Asiatic ibex is a true goat (*Capra*) species. Note the relatively stocky build, adapted for life on rugged mountains

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Explorations of Himalayan Wildlife

Mountaineers are Key Stakeholders!

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In the high Himalaya it is imperative to not just work with local communities, but most other stakeholders. Along with the armed forces, government departments, welfare agencies, tourist agencies, and NGOs, mountaineers are key stakeholders in mountain conservation.

I had a childhood fascination for snowy Himalayan heights. But it was only in my early 20s that I got to see the Himalayan panorama from Kausani in the Kumaun hills. From Panch Chuli in the east, to Chaukhamba in the west was this amazing swath of stunning mountains. Trishul dominated the view, but for some reason, in the fading orange light of the evening, I was mesmerized by the Nanda Devi, hidden behind a veil of Mrigthuni. I relished sitting for hours on end with binoculars, observing the peaks turning different hues. Later, back at my University, I began reading up on the Nanda Devi explorations. The library at the GB Pant University of Agriculture & Technology had an excellent collection of books. I longed to some day visit the 'Sanctuary' so well described by the late Lavkumar Khachar in his writings. Well, over three decades later, the Mother has not yet called me into her sanctuary… but, she did awaken an insatiable desire for me to explore the Himalaya.

On weekends and holidays I often took off into the Kumaun hills, travelling almost randomly by bus, and walking aimlessly, visiting amazing places like Chaukori, Berinag, Binsar, Lohaghat; always relishing even a glimpse of the Greater Himalaya. These wanderings were surely uplifting but there was this urge to explore the deeper valleys of these ranges, not just enjoy the vista from afar...This deep desire was finally fulfilled when I switched from an education in agriculture to a Masters in wildlife sciences at the acclaimed Wildlife Institute of India in Dehradun. I got the chance to do a PhD on a wild goat, the Asiatic ibex, in the Pin Valley National Park in Spiti. The

six years I spent for this study, three of them with my wife, Krishna, are undoubtedly the best in my life. We were given a small *kuccha* 'bunker' in Gechang by the forest department and had great local assistants, Zangpo and Chimmet. Here, at 3800 m, in November '91, I had a sense of what life in the high Himalaya really means. I instantly developed a deep adoration for these trans-Himalayan 'barren' landscapes. I loved the open, rugged slopes where one could see for miles, the crisp mountain air and cheerful people.

The Asiatic ibex is a true goat species, from the genus *Capra,* a stocky animal with relatively short limbs, strong knees and a beard in both the sexes. The males are adorned with long scimitar horns and look very striking in the rutting coat – almost black with white on their saddle, underbelly and limbs. The study led to some pioneering understanding of the species' ecology. But importantly, I could begin to see the interaction of the whole ecosystem. How local people were quite a part of it but with changes happening, there were impacts too. The largely self-sustained agro-pastoral lifestyle of the Spitians was heavily dependent on the surrounding mountains for fuel, fodder, building material, pastures and very scarce arable land. Some of these small plots of land were in tiny hamlets a day or two's walk from their villages. Extraction of fuel and fodder did affect the local resources for the wild animals but the few livestock that they owned had little impact. On the other hand there were over 8000 sheep and goats from Kinnaur and Shimla districts that came into the upper lush pastures for just three summer months, but appeared to severely deplete the meagre forage. The local Spiti herders were mainly constrained by their ability to feed livestock during the long winter months when forage was dry and often covered in snow. Agricultural residue and grasses collected from remote cliffs were used to stall feed livestock. The migratory herds on the other hand utilized the relatively abundant forage in the warmer foothills in winter and the lush growth of the high altitudes in the summer flush, thus allowing them to maintain much larger herds.

