

On the distribution and status of Tibetan argali, *Ovis ammon hodgsoni* Blyth, 1841 in Nepal

K. B. Shah

Natural History Museum, Tribhuvan University, Swayambhu, Kathmandu, Nepal

A team of biologists observed 24 argalis in 4 herds in a biodiversity survey of the upper Mustang region in Chhojung and Damodarkund areas. The Tibetan argalis utilize smooth slopes with low lushes and herbage at lower elevation and the alpine meadows at higher elevation in the Chhojung region. In the upper Damodarkund area at >5200m, the argali occupy the Tibetan desert steppe characterized by desolate plains and low undulating sand hills. In this desert terrain, very little food is available mostly in the form of xerophytic herbs. Anthropogenic activities have negative impacts on the argalis and their habitats. Therefore, *in-situ* conservation of this Trans-Himalayan species is urgent.

Key words: Tibetan argali, *Ovis ammon hodgsoni*, sheep, habitat, Damodarkund, Nepal

Introduction

The Nayan or Great Tibetan sheep or Tibetan argali, *Ovis ammon hodgsoni* Blyth, 1841 (Mammalia: Artiodactyla: Bovidae) is the largest of all living wild sheep, some rams exceeding a shoulder height of 110cm and body mass 100kg (Prater 1971, Schaller 1998). This true sheep is a close relative of the well-known Marco polo sheep, *Ovis ammon polii*, but with somewhat shorter and more massive horns (Fox *et al.* 1991b). It occurs in herds of 3-15 individuals at elevation of 3700m or above (Chakraborty 1994). Except during the rut adult rams tends to form separate male herds (Schaller 1998). It is adapted to open terrain, to escape danger through fleetness. Its typical habitat presents a wilderness of desolate plains and low undulating sand hills (Prater 1971). In summer, it moves to higher levels and descends to lower valleys during winter. It feeds on grasses, flowers, and young plants and leaves (Walker 1964).

The Tibetan argali is by far the rarest member of its wild ungulate community. Of the six subspecies of *Ovis ammon* recognized by Geist (1991), this subspecies is so far the only one listed as endangered (Schaller 1998). It is legally protected from killing by inclusion in HMG Nepal's National Parks and wildlife Conservation Act, 1973. Insufficiently known (IK) category in the Red Data Book and banned from trade by inclusion in Appendix I of Convention on International Trade in Endangered Species of wild Flora and Fauna (CITES).

The Tibetan argali occurs in India (Ladakh, Spiti and Lahul and Sikkim), western Bhutan, China and Nepal (Gee 1967, Prater 1971, Schaller 1977 and 1998, Fox *et al.* 1991a). Although Tibetan argalis were once fairly common in some of their distribution range in Nepal (Schaller 1977), it had been recorded in the high mountainous regions of Mugu, Dolpa, Gorkha, Sankhuwasabha, Rasuwa and Mustang districts (Mitchell and Punzo 1976, Schaller 1977, BCDP/KMTNC 1994, Koirala and

Shrestha 1997). A Tibetan argali ram trophy procured from an unknown locality in Nepal still can be seen in the Kesharmahal, Kathmandu. It is said to be there since more than 100 years.

Materials and methods

Information presented in this paper are partly based on the literature pertain to the previous records of the species in Nepal made by various authors and partly on the field observations made by the author. The author had visited the localities of previous records of this sheep (for e.g., Mitchell and Punzo 1976, Schaller 1977, Koirala and Shrestha 1997, Shah 1985, 1986, 2001, Shah and Giri 1992, KMTNC 1998). In addition, information were collected through the interviews with local villagers as well as by visiting potential habitats of the species.

Results and discussion

All locality records of Tibetan argali in Nepal made by various authors including recent sightings have been presented in the Table- 1. Besides these, unsubstantiated reports of this species in Nepal exist from the northern regions (Gray 1846), northeastern Nepal (Hooker 1854), northern borders areas of Nepal (Ellerman and Morrison-Scott 1966, Prater 1971). Earlier reports by Hodgson in Gray (1846) listed 4 skulls of this sheep as being collected from the northern regions of Nepal is difficult to discern the validity of these records since Hodgson was confined to the capital city of Kathmandu and had to depend on traders for his specimens (Mitchell and Punzo 1976). Prater (1971) opined that in quest of grazing the sheep occasionally cross into Nepal from the plateau of Tibet (China). It is true that some Tibetan population of the sheep may occasionally cross into Nepal due to either presence of similar habitats or more disturbances and scarcity of food in Tibetan sides. However, resident populations such as found in Mustang district also occur in Nepal.

