

CALL TO CONSERVE THE WILD WATER BUFFALO (*BUBALUS ARNEE*) IN NEPAL

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Abstract

*Wild water buffaloes (*Bubalus arnee*) are categorized as endangered on the IUCN Red List. With a global population of less than 4,000, the species has a very limited distribution spanning over less than 20,000 km² in Nepal, India, Sri Lanka, Cambodia, Myanmar, Thailand and Bhutan. In Nepal, Koshi Tappu Wildlife Reserve was designated for wild Asian buffalo; this reserve contains approximately 219 individuals, although there is no precise information on the number of pure-bred wild buffalo. The conservation of wild buffalo is of global concern; there are numerous threats due to habitat fragmentation, as well as competition, hybridization, habitat overlap, disease and parasites transmitted by domestic livestock. The reserve provides an area of only 0.80 km² per buffalo, which is insufficient maintaining a viable population of wild buffalo. It is therefore important to identify further potential habitat and to begin translocation of some of the individuals. A Wild Buffalo Conservation Alliance can play a key role in influencing conservation strategies by conducting detailed research including feasibility studies on translocation, developing awareness, holding workshops and preparing a conservation action plan. In this way the alliance can help to increase the number of wild buffaloes and to maintain a viable population of the species.*

Keywords: Wild Buffalo Conservation Alliance; *Bubalus arnee*; Nepal; Koshi Tappu.

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Introduction

The wild water buffalo (*Bubalus arnee*) are categorized as Endangered on the IUCN Red List, with the few remaining populations declining and already affected or likely to be increasingly affected by hybridization with domestic buffalo [1]. The total world population of wild water buffalo is almost certainly less than 4,000 animals, occupying an area of less than 20,000 km² in Nepal, India, Sri Lanka, Cambodia, Myanmar, Thailand and Bhutan (Fig. 1) [1-4]. The species is extinct in Bangladesh, Indonesia, and Lao People's Democratic Republic [1,4,5].

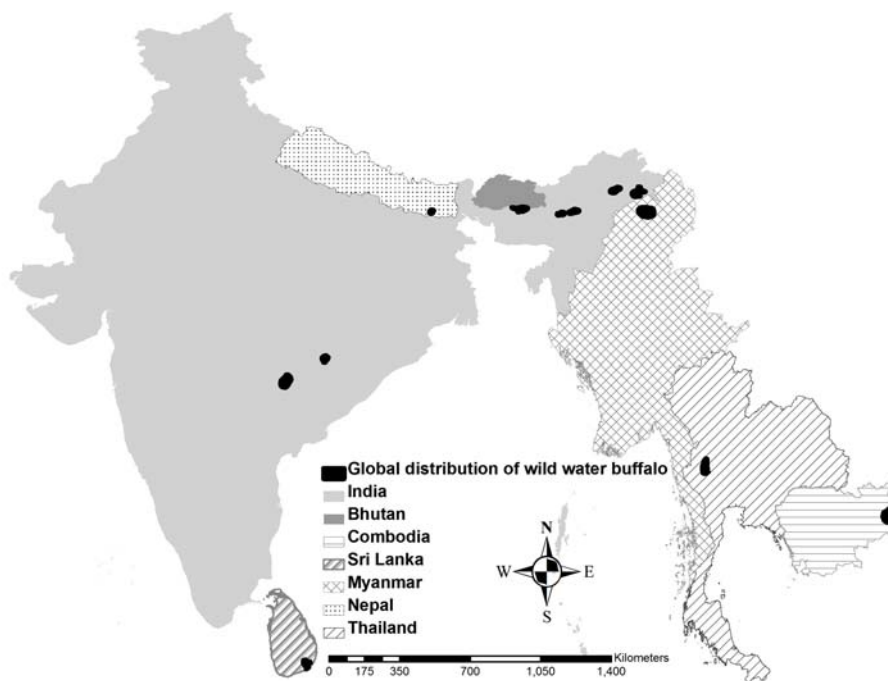


Fig. 1. Current global distribution of wild water buffalo

Weighing 800 - 1200 kg, the wild Asian buffalo is a massive, powerful animal, with the widest horn span of any bovid (more than 2 m) [1,6,7]. It is highly dependent on the availability of water. Historically, its preferred habitat was low-lying alluvial grasslands and their surroundings, but riparian forests and woodlands were also utilized. The wild Asian buffalo is mainly a grazer, eating grass and leafy aquatic vegetation. It feeds mainly in the morning and evenings, and in the midday heat it retreats to the shade or wallows in water or muddy pools, in which it is sometimes almost completely submerged with only its nostrils showing. In addition to keeping it cool, wallowing helps to remove skin parasites, biting flies, and other pests. Where there is substantial human disturbance, the wild Asian buffalo is mainly nocturnal. The domestic water buffalo (*Bubalus bubalis*) occurs as feral and domesticated populations worldwide, including in sympatry with most remaining populations of wild water buffalo (Fig. 2) [1,6,7].

A herd of female wild Asian buffalo with young is led by a dominant matriarch and often accompanied by a single adult bull. Other males live solitarily or form bachelor herds of about 10. Young males spar with each other to assert dominance, seldom engaging in serious fighting, and mix with females at mating time.