I understood that in the cold desolate areas, survival and seeing through the long winter itself was a goal for the Spitians. They appeared to work hard for the six warmer months, just to see through the remaining six cold ones! I also realized that just the mere

Ladakh urial is a true sheep (Ovis) species. Note the relatively long limbs adapted for life in rolling terrain

presence of livestock needn't cause competition with wild herbivores and that it is the intensity and nature of use that is crucial. I was beginning to see how observation and science could help understand conservation issues. I had also begun developing a deeper respect for the local people and their self-sufficient lifestyles…

The Himalaya also has true sheep, the *Ovis.* I was keen to see these and got an opportunity years later, during exploratory surveys in Ladakh.

All along the mid-elevations of the Indus and the Shyok rivers occurs this endemic sheep – the Ladakh urial. Relatives of urial in the region between the Mediterranean and Caucasus, the mufflons, are believed to be the ancestors of the domestic sheep. The Ladakh urial is limited in distribution in Ladakh and Baltistan with just a few populations totalling about 3000 animals surviving at present. They are easy to see along the Leh-Kargil highway but their distribution is getting increasingly restricted, sandwiched between the ever-growing settlements along the valley bottom and inhospitable rugged habitat higher up. Many of their winter pastures, the small moist meadows along the valley bottom, have now been taken over by settlements, agriculture or plantations.

Urial are adapted to open, rolling country. They have relatively long limbs, similar to antelopes, meant to outrun predators, unlike the *Capra* that would seek refuge in cliffs when threatened. Sheep and goats are often thought to be very similar, but they are quite different in their morphology and foraging habits. A quick look at their evolution is thus worth some space here.

It all began with the separation of India, from the Gondwanaland in the mid-Cretaceous, some 100 million years ago and the formation of Asian mountains. When India left the Gondwanaland, angiosperms and large mammals had not fully evolved. This somewhat impoverished island drifted for over 40 million years till it pushed the Tibetan plateau up, and created the Tien Shan, Kunlun and other mountain chains, and finally the Himalaya, along the southern rim of the Tibetan plateau. Before this collision, forests thrived in the warm climate of the tropics to the east and vast grasslands in the flat cooler northern latitudes, with fauna adapted to these conditions. But this spurt of mountain building from the Eocene Epoch, 55 million years ago, through the Miocene and the Pliocene, gave rise to enormous new unclaimed habitats – cold, mostly arid, some rolling plateaus, some rugged mountains. Species from all fronts tried occupying the vacant niches – there were the cold adapted 'Palearctic' species from the north, the forest dwelling 'Oriental' from the east and the arid adapted 'Ethiopian' from the west that tried their luck in these new 3-dimensional habitats that were highly seasonal in abundance of forage. The ancestors of wild sheep and goats are believed to be

Goral, a primitive species related to wild sheep and goats, occurs in open forests in mid elevations of the Himalaya (Bivash Pandav)

forest dwelling species such as the extant goral – small, solitary species, with good camouflage, that relied on crypsis in forested and bushy habitats for escaping predators. These ventured on to the new mountain habitats evolving into the cliff dwelling *Capra* and the rolling slopes dwelling *Ovis*, thus occupying the two prominent vacant niches. These new species adapted to life in the open areas where being cryptic was no longer an option. They thus evolved large body sizes, prominent markings, and group living to forage and remain secure. Since there was frequent direct contact in groups males developed adornments-cum-weapons in the form of large horns of diverse shapes. Contests for females were an important step in their evolution and sheep and goats developed strategies suited to their respective habitats. Sheep rams would backup and ram into each other with their heavy horns on rolling slopes while goats would rear-up on their hinds and try to pin down the opponent in the steeper habitats. Sheep relied on a strategy of early detection and outrunning predators like the wolf using their long limbs, while the goats remained in the proximity of cliffs to make a quick retreat into these vertical rock faces where most predators such as snow leopard

Bharal, Pseudois, looks like a sheep but behaves like a goat

couldn't follow fast enough. Goats where also able to utilize the sparse forage clinging on to cliffs, often useful when the rest of the area was under deep snow. Probably their deftness on cliffs is why ibex is an icon for some of the Indian specialized mountain forces such as the Ladakh and the Dogra Scouts.

