

Relative abundance, prey preference and niche partitioning of snow leopard (*Uncia uncia*) and Tibetan wolf (*Canis lupus chanku*) in Karakoram Pamir mountains

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Abstract

Reliable information about predator's abundance, their feeding habits, potential habitats and niches is imperative to understand the ecological interactions among herders, herbivores and carnivores on shared habitats. Therefore, the present study endeavors to fill knowledge gaps for the sustainable conservation and management of the remaining lot of endangered Snow leopard and Tibetan wolf in Khunjerab National Park (KNP) in Pakistan and Taxkorgan National Nature Reserve (TKNR) in China. Our results revealed that the Tibetan wolf and Snow leopard as the major predators in KNP, with an estimated population size of 30-35 with 0.006 Snow leopards in per km². Also, out of estimated total 822.7 kg km⁻² (animal's km⁻²) biomass, it was found that that livestock and ungulates offered around 66% and 34% diet for Snow leopard and Tibetan wolf collectively. Through scat analysis, results showed that both these predators rely heavily on livestock to fulfill food requirements. Moreover, Tibetan wolf was found having a large niche separation with Snow leopard, whereas, Snow leopard was found comparatively having greater niche than the Tibetan wolf. In the same vein, considering the large biomass needs of the carnivores and the low availability of wild prey, human-wildlife conflict is therefore an inevitable and critical issue in the region. Trans-boundary efforts are necessary to develop conservation management schemes that protect threatened wildlife species as well as provide support and benefits to the local communities living adjacent to KNP and TNR in the Karakoram and Pamir mountains of China and Pakistan. Top carnivores play an important role in maintaining energy flow and functioning of the ecosystem, and a clear understanding of their diets and foraging

strategies is essential for developing effective conservation strategies. In this paper, we compared diets and prey selection of snow leopards and wolves based on analyses of genotyped scats (snow leopards n = 182, wolves n = 57), collected within 26 sampling grid cells (5x5 km) that were distributed across a vast landscape of ca 5000 km² in the Central Himalayas, Nepal. Within the grid cells, we sampled prey abundances using the double observer method. We found that interspecific differences in diet composition and prey selection reflected their respective habitat preferences, i.e. snow leopards significantly preferred cliff-dwelling wild ungulates (mainly bharal, 57% of identified material in scat samples), whereas wolves preferred typically plain-dwellers (Tibetan gazelle, kiang and argali, 31%). Livestock was consumed less frequently than their proportional availability by both predators (snow leopard = 27%; wolf = 24%), but significant avoidance was only detected among snow leopards. Among livestock species, snow leopards significantly preferred horses and goats, avoided yaks, and used sheep as available. We identified factors influencing diet composition using Generalized Linear Mixed Models. Wolves showed seasonal differences in the occurrence of small mammals/birds, probably due to the winter hibernation of an important prey, marmots. For snow leopard, occurrence of both wild ungulates and livestock in scats depended on sex and latitude. Wild ungulates occurrence increased while livestock decreased from south to north, probably due to a latitudinal gradient in prey availability. Livestock occurred more frequently in scats from male snow leopards (males: 47%, females: 21%), and wild ungulates more frequently in scats from females (males: 48%, females: 70%).