In fact, except in the Trans-Himalayan region of Mustang district (i.e. upper Mustang area), nowadays no Tibetan argali

is found in any other localities mentioned by the previous authors in Nepal. The usual reply by the local inhabitants to this author's query about the occurrence of the sheep in Mugu, Dolpa, Sankhuwasabha and Gorkha districts was negative as they had disappeared 3-4 decades ago.

Schaller (1977) saw several skulls and was informed by villagers around Shey Gompa and upstream of Namdo in Dolpa district that though they were once fairly common. The author observed a weathered skull of an adult ram kept on the roof of a house in Mugu village in 1985. The owner of the house said that his father bought the skull some 30-40 years before from Tibet. All respondents from the village believed that Tibetan argali had disappeared 3-4 decades ago.

The author conducted a wildlife survey of Manaslu area of Gorkha district (KMTNC 1998) including the Chum Gompa area, where the sheep had been reported by Mitchell and Punzo



Plate 1 : A female heard of the argali disturbed by the photographer at 5540m in Damodarkund area, Mustang

(1976). Although the areas still have suitable argali habitat of alpine meadows, but they are no longer in existence. In fact, according to the local informants including the highland grazers argalis do not occur in any part of the Manaslu area.

Koirala and Shrestha (1997) observed 10 individuals (females and juveniles) in the Damodarkund valley, studied their food ecology and compared it with that of the blue sheep, *Pseudois nayaur* and domestic goat *Capra sp.* They found no apparent food competition during the summer between the three ungulates due to spatial separation and little dietary overlap. However, they opined if densities should increase with more overlap in habitat use, blue sheep was expected to compete more with goat and argali for food because of more similar foraging regimes than between goat and argali. While conducting biodiversity survey of the upper Mustang region, a team led by this author also observed the argali, in Chhojung (Shah 2001)

Table 1: Distribution of Tibetan argali in Nepal

Previous	- Mugu, Dolpa, Gorkha, Rasuwa and Sankhuwasabha
Recent	- Mustang

and Damodarkund valley (Shah 2002). The team also found that the argali populations in these areas are not spatially separated from the local sheep, goats, horses and other livestock.

In June 2001, an adult ram was seen at 4900m in Chhojung, besides a skull of adult ram probably killed by a snow leopard was observed in the vicinity of Chhojung Gompa at 3900m. The survey team also observed argali's droppings (pellets) and tracks at least at the 4-5 places along the Chhojung khola, where they seemed to have visited for salt licking. The valley has large

natural salt deposits between 3700m-3900m. According to the local nomad herders at least two populations of moderate size exist in the Chhojung area.

In July 2002, 23 argalis in 3 herds (herd size 4, 9 and 10) were observed in the Damodarkund valley between 5200-5600m. The herds with 9 and 10 individuals (Plate-1) contain females and young, while the third herd with 4 individuals consisted of adult males only. All 3 herds were observed feeding, resting, moving and also running due to the disturbances caused by the observers on Tibetan desert steppe habitat. Skulls are useful indicators of abundance, at least of abundance in the recent past (Schaller 1998). Five weatherworn skulls (Plate- 2) of 3 adult rams and 2 adult females were observed in the premises of the both "Dharmasala" (i.e. rest house)

situated between the main holy ponds at 5000m. It seems the local herders, pilgrims; previous researchers and hunters had bought these skulls from other parts of the valley for different purposes. Because of their heavy weight, it can be assumed that the skulls must have been collected from nearby localities within the valley. Presence of the argali skulls in the lower parts of the Damodarkund valley also indicates that the animals move seasonally to lower elevation, especially when local sheep and goat grazing do not take place. The team did not see the argali within the Namta khola valley, where Wegge, Shrestha and Koirala observed them in 1996 (DNPWC 1996).

