the middle of the herd while adults remain at the back. The animals always remain alert during grazing or walking.

Behaviour: The Wild Buffalo requires large quantities of water for drinking and wallowing. The animals usually graze near water holes especially during summer. It was observed that at a time the male drinks for about 3 minutes during summer, which is the longest recorded drinking time, and about 1.5 minutes during the monsoon, which is the shortest recorded time. The wallowing time of the Wild Buffalo was also recorded during the study. A herd of Wild Buffalo wallowed for more than 55 minutes during summer. The animals like wallowing in the ponds for longer durations particularly during summer, but a number of biotic disturbances affect their normal activities (Mishra 2001a, Kotwal and Mishra 2003). It is difficult to know precisely the population and composition of Wild Buffalo in the Sanctuary. The official record for the year 2000 was 78 animals. According to our observations, there are nearly 40 Wild Buffaloes in the Sanctuary.

The Wild Buffalo share their habitat with other animals. A Blue Bull was observed grazing with a herd of Wild Buffalo near Deojhar Amli pond in the Sanctuary. The Blue Bull waited for the buffaloes and rested in the shade of trees while the buffaloes wallowed in the pond. A good association was observed between Spotted Deer and Wild Buffalo in the Sanctuary, where a herd of Spotted Deer grazed with a solitary buffalo bull near Amar pond.

Problems for Wild Buffalo in Udanti Wildlife Sanctuary

There are 18 villages inside the Sanctuary with a human population of 3,900 and about 4000 livestock, comprising of cattle, domestic buffaloes, goat etc. Since more than 70% of the human population are dependent on the Sanctuary for fuel wood, timber and NTFPs, several conflicts occur between the locals and the wild animals, including Wild Buffalo. Many villages are situated in the prime Wild Buffalo habitat and people continue to move in the area. The plain areas where

good palatable grass can grow are encroached on by locals for agriculture. Due to the paucity of grasses, the wild animals sometimes graze on agricultural lands. While trying to save their crops, people sometime kill or injure the Wild Buffalo. Besides grazing competition, the livestock also poses a problem of disease and genetic swarming. Water is a limiting factor in summer. The use of common water holes by wild animals and livestock is a cause of conflicts and conveyance of diseases. Forest fire is the main problem in the Sanctuary. Forest fires burned about 60 to 70% of the Sanctuary area during 1999-2001. The common diseases reported from the area are rinderpest, and "foot and mouth" disease. Several other bacterial diseases are also reported. The disease infected cattle graze in grassland where wild animals also graze. Thus, contagious diseases are transferred from cattle to wild animals. There are many packs of wild dogs in the Sanctuary that prey on calves of Wild Buffalo.

Recommendations for management of the Wild Buffalo

1. The pure race of Wild Buffalo should be protected from possible genetic swarming from domestic buffalo by declaring the Sanctuary out of bonds for the domestic buffalo.
2. Five villages situated in prime Wild Buffalo habitat should

be relocated outside the Sanctuary. There should be a restriction on the numbers of livestock, and these should be fed rather than allowed to graze free in the forest.

3. The domestic cattle are potential carriers of contagious diseases. Therefore, all the cattle around the Sanctuary must be immunized every year.
4. The locals should be involved in several management activities of the Sanctuary, such as protection, fire fighting, maintenance of water holes, roads, buildings and eco-development practices. They should be sensitized towards nature conservation.
5. The forest corridors around the Sanctuary should be strengthened.
6. The interface conflicts in the Sanctuary should be regularly monitored.

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