The Himalaya has over 20 large species of herbivores and barring three of these, sambar, wild pig and barking deer, all others are uniquely adapted to the mountains[1]. Ibex and markhor are true goats inhabiting the western mountains. Ibex is spread over large parts of Hindu Kush, Karakoram, western Himalaya, till the Sutlej and northwards through the Tien Shan, Kunlun, Altai into the Shyan mountains. Markhor is much more confined, occurring in patches in Kashmir and northern parts of Pakistan and Tajikistan. Another goat, the Wild Goat occurs in the warmer, Kirthar and salt ranges in Pakistan. The Ladakh *urial* and the Tibetan *argali* are true sheep,

1 See *HJ* Volumes 70 & 71

confined to the more rolling parts of Ladakh, while argali also occurs in Sikkim and rest of Central Asia, where many subspecies, including the Marco Polo sheep occur. The blue sheep or bharal is a *Pseudois*, a species that looks like a sheep but behaves like a goat, especially during the rut. *Bharal* is widespread all across the Tibetan plateau and the fringes of the Himalaya, often reaching the southern faces of the Greater Himalaya too. The Tibetan gazelle and Tibetan antelope (chiru) are closer to the antelopes and occur in small patches of eastern Ladakh and much of the Tibetan plateau. Chiru is known only from two places within India, the Chang Chenmo and the Daulet Beg Uldi in eastern Ladakh. Kiang is an equid spread over the rolling Tibetan plateau. In the Middle Himalaya and Shivaliks are other forest dwelling relatives of sheep-goats such as the takin (patchily in the eastern Himalaya), Himalayan tahr (all along the mid Himalaya from Sikkim to Jammu) and three species of goral (all along the mid Himalaya and Siwaliks), preferring open, steep forests, and the serow, occurring in denser forests (all through the Himalaya, but mainly in the eastern portions). There are at least four species of musk deer occurring in the sub-alpine belt of the Himalaya.

Preying on these are highly adapted carnivores such as the snow leopard and the Tibetan wolf in the higher elevations, and the common leopard, tiger and wild dog are important carnivores in the mid elevations. The brown and black bear are omnivores occasionally preying on these ungulates.

My work over the years has taken me to all species except the Tibetan antelopes, takins and wild goats. Some of these have been through rapid explorations and some through more sustained scientific studies. An important revelation through these surveys was that in the Greater Himalaya and the trans-Himalaya, wildlife was pervasive – occurring in areas outside the fairly expansive wildlife protected areas, but at relatively low densities. Human use was also quite widespread and communities utilized even remote valleys seasonally. With increasing human populations, rapid transformations and development pressures, Nature was increasingly under stress. Some of these threats are discussed here. We, along with other agencies are already dealing with the issues but I will leave out that portion, of innovative ways of tackling the threats, for another article.

I have already spoken about the competition posed by large livestock holdings of migratory herders. These are from specialized hardy communities such as Bakkarwals, Gaddis, Gujjars, who take their stock to high altitude areas in summer. Grazing removes forage and when the livestock numbers are very high and the grazing is spread all through the plant growth period, there is little time for recovery, with the result that little is left for the wild denizens of the area. These suffer forage loss both, during summer when outside livestock push them out and in winter, when nothing is left for them. There is evidence that with increasing demand for wool, milk and meat many of these herds have increased manifold, impacting the rangelands, possibly beyond repair. In Ladakh, there are the Changpa, a robust nomadic community, who have now specialized in rearing the *changra* breed of cashmere goats. The limited pastures of Changthang were used by the native Changpas but after the Chinese occupation of Tibet in the 1950s, many refugees came in with their stock. The households increased and so did the livestock population of the region. With closure of cross-border trade, the Changpas moved from a sheep dominated holding to a *pashmina* goat dominated one. This intensification of livestock grazing has again degraded pastures affecting cashmere production and quality. My group has been documenting the competition faced by species such as markhor in Kajinag, Kashmir, Tibetan gazelle and argali in Changthang and ibex in Lahaul. Over half of the Western Himalaya is affected by this threat, which seems to be intensifying over the years. With climate change, increasing aridity and unpredictability of winter snows, the problem is serious for both the herders and the wildlife of the area.