The Koshi Tappu water buffaloes

The Asian wild water buffalo resembles the swamp variety, exhibiting “white chevron, socks and tip of tail, and relatively straight pale-coloured horns”, while the domestic buffalo (*Bubalus bubalis*) of the Koshi Tappu region represents the river type “with black body and curled horns” (Fig. 2 and 3). Although these two forms are readily distinguished, the hybrid populations exhibit the full range of intermediate features (Fig. 2-5) [8].



Fig. 2. A large herd of water buffalo (probably hybrid stock *Bubalus arnee* x *Bubalus bubalis*) in the Koshi Tappu Wildlife Reserve, Nepal.



Fig. 3. Wild type water buffalo (*Bubalus arnee*) from Koshi Tappu in the Kathmandu Zoo (status genetically confirmed as the wild type by Flamand et al. (2003)).



Fig. 4. Wild or backcrossed hybrid water buffalo bulls in the Koshi Tappu Wildlife Reserve.



Fig. 5. Domestic water buffalo (*Bubalus bubalis*) in the Koshi Tappu region.

Population, distribution and habitat

The wild Asian buffalo originally ranged from Eastern Nepal and India, east to Vietnam and south to Sri Lanka and perhaps to Malaysia. Scherf [9] and Heinen [4] indicated that a small isolated population remains in the Koshi Tappu Wildlife Reserve (Nepal) (Fig. 6). Flamand et al. [8] used genetic analysis to confirm that the reserve does contain pure wild stock. Heinen & Singh [10] surveyed the buffalo population in Koshi Tappu, and estimated a total of 159 wild buffalo, and a highly backcrossed, semi-feral population of 131 animals. According to a recent census carried out by Department of National Park and Wildlife Conservation (DNPWC) in 2009, the size of this population has gone up to 219. However, the number of pure-bred wild buffalo was unknown, highlighting the need for a detailed genetic study for verification (Fig. 7). The population of wild buffalo showed an increasing trend in Koshi Tappu Wildlife Reserve from 1997 to 2010 (Fig. 7) [10-16].

The Koshi Tappu Wildlife Reserve is specially designated for Asian wild buffalo conservation. The reserve was gazetted in 1976 to preserve habitat for the only remaining population of *Bubalus arnee* in Nepal, and in 1987 it was declared a Ramsar site, a wetland of international significance. The Department of National Park and Wildlife Conservation (DNPWC) and the Ministry of Forests and Soil Conservation are the government bodies responsible for its maintenance, although several interest groups and INGOs are working directly or indirectly to further its goals.

Koshi Tappu lies on the floodplains of the Sapta Koshi River in the south-eastern Terai region of Nepal. At a size of 176 km², it is Nepal's smallest wildlife reserve. The vegetation is composed mainly of tall grasslands. Once a year local villagers are permitted to collect thatch grass, which is used for roof thatching and for building walls of houses. There are also small patches of Khair-sissoo scrub forest and deciduous mixed riverine forest. The reserve contains important habitat for a variety of wildlife. Besides wild buffalo, there are 20 other mammal

species, more than 441 species of birds (14 of them endemic to Nepal), more than 80 species of fish, and the endangered Gharial crocodile and Gangetic dolphin have been recorded in the reserve.