These days Tibetan argali in Nepal is only confined to the Trans-Himalayan region of the Mustang district. A few populations of moderate size exist in the Chhojung and Damodarkund areas the upper parts of the district. It seems they have discontinuous distribution in the area. These areas lie



Plate 2 : Local herder with a Tibetan argali's (ram more than 7 years old) skull in Damodarkund, Mustang

on the north-eastside of the Kaligandaki river (Map-1). A vast land having alpine grass and bushes, alpine meadows and Tibetan desert steppe habitats connects both the areas to each other. These habitats are also characterized by the presence of flat lands, smooth slopes, undulating hills, and moderate to deep gullies and ravines. Based on the interviews with the local inhabitants, especially the herders, the team's observation and availability of the suitable habitats it is concluded that only about 70-90 Tibetan argalis occur in the area. Other ungulates sympatric with the argali in the areas are blue sheep *Pseudois nayaur*, Tibetan gazelle *Procapra picticaudata* and Tibetan wild ass (kiang) *Equus hemionus kiang*.

The Tibetan argalis occur in two distinctly separate habitats in the upper Mustang area. They utilize the smooth slopes with low bushes and herbage at the lower elevation and rolling hills covered by the alpine meadows at the higher elevation in the Chhojung region (Plate- 3). These habitats are more or less similar to the argali habitats found elsewhere in Nepal as mentioned in the old records by the

previous authors. In the upper Damodarkund area at >5200m, the argali occupy the Tibetan desert steppe characterized by the desolate plains and low undulating sand hills. In this desert terrain, very little food is available mostly in the form of xerophytic herbs. Therefore, the argali also enters into the shallow gullies (Plate- 4) and deep ravines, some of which hold trickling streams, where banks are covered with grasses and herbs. This type of habitat in the Damodarkund area is ecologically separated from the alpine meadows of the lower elevation at <5200m.

The argali prefers alpine meadows habitat to Tibetan desert steppe habitat Schaller (1998). The alpine meadows covered habitat of lower Damodarkund valley at <5200m including the area having holy ponds is definitely a favorable habitat for the argali. But, they abandon the area during the livestock-grazing period due to disturbances. However, the blue sheep *Pseudois nayaur*, seems to have developed some tolerance against these disturbances and some still use the area with sheep, goats and horses.

The Tibetan argali once found in some northern Himalayan regions of the country is now confined only to the Trans-Himalayan part of the Mustang district. The exact reasons for their disappearance from their known distribution in Nepal are unknown. According to Schaller (1998) the animals have a relatively short life, seldom reaching 10 years, as shown by the age rings of horns of rams found in the field. Hunting could be one of the factors, but not the major one. Tibetan argali is much sought after for its flesh, pelt and horns. Its flesh said to be excellent and coat is most effective against cold. According to the local informants every year at the advent of the winter Chinese hunters visit the Damodarkund area on the horseback and hunt indiscriminately through the sophisticated arms. They include Tibetan argali, blue sheep and kiangs as main targeted species. The local tribesmen are also excellent hunters and some of them hunt for their subsistence.



Plate 3 : Alpine meadows habitat of the argali in Chhojung. Note the grazing yaks and blue sheep