Pangi in Himachal Pradesh, Sarthal in Jammu, the Pir Panjal range, Shamsabari and Gurez in Kashmir, Tawang in Arunachal Pardesh are areas with fascinating wildlife but we have seen evidence of some organized poaching and remnants of traditional winter hunting practices. Villagers drive the wild herds into deep snow and then kill them. Wildlife is by and large sparse in these parts. Some already rare species such as markhor are under particularly high threat. Speaking of markhor, there is another interesting issue. Our work over a decade shows that they presently occur mainly in two small populations in Hirpura in the Pir Panjal range and the Kajinag mountains just north

of Baramulla-Uri towns; now confined in a fraction of the range that spanned most of south and western Kashmir just a few decades ago. Apart from increasing pressure from the Bakkarwal herders and some local hunting, the fence created along the Line of Control with Pakistan by Indian security forces to curb infiltration of militants is fragmenting markhor habitats and populations. With barely 300 left on the Indian side, the armed forces can greatly help in conservation of this species. The fence may remain unavoidable till political normalcy is restored, but they can possibly play a crucial role in ensuring no poaching of markhor in the area. Greater awareness among the units manning posts along this region can significantly help with this.

Like I mentioned earlier, bulk of the local inhabitants across the range are agro-pastoralists. Agriculture is limited to just one crop in small pockets of arable land on alluvial fans and some valley bottoms. Sustenance agriculture was practiced till a few decades ago but in many areas this has been replaced by high value cash crops such as green peas, other vegetables and fruit orchards. Livestock is also vital for local economy, with sheep-goats being reared for wool, *pashmina* and meat; yaks and cattle for milk, draught and meat; horses for transport, draught, and ceremonial purposes and the hardy donkey for transport. Some pockets also have the Bactrian camel that is used for draught and tourism. Many of these livestock types provide coarser hair that is used for making ropes, rugs, etc. Many areas where we have studied, livestock may outnumber native wild herbivores by over ten fold. They have always been preyed by wild carnivores but some areas can suffer significant damage. There are occasions when snow leopard may get into a livestock corral and kill tens of animals, causing tremendous economic loss and emotional distress to the herders. Herders may occasionally resort to kill snow leopard in retaliation. These days, there is some evidence that the fur and bones of such animals are finding their way into the illegal wildlife trade market too. With a huge people-wildlife interface, managing this issue poses a significant conservation challenge.

Crops are cultivated in the warmer summer season, when most wild ungulates naturally live at higher elevations. However, there is a small window during spring when the mountains still have sparse, dry forage but the crop fields have much more green biomass. This

Livestock depredation in a corral in Ladakh (Stanzin Namgail)

is the time when the winter-starved wild ungulates may raid crop fields, thus causing significant damage to the crops. With agriculture now spreading to higher elevations, aided by climate change and government schemes of allotting land to the landless, there are now some isolated fields that are vulnerable to crop depredation. We also have found that some of the newer crops such as green pea remain palatable through this season (unlike the native barley, which is mainly palatable during spring). Crop fields that are isolated, with palatable crops like green peas and importantly, that are near cliffs (preferred by animals such as bharal and ibex), are more vulnerable to crop damage. Such losses cause considerable economic loss and resentment among local people.

