

Mighty peaks and magnificent mammals

By Ranjana Pal, 20th July 2020

The Indian Himalaya are blessed with a splendour of peaks, glaciers and river systems. The birth of these mountains gave rise to novel ecological niches and produced some of the world's most diverse biodiversity hotspots. The various habitats, harsh weather, deep gorges, rugged terrain and high altitudes are a sanctuary for many rare and endemic mammals. Although there is a long history of Himalayan biodiversity exploration, several areas in the Himalaya still hold their secrets close. One such landscape is the Bhagirathi basin in the Western Himalaya—the upper catchment of the river Ganga.



The high elevation areas exemplify typical geographical features of the greater Himalaya: massive mountain peaks, complex U- and V-shaped valleys, and an intricate web of glaciers. Photo: Ranjana Pal

Situated in the laps of some of the mightiest peaks, the Gangotri glacier gives rise to the Bhagirathi River, a major tributary of the Ganga. From its origin, the river traverses 217 km, passing through diverse habitats (from 5,000 to 500 m) and forming a catchment area of 7,586 km². The pristine

alpine habitat and rocky valleys characterize a large proportion of the Upper Bhagirathi landscape. The lower part of the basin comprises forest patches interspersed with agricultural land and human settlements. Even amidst the modified human landscape, the steep slopes and rugged areas harbour dense forests. Gangotri National Park is the only protected area in the Bhagirathi basin, providing protection to species confined to the Trans-Himalaya and Greater Himalaya landscapes.



The only way to explore the remote corners of the Bhagirathi basin is on foot. Photo: Ranjana Pal

The rich alpine pastures attract herders in the summer season. For centuries forests in the lower part of the basin have been used for livestock grazing and extraction of non-timber forest products. Even though a shift in the lifestyle and income sources of local people has reduced pressure on the forest, these activities are still practised in remote villages. Mountaineering and pilgrimage also attract millions of tourists. Although the summer season provides new nutrients for animals, it also brings large numbers of people to these fragile landscapes, where species have to struggle to access precious resources.



In the summer, wild mammal species of the alpine area share the space with migratory livestock and herders
Photo: Ranjana Pal

The landscape of the Bhagirathi basin provides a unique opportunity to study the distribution of species over a range of elevations and in different habitats, and how they are affected by anthropogenic pressures. Our work started in 2015 when we carried out a brief reconnaissance survey, followed by camera trapping at 209 sites during October 2015–September 2017. We worked especially hard to ensure the sites were surveyed in both summer and winter. From our findings we are able summarize the diversity of mammals found in the Bhagirathi basin and the factors influencing the distribution of some of the threatened species that call it home.

Many wildlife species have now adapted to living in human-dominated landscapes and are changing their behaviour in response to human presence. Mountain-dwelling animals are no exception. In the Bhagirathi basin threatened mammals occur in habitats that are subjected to a range of anthropogenic use. Our study confirmed the presence of 39 non-volant mammal species in the Bhagirathi basin, their persistence attributable to the presence of a diversity of habitats, some of which are remote and pristine.



Bhagirathi is a stronghold for many mammals, including six threatened species: the snow leopard, common leopard, Himalayan brown bear, Asiatic black bear, musk deer and sambar. Photo: DST-NMSHE-Wildlife Institute of India

The seasonal absence of livestock grazing and people at higher elevations gives the wild species space in which to flourish. We also recorded five mammal species hitherto not recorded in the state of Uttarakhand: the argali, sand fox, woolly hare, Eurasian lynx and woolly flying squirrel. Our study showed Bhagirathi to be a stronghold of many species, including six threatened species (Himalayan brown bear, Asiatic black bear, snow leopard, common leopard, musk deer and sambar).

Our camera traps also recorded Asiatic wild dogs and tigers. Importantly, we found that the distribution of these threatened species overlaps with human activities in both time and space. Grazing is practised in almost all the alpine and subalpine areas in the summer, irrespective of the

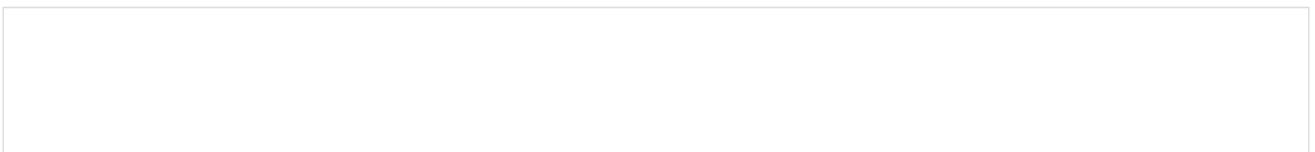
protection status of the area. The free-ranging feral dog population poses an added risk to these species. An additional problem is the recurrent burning of hill slopes to augment grass growth, resulting in altered structure and composition of vegetation.



Camera-trap image of dogs attacking sambar deer in Kheda valley in the Bhagirathi basin. The increasing presence of free-ranging dogs is a growing problem throughout this landscape. Photo: DST-NMSHE-Wildlife Institute of India

The forests in the lower (< 2,000 m) Bhagirathi basin are now fragmented, and anthropogenic activities in the high altitude areas are posing a threat to the native wildlife there. The long-term survival of this diverse array of species requires the support of multiple stakeholders, including scientists, government and local people. Infrastructure development (Char Dham Railway Project and the ongoing all-weather Char Dham Road Project) pose serious threats to these fragile mountain habitats and their wildlife species. We hope that our findings may help to achieve a balance between socioeconomic development and conservation of the rare and threatened species of the Bhagirathi basin.

The article [Mammals of the Bhagirathi basin, Western Himalaya: understanding distribution along spatial gradients of habitats and disturbances](#) is available in *Oryx—The International Journal of Conservation*.





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Ranjana Pal is an aspiring ecologist and a PhD Scholar at the Wildlife Institute of India, studying high altitude mammals of the Himalaya. She is interested in exploring the distribution and dynamics of animal populations and utilizing to advance conservation planning and implementation.