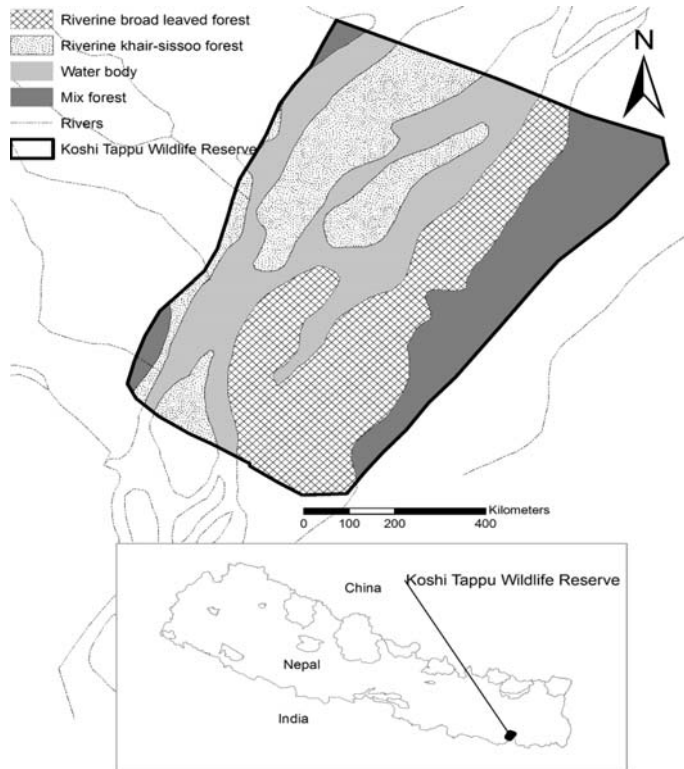


Fig. 6. Location of the Koshi Tappu Wildlife Reserve, Nepal

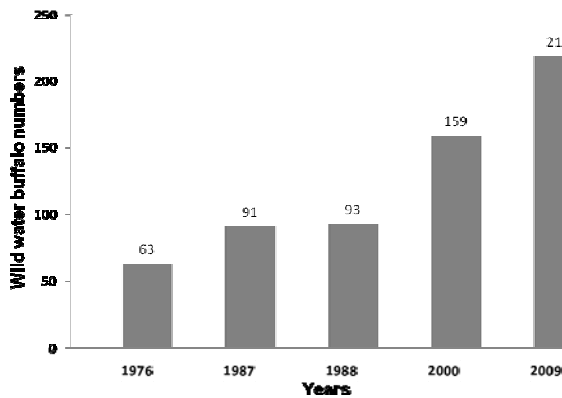


Fig. 7. Wild water buffalo population trend in KWR, Nepal

Threats

The Asian wild buffalo population has been in continuous decline over the last half century, due to habitat fragmentation, competition and habitat overlap with livestock. Hybridization with local domestic buffalo is also a significant problem. The conservation of wild buffalo is a global concern.

Currently there are 219 buffaloes in Koshi Tappu which are deemed to be of pure (or almost pure) wild stock, a slight increase over the number censused in previous studies [10-16], genetic data are needed to verify that these don't include hybrids. Providing an area of only 0.80 km² per buffalo, the size of the Koshi Tappu reserve is insufficient for maintaining a viable population. Continuous flooding inside the reserve has been destroying the grassland and tree cover, which further reduces the area available by converting potential habitat to barren/degraded land. Cattle and domestic buffalo grazing inside the reserve is another serious problem, and local people keep domestic buffalo in a semi-wild or tended, free-ranging state to crossbreed with wild males because hybrid calves fetch higher prices [14]. The most important threats to wild Asian buffalo are interbreeding with feral and domestic buffalo, habitat loss/degradation, and hunting. Diseases and parasites (transmitted by domestic livestock) and competition for food and water between wild buffalo and domestic stock are also serious threats [1].

Recommended Strategies

The wild buffalo is highly endangered with the few remaining populations already affected or likely to be increasingly affected by hybridization with the domestic buffalo [8]. An important problem in the reserve is to distinguish the pure wild buffalo from the domestic, semi-feral buffalo and hybrids. In the regard, studies are needed that use genetics (both mitochondrial and nuclear), not only in Nepal but also throughout tropical Asia [17]. As a first step, the hybridized stock in Koshi Tappu should be removed and donated to buffalo herders in the vicinity of the reserve, in exchange for their agreement not to graze their herds inside the reserve. Next, a translocation program to establish a second Nepalese wild population in a protected area should be undertaken [4,8,13]. To begin with, a few individuals could be translocated to Parsa Wildlife Reserve, or a separate protected area might be established adjoining the eastern part of Parsa Reserve, or on the western part adjoining the Chitwan National Park and Koshi Tappu Wildlife Reserve. Another potential destination for wild buffalo translocation is the Trijuga Ban area. However, as we have argued in the past, the best buffalo habitat other than Koshi Tappu is the riverine grasslands along the north side of Chitwan, where wild buffalo were known to occur up to the 1960s. The Trijuga River Valley is quite narrow, and potential riverine grassland habitat is rather restricted there. Still, that area should have been made a reserve for many reasons (Gaur and other large ungulates, some tiger activity in the past, etc.). Further studies are needed to identify potential sites in and outside of the protected areas of the tropical zone of Nepal. The translocation of wild buffalo to suitable sites is a matter of urgency to maintain the last remaining populations of these animals, averting an otherwise likely extinction of the species within 100 years.

Apart from various conservation strategies there is strong need to form an alliance or group which would advise on conservation issues of wild buffalo in Nepal. The necessity of such a group has led us to form the Wild Buffalo Conservation Alliance, Nepal, a name which could be amended as necessary.

Wild Buffalo Conservation Alliance, Nepal

The Nepal wild buffalo population is restricted to the Koshi Tapu Wildlife Reserve, and the government of Nepal has prioritized its conservation. Unfortunately, limited resources and improper management practices have so far prevented this goal from being achieved. The lack of awareness for the importance of wild buffalo and a certain amount of hostility towards the species, have motivated local people to generate threats towards the remaining population and it is therefore essential that the awareness group and those responsible for wild buffalo conservation work together. It is also essential to achieve international affiliation for such an alliance, thereby gaining influence which will help to fulfill its aims.

The objectives of the alliance will be:

- a. To conduct detailed research on wild buffalo and their status;
- b. To conduct conservation awareness activities at the local level;
- c. To assess the feasibility of wild buffalo translocation to other potential protected areas of Nepal;
- d. To conduct workshops and meetings on wild buffalo conservation and research, at national and international levels;
- e. To prepare a wild buffalo Conservation Action Plan for Nepal.

The alliance, which has the motto “Save the wild buffalo in the wild”, was formed in Nepal and admits membership from around the world.

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