Much of the region, the higher altitudes of the Himalaya, has had relatively poor infrastructure – including roads, rail, and power lines. With growing strategic importance of these border areas and the people's rightful aspirations, there has been a significant thrust in the past decade to improve the infrastructure. Road access to border areas in all the five Himalayan states, for example, is being

given a strong impetus. Infrastructure in itself can be damaging to the ecosystem. However, this, along with other construction work, is bringing in more and more outside labour to the region. These relatively poor people from the plains of India and from Nepal often live under sub-optimal conditions in this cold, harsh terrain, and may get involved with poaching to supplement their food. They may even get involved with organized poachers and traders of forest resources. I saw clear evidence of this while working in Pangi. In Buddhist areas such as Spiti and Ladakh where poaching is rare, this aspect is adding a completely new threat to wildlife. We have seen instances of labourers who had cornered bharal in deep snow and were trying to stone them to death. Greater awareness, better living conditions of the labourers and accountability by the contractors can be helpful in minimising such instances. Almost the entire high altitude belt of the Himalaya is vulnerable to this theat.

Road construction in the Himalaya. The roads themselves, and the influx of outside labourers, who often hunt, cause harm to wildlife

Tourism is now reaching the remote corners of the mountains - the border areas of Ladakh, Sikkim, Tawang, Spiti, Pangi, Kisthwar, Kinnaur, Gangotri, Askot, are all receiving tourists of different hues; people seeking adventure, proximity to nature and the thrill of exploration. Wildlife tourism in parts of Ladakh and Spiti brings tourists in the peak of winter to see snow leopards. This has brought new and substantial income for local communities, which is a positive development. However, with improper planning, the usual problems that affect this sector in India – crowding, pollution, garbage accumulation, excessive extraction of local fuel and fodder, cultural dilution, are reaching these remote, till recently pristine areas. A related problem that has become significant in the past decade is the tremendous multiplication of free-ranging dogs. These essentially survive on the garbage available from tourist facilities, livestock carcasses and in some cases, garbage from the armed force camps. They multiply and large packs attack livestock, wildlife and even people. A major thrust for control of these dogs is key for both conservation and local economy. Animal Birth Control (ABC) along with garbage management are ways ahead on this issue.

There are just a handful of wildlife researchers in the high altitudes, where wildlife is spread widely, but sparsely, all along this range.

This picture shows a dog eating a freshly killed marmot (Abhishek Ghoshal)

Snow leopard is a flagship species representing the Himalayan high altitudes. It is widespread but occurs at very low densities (Steve Tracy)

Systematic research has been able to cover barely 3% of the 100000 sq km potential snow leopard range in India. Simply learning about the distribution and then abundance of species is an important first step for conservation, but there are large gaps in this regard. Understanding where to conserve a target species and under what threats, is a key conservation challenge in the Himalaya.

Conservation approaches in wildlife protected areas (PAs) have increasingly shifted to become more inclusive towards local communities in recent years. In the high Himalaya however, where much conservation needs to happen outside of PAs, it is imperative to not just work with local communities, but most other stakeholders. Along with the armed forces, government departments, welfare agencies, tourist agencies, and NGOs, mountaineers are key stakeholders in mountain conservation. With mounting threats, I see the need for a close partnership between conservationists and mountaineers. Both are passionate about mountains and so are natural partners in its conservation. There is a tremendous scope for mountaineers and trekkers to provide information on species records from their travels. The scientists can provide material that helps in

correct identification of species. There is scope of collaborations in exploration of remote mountain areas and tackling conservation issues wherever possible. One only has to see the magic that a fleeting glimpse of a snow leopard, or an ibex traversing a vertical slope, or the argali males ramming for winning over an eve, or a snow cock calling out early in the morning, can bring to an arduous climb. Mountaineer-naturalists are what we need!

Summary

A call to mountaineers and nature lovers to help conserve wildlife of the high Himalaya.

About the Author

YASH VEER BHATNAGAR did his PhD in Wildlife Sciences studying the Asiatic ibex in Spiti. He has continued to work over two decades in the Indian Himalaya on issues related to wildlife conservation and management. He works for the Mysuru based Nature Conservation Foundation and the Snow Leopard Trust (Seattle) and is presently advising governments in Himalaya and Central Asia on landscape level management planning.