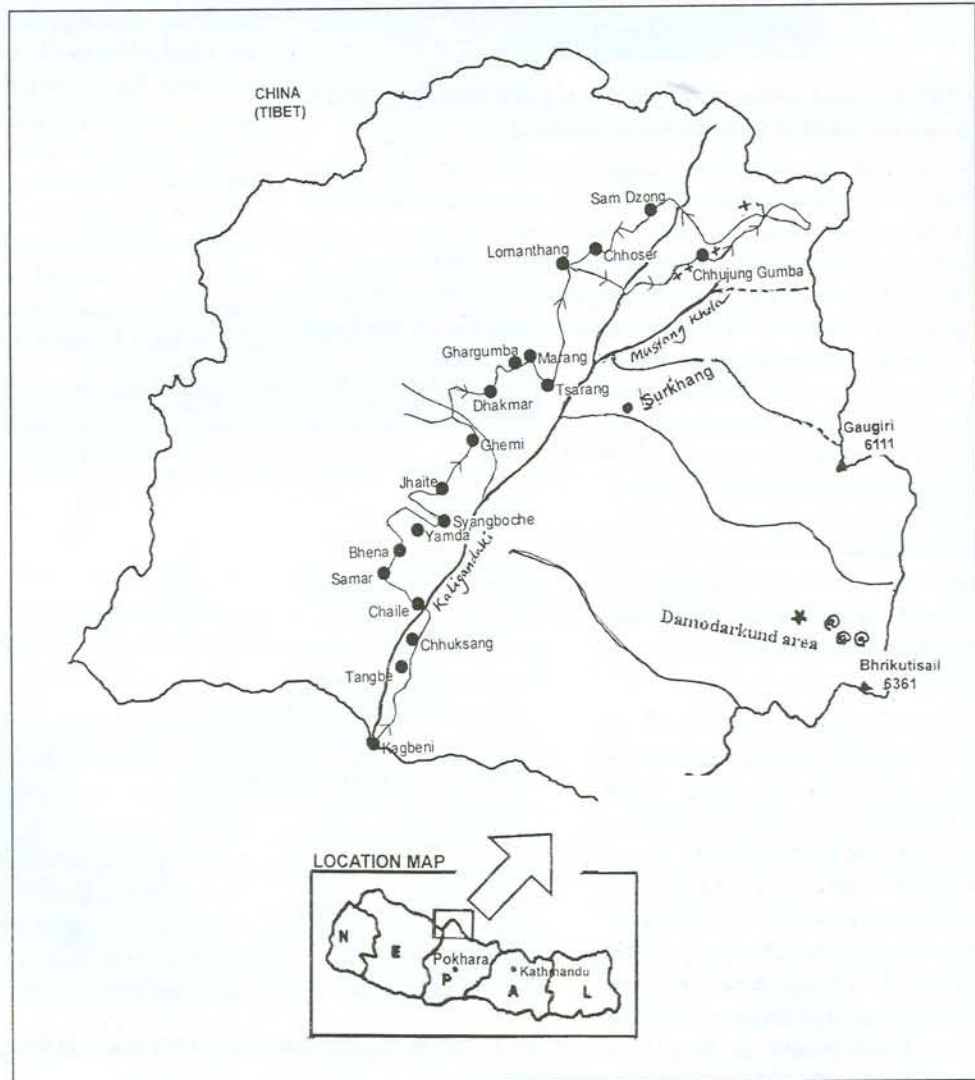
Plate 4 : Typical Tibetan desert steppe habitat of the argali in upper Damodarkunda area at 5560 m

be principal predator of the Tibetan argali in Tibet, China (Schaller 1998).

The Tibetan argali has great scientific interest and potential values. Origin of domestic sheep is still unknown, and perhaps they have derived from one or more species of *Ovis* (Walker 1964). Thus, Tibetan argali may be one of the ancestors of the domestic sheep.

It is a globally protected species. Except for about 200 animals in Ladakh and a few in Nepal (70-90) and Sikkim, all Tibetan argalis, about 7000 individuals (Schaller 1998) are within China. Most populations are so small and fragmented that many will vanish in the coming decades (Schaller 1998). Contrary to Koirala and Shrestha (1997), the Mustang populations of the argali

Herders from China and Nepal, extensively use all potential argali habitats for livestock grazing. Possibly diseases transmitted from the domestic stock might have added fuel to the fire. Diseases transmitted by livestock could also have had a serious impact, as they have on North American sheep (Lawson and Johnson 1982), but no research has been done. Besides, spreading diseases the domestic stock also causes food shortage. Small, isolated sheep populations are highly vulnerable to genetic and environmental mishaps, especially if they number fewer than 50 individuals (Berger 1990). Living at the age of their range at low densities in an area where snowfall can be heavy, it is possible that the populations were decimated by several severe winters coupled with snow leopard and wolf depredation. The wolf is found to



Map 1 : Recent citings of Tibetan argali in Nepal

**Koirala and Shrestha (1997)*
Shah (2001) +
Shah (2002)@**

are not spatially separated from the local livestock, which causes several threats to their survival. Therefore, urgency for the in situ conservation of this Trans-Himalayan species is warranted. ■

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